



# EPIP 2021 CONFERENCE

## IP AND THE FUTURE OF INNOVATION

Madrid, 8-10 September, 2021



[epip2021.org](http://epip2021.org)

 @AssociationEPIP

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ACKNOWLEDGEMENTS



IRP-ALLIES (CNRS-CSIC) MIMA-CM (H2019/HUM-5859)

# WELCOME TO EPIP2021

Dear conference participants,

I am very happy to welcome you in Madrid for the 16<sup>th</sup> annual conference of the EPIP Association. The conference and preceding PhD workshop will take place between Wednesday 8 and Friday 10, September 2021 and will bring together scholars in the fields of economics, law, management science and political science as well as stakeholders and policy-makers for theoretical, empirical and policy-oriented presentations and discussions on intellectual property protection, science and innovation.

Originally planned for September 2020, the pandemic surprised us all and we decided to postpone it to 2021. The EPIP conference is finally taking place in Madrid in 2021 as a hybrid event, with about 30% of registered participants on-site and 70% online, from more than 30 different countries. Our aim is to make sure all participants, regardless of their location, have the chance to intervene in the debates, get feedback from colleagues and network with other participants. Those who travel to Madrid will have the advantage of enjoying Spanish food and do some real sight-seeing, though.

Warm regards to all, looking forward to seeing you around, on-site or online, at EPIP2021!



Catalina Martínez

EPIP2021 Organising Committee Chair

# 1. EPIP2021 ORGANISING COMMITTEE



**CATALINA MARTINEZ**  
**CSIC Institute of Public Goods and Policies**  
**EPIP Board Member**

Catalina Martínez is Tenured Scientist at the Institute of Public Goods and Policies at the Spanish National Research Council (CSIC-IPP) in Madrid since July 2006, Deputy Director of the institute between 2015 and 2018 and Advisor at the CSIC Vice-presidency of Organization and Institutional Relations between July 2018 and January 2021. With a PhD in Economics, before joining CSIC she worked at a consulting firm on competition economics in London and Brussels and at the OECD

Directorate of Science, Technology and Industry in Paris. Her research interests relate to science and technology policies, strategies and actors, with a focus on technology markets, internationalization of patent protection, academic inventors and science-industry links. Her published in Research Policy; Scientometrics; Journal of Technology Transfer; Economics of Innovation and New Technology; Technology Analysis and Strategic Management; Research Evaluation; Science and Public Policy; Industry and Innovation. She is member of the scientific committee of the Observatoire des Sciences et Techniques (Hcéres-OST) in France.



**LAURIE CIARAMELLA**  
**Télécom ParisTech & Max Planck Institute for Innovation and Competition**

Laurie Ciaramella is Assistant Professor at Telecom Paris - Institut Polytechnique de Paris, and Affiliated Research Fellow at the Max Planck Institute for Innovation and Competition. Laurie obtained her PhD in Economics from Mines ParisTech - PSL. She also holds a Master degree in Economics of Markets and Organizations from the Toulouse School of Economics. In her research, Laurie conducts empirical studies in economics of innovation, with a focus on markets for technology. She is particularly interested in the interplay of these markets and taxation, digital transformation and

firm growth. Laurie's PhD dissertation has received the Best Dissertation award, finalist of the TIM division of the Academy of Management 2018 in Chicago.



**DOMINIQUE GUELLEC**  
**Observatoire des Sciences et Techniques OST-Hcéres**

Dominique Guellec is Scientific Advisor at the Observatory of Science and Technology, a French government agency based in Paris. He contributes to the activities of the OST in the field of patent statistics and scientific publications. He leads a project using semantic analysis techniques on patent texts, in view of mapping technology evolution and the emergence and impact of novel ideas. Until August 2019, Dominique Guellec was responsible for science and technology policies at the Organization for Economic Cooperation and Development (OECD),

developing policy analysis and recommendations in these fields for around fifty countries. He had previously been responsible for science and technology statistics at the OECD, leading notably the Patent Statistics Manual in 2009. He was chief economist of the European Patent Office in 2004-2005, where he initiated the Patstat database. He has published numerous academic articles and several books on industrial property, innovation and economic growth, in French and English (among others: The Economics of the European Patent System, Oxford University Press, 2007).



### **GERARD LLOBET**

#### **Center for Economic and Financial Studies - Cemfi**

Gerard Llobet is Associate Professor of Economics at CEMFI. His research is in the area of industrial organization and competition policy. Most of his work has focused on innovation, how patents can foster it and their effects on competition and welfare. He has also made contributions in other areas, like energy markets, bank competition or the automobile industry. His works have been published in outlets like the Journal of Political Economy, Review of Financial Studies, the Journal of Law and Economics or Management Science.



### **JOOST POORT**

#### **University of Amsterdam, Institute for Information Law**

#### **EPIP Board member**

Joost Poort is Associate Professor and co-director of the Institute for Information Law. He works as an economist on various economic and multidisciplinary research projects in the field of copyright, telecommunications and media. Examples include studies on online piracy and enforcement measures against it, the financing of

European films and the extension or renewal of licences for telecommunications and commercial radio. On 18 February 2015, he defended his dissertation Empirical Evidence for Policy in Telecommunication, Copyright and Broadcasting. He graduated cum laude as a physicist at Utrecht University in 1996. A year later, he graduated in the Philosophy of Science. During his studies Joost spent a year in Ireland at University College Cork. After his studies, Joost started in 1998 as an economic researcher at Nyenrode Forum for Economic Research (NYFER), where he has been working as a senior researcher since 2000. From 2003 he worked at SEO Economic Research, initially as senior researcher and since 2008 as head of the Competition and Regulation cluster. Over the years, his research has increasingly focused on the economic aspects of copyright, telecommunications and media. Joost is lead author and in many cases project leader of a large number of studies and has written many articles and chapters in scientific, semi-scientific and popular media. He regularly speaks at scientific conferences and expert meetings and debates at home and abroad. In addition, he has written position papers and essays for various ministries and on several occasions was secretary of interdepartmental government committees. Since mid-2015 he has been an Honorary Economics Fellow at CREATE, the RCUK Centre for Copyright and New Business Models in the Creative Economy, at the University of Glasgow.



### **VALERIO STERZI**

#### **GREThA, University of Bordeaux and CNRS**

Valerio Sterzi is Associate Professor of Economics at the University of Bordeaux where he teaches economics of intellectual property rights and economics of innovation. He is also research fellow at GREThA, CNRS, and co-director and chairman of the Strategic and Scientific Committee of VIA Inno (<https://gretha.cnrs.fr/via-inno/>), the technological platform and center of expertise on patent analysis of the University of Bordeaux. His main research

interests relate to economics of innovation and economics of patents and his work appeared in international peer-reviewed scientific journals such as Research Policy, Industrial and Corporate Change, World Development, and Journal of Economics & Management Strategy. He has been the coordinator of a project funded by the French National Research Agency on the role of non-practicing entities in the European patent market (<https://npeie.org>).

## 2. EPIP BOARD

- Stefan BECHTOLD, ETH Zurich, Switzerland, **president**
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# 3. ORGANIZATIONAL INFORMATION

## → CONFERENCE VENUE

The EPIP2021 conference will take place at the Centre of Humanities and Social Sciences (CCHS) of the Spanish National Research Council (CSIC), Albasanz 26-28, 28037 Madrid.

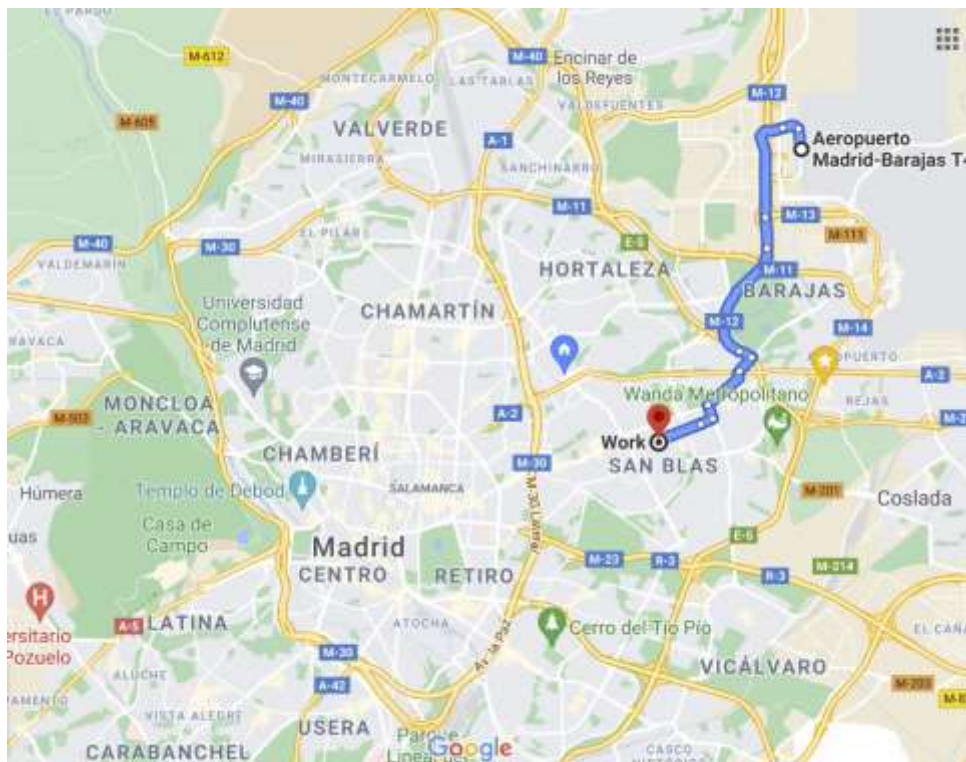


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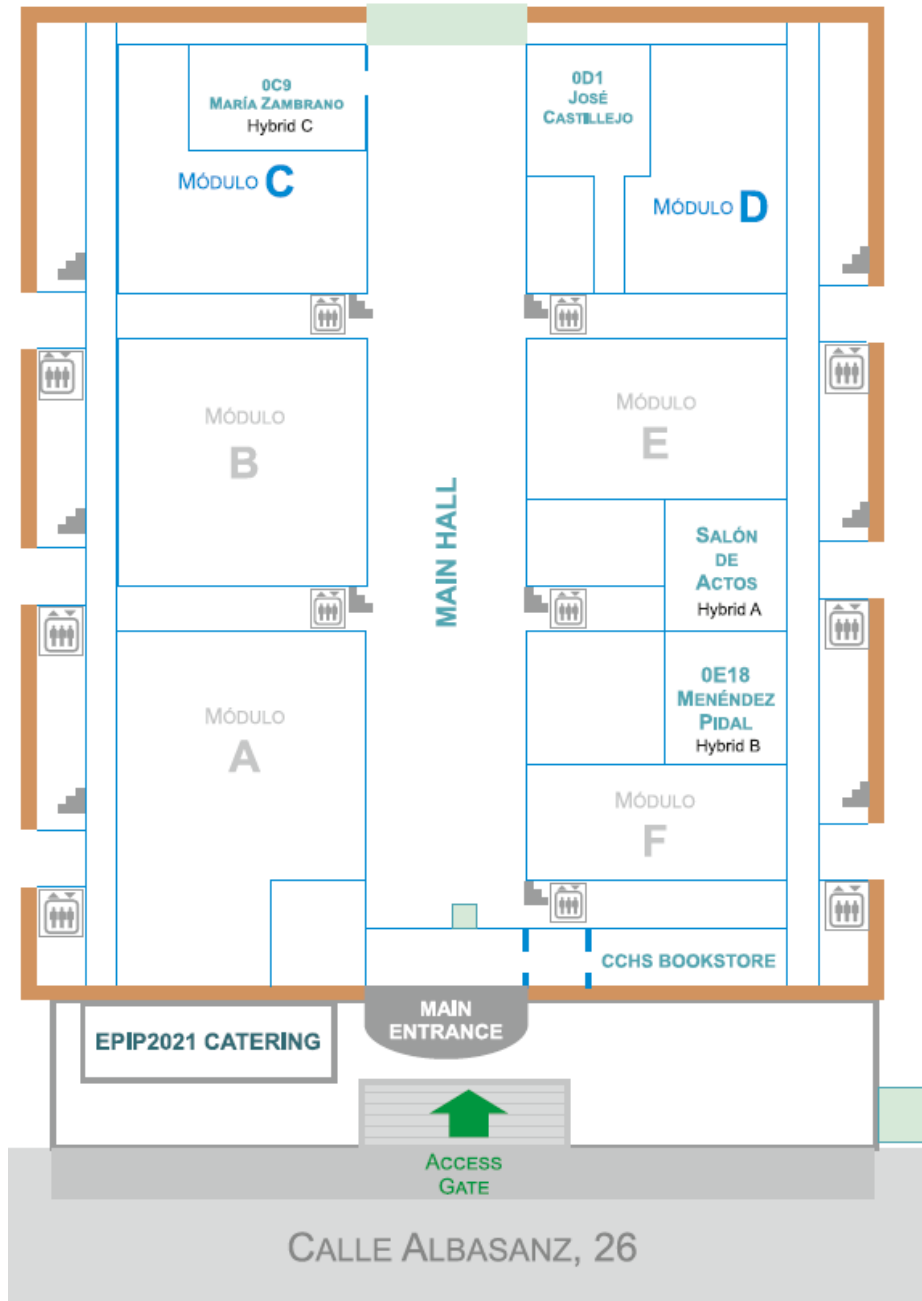


## → HOW TO GET TO THE CCHS-CSIC:

Metro line 5 (green line) direction Alameda de Osuna, stop Suanzes - 10' walk to get to CCHS-CSIC. More information: <http://cchs.csic.es/en/location>



→ CONFERENCE AREA IN THE BUILDING





## → CONFERENCE ROOMS

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**SALON DE ACTOS  
(Plenary & Hybrid A)**  
*Covid19 protocol capacity 75  
(normal capacity 248)*

Ground floor



**SALA MENÉNDEZ PIDAL  
(Hybrid B)**  
*Covid19 protocol capacity 26  
(Normal capacity 57)*

Ground floor [0E18]



**SALA MARIA ZAMBRANO (Hybrid C)**  
*Covid19 protocol capacity 32  
(normal capacity 65)*

Ground floor [0C9]



## → WELCOME COCKTAIL

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The EPIP2021 Welcome Cocktail is sponsored by the **PONS Foundation** and will take place at their venue, a villa at 138 Serrano Street, 28006 Madrid, close to the city center and in front of CSIC headquarters. With more than 15 years of existence, the Pons Foundation is a place open to exchange and knowledge that actively promotes social development with the aim and the illusion of being able to contribute to making a better future a reality. The PONS Foundation works to raise awareness of the importance of business innovation, R&D and innovation research and the defense of industrial and intellectual property for the social and economic progress of our society and to improve people's quality of life. It also works to promote the culture of talent, the responsible use of new technologies and the prevention of traffic accidents.  
<https://www.fundacionpons.org/>



## → GALA DINNER

The EPIP 2021 conference gala dinner will take place in the evening of 9 September, outside, at the **Instituto de Ciencias de la Construcción Eduardo Torroja (IETCC)** of the **Spanish National research Council, CSIC**, at 4 Serrano Galvache Street, 28033 Madrid. Transfer from the conference venue to the gala dinner is included in the registration fee for on-site participants. The IETCC, located among pine trees, is a milestone in industrial architecture and research, a model of interdisciplinary collaboration between architecture and engineering, inaugurated in 1953.

<https://www.ietcc.csic.es/>



Photos © Archivo IETCCe



## → OTHER INFORMATION

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### Conference Virtual Platform

A personal user name and password will be sent to all registered participants before the conference to access the conference virtual platform at:  
<https://event.meetmaps.com/epip2021/en/virtual/home>

Participants on-site willing to follow sessions online should bring their own portable computers and headphones. There will be room available (e.g. José Castillejo) for that purpose, properly indicated.

### Social Media

Please use the hashtag #epip2021 in your social media posts, updates and tweets, and follow @AssociationEpip on twitter.

### On-site participants and COVID-19 protocol

The Government of Spain has implemented a series of measures to protect the general public's health, including health control of passengers upon arrival in Spain. Remember, too, that when you return, you will have to check the conditions of entry to your respective countries of origin. These regulations change regularly depending on the evolution of the pandemic and the level of risk in both the country of origin and destination. The city of Madrid welcomes all participants who want to travel to Madrid in a safe way. Here is a link where you can check the latest information and advice on Coronavirus: <https://www.esmadrid.com/en/information-coronavirus>.

As organizers, we wish to reassure those who will be attending in person that we are doing all we can to plan all onsite activities in such a way that the official requirements as regards numbers of people, social distancing, ventilation etc. are respected in order to try to ensure the safety of all participants. Remember that you should not attend the conference on-site if you have symptoms compatible with COVID-19 (fever, cough, respiratory distress), if you have been diagnosed with COVID-19 in the last 14 days, or if you have had close contact with a confirmed case of COVID-19 in the last two weeks.

### Wireless Internet

Eduroam can be accessed throughout the CCHS-CSIC building. In addition, you may also access Internet in the building using WiFi SSID: EPIP 2021 Conference & Password: EPIP2021Conference

### Questions

Any other questions about practical aspects of EPIP should be addressed to [info@epip2021.org](mailto:info@epip2021.org)

### More Information

For more information about the conference, please also check the conference website [www.epip2021.org](http://www.epip2021.org).

# 4. CONFERENCE PROGRAMME

## → OVERVIEW 8-10 SEPTEMBER

Wednesday 8 September 2021	
8:30	Morning coffee
9:00	<div style="display: flex; justify-content: space-between;"> <div style="width: 60%;">EPIP 2021 PhD workshop</div> <div style="width: 35%; text-align: center;">Guided Tour</div> </div>
10:45	Coffee break
11:00	EPIP 2021 PhD workshop
13:30	Lunch
15:30	Afternoon coffee
16:00	Welcome with CSIC Deputy Vicepresident for Knowledge Transfer, OERW Director and EUIPO Executive Director
16:30	Keynote Speech "Tax policy and innovation" by Stefanie Stancheva
17:30	Coffee break
17:45	Roundtable on "Transatlantic Convergence and Divergence in Copyright Law & Policy", with Pamela Simonson, Benoit Hugoniholtz and Raquel Xalabarder
19:00	Wrap up first day
19:05	Buses to Pons Foundation
19:45	Welcome cocktail
21:00	Buses back to area of conference venue and city center

Thursday 9 September 2021	
8:30	Morning coffee
9:00	Parallel sessions-I
10:00	Interval
10:15	Parallel sessions-II
11:15	Coffee break
11:45	Parallel sessions-III
12:45	Interval
13:00	Roundtable on "Covid19 lessons for the Future of IP" with Dietmar Harhoff, Ellen 't Hoen, Anita McQueen and Chirantan Chatterjee
14:15	Lunch
15:15	EPIP Young Scholar Award & EPIP General Assembly
15:45	Keynote speech "Patent Metrics for Innovation Research: Overview, Update and Speculation" by Adam Jaffe
16:45	Coffee break
17:00	Parallel sessions-IV
18:15	Interval
18:25	Parallel sessions-V
19:25	Wrap up second day
19:30	Buses to CSIC Torroja Institute
20:00	Gala Dinner
23:00	Buses back to area of conference venue and city center

Friday 10 September 2021	
8:30	Morning coffee
9:00	Parallel sessions-VI
10:00	Interval
10:15	Roundtable on "IP & Competition" with Jorge Padilla, Claudia Tapia, Brittilise Vuogela and Gerard Llobet
11:30	Coffee break
12:00	Parallel sessions-VII
13:00	Interval
13:15	Parallel sessions-VIII
14:15	Lunch
15:30	Roundtable on "Challenges for Patent and Trademark Offices" with EPO, EUIPO, OEPM, USPTO, UK IPO and WIPO
16:45	Farewell

## → SCHEDULE 9 SEPTEMBER

		HYBRID-A	HYBRID-B	HYBRID-C	ONLINE-A	ONLINE-B	ONLINE-C	ONLINE-D
8:30	Welcome & Morning Coffee							
8:45	Parallel sessions I	I-HA	I-HB Themed	I-HC	I-OA Themed (WIPO)			
9:00								
10:00	Interval							
10:15	Parallel sessions II	II-HA	II-HB Themed	II-HC	II-OA Themed	II-OB Themed	II-OC	
11:15	Coffee break							
11:30								
11:45	Parallel sessions III	III-HA Themed	III-HB	III-HC	III-OA Themed (EPO)			
12:45	Interval							
13:00	Plenary	Roundtable on "Covid19 lessons for the Future of IP"						
14:15	Lunch				L-OA Themed			
15:15	Plenary	EPIP2021 Young Scholar Award & EPIP General Assembly						
15:40	Interval							
15:45	Plenary	Keynote speech by Adam Jaffe						
16:45	Coffee break							
17:00	Parallel sessions IV	IV-HA Themed	IV-HB Themed (WIPO)	IV-HC Themed	IV-OA Themed	IV-OB	IV-OC Themed	IV-OD
18:15	Interval							
18:25	Parallel sessions V	V-HA Themed	V-HB	V-HC	V-OA	V-OB	V-OC Themed	
19:25	Plenary	Wrap up 2nd day						

→ SCHEDULE 10 SEPTEMBER

10 September 2021		HYBRID-A	HYBRID-B	HYBRID-C	ONLINE-A	ONLINE-B	ONLINE-C
8:30	Welcome & Morning Coffee						
8:45	Parallel sessions-VI	VI-HA	VI-HB		VI-OA Themed	VI-OB	VI-OC
9:00				VI-HC			
10:00	Interval						
10:15	Plenary	Roundtable on "IP & Competition"					
11:30	Coffee break						
11:45							
12:00	Parallel sessions-VII	VII-HA	VII-HB	VII-HC	VII-OA	VII-OB	VII-OC
13:00	Interval						
13:15	Parallel sessions-VIII	VIII-HA	VIII-HB	VIII-HC	VIII-OA	VIII-OB	
14:15	Lunch						
15:30	Plenary	Roundtable on "Challenges for Patent and Trademark Offices"					
16:45	Farewell	Farewell					

# 5. PLENARY SESSIONS

→ WELCOME

Wednesday, 8 September 2021

16:00-16:30

Welcome Speeches

ROOM: PLENARY - SALON DE ACTOS



## STEFAN BECHTOLD

**Professor Intellectual Property, ETH, Zurich and EPIP President**

Stefan Bechtold is Professor of Intellectual Property at ETH Zurich, Switzerland. His research interests include intellectual property, Internet, privacy, telecommunications, and antitrust law, law & technology, as well as law & economics. He was a Visiting Professor at New York University School of Law (2014 & 2022) and the University of Haifa, a Senior Research Fellow at the Max Planck Institute for Research on Collective Goods, and spent research visits in Amsterdam, Berkeley, Chicago, Munich, and Singapore. Stefan Bechtold is a member of the foundation board of the Study Center Gerzensee (a foundation of

the Swiss National Bank), where he is involved in the organization of law & economics courses for doctoral students. He is also an affiliated faculty member of the ETH AI Center, a member of the Academic Advisory Board of the German Federal Ministry for Economic Affairs and Energy, advising the ministry on all issues of economic policy, a board member of the Society for Empirical Legal Studies, and an Advisor to the Copyright Project of the American Law Institute. From 2018 to 2021, he was Head of the Department of Humanities, Social and Political Sciences at ETH Zurich.



## ANA CASTRO

**Deputy Vice-president for Knowledge Transfer, VATC, Spanish National Research Council, CSIC**

Dr. Ana Castro is Deputy Vice-President for Knowledge Transfer at CSIC (VATC-CSIC) since March 2021. From VATC, CSIC aims to bring closer its capabilities, scientific and technological achievements to all national and international socio-economic sectors to transform them in social, economic and cultural well-being for society. Prior to taking this position, Ana held different management positions both at public and private sector, including Director of

Medicinal Chemistry Institute at CSIC for the last five years, President of the Board of the “Lora-Tamayo” Organic Chemistry Centre (CSIC) (2016-2018) and Secretary of the Spanish Society of Medicinal Chemistry (2011-2015).



## JOSÉ ANTONIO GIL CELEDONIO

**Director, Spanish Patent and Trademark Office, OEPM**

José Antonio Gil Celedonio is Director of the Spanish Patent and Trademark Office (OEPM) since 2018. Graduate in History and Master’s Degree in Diplomacy and International Relations from the Diplomatic School (MAEC). Prior to being nominated at Director of the OEPM, he served at the Consulate General of Spain in Lima and, as Civil Administrator of the State, as senior administrator at the Legal Coordination and International Relations Department at the OEPM, Manager of the National Lyric Theatre and Deputy

Assistant Director of International Cooperation and Foreign Educational Promotion of the Spanish Ministry of Education, Culture and Sport.





## CHRISTIAN ARCHAMBEAU

**Executive Director, European Union Intellectual Property Office, EUIPO**

Christian Archambeau is Executive Director of the EUIPO since October 1, 2018. He has been part of the Office's top management team since 1 December 2010, when he was appointed as Deputy Executive Director by the Council of the European Union. A native of Belgium, he graduated from Université libre de Bruxelles as a civil engineer and worked in construction in the Middle East before moving to the European Space Agency in facility management. Prior to joining the EUIPO (formerly known as OHIM), he held a number of senior positions in the European Patent Office in Infrastructure, Administration and Human Resources.

**ON-SITE CHAIR - CATALINA MARTINEZ, CSIC Institute of Public Goods and Policies.**

## → KEYNOTES

Wednesday, 8 September 2021

16:30 - 17:30

Keynote Speech

ROOM: PLENARY - SALON DE ACTOS



## STEFANIE STANTCHEVA

**Professor of Economics, Harvard University**

*Tax policy and innovation. This talk will review the effects of tax policy on innovation and point to directions for policy design to foster innovation. It will discuss the possible channels through which general tax policy (income and corporate taxes) can affect innovation. It will also provide empirical evidence of these effects, based on cross-country modern patent data, as well as long-run historical patent data for the US.*

Stefanie Stantcheva is Professor of Economics at Harvard University. Her research focuses on how to improve the tax and transfer system for firms and individuals. She combines theory and empirics to study the effects of taxes and transfers on economic outcomes and how to incorporate these effects into our tax models. Stefanie focus on three main topics: 1) The dynamic, long-run effects of taxes on innovation, human capital, and wealth; 2) The determinants of our social preferences, attitudes, and perceptions that ultimately drive support for redistribution. For this, she conducts large-scale online surveys and experiments. 3) The effects of taxes in imperfect markets with informational frictions and rents. Since May 2018, she has been a member of the French Council of Economic Advisers (Conseil d'Analyse Economique). Starting January 2020, Stefanie is also co-editor at the Quarterly Journal of Economics. She received my Ph.D. in Economics from MIT in 2014 and was a junior fellow at the Harvard Society of Fellows 2014-2016 before joining the Harvard Department of Economics in July 2016.

**ON-SITE CHAIR - VALERIO STERZI, GREThA, University of Bordeaux and CNRS**

**ONLINE CHAIR - LAURIE CIARAMELLA, Telecom ParisTech & Max Planck Institute for Innovation and Competition**

Thursday, 9 September 2021

15:45 - 16:45

Keynote Speech

ROOM: PLENARY - SALON DE ACTOS



### ADAM B. JAFFE

Research Professor at Brandeis University and Senior Lecturer at the Sloan School of Management at M.I.T.

*Patent Metrics for Innovation Research: Overview, Update and Speculation.* Patent data have been a workhorse of innovation research since Jacob Schmookler tested the demand-pull theory by looking at 19th century railroad patents. Recent expansions in the amount of public information about the examination process, applications of Natural Language Processing ('NLP') algorithms to patent text and

increases in computing power have led to development of new metrics and research methods. I will survey these developments, attempt to assess their significance, and speculate as to where they will take us.

Adam B. Jaffe is Research Professor at Brandeis University and Senior Lecturer at the Sloan School of Management at M.I.T. From 2013-17 he was Director and Senior Fellow of Motu Economic and Policy Research in Wellington New Zealand. He came to Motu from Brandeis University, where he was the Fred C. Hecht Professor in Economics, Chair of Economics and Dean of the Faculty of Arts and Sciences. Jaffe's research focuses on the economics of research and innovation, particularly the relationship between public research and commercial innovation, the measurement of the impacts of research, and the role of the patent system. He is an Editor of Research Policy and the Chair of the U.S. National Academies Board on Science, Technology and Economic Policy. Jaffe is the author of over 100 scholarly articles and two books—Patents, Citations and Innovations: A Window on the Knowledge Economy (with Manuel Trajtenberg, 2002); and Innovation and Its Discontents: How Our Broken Patent System is Endangering Innovation and Progress and What to Do About It (with Josh Lerner, 2004). Jaffe is Principal Investigator for the Sloan-Foundation-funded Innovation Information Initiative (<https://iii.pubpub.org/>), which is building a network of researchers to foster standardized sharing through open access of innovation metrics based on patent data.

ON-SITE CHAIR - DOMINIQUE GUELLEC, OST-Hcéres

ONLINE CHAIR - LAURIE CIARAMELLA, Telecom ParisTech & Max Planck Institute for Innovation and Competition

→ PANEL on TRANSATLANTIC CONVERGENCE AND DIVERGENCE IN COPYRIGHT LAW & POLICY

Wednesday, 8 September 2021

17:45 - 19:00

Roundtable

ROOM: PLENARY - SALON DE ACTOS

*Moderated by Prof. Raquel Xalabarder, Prof. Pamela Samuelson and Prof. Bernt Hugenholtz will discuss transatlantic convergence and divergence in copyright law and policy. A focal point will be intermediary liability for online infringement after Article 17 and the prospects of similar legislation in the US, given transatlantic differences in the policy towards big tech.*



## **BERNT HUGENHOLTZ**

**Professor of Intellectual Property Law, Institute for Information Law, University of Amsterdam**

Bernt Hugenholtz is Professor of Intellectual Property Law at the University of Amsterdam, Institute for Information Law (IViR). He is also Professor II at the University of Bergen (Norway), and Visiting Professor at Charles University (Prague). Prof. Hugenholtz is a world-leading expert in the field of international and European copyright law, and a regularly invited speaker at international conferences. In 1989, he received his doctorate cum laude from the University of Amsterdam for his dissertation on the legal protection of databases ('Auteursrecht op informatie'). He is the co-author, with Professor Paul Goldstein (Stanford University), of *International Copyright. Principles, Law, and Practice* (4rd. ed., Oxford University Press, 2019), and the co-author, with Professor Thomas Dreier (TU Karlsruhe), of *European Copyright Law* (2nd ed., Kluwer Law International, 2016). He has acted as a consultant to the World Intellectual Property Organisation (WIPO), the OECD, the European Presidency, the European Commission, the European Parliament, the government of the Netherlands and several other national governments, and has produced studies for the European Commission, the European Parliament, WIPO, UNESCO and various Dutch government agencies. He is the General Editor of the Information Law Series, published by Kluwer Law International. He is one of the founders of the Wittem Group that drafted the European Copyright Code, and co-founder and member of the European Copyright Society. He is including the annual Fordham Conferences on International Intellectual Property Law & Policy in New York and Cambridge. Prof. Hugenholtz teaches at the University of Amsterdam, the University of Bergen (Norway), Charles University (Prague), the Munich IP Law Centre, the University of Alicante, Católica Global School of Law (Lisbon), and occasionally at other universities. He was a member of the Amsterdam Bar from 1990 to 1998, and is currently an adjunct-judge at the Court of Appeals in Arnhem/Leeuwarden.



## **PAMELA SAMUELSON**

**Professor of Law, University of California at Berkeley**

Pamela Samuelson is the Richard M. Sherman '74 Distinguished Professor of Law at the University of California at Berkeley and a Co-Director of the Berkeley Center for Law & Technology. She has taught courses on intellectual property, cyberlaw, and information law. She has written and spoken extensively about the challenges that new information technologies pose for traditional legal regimes, especially for intellectual property law. She is a member of the American Academy of Arts & Sciences, a Fellow of the Association for Computing Machinery (ACM), a Contributing Editor of *Communications of the ACM*, a past Fellow of the John D. & Catherine T. MacArthur Foundation, and an Honorary Professor of the University of Amsterdam. She is a co-founder and chair of the Board of Directors for Authors Alliance, a nonprofit whose mission is to facilitate authorship in the public interest. She is also Chair of the Board of Directors of the Electronic Frontier Foundation, as well as a Fellow of the Center for Democracy & Technology, and a member of the Advisory Boards for Public Knowledge and the Electronic Privacy Information Center. A 1971 graduate of the University of Hawaii and a 1976 graduate of Yale Law School, Samuelson was a litigation associate with the New York law firm Willkie Farr & Gallagher before turning to academic pursuits. From 1981 through June 1996 she was a member of the faculty at the University of Pittsburgh Law School. She has been a member of the Berkeley faculty since 1996 and a Visiting Professor at Columbia, Cornell, Emory, Fordham, Harvard, and NYU Law Schools.



## RAQUEL XALABARDER

Chair of Intellectual Property, Universitat Oberta de Catalunya, Barcelona, Spain

**MODERATOR:** Doctor in Law (J.S.D.), University of Barcelona, 1997. Master of Laws (LLM), Columbia University Law School, New York, 1993. Law Degree (J.D.), University of Barcelona, 1988. Visiting Scholar at Columbia University Law School (Fulbright Scholar), New York, 2000-2001. Honorarvertrag at Max-Planck-Institute for Intellectual Property and Competition Law, Munich, 2008.

Tutor of IP courses for the WIPO Academy (since 2000). Member of the European Copyright Society (ECS) and the ALAI - currently, vicepresident of the ALAI Spanish Group ALADDA. She has extensively taught and written in the fields of Intellectual Property, Private International Law, and Internet Law. Since 1997, she has been working at the Universitat Oberta de Catalunya (UOC) where she was Director of its Law Degree (Feb.2002 -Sept.2007) and Adjunct Director to the Vicerectorate of Academic Affairs and Faculty (Nov.2008 - Sept.2013).

**ON-SITE CHAIR:** JOOST POORT, University of Amsterdam, Institute for Information Law

## → PANEL on COVID 19: LESSONS FOR THE FUTURE OF IP

Thursday, 9 September 2021

13:00 - 14:15

Roundtable

ROOM: PLENARY - SALON DE ACTOS

*The covid19 pandemic has brought intellectual property, private incentives, public funding and access to essential knowledge and assets to the forefront of the debate. This roundtable gathers renowned international experts on innovation, public health and intellectual property rights to exchange views on the role of IP for collaborative innovation and access to essential knowledge for medicines R&D in an interconnected world facing recurring pandemics. The round table shall also discuss strengths and weaknesses of the current IP system & offer normative approaches for incentives for innovation to respond to tomorrow's diseases and pandemics.*

## DIETMAR HARHOFF\*

Director at the Max Planck Institute for Innovation and Competition and Professor for Entrepreneurship and Innovation at the Ludwig-Maximilians-Universität (LMU) Munich

*\*Could not attend due to unforeseen obligations*

Dietmar Harhoff is Director at the Max Planck Institute for Innovation and Competition and Professor for Entrepreneurship and Innovation at the Ludwig-Maximilians-Universität (LMU) Munich. His research focuses



on innovation, entrepreneurship, intellectual property, and industrial economics. Before assuming his current position at the Max Planck Institute for Innovation and Competition, Dietmar Harhoff was Full Professor and Director of the Institute for Innovation Research, Technology Management and Entrepreneurship at LMU Munich (1998-2013) and Associate Director of the Centre for European Economic Research (ZEW) (1995-1998). Many of his contributions have focused on intellectual property, the design of IP institutions and the determinants and outcomes of innovation processes. Dietmar Harhoff is Fellow of the Centre for Economic Policy Research (CEPR) and elected member of the German Academy of Science and Engineering (acatech), the German National Academy of Sciences Leopoldina, and the Bavarian Academy of Sciences

and Humanities (BAW). He has served in advisory functions to private and public organizations at various times. Since 2004, he has been a member of the Scientific Advisory Boards of the Federal Ministry of Economics. From 2008 to 2013, he was a member of the Economic Advisory Group on Competition Policy (EAGCP). From 2012 to 2015, he chaired the Economic and Scientific Advisory Board (ESAB) at the European Patent Office. From 2007 to 2019, he was Chairman of the Commission of Experts for Research and Innovation (EFI) who presents annual reports on research, innovation and technological performance to the German Chancellor. In 2019, he was appointed chair of the Commission for the establishment of the German Agency for Disruptive Innovation (SPRIND). He is now member of the SPRIND supervisory board, director at the BIDT (Bavarian Research Institute for Digital Transformation) and member of the Bavarian Council on AI. Dietmar was a founding member of the EPIP Association.



## ELLEN 'T HOEN

### LLM PhD, Director of Medicines Law & Policy

Ellen 't Hoen (1960) is the director of **Medicines Law & Policy** (<https://medicineslawandpolicy.org/>), a group of legal and policy experts offering advice to international organizations and governments. From 1999 until 2009 she was the director of policy for Médecins sans Frontières. In 2009 she joined UNITAID in Geneva to set up the Medicines Patent Pool (MPP). She was the MPP's first executive director until 2012. She has published widely and is the author of several books. In 2017 she received the Prix Prescrire for her book *Private Patents and Public Health: Changing intellectual property rules for public health*. In 2005, 2006, 2010, 2011 and in 2020 she was listed as one of the 50 most influential people in intellectual property by the journal *Managing Intellectual Property*. In 2020, the King of the Netherlands appointed her *Officer of the Order of Oranje-Nassau*, in recognition of her work on access to medicines. She has a master's degree in law from the University of Amsterdam and a PhD from the University of Groningen where she remains a Global Health Law Fellow at the law faculty.



## ANITA M. MCGAHAN

### University Professor and George E. Connell Chair in Organizations and Society, University of Toronto

Anita M. McGahan is University Professor and George E. Connell Chair in Organizations and Society at the University of Toronto. Her primary appointments are at the Rotman School of Management and the Munk School of Global Affairs and Public Policy. She is cross appointed to the Medical School and the Dalla Lana School of Public Health; is Senior Associate at the Institute for Strategy and Competitiveness at Harvard University; is the Chief Economist in the Division of Global Health Innovation at the Massachusetts General Hospital; and is a past President of the Academy of Management. From 2014 to 2019, she was a faculty member of the MacArthur Foundation Research Network on Opening Governance. McGahan's credits include four books and over 150 articles, case studies, notes and other published material on competitive advantage, industry evolution, and global health. Her current research emphasizes entrepreneurship in the public interest and innovative collaboration between public and private organizations. Her recent work emphasizes innovation in the governance of technology to improve global health.



## CHIRANTAN CHATTERJEE

**MODERATOR** - Associate Professor IIMA & Visiting Fellow (Hoover Institution, Stanford University)

Chirantan Chatterjee is an associate professor in economics and strategy at the Indian Institute of Management, Ahmedabad (IIMA), where he also holds the ICICI Bank Chair in Strategic Management. Chatterjee is also the Chairperson for the Centre for Management of Health Services at IIMA. Currently a Visiting Fellow, Chatterjee is a former Campbell and Edward Teller National Fellow at Hoover Institution, Stanford University. His current research on global health economics is supported by Wellcome Trust India Alliance Grant, Alliance for a Healthy World Launchpad at Johns Hopkins University and Dinesh Thakur Foundation. Chatterjee earned his Ph.D. & M.Phil. from Carnegie Mellon University in public policy and management. His work is published in the RAND Journal of Economics, Research Policy, Production and Operations Management, Journal of Health Economics, Social Science and Medicine, The Journal of Law & Economics, Strategy Science, Journal of Business Ethics, Stanford Social Innovation Review and Harvard Business Review. In the past, Chatterjee’s research has been supported by World Bank, Pfizer, Qualcomm, US National Science Foundation and Sloan Foundation. He is joining SPRU-Sussex from Fall 2021 as a tenured Reader in Economics of Innovation.

### → PANEL on IP AND COMPETITION

Friday, 10 September 2021

10:15 - 11:30

Roundtable

ROOM: PLENARY - SALON DE ACTOS

*Intellectual property and antitrust can both contribute to innovation. IP seeks to reward innovators for their investment and risk. Antitrust, by laying out a level playing field, provides incentives for firms to invest to get ahead and obtain a competitive advantage. While properly applied IP and antitrust could be complementary in fostering innovation, in recent years we have seen many instances in which they have been in conflict.*



## JORGE PADILLA

**Senior Managing Director and Head of Compass Lexecon Europe**

Dr. Jorge Padilla is Senior Managing Director and Head of Compass Lexecon Europe. Dr. Padilla earned M. Phil and D. Phil degrees in Economics from the University of Oxford. He is Research Fellow at the Centro de Estudios Monetarios y Financieros (CEMFI, Madrid) and teaches competition economics at the Barcelona Graduate School of Economics (BGSE). He has given expert testimony before the competition authorities and courts of several EU member states, as well as in cases before the European Commission. Dr. Padilla has submitted written testimony to the European General Court, and the UK Competition Appeals Tribunal in cartel, merger control and abuse of dominance cases. He has also given expert testimony in various civil litigation (damages), international arbitration cases, and competition cases in non-EU jurisdictions (Argentina, Chile, China, Colombia, India, Israel, Jamaica, South Africa and Turkey). Dr. Padilla has written numerous papers on competition policy and industrial organization in the Antitrust Bulletin, the Antitrust Law Journal, the Economic Journal, the European Competition Journal, the European Competition Law Review, the Fordham International Law Journal, Industrial and Corporate Change, the International Journal of Industrial Organization, the Journal of Competition Law and Economics, the Journal of Economics and Management Strategy, the Journal of

Economic Theory, the RAND Journal of Economics, the Review of Financial Studies, the University of Chicago Law Review, and World Competition. He is also co-author of The Law and Economics of Article 102 TFEU, 2nd edition, Hart Publishing, 2013.



## **CLAUDIA TAPIA**

### **Director IPR Policy at IPR & Licensing within the Ericsson Group**

Dr. Claudia Tapia is Director IPR Policy and Legal Academic Research at Ericsson. With over 49,000 granted patents, Ericsson has emerged as the company holding the strongest radio communication patent portfolio in the industry covering 2G, 3G and 4G cellular standards. Claudia's main responsibility is related to research, strategy and policy in the IP field. Prior to joining Ericsson, Claudia was Director IP Policy at BlackBerry. While at BlackBerry, she focused on various aspects of intellectual property, including intellectual property rights policies in standards, global patent policies, as well as licensing and litigation. Claudia is also president of 4iP Council, a non-profit research council dedicated to developing high-quality academic insight and empirical evidence on topics related to IP and innovation. Claudia holds a law degree from the University of Valencia, an LLM degree specialising in International Patent Law from the Ludwig-Maximilian University in Munich and a PhD degree (summa cum laude with a scholarship of the Max Planck Institute) on FRAND and Standardisation in the telecoms sector from the Faculty of Law in Augsburg. She is Member of the Editorial Board of The Patent Law magazine and Intellectual Property Magazine. Originally from Argentina, but brought up in Spain and residing in Germany, she is truly a global citizen, and speaks English, Spanish and German.



## **REINHILDE VEUGELERS**

### **Full Professor of Economics, KULeuven**

Prof Dr. Reinhilde Veugelers is a full professor at KULeuven (BE) at the Department of Management, Strategy and Innovation. She is a Senior Fellow at Bruegel since 2009. She is also a CEPR Research Fellow, a member of the Royal Flemish Academy of Belgium for Sciences and of the Academia Europeana. From 2004-2008, she was on academic leave, as advisor at the European Commission (BEPA Bureau of European Policy Analysis). She served on the ERC Scientific Council from 2012-2018 and on the RISE Expert Group advising the commissioner for Research. She is a member of VARIO, the expert group advising the Flemish minister for Innovation. She is currently a member of the Board of Reviewing Editors of the journal Science and a co-PI on the Science of Science Funding Initiative at NBER. With her research concentrated in the fields of industrial organisation, international economics and strategy, innovation and science, she has authored numerous well cited publications in leading international journals. Specific recent topics include novelty in technology development, international technology transfers through MNEs, global innovation value chains, young innovative companies, innovation for climate change, industry science links and their impact on firm's innovative productivity, evaluation of research & innovation policy, explaining scientific productivity, researchers' international mobility, novel scientific research.



## GERARD LLOBET

**MODERATOR** - Associate Professor, CEMFI

Gerard Llobet is Associate Professor of Economics at CEMFI. His research is in the area of industrial organization and competition policy. Most of his work has focused on innovation, how patents can foster it and their effects on competition and welfare. He has also made contributions in other areas, like energy markets, bank competition or the automobile industry. His works have been published in outlets like the Journal of Political Economy, Review of Financial Studies, the Journal of Law and Economics or Management Science

**ONLINE CHAIR:** TATIANA ROSÁ, Universidad Católica de Chile

### → PANEL on CHALLENGES FOR PATENT AND TRADEMARK OFFICES

Friday, 10 September 2021

17:45 - 19:00

Roundtable

ROOM: PLENARY - SALON DE ACTOS

*The Chief Economists of the World Intellectual Property Office (WIPO), the European Patent Office (EPO), the European Intellectual Property Office (EUIPO) and the United States Patent and Trademark Office (USPTO), the Chief Analyst of the UK Intellectual Property Office (UK IPO) and the Director of the Spanish Patent and Trademark Office (OEPM) will exchange views on the current challenges faced by national and international patent and trademark offices and the measures they taken by their offices to address them.*



## CARSTEN FINK

**Chief Economist, WIPO**

Carsten Fink is the Chief Economist of the World Intellectual Property Organisation (WIPO) based in Geneva. Before joining WIPO, he was Professor of International Economics at the University of St.Gallen. He also held the positions of Visiting Professor at the Fondation Nationale des Sciences Politiques (Sciences Po) in Paris and Visiting Senior Fellow at the Group d'Economie Mondiale, a research institute at Sciences Po.

Prior to his academic appointments, Mr. Fink worked for more than 10 years at the World Bank. Among other positions, he was a Senior Economist in the International Trade Team of the World Bank Institute, working out of the World Bank's office in Geneva and an Economist in the Trade Division of the World Bank's research department, based in Washington, DC. Mr. Fink's research work - focused on intellectual property, innovation, and international trade - has been published in academic journals and books. He holds a doctorate degree in economics from the University of Heidelberg in Germany and a Master of Science degree in economics from the University of Oregon in the United States.



## YANN MÉNIÈRE

**Chief Economist, EPO**



Yann Ménière joined the EPO as Chief Economist in February 2016. He has many years of extensive experience of providing economic insights into issues relating to patents, innovation and economic growth and contributes high-level expertise and analysis to public and expert forums on a regular basis. Yann led the chair on IP and Markets for Technology at MINES ParisTech where he was previously a professor of economics. He also lectured on the economics of IP at Imperial College London, the Université catholique de Louvain (Belgium) and CEIPI. His research and expertise relate to the economics of innovation, competition and intellectual property.



## **NATHAN WAJSMAN**

### **Chief Economist, EU Observatory on Infringements of IP Rights, EUIPO**

Born in Wrocław, Poland and a dual Polish/Danish national, Nathan Wajzman was educated at the University of Aarhus in Denmark and later undertook graduate studies in the USA, earning a PhD in Economics from the University of Florida and an MBA from Temple University in Philadelphia. Dr. Wajzman was named Chief Economist of the EUIPO in May 2011. He has been with the agency since 2007, previously working in Finance and Quality Management. Prior to joining the EUIPO, he spent 20 years working in the private sector. A stint as a forecasting analyst at an electric utility in Florida was followed by a career in telecommunications and finance industries in the USA and several European countries, including positions with AT&T in the USA and Belgium, Swiss Reinsurance Company in Zurich, and Claranet Benelux, a managed hosting and internet service provider in the Netherlands.



## **ANDREW TOOLE**

### **Chief Economist, USPTO**

Dr. Andrew Toole is the Chief Economist at the U.S. Patent and Trademark Office (USPTO) and a Research Associate at the Centre for European Economic Research (ZEW). Dr. Toole joined the USPTO with experience in the private sector, academia, and government. While completing his PhD in economics at Michigan State University, Andrew Toole was a Senior Economist for Laurits R. Christensen Associates where he conducted studies on total factor productivity, cost and price analysis, and competitive strategy. In 1998, Dr. Toole went to Stanford University as a postdoctoral student before becoming a faculty member at Illinois State University and Rutgers University in New Jersey. As an academic researcher, Dr. Toole was asked to advise on science and technology policy issues for institutions such as the U.S. National Academies of Science, U.S. National Institutes of Health, and the U.S. Department of Agriculture (USDA). In 2010, he joined the Science Policy Branch of USDA's Economic Research Service. His research focuses on the economics of innovation, intellectual property, and related science and technology policies. Dr. Toole has published in the Journal of Law and Economics, the Review of Economics and Statistics, Research Policy, Management Science, and many other peer-reviewed journals.



## **SAM BRAND**

### **Chief Analyst, UK Intellectual Property Office**

Sam Brand joined the UK Intellectual Property Office as Chief Analyst in June 2021. He leads the UKIPO's economics, research, statistics, management information and business intelligence activities. Sam has previously worked as Deputy Director of Covid analysis at the UK Business Department, Deputy Director of EU Exit Analysis in the UK Department for Exiting the EU, and Chief Economist

at the UK Home Office. He has a degree in Economics from Southampton University and a Masters in Economics from the London School of Economics



## **JOSÉ ANTONIO GIL CELEDONIO**

**Director, OEPM**

Director of the Spanish Patent and Trademark Office (OEPM) since 2018. Graduate in History and Master's Degree in Diplomacy and International Relations from the Diplomatic School (MAEC). Prior to being nominated at Director of the OEPM, he served at the Consulate General of Spain in Lima and, as Civil Administrator of the State, as senior administrator at the Legal Coordination and International Relations Department at the OEPM, Manager of the National Lyric Theatre and Deputy Assistant Director of International Cooperation and Foreign Educational Promotion of the Spanish Ministry of Education, Culture and Sport.

**MODERATOR - CATALINA MARTÍNEZ, CSIC Institute of Public Goods and Policies**

**ONLINE CHAIR - MALWINA MEJER, European Commission**

# 6. PARALLEL SESSIONS

## PARALLEL SESSIONS I

→ Parallel SESSION I - HA

Thursday, 9 September 2021

9:00 - 10:00

Themed session

ROOM: HYBRID A - SALON DE ACTOS

**Chair:** Joost Poort (University of Amsterdam)

### Presentations:

→ THE IMPACT OF IMPLEMENTING A 25-YEAR REVERSION/TERMINATION RIGHT

**Paul Heald** (University of Illinois)

European regulators re-evaluating the power of authors to terminate the assignment of a copyright or to benefit from a statutory rights reversion can take valuable lessons from a recent empirical study of the proposed 25-year reversion/termination right in Canada. The data and analysis are clearly relevant to the European situation and demonstrate how enhancing author rights increases the availability of works to the public (in addition to relieving authors from over-reaching contracts). The paper details a concrete framework for a termination right that can be crafted to overcome any possible negative effects that might follow from rights reversion.

→ A DEEPER LOOK INTO THE EU TEXT AND DATA MINING EXCEPTIONS: HARMONISATION, DATA OWNERSHIP, AND THE FUTURE OF TECHNOLOGY

**Thomas Margoni** (CiTiP) and **Martin Kretschmer** (CREATe, University of Glasgow)

The Directive on Copyright in the Digital Single Market (CDSM) entered into force in June 2019 giving 24 months to Member States to implement it. The Directive, a complex instrument containing a rich number of provisions intended to make EU copyright law “fit for the digital age”, has been object of much attention and, in relation to certain provisions, sharp criticism. Arts. 3 and 4 introduce two mandatory exceptions under EU copyright law that will exempt acts of reproduction for the purpose of text and data mining (TDM) made by research organizations and cultural heritage institutions for the purpose of scientific research (Art. 3) or by anyone but with the possibility of “contract-out” (Art. 4). This paper discusses the EU TDM provisions from an EU and international point of view and shows why their current formulation - although underpinned by important innovation policy goals - is conceptually wrong and normatively misguided. Under the label ‘TDM’ the real game being played - wittingly or unwittingly - is the issue of data ownership under EU copyright law. Affirming that a category of mere facts and data can be reused only thanks to an exception implies a rule that they may be object of proprietary claims, despite formal statements to the contrary in international and EU law. Instead of opening up the EU digital data analytic sectors, Arts. 3&4 will likely create additional economic, technological and administrative bottle-necks to the development of modern EU based Artificial Intelligence. This puts the EU creative and technological sectors at a considerable disadvantage on the global race for AI sovereignty.

## → OPTIMIZING COPYRIGHT REGULATION IN THE EU FOR THE DIGITAL SINGLE MARKET: INSTITUTIONAL PERSPECTIVES ON REFORM

**Natasha Mangal** (CEIPI, University of Strasbourg, Queen Mary University of London)

This Article sets out a basis for reconsidering current institutional arrangements for regulating copyright in the EU in light of the unique challenges presented by regulating copyright in the digital environment. In Part II, examples of regulatory approaches drawn from EU directives on copyright (InfoSoc Directive and CDSM Directive) will be scrutinized in terms of how effectively they balance private and public interests. Part III then examines EU instruments which specifically contemplate the formation of new EU level bodies in its overall regulatory design. Part IV will then address specific issues identified with the Art. 17 regime of the CDSM Directive by proposing several possible institutional options for improving its implementation. Part V concludes with recommendations.

## → Wiki (POCC) AUTHORSHIP: THE CASE FOR AN INCLUSIVE COPYRIGHT

**Sunimal Mendis** (TILT-Tilburg University)

Public open collaborative creation (POCC) constitutes an innovative form of collaborative authorship that is emerging within the digital humanities. At present, the use of the POCC model (or Wiki authorship model) can be observed in many online creation projects the best known examples being Wikipedia and free-open source software (FOSS). This paper presents the POCC model as a new archetype of authorship that is founded on a creation ideology that is collective and inclusive. It posits that the POCC authorship model challenges the existing individualistic conception of authorship in exclusivity-based copyright law. Based on a comparative survey of the copyright law frameworks on collaborative authorship in France, the UK and the US, the paper demonstrates the inability of the existing framework of exclusivity-based copyright law (including copyleft licenses which are based on exclusive copyright) to give adequate legal expression to the relationships between co-authors engaged in collaborative creation within the POCC model. It proposes the introduction of an 'inclusive' copyright to the copyright law toolbox which would be more suited for giving legal expression to the qualities of inclusivity and dynamism that are inherent in these relationships. The paper presents an outline of the salient features of the proposed inclusive copyright, its application, and effects. It concludes by outlining the potential of the 'inclusive' copyright to extend to other fields of application such as traditional cultural expression (TCE).

## → Themed SESSION I - HB

Thursday, 9 September 2021

9:00 - 10:00

Themed session

ROOM: HYBRID B - MENENDEZ PIDAL

## THE DESIGN OF IP RIGHTS AND BUSINESS STRATEGY

Intellectual property protection matters a lot in how firms can capture value from innovation. Moreover, firms continuously make strategical decisions in response to intellectual property protection. This proposed themed session consists of three proposals investigating how firms strategically interact with the institutional system of IP protection. These three papers offer important public policy as well as managerial implications.

**Chair: Stefan Wagner** (ESMT Berlin)

## Presentations:

### → STRATEGIC PATENTING: EMPIRICAL EVIDENCE

Yun Hou (National University of Singapore), I.P.L. PNG, and Xi Xiong

It examines how stronger legal protection affects patenting strategy. The authors devise a novel identification strategy to identify an increase in legal protection of patents by leveraging the establishment of U.S. Court of Appeals for the Federal Circuit. This proposal demonstrates that as patents receive stronger legal protections, firms strategically reduce patenting.

### → TRADE SECRECY PROTECTION AND FIRM ACQUISITIONS: EVIDENCE FROM THE UNIFORM TRADE SECRETS ACT

Marta Arroyabe (University of Essex), Christoph Grimpe (Copenhagen Business School), Katrin Hussinger (University of Luxembourg)

The authors study how stronger trade secrecy protection affects the attractiveness of acquiring control over knowledge and technology. Leveraging the staggered implementation of the Act in U.S. states, the authors find that stronger trade secrecy protection is positively related to firms' engagement in the market for corporate control. The authors further suggest that the mechanism is mainly through the constraint on knowledge outflows and better protection of knowledge and technology.

### → MAPPING MARKUSH

Stefan Wagner (ESMT Berlin), Christian Sternitzke (Sternitzke Ventures UG), Sascha Walter (University of Würzburg)

The authors examine a particular strategy used by pharmaceutical companies in the patent application process, namely Markush structures. The authors firstly summarize the ongoing policy debate regarding the possibility to claim Markush structures in patents, and then present a novel dataset and provides first quantitative evidence on how Markush structures are used in patents in the pharmaceutical industry and their effects on important outcomes in the patent prosecution process.

### → Parallel SESSION I - HC

Thursday, 9 September 2021

9:00 - 10:00

Themed session

ROOM: HYBRID C - MARIA ZAMBRANO

**Chair:** Eduardo Melero (Universidad Carlos III de Madrid)

## Presentations:

### → TRANSPORTATION NETWORKS AND THE RISE OF THE KNOWLEDGE ECONOMY IN 19TH CENTURY FRANCE

Georgios Tsiachtsiras (University of Barcelona)

This paper exploits an episode of French history to study the relationship between the rollout of railroads

and the rise of the knowledge economy. Two substantial changes occurred during the second half of 19th century in France: the development of an extended rail network and the establishment of a new patent legislation. I take advantage of the exogenous variation in railway access arising from a time variant instrument, to document that access to rail network increases the innovation activity at the canton level. I explore two underlying mechanisms behind the main results. First, I introduce a market access framework to study how the reduction in transportation costs, due to expansion of rail and canal network, affects the patent activity of a canton. Second, using text analysis techniques, I am able for the first time, to determine the class of each patent application in the historical database of INPI and to explore how connectivity with the global city of Paris is associated with the diffusion of novel technologies.

### → INTERNET TELEVISION PIRACY

**Antanina Garanasvili** (Bournemouth University)

IPTV (Internet Protocol Television) and VoD (Video on Demand) piracy is a rapidly growing phenomenon throughout the global markets. Much debate exists around the impact that online piracy has on creative sectors, and especially on the audiovisual industries. Given the relative novelty of Internet television compared to cable and satellite technologies, most of earlier research and academic work studied the impact of piracy of physical movie copies, such as DVD, or illegal movie downloads and peer-to-peer file sharing. IPTV piracy presents quite a distinct case when estimating both its level and its impact. The shift in trend is also raised by Hadopi “International Survey” (2017) as they find that large number of web users moved from peer-to-peer to streaming uses and recently, towards IPTV piracy. This paper addresses the existing gap by providing comprehensive analysis of IPTV market in the European Union. I aim to build and analyze comprehensive dataset observing the average prices charged by both legitimate and illicit IPTV providers. Econometric analysis is applied in order to estimate the effects and incentives to access the unauthorized IPTV services instead of opting for a legitimate subscription. The analysis is carried out across the EU-28 Member States for the year 2018.

### → PHYSICAL CONSTRAINTS ON MARKETS FOR IDEAS

**Laurie Ciaramella** (Télécom ParisTech) and **Gaétan de Rassenfosse** (EPFL)

In this paper, we analyze how travel time between contracting parties distorts technology transactions by inducing excessive delays. We use a novel dataset of patent sales and licensing deals in France, together with geo-localization of parties, demographic information, and technology characteristics. To deal with issues of selection and omitted variables bias, we measure affiliation to technological clusters, and exploit both the decentralization laws and the introduction of high-speed train lines to construct an instrument. We find robust evidence that travel time delays transactions on markets for technology, the effect being particularly large for deals between SMEs. Our results suggest that, in addition to the skewness of the spatial distribution of economic actors traditionally described in the literature, an increase in transaction costs may explain the negative impact of geography on markets for technology.

### → BOARD INDEPENDENCE AND ACQUISITIONS OF EXTERNAL KNOWLEDGE: OVERCOMING THE NIH SYNDROME

**Araksya Ayvazyan** (University of Groningen), **Kurt Desender** (Universidad Carlos III de Madrid) and **Eduardo Melero** (Universidad Carlos III de Madrid)

The not-invented-here (NIH) syndrome, defined as a negative attitude toward outside knowledge, prevents organizations from absorbing external knowledge to generate further innovations. We argue that corporate-level actions can play an important role in neutralizing the NIH syndrome. Accordingly, we

examine the role of independent members of boards of directors, given their monitoring and advisory functions. We hypothesize and show that a higher presence of independent directors increases the probability of acquiring intellectual property in markets for technology, and that this relationship is particularly intense in settings where the NIH syndrome is more likely to be present. Furthermore, the effect is expected to be weaker when the CEO is in a strong position of power. Overall, our results suggest that independent directors in corporate boards favor the incorporation of outside knowledge and help overcoming the NIH syndrome.

→ Themed SESSION I - OA (SPONSORED BY WIPO)

Thursday, 9 September 2021

9:00 - 10:00

Themed session

ROOM: ONLINE A

## THE GEOGRAPHICAL CONCENTRATION OF INNOVATION (I)

**Chairs:** Carsten Fink and Julio Raffo, WIPO Chief Economist  
Unit, Ernest Miguez, GREThA - CNRS-U. Bordeaux



Innovation certainly played a major role in this new landscape ranging from Silicon Valley to Shenzhen's Bay area. What are the main channels through which innovation affects regional (local) development? What can we learn from the evolution of the successful (and less so) local innovation ecosystems? Can these industrial and technological transformations offer economic and policy insights for other developing regions of the world? Topics of interest relevant to this session include but are not limited to: i) Defining innovation-dense regions and metropolitan areas (i.e. hotspots); ii) Emergence of new innovation hotspots; iii) Local innovation ecosystems within hotspots/regions; iv) Innovation related indicators with geo-localized data; v) Measuring innovation networks across and within hotspots; vi) The role of local Innovation and IP Policy in regional/hotspot technological trajectories.

### Presentations:

→ EMERGING 21ST CENTURY TECHNOLOGIES: IS EUROPE STILL FALLING BEHIND?

**Hugo Confraria** (UECE/REM- ISEG, Universidade de Lisboa & SPRU - Science Policy Research Unit, University of Sussex), **Vitor Hugo Ferreira** (Polytechnic Institute of Leiria) and **Manuel Mira Godinho** (UECE/REM- ISEG, Universidade de Lisboa).

Firms and countries that specialise in emerging technologies tend to have a higher chance of becoming or remaining competitive in the future. This paper aims to analyse the most dynamic areas of technological competition between 2010 and 2019 and to identify which actors are leading in those areas. We analyse patenting dynamics in four major patent offices (USPTO, EPO, JPO, KIPO), to have a global landscape of technological dynamism, and we use the 4-digit IPC patent classification system to proxy the technological areas. We first track growth patterns in patent grants in all IPC classes, and examine what firms own a significant share of patents in growing technological areas. Then, in order to compare the performance of European companies with those from other global regions, we built a score to classify the emergent technologies across the four offices. Our results indicate twelve "emerging" IPC classes, which are related to software engineering, digital communication, IT methods for management, medical technology, pharmaceuticals, energy conservation, games, biotechnology, and semiconductor devices. We find that European firms do not hold a leading share in any of these IPC classes. This is particularly true in emerging areas such as software engineering, energy conservation and semiconductor devices, which are likely to be critical to succeed in the new techno-paradigms related to digitalization and clean energy. While no

simple solution exists for Europe to address its structural scale disadvantages related to insufficient frontier tech investment, political fragmentation, lack of superstar firms and digital platforms, the observed trends do not bring any evidence that Europe is in the way of finding answers to its shortcomings. Research and innovation policies should target the new emerging technologies and invest in Europe's capacity to activate its entrepreneurial culture to integrate the next generation of new leading firms.

#### → **DEMYSTIFYING SHENZHEN'S INNOVATION: A PERSPECTIVE OF LOCAL INNOVATION ECOSYSTEM WITHIN GLOBAL INNOVATION NETWORK**

**Deyun Yin** (Harbin Institute of Technology, Shenzhen), **Julio Raffo** (World Intellectual Property Organization) and **Jie Tang** (Harbin Institute of Technology, Shenzhen).

During the past 40 years, Shenzhen has risen from a finishing village into a globally leading innovation hotspot. What drives such remarkable growth? Is there a "Shenzhen model" for technological catch-up that is different from the classical "Silicon Valley model"? What kind of policy lessons Shenzhen can offer to developing countries and lag-behind regions? Based on international patent and scientific publication data, this paper dissecting Shenzhen's technological trajectory and catch-up process into three stages: 1) access to advanced technology by participating in Global Production Network and Global Value Chain (GVC), 2) accumulate technological knowledge and enhancing absorptive capability through imitation, and 3) achieve indigenous innovation. We interpret this remarkable catch-up process from the perspective of 1) technological specialization, 2) local innovation ecosystem and 3) its embeddedness into the global innovation network. The last part summarizes Shenzhen's policy lessons in fostering innovation-based economic growth in developing countries and areas.

#### → **MAPPING THE CHANGING PATTERN OF KNOWLEDGE FLOWS AMONG INNOVATORS IN A SMALL OPEN ECONOMY: THE CASE OF SINGAPORE**

**Poh-Kam Wong** (National University of Singapore), **William Kwek** (Intellectual Property Office of Singapore), **Jasmine LAM** (Intellectual Property Office of Singapore, Singapore), **Intan Hamdan-Livramento** (World Intellectual Property Organization, WIPO).

Singapore has arguably benefitted from the globalization of innovative activities. Over the past few decades, the small island nation has seen its income rise to become one of the richest countries in the world by building itself as an attractive investment and innovation destination. The Singaporean government's approach in tailoring its industrial and innovation policies to its development needs may have played a crucial role in this rise. Despite this success, Singapore arguably has not been able to leverage its position as an innovation hub to build its local innovation capacity. Most of the innovative activities in the country are by local subsidiaries of foreign firms. This paper attempts to study the evolution of Singapore to an innovation hub of the region. It argues that the Singapore experience provides a strong case for planned agglomeration to create an innovation cluster, with strong government support to facilitate technology transfer. It further argues that Singapore's difficulty in transforming its success into building local innovative capability merits further examination.



## PARALLEL SESSIONS II

→ Themed SESSION II - HA

Thursday, 9 September 2021

10:15 - 11:15

Themed session

ROOM: HYBRID A - SALON DE ACTOS

**Chair:** Christoph Grimpe (Copenhagen Business School)

### Presentations:

→ **PATENTS, FREEDOM TO OPERATE, AND FOLLOW-ON INNOVATION: EVIDENCE FROM POST-GRANT OPPOSITION**

**Fabian Gaessler** (Max Planck Institute for Innovation and Competition), **Dietmar Harhoff** (Max Planck Institute for Innovation and Competition) and **Stefan Sorg** (Max Planck Institute for Innovation and Competition).

We investigate the causal effect of patents on cumulative innovation, using large-scale data from post-grant oppositions at the European Patent Office. We introduce a novel instrumental variable for patent invalidation that exploits temporary personnel scarcity in the opposition proceeding. We find that patent invalidation leads to a significant and sizeable increase of follow-on innovation in our setting. The effect is driven by cases where patent invalidation creates substantial freedom to operate for third parties. Our heterogeneity results suggest that licensing failure between upstream and downstream innovators is caused not only by bargaining failure, but in particular contexts also by rent dissipation.

→ **PATENT OPPOSITION AND TECHNOLOGY ENTRY**

**Julia Mazzei** (Sant'Anna School of Advanced Studies), **Arianna Martinelli** (Sant'Anna School of Advanced Studies) and **Daniele Moschella** (Sant'Anna School of Advanced Studies)

A substantial empirical literature suggests that the patterns of innovative activities depend on technology-specific dimensions. Among these, emerging distortions in appropriability conditions by the means of patents may affect the Schumpeterian forms of “creative destruction” or “creative accumulation”. In this paper, we argue that the recent surge of patent disputes plays an important role in discouraging firms from entering new technology domains (NTDs). Using a large-scale dataset combining data from PATSTAT and ORBIS-IP and containing patents applied for at EPO between 2000 and 2015, we first construct a new measure of litigiousness using patent opposition data, then we investigate to what extent entry is affected by patent disputes and other technology and firm level characteristics. We find that the degree of litigiousness and the density of patent thickets negatively affect the likelihood of firms to enter NTDs. Across technologies, the frequency of oppositions discourage firms mostly in low-tech industries, whereas patent thickets represent a barrier to entry in high-tech industries. Across firms, the risk of opposition falls disproportionately on small rather than large firms. Moreover, small firms are not able to benefit from experience with the opposition procedure, while for large firms we observe a sort of learning-by-opposing effect. These evidences suggest that litigiousness and hold-up potential discourage firms from entering new domains, shaping Schumpeterian patterns of innovation characterized by a stable number of large-established firms and a lower degree of turbulence.

→ **DO PATENT GRANTS MATTER FOR COMMERCIALIZATION TIMING**

**George Younes** (EPFL)

When releasing a new invention into the market, companies aim to attenuate the risks of commercializing too early or too late. Entering the market too early may risk commercializing an under-developed product and thus suffering negative consequences, whereas entering the market too late may cost the company potential sales and market share. Aside from the company's strategy, a lot of factors affecting the company's decision come into play. Uncertainties around patent protection rights for new inventions is an important factor for companies to consider. In this study, we investigate the relationship between a product's commercialization lag and the time needed for patents filed for the product to be granted. We find that an increase in the time needed for a patent to be granted is associated with an increased commercialization lag consistently across our models.

## → THE (SECRETE) POWER OF COMMUNICATION: HOW COMMUNICATIVE PRACTICES SHAPE THE PATENT PROSECUTION PROCESS

**Susanne Beck** (Ludwig Boltzmann Gesellschaft & Copenhagen Business School), **Karin Beukel** (Circular Food Technology), **Christoph Grimpe** (Copenhagen Business School) and **Marianne Weile** (Circular Food Technology)

The patent examiners' decision to grant a patent is critical to firms' competitive advantage but can also lead to immense costs for society if the patent's scope is too broad. Given the importance of this evaluation, the patent application process is designed to be uniform and objective, with arguments being fact-based and patent examiners and patent agents being both replaceable. However, practice and research raise doubts regarding this idealistic objectivity: While practitioners describe the processes rather as dispute resolution, scholars have found first evidence that the outcome of the prosecution process is not independent of the examiner involved. In line with this, we build upon the new rhetorical model of decision-making and argue that communicative practices shape the patent prosecution process and its outcome. In particular, this study explores (1) how such an exchange of arguments occurs in the first place, (2) whether, and if so, which communicative practices both parties apply, and (3) whether specific communicative practices can be associated with application success. Preliminary results from our two-study mixed-method approach (i.e., expert interviews and document analyses) indicate that patent agents and especially examiners use (different) communicative practices in their letters, although not strategically yet. Moreover, comparing the practices applied in successful and rejected applications reveals significant differences, indicating that some combinations of practices are better able to reach a generative dialogue to co-produce a shared meaning. Our findings have implications for practitioners as well as for research on the strategic management of patents and institutional decision-making.

## → Parallel SESSION II - HB

Thursday, 9 September 2021

10:15 - 11:15

Themed session

ROOM HYBRID B - MENENDEZ PIDAL

**Chair:** Martin Kretschmer (CREATe, University of Glasgow)

### **Presentations:**

## → ROUNDTABLE ON CENTRIFUGAL FORCES IN EU COPYRIGHT LAW

**Ula Furgal** (University of Glasgow), **Thomas Margoni** (CREATe - University of Glasgow and KU Leuven CiTiP), **Joost Poort** (Institute for Information Law (IViR) - University of Amsterdam), **João Pedro Quintais** (Institute for Information Law (IViR) - University of Amsterdam), **Caterina Sganga** (Scuola Superiore Sant'Anna) plus discussants (TBD)

In recent times copyright law has faced pivotal changes in the patterns of production, distribution and consumption of cultural and creative content. From AI-based creations to the advent of new digital business models, up to automated content moderation and rights management mechanisms, these new phenomena have challenged stakeholders and decision-makers, triggering a panoply of policy and market responses. Most of them have impacted on the current EU copyright legal framework, exercising centrifugal and oft-juxtaposed forces over its traditional core. From January 2020, the H2020 consortium reCreating Europe has mapped, measured and assessed in a cross-disciplinary and transnational fashion how such centrifugal forces are shaping and stretching EU copyright law. Bringing together researchers, practitioners, and stakeholders in an innovative qualitative and quantitative research, reCreating Europe's ground-breaking contributions are giving shape to a clearer understanding of what makes a regulatory framework fit to promote a diverse cultural and creative production and optimize inclusive access, distribution and consumption of cultural and creative content. This roundtable, featuring four reCreating's presenters and three discussants from the legal, economic and policy arena, aims at presenting the interim results of the project, gather feedback and kick off a debate with academics, policy makers and stakeholders, which looks at the choices the EU must make between public and private ordering, innovation by country variation and uniform digital market strategy in order to understand, internalize and guide those centrifugal forces. Main topics will be (a) copyright flexibilities, users' rights, access to culture and vulnerable groups; (b) authors' remuneration, income distribution and bargaining power, with a special focus on reversion rights; (c) copyright, data ownership, transparency and AI technologies; (d) intermediaries, content moderation, access to culture and freedom of (creative) expression.

→ Parallel SESSION II - HC

Thursday, 9 September 2021

10:15 - 11:30

Themed session

ROOM HYBRID C - MARIA ZAMBRANO

**Chair:** Esther Van Zimmeren (University of Antwerp)

**Presentations:**

→ **GENDER GAP AND INNOVATION: FEMALE EMPOWERMENT AS A ROADMAP FOR A PARETO-EFFICIENT DIGITAL ECONOMY**

**Francesca Rodríguez Spinelli** (Georg-August-Universität Göttingen)

The gender gap in innovation, entrepreneurship, and patenting not only accounts for an obvious discrimination that keeps women behind worldwide, but also reveals a clear economic inefficiency that hurts men and women equally. In times of a "Fourth Industrial Revolution" and an inevitable "digital Darwinism", matching the playing field goes beyond a social equity goal. It is about highlighting the costs or, rather, the economic losses that gender inequality entails for the global innovation landscape, particularly in countries such as Germany and Chile, which although quite different from each other, recognize the problem as part of the challenges of their current government agendas, in pursuit of an inclusive, sustainable, and economically efficient digital future. This article aims to provide an economic (and sororal) point of view of the topic, to show the figures of gender inequality in innovation ecosystems, both as a problem and an opportunity for everybody.

→ **MORALITY, CONTRACT ENFORCEMENT, AND THE ORGANIZATION OF FIRMS**

**Giuseppe Pignataro** (Department of Economics, University of Bologna), **Alireza Naghavi** (Department of Economics, University of Bologna) and **Katja Zajc Kejza** (University of Ljubljana)

Legal enforcement is often viewed as a remedy to improve contractual performance and avoid deviations that occur in an incomplete contract environment due to hold-up or technology infringement. It is not straightforward, however, whether strong assertion of contract enforcement can be beneficial or detrimental to a relationship when it relies on obligations that can emanate from the morality or trust embedded in the society. What are then the impacts of implementing contract law to secure supplier relationships? What are the implications of existing cultural and technological characteristics that rest upon country or industry-specific factors, respectively? Under what circumstances should state intervention and legal coercion be kept to a minimum in order to preserve commercial relations? This paper introduces morality in a model of asymmetric information, embedding the empirically relevant feature of the property rights theory that organizational form is used to generate investment incentives (Hart 1986, 1990). We use the framework to first study firms' organizational choice, distinguishing between decisions in sectors where customization effort rather than technology is relevant, and those where valuable intangible assets play a pivotal role and risk being expropriated. We then explore the role of contract enforcement by legal (formal) means as a tool to eliminate information asymmetry between the two sides of the contract and study the circumstances in which it could be advantageous or disruptive to supplier relations. In particular, the interaction of contract enforcement with the existing level of morality in the society along with sectoral characteristics determines whether or not law consolidates relationships under different organizational modes. Our testable predictions are accompanied by evidence from comprehensive Slovenian transaction level data.

## → THE CONCEPT OF PATENT EXCEPTIONALISM AND ITS IMPLICATIONS IN EUROPE AND THE UNITED STATES

Felipe de Andrade (University of Antwerp) and Esther Van Zimmeren (University of Antwerp)

Patent experts tend to claim that patent law is unique in view of its combination of complex legal doctrine and technical issues. This has promoted the creation of specialized courts and the isolation of patent law in relation to other fields of law. By means of a comparative study between Europe and the United States, this research aims at (1) developing a conceptualization of patent exceptionalism and (2) explaining how patent exceptionalism is reflected in those jurisdictions.

## → Themed SESSION II -OA

Thursday, 9 September 2021

10:15 - 11:15

Themed session

ROOM ONLINE A

## FRONTIERS IN EMPIRICAL TRADEMARK RESEARCH (I)

**Chairs:** Carolina Castaldi (Utrecht University)

**Summary:** Trademarks are the most widely used intellectual property rights, but they have been largely neglected in economic, innovation, and geography research for a long time. This is now changing, and we are seeing great momentum in trademark research, largely owing to such initiatives as special issues (in Industry and Innovation and Regional Studies) and to more data becoming available from several offices (USPTO, EUIPO, and IP Australia). Still, the full potential of trademark data for original empirical research is yet to be exploited. This session includes contributions that are at the forefront of empirical trademark research in such disciplines as economics, geography, management, and legal studies. Topics covered are: i) empirical studies investigating motives for trademarking and/or trademark strategies for specific types of firms/innovation/industries; ii) empirical studies exploiting the richness of trademark records (e.g., goods and service descriptions, oppositions, monetization); iii) empirical studies reconstructing bundling strategies where trademarks

play a key role; iv) empirical studies aiming at measuring the societal returns of trademarks; v) methodological studies on technical aspects associated with trademark data.

### **Presentations:**

#### **→ TRADEMARKS AND HOW THEY RELATE TO THE SOCIAL AND ECONOMIC OUTCOMES OF SOCIAL STARTUPS**

**Mirko Hirschmann** (Trier University) and **Jörn Block** (Trier University)

Prior research shows that trademarks positively relate to startups' growth and survival. However, empirical evidence on the impact of intellectual property rights, especially trademarks, on the development of social startups' hybrid outcomes is very limited. Our study aims to fill this gap by investigating how early trademarking relates to the social and economic outcomes of social startups. Based on a sample of 485 social startups from Germany, we find that social startups that register a trademark within the first three years of their existence have both significantly higher social and economic outcomes. Additionally, we identify that the geographical scope of a trademark relates differently to social startups' outcomes. Our results contribute to the emerging literature on social startup development and to trademark research that lacks an understanding of the importance of trademarks for startups that aim for hybrid outcomes. We provide several practical implications for social startups, social investors, and policy-makers.

#### **→ INNOVATION AND REGIONAL BRANCHING: A COMPREHENSIVE EXPLORATION OF PATENT, TRADEMARK AND DESIGN RIGHTS**

**Kyriakos Drivas** (University of Piraeus) and **Carolina Castaldi** (Utrecht University)

This paper examines how relatedness within and between different innovation stages contributes to new specializations across each stage. We comprehensively operationalize these different aspects of innovation by considering in a single framework patents, trademarks and industrial designs. We provide two separate analyses: one for 363 MSAs of the US by employing USPTO data, two for 259 NUTS-2 European regions by employing EPO and EUIPO data. We find that these types of IP are significantly intertwined. While own relatedness significantly contributes to new specializations, related capabilities of the other types of IP also contribute substantially. Additional findings provide insights on the idiosyncrasies of each innovation stage. In terms of policy, the study shows that regional diversification is a comprehensive process spanning the entire innovation ladder.

#### **→ PUBLIC LISTING, MANAGERIAL SHORT-TERMISM, AND LONG-TERM PERFORMANCE OF NEW TRADEMARKS**

**Po-Hsuan Hsu** (National Tsing Hua University), **Long Yi** (Hong Kong Baptist University), **Yunan Liu** (University of Hong Kong) and **David Hsu** (University of Pennsylvania)

We construct a novel and comprehensive dataset of trademarks owned by privately held and publicly listed firms in the U.S. over three decades to examine whether and how public listing status affects trademark performance. We find that while publicly listed firms register more trademarks compared with their privately held counterparts, their trademarks are associated with a much lower survival likelihood. Moreover, we find that firms' long-term profits are negatively associated with their number of cancelled trademarks but are positively associated with the number of renewed trademarks. These results support that publicly listed firms experience greater levels of greater managerial short-termism, due to external pressure. Using an unexpected court ruling in the Ninth Circuit court that exacerbates managerial myopia

for public firms as an identification test, we find that the effect of public listing on trademark performance becomes even more significant after this ruling, which supports a causal interpretation of our results.

→ Themed SESSION II - OB

Thursday, 9 September 2021

10:15 - 11:15

Themed session

ROOM ONLINE B

## DATA SCIENCE FOR INNOVATION AND SCIENCE DATA (I)

**Chair:** Dominique Guellec (Hcéres-OST)

**Summary:** New quantitative methods are increasingly being applied to patent data, enabled by new approaches, powerful computers and big databases. Such methods include notably machine learning (for classification, natural language processing etc.) and graph analysis. They complement traditional techniques, notably econometrics. The use of these techniques allows to revisit issues already addressed with traditional techniques like the connection between science and technology, knowledge spillovers, technology diffusion, the value and impact of inventions etc.; it also allows to investigate quantitatively new issues like the facets and determinants of novelty in inventions, the genesis and evolution of specific technical ideas etc. Traditional techniques exploit mainly the metadata that are generated by the patenting process: dates, authors/inventors, assignees, technical classes, journals, citations. New semantic techniques, in addition, allow the use of text: This has been facilitated notably by progress in natural language processing, with the development of text embeddings, syntactic analysis etc. Other techniques infer deep structures in data, e.g., graph-based models allow to capture complex patterns of distant influence between entities, akin to knowledge circulation. This session gathers presentations making use of new quantitative methods applied to patent and other IP data for addressing innovation and science related issues.

### Presentations:

→ THE TECHNOLOGICAL QUALITY OF PATENTS: A GRAPH THEORETIC APPROACH

Sana Elouaer Mrizak (ISI - Université du Littoral Côte d'Opale) and Didier Lebert (UEA - ENSTA Paris)

In 2013, the OECD published a working paper listing a dozen indices used to estimate the economic and technological quality of a patent, i.e. the potential impact of this invention on subsequent technological developments. In this paper, we propose to rethink two popular indicators in innovation economics, originality and generality, in the light of graph theory. We propose, as an extension, other indicators of the technological quality of patents that we apply to data from the CORDIP database over the 2011-2016 period.

→ TECHNOLOGY DIFFERENTIATION, PRODUCT MARKET COMPETITION AND FIRM PERFORMANCE

Sam Arts (KU Leuven), Jianan Hou (KU Leuven) and Bruno Cassiman (KU Leuven)

Prior work has extensively studied how investing in R&D and building a patent portfolio relate to firm performance. But the value of a patent portfolio is arguably also driven by the degree to which it differentiates from other firms. In this paper, we develop a new method to dynamically characterize firm

patent portfolios, to map each firm's location in technology space, and to measure technology differentiation based on the semantic content of patent portfolios. Using a large panel of US public firms and controlling for amongst others R&D investments and the number of citation-weighted patents in the portfolio, we find that technology differentiation has a strong positive and long-lasting relation with firm performance as measured by ROA or market value. Moreover, technology differentiation has a negative relation with product market competition as measured by the similarity in the business descriptions of annual 10-K reports. We provide open access to all data to dynamically measure the technology similarity between and the technology differentiation of all US public firms.

### → NEW INDICATOR OF SCIENCE AND TECHNOLOGY INTER-RELATIONSHIP BY USING TEXT INFORMATION OF RESEARCH ARTICLES AND PATENTS IN JAPAN

**Kazuyuki Motohashi** (The University of Tokyo)

In this study, the text information of academic papers (about 2.3 million) published by Japanese authors and patents filed with the Japan Patent Office (about 12 million) since 1990) are used for analyzing the inter-relationship between science and technology. Specifically, a distributed representation vector using the title and abstract of each document is created, then neighboring documents to each are extracted using cosine similarity. A time trend and sector specific linkage of science and technology are identified by using the count of neighbor patents (papers) for each paper (patent). It is found that the number of patents with similar contents of papers decreased over time while the number of papers with similar contents of patents increased. This can be interpreted as an advance the expansion of the scientific frontier by papers come first, then the technological progress (by patents) follows in the fields with substantial scientific knowledge already existed. This paper proposes a new methodology of measuring science and technology interlinkage by using textual information as a complement to traditional indicators based on non-patent literature citations of patents.

### → Parallel SESSION II - OC

Thursday, 9 September 2021

10:15 - 11:15

Themed session

ROOM ONLINE C

**Chair: Salvatore Torrisi** (University of Milano Bicocca)

#### Presentations:

### → AN ANALYSIS OF THE THREE KNOWLEDGE AND TECHNOLOGY TRANSFER CHANNELS: PUBLICATIONS, PATENTS, STANDARDS - THE CASE OF HYDROGEN TECHNOLOGY

**Parsa Asna Ashari** (BAM Federal Institute for Materials Research and Testing / Technical University of Berlin) and **Knut Blind** (Technical University of Berlin / Fraunhofer Institute of Systems and Innovation Research)

Climate change and the need to reduce greenhouse gas emissions pose tremendous challenges to policymakers, the economy, and society. In this context, the development of clean, low-emissions technologies plays a crucial role to mitigate the negative impact of fossil fuels on the climate. Hydrogen is a promising energy carrier and fuel that, thanks to its versatility, can be used in many applications. However, the adoption of hydrogen technology requires sufficient trust in its safety. To proxy the development of hydrogen safety innovations, we provide an analysis along the three knowledge and technology transfer channels of publications, patents, and standards. Our results show that research on

hydrogen safety has strongly increased in the last decades, with hydrogen patents regarding safety having experienced a general upward trend between 1980 and 2020, that just recently decreased. An analysis of almost 100 international hydrogen and fuel cell standards, however, shows only a small number of references to scientific publications. This apparently limited transfer of knowledge from publications points to the need to optimize the coordination of the three knowledge and technology transfer channels for the future development of hydrogen technology. Based on the exploration of this gap, we recommend that research on the three channels for hydrogen be intensified and that the impact of hydrogen safety technology research and development on their diffusion be investigated.

## → ONLINE REPOSITORIES, SEARCH COSTS AND CUMULATIVE INNOVATION

Thomas Schaper (KU Leuven)

Efficient access to existing knowledge is essential to technical advance, yet little is known about how access-enhancing institutions shape intertemporal knowledge spillovers. In this paper, I investigate the cumulative technological impact of the CNIDR AIDS Database, the first, disease-targeted, online repository of electronic patent documents, launched in 1994. Tracing references from subsequent patents, I find that the marginal impact of the repository was largest (+30%) among patents for which the established disease-link was previously non-obvious to detect through standard bibliographic search, in line with predictions of stronger reduction of internal search costs. Further findings suggest that increased visibility and attention to more "hidden" prior art particularly benefited private sector HIV researchers, and was reflected in enhanced diffusion of technological knowledge across scientific community and geographic boundaries.

## → THINK IT, BUILD IT, SHHH...IP IT! MANAGING TRADE SECRETS IN THE CONTEXT OF AGILE TECHNOLOGY DEVELOPMENT

Ellenor Hayes (Spotify AB / Center for Intellectual Property)

Over the past two decades, agile methodologies have become a mainstay of software development practices at companies large and small. With their focus on short development cycles and autonomous, self organizing teams, agile technology development presents a significant challenge for the effective management of trade secrets. At the same time, many of the intellectual assets of highest strategic importance to agile technology companies – e.g. proprietary algorithms, machine learning models, unique datasets, and valuable data derived insights – cannot be registered as patents, trademarks or designs. (Nor can they be effectively claimed and protected via copyright.) Rather, if the company is to retain any intellectual property based control position in relation to these assets, they must be managed and protected as trade secrets.

Via a systematic literature review and multiple case study research design, this study examines this tension and seeks to contribute to the field by providing research based guidance on how agile technology companies may incorporate trade secret protection procedures without undermining the speed and autonomy of their product development practices.

The findings demonstrate that, by relying on the inherent flexibility of the laws governing trade secrets (specifically the contextual requirement of "reasonable steps"), it is possible to manage the tension between agility and robust trade secret protection. In doing so, agile technology companies should take a measured approach that focuses on building awareness and trust among individual employees so as to frame trade secret management as a cross functional task and enable positive behaviors. The findings of the study can be used to inform the development of trade secret protection procedures that enable technology companies to continue to develop products with agility while using trade secrets to secure practically effective and legally defensible intellectual property based control positions for their most strategically important assets.



## PARALLEL SESSIONS III

→ Themed SESSION III - HA

Thursday, 9 September 2021

9:00 - 10:00

Themed session

ROOM HYBRID A - SALON DE ACTOS

**Chair:** Sebastian Schwemer (CIIR, University of Copenhagen)

**Summary:**

→ **ROUNDTABLE ON ALGORITHMIC PROPAGATION: DO PROPERTY RIGHTS IN DATA INCREASE BIAS IN CONTENT MODERATION?**

Thomas Margoni (CiTiP, KU Leuven), João Quintais (IViR, University of Amsterdam), Sebastian Schwemer (CIIR, University of Copenhagen), Niva Elkin-Koren (Tel-Aviv University Faculty of Law & Berkman Klein Center at Harvard University), and Irene Roche-Laguna (Digital Services and Platforms (CNECT.F.2), European Commission)

This session focuses on the link between training data access regimes and content moderation performed through machine learning (ML) algorithms. More specifically, we explore whether current EU copyright rules may have the effect of favoring the propagation of bias present in training data into the AI tools employed for content moderation.

While this dynamic may find application in a wide range of content moderation scenarios, our session specifically examines it in light of Art. 17 CSDMD. This provision incentivizes platforms to filter content uploaded by users. This is mostly done through matching and fingerprinting technology. This technology, however, is incapable of assessing contextual uses, and therefore not suitable to ensure the required protection of freedom of expression-based exceptions like parody, criticism and review. Accordingly, more sophisticated tools seem necessary to enable preventive measures while respecting user rights. This suggests that ML algorithms will be increasingly employed for copyright content moderation. However, the question is what happens if these tools are based on biased datasets and what effect this may have on users' freedom of expression.

The session will first identify the role of copyright in training data and the potential of such legislation to play an active role in embedding bias into the algorithmic tools trained on these data. We will then discuss how the so created algorithmic content moderation tools are employed in the online environment. Finally, we will attempt to identify whether and how bias may be further propagated through voluntary and mandatory measures required or incentivised by platform regulation rules. In doing so, we will explore potential approaches to measure this bias at the input and output phases.

→ Parallel SESSION III - HB

Thursday, 9 September 2021

9:00 - 10:00

Themed session

ROOM HYBRID B - MENENDEZ PIDAL

**Chair:** Joy Wu (LMU Munich)

**Presentations:**

## → THE INTERPLAY BETWEEN FIRM INNOVATION, PUBLISHING, PATENTING AND STANDARDIZATION

**Knut Blind** (TU Berlin, Fraunhofer ISI), **Bastian Krieger** (ZEW Mannheim) and **Maikel Pellens** (Ghent University, ZEW Mannheim, KU Leuven)

Firms can protect their innovations in many ways. One particular way of increasing appropriation is disclosure. Disclosure can occur through proprietary disclosure in patent documents, but also through non-proprietary disclosure in scientific literature, or standard documents. While the mechanisms between these individual instruments and innovation are fairly well-understood, the literature has as of yet not considered their interrelation. We, therefore, contribute by assessing how the different combinations of patenting, publishing, and standardization relate to innovation performance. Based on a broad sample of innovative firms from the 2015 German Community Innovation Survey, enriched with patent and publication information, we show that combinations of proprietary and non-proprietary forms of disclosure generate tensions that lead to discomplementarities in terms of innovation performance.

## → ARTIFICIAL INTELLIGENCE - FROM SCIENCE TO MARKETS

**Sebastian Heinrich** (ETH Zürich)

Guided by the idea of artificial intelligence (AI), a series of technologies was recently developed and successfully used in novel applications. The full range of this technological development is difficult to foresee. Nevertheless, there is currently a discussion on economic implications, such as for the labor market, productivity and economic growth. To inform this discussion, more empirical insight is needed about the state of diffusion and current applications of technologies related to AI. This empirical insight is obviously dependent on data sources that allow the measurement of different aspects of AI related technologies. The contributions of this study are twofold. First, I assess a novel data source using a long running panel of textual data from company websites - which is to my information the first of its kind. I validate the new data type with more established data sources, namely the scientific literature and patent data. Second, I document the diffusion process of AI related technologies and the technology's applications using scientific literature, patent documents and webpages.

## → A HYBRID MACHINE LEARNING WITH HUMAN ASSISTANCE APPROACH TO ANALYZING STANDARD ESSENTIAL PATENTS

**Vijai Kasthuri Rangan** (Google) and **Jay Yonamine** (Google)

Technology standards are a cornerstone of innovation. Standards help ensure interoperability between devices, meaning that your bluetooth speaker, laptop or wifi at home, all probably manufactured by different companies, can work seamlessly with one another. Given their high utility, standards are important for corporate entities and they vie to patent technology, products and services that utilize these standards by declaring patents as Standard Essential Patents (SEPs). SEPs are an important subset of the broader patent ecosystem for researchers and corporations. For researchers, SEPs provide one of the clearest mappings between products (and their revenue) and patents, which enables a unique framework to analyze firm innovation strategies and behaviors. For corporations, SEPs are critical in progressing adoption of the underlying technologies and also for determining licensing rates. For both academics and corporations, understanding the true set of patents that are essential to a given standard is challenging. Historically, this process is heavily manual - with patent owners initially 'declaring' that one or more of their patents are 'essential', and then relying on manual review to resolve any disputes. While potentially benefiting from high accuracy in some cases, manual review can be slow and costly for standards with thousands or tens of thousands of declared patents. Machine Learning and Natural Language Processing

provide an interesting opportunity to improve purely manual approaches to determining essentiality of declared patents. Existing approaches leveraging ML and NLP for SEPs are generally either restricted to using only the text in the patent or consider the entirety of the patent as a single piece of text when computing similarities with the specification. In this paper, we propose a state of the art language machine learning model combined with keyword based linguistic approaches on sections of both patent and technical specification to create similarity rankings that may help reviewers swiftly determine essentiality.

## → LICENSING BEHAVIOR OF CREATORS AND OWNERS OF ALGORITHMS

Joy Wu (LMU Munich)

This study explores valuation and decision-making in licensing algorithms: a type of information good that contains a finite-step, computer-implementable procedure to resolve a well-defined type of problem. In this project, I study how individuals value algorithms that attempt to solve the canonical "balance puzzle." In three experimental studies, I observe behavior indicative of psychological ownership in creators and non-creator owners of ideas. Licensors assigned to create and/or own an algorithm reveal higher reservation prices for licensing than licensees, who do not own but can use the algorithm to gain profits. When licensors and licensees are treated with meta-information about an algorithm's likelihood of being successful, I find a lack of evidence for these disparities in valuation among higher quality algorithms. However, among low quality algorithms, valuation gaps persist, suggesting a resistance to external signals for owners of poor-quality algorithms.

## → Parallel SESSION III - HC

Thursday, 9 September 2021

9:00 - 10:00

Themed session

ROOM HYBRID C - MARIA ZAMBRANO

**Chair:** Carlos Muñoz Ferrandis (Max Planck Institute for Innovation and Competition)

### Presentations:

## → TRADE SECRETS AND WHISTLEBLOWERS: FRIENDS OR FOES? AN ANALYSIS OF THE EUROPEAN UNION (EU) LEGAL FRAMEWORK ON TRADE SECRETS PROTECTION AND THE DIRECTIVE ON THE PROTECTION OF PERSONS REPORTING BREACHES OF UNION LAW

Dimitrios Kafteranis (University of Luxembourg) and Esther van Zimmeren (University of Antwerp)

Trade secrets are valuable assets that need protection from, inter alia, unauthorised disclosures. This was the rationale for the European Commission when it proposed the Trade Secrets Directive, back in June 2016, as the protection of trade secrets in EU Members States was very fragmented and did not lead to an effective level of protection. In an effort to provide a uniform legal framework on trade secrets at the EU level and to foster the internal market, the European Commission adopted common minimum standards on the protection of trade secrecy. The proposed Trade Secrets Directive provoked a fierce debate in view of the negative impact on the protection of whistle-blowers due to the limitation on the right to freedom of expression. Two years later, the European Union adopted Directive 2019/1937 on the protection of persons reporting breaches of Union law (hereinafter 'Whistleblower Protection Directive'). Therefore, in this respect it is interesting to examine the Whistleblower Protection Directive in relation to the Trade Secrets Directive. The objective of this paper is to examine if the Trade Secrets Directive and the Whistleblower Protection Directive should be regarded as allies or enemies.

## → ABSTRACT IDEAS AND PATENT-ELIGIBLE SUBJECT MATTER IN THE US PATENT SYSTEM: WHO CAN PROVIDE GUIDANCE IN THIS UNCERTAIN LEGAL LANDSCAPE?

Federica Baldan (Uantwerpen) and Ekaterina Stolbova (KU Leuven)

Similarly to what happens in Europe, the interpretation of patent-eligibility for computer-implemented inventions has represented for years a hot topic in the U.S. patent system. The Supreme Court's quartet of decisions on 35 U.S. Code Section 101 - and in particular the creation of the so-called Alice/Mayo test - shifted patent eligibility standards leading to great uncertainty in this area of patent law. Scholars, attorneys as well as judges have repeatedly prompted the Supreme Court to step in and clarify the application of the Alice/Mayo test by reviewing one of the pending cases. However, doubts persist whether the Supreme Court is the most suitable actor to provide guidance in complex patent law and policy issues such as patent eligibility.

This paper aims to add to the existing scholarship by analyzing some of the main issues in the interpretation of patent-eligible subject matter and reflecting on the role of the actors of the U.S. patent system in their clarification. Our objectives are threefold. Firstly, we explore the main issues in the field of patent eligibility by referring to the recent Section 101 case law in the area of "abstract ideas" and, in particular, to the CAFC decision in the Chamberlain case. Secondly, we illustrate the role of the various actors of the U.S. patent system (the courts, the patent office and Congress) from the perspective of their expertise in the patent field. Finally, we provide some considerations on their suitability to provide guidance on the determination of patent-eligible subject matter. This analysis is developed on the basis of literature in the fields of IP and administrative law.

## → OPEN SOURCING AI: IPR STRATEGY FOR PLATFORM LEADERSHIP

Carlos Muñoz Ferrandis (Max Planck Institute for Innovation and Competition) and Marta Duque Lizarralde (None at submission time, and, Technische Universität München at presentation time (September))

AI is one of the most strategic technologies of our century. Consequently, tech companies are adopting IP strategies to protect their investment in the field, which encompasses the use of copyright, trade secrets and patents. It is worth to observe that, while the number of AI-related patent applications is increasing, the number of open-source AI projects, primarily sponsored by major AI patent holders, is also on the rise. This article explores the many motivations for adopting this hybrid strategy, as well as how some players are using it successfully to attract a critical mass of users and build an ecosystem around their AI/ML platforms. It also analyses which licenses are most commonly used in open-source AI projects and why, before pointing out the most relevant terms in each of these licenses that developers should be aware of.

→ Themed SESSION III - OA (SPONSORED BY EPO)

Thursday, 9 September 2021

11:45 - 13:00

Themed session

ROOM ONLINE A

## EPO ACADEMIC RESEARCH PROGRAMME

**Chairs:** Yann Ménière, Chief Economist, EPO, and  
Xavier Seuba, Director European Patent Academy and EQE, EPO



**Summary:** The four grant recipients present their final and interim results of their research projects done with the support of the EPO under the Academic Research Programme. The reports present new insights into i) the analysis of standard-essential patents using semantic comparison, ii) how collaborations in science and in patents are related at regional level, iii) the interplay between universities and firms located in the same European regions, and iv) data on patents that were used as collateral in loan negotiations.

### Presentations:

#### → APPROXIMATING THE STANDARD-ESSENTIALITY OF PATENTS - A SEMANTICS-BASED ANALYSIS

Lorenz Brachtendorf (Max Planck Institute for Innovation and Competition), Fabian Gaessler (Max Planck Institute for Innovation and Competition) and Dietmar Harhoff (Max Planck Institute for Innovation and Competition).

Standard-essential patents (SEPs) have become a key element of technical coordination in standard-setting organizations (SSOs). Yet, in many cases, it remains unclear whether a declared SEP is truly standard-essential. This report introduces a semantics-based method for approximating the standard essentiality of patents. We provide details on the mechanics of our approach and the measures of semantic similarity between patent and standard texts. We assemble data on patent-standard pairs (either specifically declared or determined by our similarity measure) for three leading SSOs in the ICT industry: ETSI, IEEE, and ITU-T. We further demonstrate the method's internal and external validity through several exercises. Most notably, we exploit information on manual essentiality assessments for a sample of patents declared essential to either ETSI or IEEE standards. We find strong and significant correlation between the experts' decisions on standard essentiality and our measure of semantic similarity. In a first empirical application, we demonstrate that the similarity measure can be used to estimate the share of (presumably) true SEPs in firm patent portfolios. Doing so, we find statistically and economically substantial differences between firms. We further illustrate that our measure can be used to shed light on the number and identity of SEPs in those cases, where firms filed only blanket (i.e., unspecific) declarations. Despite the method's limited accuracy, we see various possible use cases in the academic as well as practical sphere. Most importantly, the method may facilitate the large-scale assessment of declared SEPs and the search for relevant, but (so far) undeclared patents, rendering it a potentially valuable tool for SSOs, regulators, and firms alike.

#### → THE EFFECTS OF PUBLIC RESEARCH FUNDING ON PUBLICATIONS AND PATENTS: AN ANALYSIS OF ERC RESEARCH GRANTS

Federico Munari (University of Bologna), Elisa Leonardelli (Fondazione Bruno Kessler), Stefano Menini (Fondazione Bruno Kessler), Hérica Morais Righi (University of Bologna), Maurizio Sobrero (University of Bologna), Sara Tonelli (Fondazione Bruno Kessler) and Laura Toschi (University of Bologna).

This study aims to expand the discussion and the evidence on the impact of public funding for scientific research on the development of new innovative technologies. We develop and test a methodology to identify patents relying on scientific publications generated by publicly funded scientific research. Our analyses are based on projects funded by the European Research Council (ERC) in the Life Sciences and Physical Engineering sectors during the FP7 program. We identify patents that build on ERC-funded scientific publications and compare them with those directly reported by the PIs at the end of the grants. We document important technological spillover effects generated by research funded by the ERC. Our results also highlight some influential factors that shape the relationships between patents, publications, and grants, such as project type, age, duration, scientific domain, and number and quality of associated publications. Therefore, our findings present significant policy implications for funding agencies, universities, TTOs, and policymakers interested in monitoring public research investments' technological outcomes

### → THE INTERPLAY BETWEEN SCIENCE AND INVENTION NETWORKS IN KNOWLEDGE COHESION: EVIDENCE FROM EUROPEAN REGIONS

**Semih Akçomak** (Middle East Technical University), **Erkan Erdil** (Middle East Technical University), **Müge Özman-Gossart** (Institut Mines-Télécom Business School) and **Umut Yılmaz Çetinkaya** (Middle East Technical University).

This paper aims to analyse international collaborations in science and inventive activity and investigate how the landscape of knowledge production in Europe has changed in the past 25 years. We further aim to analyse to what extent collaborations in science and collaborations in patents are related at the regional level. These collaborations can be set up by researchers, universities and firms, and governments fund such collaborative initiatives (e.g., EU's Framework Programmes). Thus, both academics and policy makers will benefit from knowing the impact of collaborations in research and patents. The paper has four research questions: 1) Do patent and research networks in Europe have similar dynamics? 2) Do patents have any impact on the formation and evolution of research networks? 3) Do the innovation performances of regions affect the formation and evolution of research networks? 4) Do the innovation performances of regions affect the formation and evolution of patent networks? By answering these questions our ultimate aim is to coin a new concept we refer as “knowledge cohesion” and provide a critical look at the smart specialization policies in Europe.

### → PATENTS AS A SOURCE OF FINANCE TO MITIGATE FINANCING CONSTRAINTS

**Felix Bracht** (KU Leuven) and **Dirk Czarnitzki** (KU Leuven).

The purpose of this project is to collect data on patents that were used as collateral in loan negotiations in Sweden and the Netherlands where it is mandatory to report to the local patent authority if intellectual property rights have been pledged. In addition, we conduct an economic analysis of pledged patents in order to shed some light on I. how frequently are patents used as collateral, II. which patents are used as collateral, III. which type of firms pledge patents, IV. whether we can use pledged patents to estimate their value through firms' debt levels, V. whether patent-pledging is effective in mitigating financing constraints of corresponding firms significantly. The study has several interesting findings. For example, one preliminary results of our empirical study for Sweden suggests that patent-pledging adds a marginal value of 21% to the debt level of the treated firms. The median of debt in the group of patent-pledging firms is about EUR 845,000 before the loan contracts involving patent collateralization are being negotiated. We thus estimate a treatment effect, i.e., the value of the pledged patent portfolios, of roughly EUR 197,000.

## PARALLEL SESSION L

→ Themed SESSION L - OA

Thursday, 9 September 2021

9:00 - 10:00

Themed session

ROOM ONLINE A

### IP AND INTERNATIONAL TRADE

**Chairs:** Marco Grazzi, Università Cattolica del Sacro Cuore, Milano (Italy) and Daniele Moschella, Scuola Superiore Sant'Anna, Pisa (Italy)

**Summary:** Intellectual Property (IP) rights and trade flows are deeply intertwined. This is supported both on the basis of theoretical and empirical ground. The direction of causality is not always easy to be singled out and most likely it runs in both directions over different time horizon. On the one side, higher IP protection in the destination countries of export might foster larger trade flows, as exporting firms bear a smaller risk of being imitated. On the other side, and probably on a longer time span, an increase in the size of the market, both in a given destination as well globally, is likely to increase the incentive of firms to invest in R&D, introduce new products and resort to IP. The works gathered in this session contribute to the debate in different but complementary manners, by combining theoretical and empirical analyses on the relation between IP (both trademarks and patents) and international trade.

#### Presentations:

##### → INTERNATIONAL PATENT PROTECTION AND TRADE: TRANSACTION-LEVEL EVIDENCE

Gaetan De Rassenfosse (EPFL), Marco Grazzi (Università Cattolica del Sacro Cuore, Milano), Daniele Moschella (Scuola Superiore Sant'Anna, Pisa) and Gabriele Pellegrino (Università Cattolica del Sacro Cuore, Milano)

This paper investigates the extent to which international trade hinges on patents. We analyze the export and patenting activities of the universe of French exporting firms over the period 2002-2011. The noticeable feature of our study is that we observe export and patenting activities worldwide and at the product level. We exploit how heterogeneity of patent coverage across (and within) product-country relates to exports. We find a patent premium of at least 10 percent, which is mainly associated with a quantity effect. A modest price effect emerges in specific sectors, notably pharmaceuticals.

##### → INTERNATIONAL PATENTING WITH HETEROGENEOUS FIRMS

Nikolas Zolas (U.S. Census Bureau)

How do firms decide where and when to patent? This paper develops a heterogeneous firm model of trade with imitation where innovating firms compete with imitating firms on price. Patenting reduces the number of imitating firms and provides higher expected profits and increased markups from reduced competition and greater appropriability. Countries with higher technological capabilities, more competition and better patent protection have a higher proportion of entrants who patent. Industries follow a U-shaped pattern of patenting depending on the variability of production and substitutability. Using bilateral international patent flows, the model is calibrated to obtain measures of country technology states and IP benefits. A look at the benefits of international patent treaties and its member countries highlights how nearly all countries benefit from participating in patent treaties and that patent treaties have reduced administrative fees for innovating firms by more than \$7.2B in 2012. Further

simulations suggest that technology gains and trade liberalization between 1996 and 2012 both contributed substantially to the rise of international patents.

#### → THE GLOBAL FOOTPRINT OF LOCAL CORPORATIONS

**Steve Petrie** (Swinburne University of Technology), **Trevor Kollman** (Swinburne University of Technology), **Russell Thomson** (Swinburne University of Technology), **Alex Cordoraneau** (Swinburne University of Technology) and **Elizabeth Webster** (Swinburne University of Technology).

The measurement of firms pursuing new goods producing business models, often called fabless manufacturing or own-brand importer-marketers, has centered on industry-specific micro measures that are limited by cost, confidentiality, coverage or geographic granularity. Most often these firms that adopt these factoryless product-focused models are unhelpfully classified as wholesale traders. We introduce a new internationally linked trademark database (TM-Link) and show that variation in international trademarking activity, after controlling for exports and outward FDI, conforms well to product complexity measures and existing evidence on the growth of both fabless manufacturing and production fragmentation (by State and by industry). We argue that since companies trademark in markets where they want control over product management, design and distribution, domestic and international trademark data can shed light on the firms and locations that are engaged in these new business models.

#### → INTELLECTUAL PROPERTY-RELATED PREFERENTIAL TRADE AGREEMENTS AND THE COMPOSITION OF TRADE

**Keith Maskus** (University of Colorado Boulder) and **William Ridley** (University of Illinois Urbana Champaign)

We study how preferential trade agreements (PTAs) with chapters covering intellectual property rights (IPRs) affect the trade of member countries, defining treatment PTAs as those in which one partner is the United States, the European Union, or the European Free Trade Association. While effects on total trade are relatively limited, we show that the inclusion in PTAs of IPRs chapters with elevated standards causes significant increases in bilateral exports of biopharmaceutical goods and other IP-sensitive sectors to markets outside the PTAs, while generally reducing trade in sectors less reliant on IP protection. These impacts suggest that "behind the border" regulations within PTAs do influence trade.

## PARALLEL SESSIONS IV

### → Themed SESSION IV - HA

Thursday, 9 September 2021

9:00 - 10:00

Themed session

ROOM HYBRID A - SALON DE ACTOS

### DATA SCIENCE FOR INNOVATION AND SCIENCE DATA (II)

**Chair:** Dominique Guellec (OST-Hcéres)

**Presentations:**



## → FREEDOM TO OPERATE AND NOVELTY PATENT ANALYSIS WITH BERT

**Michael Freunek** (Mathematical Institute, University of Bern) and **André Bodmer** (Institute of Economics, University of Bern)

In this paper we present a method to apply BERT to freedom to operate and novelty patent analysis. We describe in detail, how BERT can be trained for these tasks by concatenating claims and descriptions of patents. Such a trained BERT can identify novelty relevant patent descriptions for claims and freedom to operate relevant claims of an invention or product based on a short description. We demonstrate, how the output for novelty searches can be interpreted by introducing a novelty or relevance scoring. We tested the methods by training BERT on the first claims and corresponding descriptions on patents of the IPC/CPC class G06T1/00. For the novelty search, we applied the method to five patent applications and compared the results with the cited X documents in the search reports provided by the European Patent Office. The test showed that BERT has scored some of the cited X documents as highly relevant. For the freedom to operate, we tested the trained BERT on five inventions classified in G06T1/60.

## → RELIANCE ON SCIENCE BY INVENTORS: HYBRID EXTRACTION ON IN-TEXT PATENT-TO-ARTICLE CITATIONS

**Matt Marx** (Boston University) and **Aaron Fuegi** (Boston University)

We curate and characterize a complete set of citations from patents to scientific articles, including nearly 16 million from the full text of USPTO and EPO patents. Combining heuristics and the GROBID machine-learning package, we achieve 25% higher performance than machine learning alone. At 99.4% precision, coverage of 87.6% is achieved, and coverage above 90% with precision above 93%. Performance is evaluated with a set of 5,086 randomly-sampled, cross-verified “known good” citations, which the authors have never seen. We compare these “in-text” citations with the “official” citations on the front page of patents. In-text citations are more diverse temporally, geographically, and topically. They are less self-referential and less likely to be copied from one patent to the next. That said, in-text citations have been overshadowed by front-page in the past few decades, dropping from 80% of all patent-to-article citations to less than 40%. In replicating two published articles that use only citations on the front page of patents, we show that failing to capture those in the body text leads to understating the relationship between academic science and commercial invention. All patent-to-article citations, as well as the known-good test set, are available at <http://relianceonscience.org>.

## → BEYOND PATENT-LEVEL EMBEDDINGS: A DEEP LEARNING APPROACH TO GENERATING AND UTILIZING PARAGRAPH EMBEDDINGS FOR PATENTS

**Rob Srebrovic** (Google) and **Jay Yonamine** (Google)

Patents are the richest source of publicly available information that represent innovation worldwide. Although patents contain images and metadata fields, the most important information in patents is in text. Patent text is semi-structured in different required sections (e.g., title, abstract, description, claims) and highly complex, using distinct terminology and styles. In order to analyze patents at scale using statistical and machine learning techniques, researchers and practitioners often convert the text of a patent into embeddings. Historically, most patent embeddings used in research are at the patent document level, meaning that a single embedding is used to represent all of the text for each sub-section for each patent. While useful, this approach has a meaningful limitation in that all of the diverse information conveyed in a patent is forced into a single embedding.

This leads to at least two major shortcomings. First, it is difficult to perform nuanced multivariate classifications, such as hierarchical taxonomic classifications where a patent can have multiple classification that can be driven by specific elements of a specific sub-section. Second, it is extremely difficult to infer which element of the patent contributed to a given prediction. This is especially challenging in information retrieval tasks where an ML model is used to provide a ranked list of patents based on predicted relevance to a human user who will then manually review.

In this paper, we introduce a framework for generating and utilizing paragraph embeddings for patents. To generate the embeddings, we first train a Siamese Sentence-BERT on the patents corpus, and then use this model to generate and store embeddings for each claim, paragraph in specification, and abstract for each patent. We then implement a novel deep learning architecture to use these embeddings simultaneously for various tasks, highlighting performance lift on multivariate hierarchical classification, basis of literature in the fields of IP and administrative law.

## → PATENTSBERTA: A DEEP NLP BASED HYBRID MODEL FOR PATENT DISTANCE AND CLASSIFICATION USING AUGMENTED SBERT

**Daniel Hain** (Aalborg University Business School), **Hamid Bekamiri** (Aalborg University Business School) and **Roman Jurowetzki** (Aalborg University Business School)

This study provides an efficient approach for using text data to calculate patent-to-patent (p2p) technological similarity, and presents a hybrid framework for leveraging the resulting p2p similarity for applications such as semantic search and automated patent classification. We create embeddings using Sentence-BERT (SBERT) based on patent claims. To further increase the patent embedding quality, we use transformer models based on SBERT and RoBERT, and apply the augmented approach for fine-tuning SBERT by in-domain supervised patent claims data. We leverage SBERTs efficiency in creating embedding distance measures to map p2p similarity in large sets of patent data. We deploy our framework for classification with a simple Nearest Neighbors (KNN) model that predicts Cooperative Patent Classification (CPC) of a patent based on the CPC assignment of the K patents with the highest p2p similarity. We thereby validate that the p2p similarity captures their technological features in terms of CPC overlap, and at the same demonstrate the usefulness of this approach for automatic patent classification based on text data. Furthermore, the presented classification framework is simple and the results easy to interpret and evaluate by end-users. In the out-of-sample model validation, we are able to perform a multi-label prediction of all assigned CPC classes on the subclass (640) level on 163,269 patents with an accuracy of 54% and F1 score > 63%, which suggests that our model outperforms the current state-of-the-art in text-based multi-label and multi-class patent classification by a margin of > 18. We furthermore discuss the applicability of the presented framework for semantic IP search, patent landscaping, and technology intelligence. We finally point towards a future research agenda for leveraging multi-source patent embeddings, their appropriateness across applications, as well as to improve and validate patent embeddings by creating domain-expert curated Semantic Textual Similarity (STS) benchmark datasets.

Thursday, 9 September 2021

9:00 - 10:00

Themed session

ROOM HYBRID B - MENENDEZ PIDAL

## THE GEOGRAPHICAL CONCENTRATION OF INNOVATION (II)

**Chairs:** Carsten Fink and Julio Raffo, WIPO Chief Economist Unit, and Ernest Miguelez, GREThA - CNRS-U. Bordeaux



**Summary:** Innovation certainly played a major role in this new landscape ranging from Silicon Valley to Shenzhen's Bay area. What are the main channels through which innovation affects regional (local) development? What can we learn from the evolution of the successful (and less so) local innovation ecosystems? Can these industrial and technological transformations offer economic and policy insights for other developing regions of the world? Topics of interest relevant to this session include but are not limited to: i) Defining innovation-dense regions and metropolitan areas (i.e. hotspots); ii) Emergence of new innovation hotspots; iii) Local innovation ecosystems within hotspots/regions; iv) Innovation related indicators with geo-localized data; v) Measuring innovation networks across and within hotspots; vi) The role of local Innovation and IP Policy in regional/hotspot technological trajectories.

### Presentations:

#### → TOWARDS NEW NARRATIVES ON URBAN INNOVATION: A FIRST COMPREHENSIVE ANALYSIS OF USPTO PATENTS, TRADEMARKS AND DESIGN RIGHTS

Carolina Castaldi (Utrecht University)

The identification of innovative clusters and more in general the geography of innovation literature has gone hand in hand with a focus on technology and on patents, with only a handful of exceptions. When it comes to the United States, the 'large cities' narrative has been one of innovation increasingly concentrated in large cities, because of multiple externalities related to agglomeration and density. This dominant narrative is being challenged in several ways. This study takes stance with the claim that innovation equates to technological invention and that patents are the best and only way to capture innovation.

The question that motivates this work is: do we get a different narrative on urban innovation in the United States if we go beyond technological invention only?

The question is a conceptual and empirical one. While most studies on urban innovation recognize the limitations of patent data, it is surprising that there have been only rare attempts at leveraging other metrics. One of the seminal work in the geography of innovation (Feldman, 1994) did look at commercialized product innovation (at the state level) rather than inventions, but later studies have almost exclusively used patents. I argue that complementing patent metrics with two other metrics, namely trademarks and design rights, allows to capture other stages of the innovation process. All three are intellectual property rights, formal appropriation tools widely used by innovative individuals and companies. They have the potential to capture more phases of the innovation process and more types of innovation.

The results indicate that using broader innovation metrics allows to uncover more and different urban innovation centers than focusing on patents only.

## → GLOBAL INNOVATION NETWORKS AND LOCAL HOTSPOTS OF INNOVATION: AN ANALYSIS OF THE SAO PAULO ECOSYSTEM

**Ernest Miguelez** (CNRS-GREThA University of Bordeaux), **Julio Raffo** (World Intellectual Property Organization), **Massimiliano Coda Zabetta** (University College of Dublin), **Renato Garcia** (University of Campinas) and **Veneziano Araujo** (Federal University of São Paulo)

Over the past 40 years, the world has seen profound changes in the global innovation landscape. Even though knowledge generation activities are increasingly concentrated in some metropolitan areas, they are gradually spreading to regions outside the traditional centers in the United States, Western Europe and Japan (CRESCENZI et al., 2019; MIGUELEZ et al., 2019). During this period, some regions in developed countries, such as San Francisco, New York, Frankfurt and Tokyo, consolidated their position as the main global innovation hotspots. In addition, regions in developing countries, such as the Shenzhen-Hong Kong bay area, Singapore, Bangalore, and Sao Paulo, have become emerging centers for important knowledge activities. Meanwhile, the production of knowledge in all these localized hotspots has become increasingly interconnected, forming complex global innovation networks, whose connectivity sometimes defies geographic distance. Based on this context, this paper aims to present some of the main characteristics of the Sao Paulo ecosystem in Brazil. Sao Paulo ecosystem has become the main innovation hotspot in Brazil and even in Latin America, as it concentrates a relevant share of the efforts to generate new scientific and technological knowledge. This role can be verified through scientific production indicators, measured by academic publications; and through technological production indicators, measured by both patents applications.

## → SCIENCE AND TECHNOLOGY PARKS AND THEIR EFFECTS ON INNOVATIVE PERFORMANCE

**Marcos Antón Tejón** (University of Malaga), **Catalina Martínez** (Institute of Public Goods and Policies, CSIC-IPP), **Alberto Albahari** (University of Malaga) and **Andrés Barge Gil** (Complutense University of Madrid)

The attention paid by the scientific community to Science and Technology Parks (STPs) has grown with the weight that parks have been acquiring in the technology policies of many countries. Research has mainly focused on assessing whether on-park location affects economic performance, innovative performance and cooperation patterns of park's tenants. Studies on the effects of STPs on innovative performance tend to use the number of patents applied for by firms as a common indicator. However, it is well-known that patent counts does not capture the technological importance of inventions and the quality of patents is a highly skewed. This paper aims at exploring whether Spanish STPs contribute to increase the quality of patents. Using a novel database of Spanish firms located on and off-park, purposefully created for this project, we compare the technological importance and spillovers generated by patents generated inside and outside parks in the period 2004-2019 to estimate the effect of on-park location and analyse the channels through which STPs have an influence on the innovative performance of park's tenants.

## → *Themed SESSION IV - HC*

Thursday, 9 September 2021

9:00 - 10:00

Themed session

ROOM HYBRID C- MARIA ZAMBRANO

## ROUNDTABLE ON IP, TECHNOLOGY DEMOCRATISATION AND START-UPS

**Chair:** **Aurelio López-Tarruella Martínez** (Associate Professor of Private International Law, Director of the Global Innovation & Policy Law Research Group, University of Alicante)

## Summary:

**Aurelio López-Tarruella** (University of Alicante (GIP Law))

**Anna Vainio** (Patent Engineer at IQM Quantum Computers)

**Begoña González Otero** (Max Planck Institute for Innovation and Competition),

**Vicente Zafrilla Díaz-Marta** (Universidad de Alicante (GIP Law) & Max Planck Institute for Innovation and Competition)

**Rebeca Ferrero Guillén** (University of Alicante (GIP Law) & European Patent Office trainee)

Much has been written about technology democratization in the latest years. While there is not a unanimous definition of the phenomenon, in our opinion, the most suitable one refers to the reduction of barriers to access technology so that everyone can benefit from it. To our understanding, technology democratization is caused by six interrelated elements.

a. Widespread access to internet b. Reduction of storage and processing costs due to Moore's Law. c. Open Source Software. d. Open Data/Content e. Standards. f. Public domain.

Technology democratization provides huge opportunities to SMEs and individual entrepreneurs all around the world. SMEs with brilliant ideas and talent can now compete with big corporations without the need of vast amounts of money. Available data already shown the effects of technology democratization. According to the ONTSI Report of 2020, 94% of enterprises in the Infomediary sector in Spain are SMEs (47% with less than 10 workers). Similar data exists in relation to other countries in Europe

However, technology democratization raises new challenges from the point of view of intellectual property not only in relation to the protection of the innovative ideas generated by SMEs, but also in relation to the design of their business models.

The purpose of this themed session is to discuss these challenges and to make recommendations to SMEs for fully profiting from the opportunities offered by technology democratization.

→ Themed SESSION IV - OA

Thursday, 9 September 2021

9:00 - 10:00

Themed session

ROOM ONLINE A

## DEMOGRAPHICS AND DISCLOSURE: STUDIES ON THE U.S. PATENTING PROCESS AND INNOVATION

**Chair:** Andrew A. Toole (USPTO Chief Economist)

### Presentations:

→ TRY, TRY, TRY AGAIN? DIFFERENTIAL RESPONSES TO REJECTION AND GENDER INNOVATION GAP

Abhay Aneja (Berkeley Law), Oren Reshef (WashU St. Louis), Gauri Subramani (Berkeley-Haas)

→ PATENTS AND THE INVENTOR LIFECYCLE: EVIDENCE FROM A RANDOMIZED CONTROL TRIA

Charles A. W. deGrazia (Ecole de Management Leonard De Vinci), Nicholas Pairoloero\* (USPTO), Peter- Anthony Pappas (USPTO), Mike H.M. Teodorescu (Boston College, Carroll School of Management & MIT D- Lab), Andrew A. Toole (USPTO & ZEW)

## → ASSESSING FACTORS THAT INFLUENCE WOMEN'S PARTICIPATION IN THE INVENTION ECOSYSTEM

Michelle Saksena (USPTO), Nicholas Rada (USPTO), Katherine Black (USPTO), Lisa Cook (Michigan State University)

## → VISIBILITY OF TECHNOLOGY AND CUMULATIVE INNOVATION: EVIDENCE FROM TRADE SECRETS LAWS

Bernhard Ganglmair (University of Mannheim, ZEW Mannheim & MaCCI), Imke Reimers<sup>a</sup> (Northeastern University)

Economic research shows that innovation is critical for sustained economic growth and improvements in standards of living. Less clear are the policies that will help spur innovation. Among the various policy options, intellectual property (IP) is often seen as an important legal mechanism supporting innovation. Policymakers are keenly aware of this and are actively pursuing new ways to use the IP system for innovation. In the United States, the 2018 SUCCESS Act (U.S. Public Law 115-273) called for expanded participation by women, minorities, and veterans in the patent system. Currently, the U.S. Congress is considering the "Endless Frontier Act" that would commit \$100 billion in new funding for science and technology, including an additional \$10 billion to establish regional "technology hubs."

This session explores two very important aspects of how IP contributes to innovation. The first three papers focus on the experiences of women and "pro se" inventors in the process of obtaining a patent from the U.S. Patent and Trademark Office (USPTO). The first paper explores the gender gap in patenting and uncovers key differences between men and women during patent prosecution that policy could target to increase participation. The second paper uses a randomized control trial conducted at the USPTO to better understand both the benefits of a policy designed to increase participation in the patent system, as well as understand the causal impact of patenting on inventor outcomes. The third paper explores the regional determinants of the gender patenting gap and discusses policy implications.

The final paper focuses on how the disclosure of information affects firm-level patenting decisions. By exploiting exogenous variation in the strength of trade secrets, the fourth paper quantifies the tradeoff between trade secrecy and patents for invention disclosure and research and development expenditure.

## → Parallel SESSION IV - OB

Thursday, 9 September 2021

9:00 - 10:00

Themed session

ROOM ONLINE B

**Chair:** Fabio Montobbio (Catholic University Milan)

### Presentations:

## → THE REAL EFFECTS OF FINANCIAL MARKETS ON SCIENTIFIC DISCLOSURE: EVIDENCE FROM A QUASI-NATURAL EXPERIMENT

Stefano Baruffaldi (University of Bath), Markus Simeth (Copenhagen Business School) and David Wehrheim (IESE Business School)

While innovation disclosure is essential for cumulative knowledge production and economic growth, evidence on firm incentives to disclose innovation outcomes is lacking. We examine the role of financial markets in firms' decisions to disseminate scientific research results. We employ a quasi-natural

experiment that exploits plausibly exogenous variation in analyst coverage, resulting in higher information asymmetries. We find that firms respond by a quick and enduring increase in scientific publications. We also show that disclosure decisions are shaped by financial constraints and managerial incentives. We discuss important implications, such as potential crowding out effects between transparency initiatives and socially desirable innovation disclosure.

## → PATENTS AND KNOWLEDGE DIFFUSION: THE IMPACT OF MACHINE TRANSLATION

**Benjamin Buettner** (Eindhoven University of Technology), **Emilio Raiteri** (Eindhoven University of Technology) and **Murat Firat** (Eindhoven University of Technology)

One of the main rationales for the patent system's existence is to encourage knowledge diffusion and follow-on innovation through the full disclosure of the technical knowledge embodied in a patented invention. Yet, economists and legal scholars cast doubts on the validity of the disclosure theory and stress that inventors do not learn their science from reading patents. The empirical evidence on the actual benefits of the disclosure function is, indeed, limited. The present paper aims at expanding our understanding of how information spreads via patent disclosure and exploits recent improvements in machine translation (MT) to identify the effect of broader access to patented knowledge. More specifically, the paper uses a unique natural experiment. In September 2013, Google launched a major upgrade of its Google Patents service and added patent applications from the China National Intellectual Property Agency (CNIPA) to its searchable patent database. To do so, Google used its own neural machine translation service to translate patent documents previously available to the general public only in Chinese. Using a difference-in-differences approach, we show that the translation of the Chinese patents into English resulted in an increase in citations received from patents filed by U.S. inventors, compared to a suitable control group composed of patents which Google translated only in 2016. Our results suggest that increased access to patented knowledge promotes technological progress. This finding seems to confirm the beneficial effect of patent disclosure.

## → AT THE ORIGIN OF A BREAKTHROUGH INNOVATION: THE ECONOMIC AND SCIENTIFIC CONSTRUCTION OF MRNA VACCINES

**Fabio Montobbio** (Catholic University Milan), **Pellegrino Gabriele** (Catholic University Milan), **Massimo Riccaboni** (IMT Lucca) and **Valerio Sterzi** (Gretha - Bordeaux University)

This paper studies the economic and scientific origin of the mRNA vaccines. This technology is reshaping vaccinology and opening new possibilities for developing new therapies. However, this rapid development would have not been possible without preexisting investments in basic research on mRNA and related methods. We merge four databases: Evaluate for economic data on product development, USPTO data for patents and patent citations, ORBIS for company data and SCOPUS/Pubmed for scientific publications. The starting point is the set of 113 mRNA patents listed in Martin & Lowery (2020). We exploit their methodology (keyword search in patent text and manual check) to update the initial core set of patents to the most recent ones. Secondly, we use cited patents and cited scientific publications. This paper asks who are the actors involved in the innovation process and in the generation and development of the knowledge base. The patent landscape allows understanding the technological activity, competencies and collaborations of the firms that successfully developed mRNA vaccines: (Phase III or approved) Pfizer BioNTech, Moderna, Curevac and Sanofi - Translate Bio). We aim at capturing the different roles of public institutions, funding the basic research and also supporting the development of the vaccines with procurement contracts and purchase options. At the same time, a vast network of small, medium and large companies have contributed to the innovation process, particularly in the US and Germany and in other areas of the world. Finally, we analyze the sources of scientific knowledge that enabled the discovery and development of the mRNA vaccine. The evidence allows an accurate analysis of where the

credit is due and whether the distribution of the economic rents derived from the commercialization of the vaccines in the market reflects the distribution of the efforts provided.

→ Themed SESSION IV - OC

Thursday, 9 September 2021

9:00 - 10:00

Themed session

ROOM ONLINE C

## SECRECY AND OPENNESS IN A GLOBALIZED AND DIGITALIZED WORLD

**Chair:** Mark Schultz (University of Akron School of Law)

### Presentations:

→ TRADE SECRETS AND AI

Tanya Aplin (King's College London) and Sharon Sandeen (Mitchell Hamline)

Access to and sharing of anonymized machine-generated data and the transparency of data analysis techniques has taken on vital importance in a world characterized by 'big data', the 'internet of things' and 'AI'. In short, this paper will explore the ways in which EU and US trade secrets law may operate as barriers to access to and sharing of machine learning data and algorithms. It will interrogate the extent to which such data and algorithms may qualify as 'trade secrets' - focusing in particular on whether such information may be considered valuable because it is secret and the reasonable steps required for keeping it secret - and whether reverse engineering and public interest exceptions may act as levers to promote access and sharing. The processes by which requests for information access are made and considered will also be discussed to determine if, when, and how the public interest in access to information is and should be considered.

→ CALCULATING PERMANENT INJUNCTION LIFE IN TRADE SECRET MISAPPROPRIATION CASES

Lynda Oswald (University of Michigan Ross School of Business)

This paper explores the disconnect between doctrine and practice in the calculation of the life of permanent injunctions in trade secret misappropriation cases, drawing upon findings from an empirical analysis of twelve years' of federal and state cases.

The case law and scholarly commentary on the measurement of the life of permanent injunctions in U.S. trade secret misappropriation cases reveals a legal doctrine that is rich, nuanced, and indeed rather elegant in its design. Under modern doctrine, courts are to carefully refine the scope of a permanent injunction against further misappropriation by considering the time it would take for the defendant to independently develop the trade secret through legitimate business practices; the resulting injunction life is thus very fact-dependent and unpredictable.

This paper argues that the nuanced articulated doctrine does not reflect the actual practices of courts granting this form of equitable relief to trade secret owners whose trade secret has been misappropriated. The paper undertakes an empirical analysis of 143 cases decided in federal court and 172 cases decided in state court in the twelve-year period between January 1, 2009 and December 31, 2020 to examine whether and how courts calculate the life of permanent injunctions in trade secret misappropriation cases. The results of the study indicate that practice is indeed different from theory in this matter - the vast majority of courts issuing permanent injunctions for trade secret misappropriation pay little to no attention to the nuanced rules set forth by statute and case law and instead issue terse



permanent injunctions that fail to specify any time limit at all. However, preliminary analysis of the study's results also suggests that this startling divergence between doctrine and practice is not problematic and, in fact, may promote more efficient outcomes by conserving judicial and litigant resources.

### → AN ANALYSIS OF THE DIFFERENTIAL APPROACHES TO DEFINING TRADE SECRET IN THE UNITED STATES (US), THE UNITED KINGDOM (UK), AND AUSTRALIA

**Suzana Nashkova** (UNSW law)

This paper addresses some of the issues emerging due to the lack of a unanimously accepted definition of a trade secret as a legal concept. The analysis of the legal theory, case law, and legislation within the jurisdictions examined in the paper - the US, the UK, and Australia - indicates that the lack of a precise definition has spawned potentially significant differences in its understanding and legal treatment. Whilst the concept of a trade secret in the US and the UK is a subject of statutory regulation, Australia defines it broadly under the common law. Finding a precise answer to the question - what trade secret is? hence remains crucial given that the manifold legal variations in the definitions have implications on the legal treatment and the protection of information as a trade secret, which can prove particularly challenging in cross-border transactions of its transfer.

### → ACCESS TO TRADE SECRETS UNDER THE EU TRADE SECRETS DIRECTIVE

**Katharina Behrend** (University of Oxford) and **Katarina Foss-Solbrekk** (University of Oxford)

The paper focuses on access to vaccines and medication against Covid-19 from an EU law perspective. In particular, it shows the difficulty of balancing openness and secrecy in trade secret law. On the one hand, the EU Trade Secrets Directive of 2016 refers to public interest grounds such as "public health" that can prevail over the interest of the trade secret holder to keep the relevant information confidential. On the other hand, several provisions do in fact protect the trade secret holder. The paper provides clarity on this issue.

### → Parallel SESSION IV - OD

Thursday, 9 September 2021

9:00 - 10:00

Themed session

ROOM ONLINE D

**Chair:** **Dan Burk** (University of California, Irvine)

#### **Presentations:**

### → PATENT SYSTEM: FROM REDUCTIONISM TO COMPLEXITY

**Girish Somawarpet Nagraj** (University of Alicante)

The paper is an exposition of various lens of viewing the patent system finally concluding that evolutionary or complex adaptive system (CAS) lens provides means and methods to understand intellectual property systems in the present era of complexity.

Innovation and the patent system are strange bedfellows, the patent system was envisaged to positively feed the innovation engine. However, scholarly literature offers a spectrum of opinions and evidence ranging from positive to negative feedbacks and anywhere in between. The pro patent lobby, the anti-

patent activist, the centrists arguing for nuanced contextual based patent system form a whole spectrum. The paper providing an insight into the various theories and argues for an institutional, evolutionary and complex adaptive systems (CAS)-based approach in addressing the nexus between innovation and the patent system. CAS argues for a holistic vision in approaching non-linear dynamical systems rather than the search for a reductionist, causal linear relationship between innovation systems and the patent system. Patent system has kept evolving and adapting thanks to its underlying foundation in property law, which, due to its bundle of sticks or Lego blocks analogy provides options to an agent to build or strategize as needed. A complex systems approach would provide a framework for contemporary analysis of IP systems.

## → JUDICIAL DIALOGUE IN THE EUROPEAN PATENT SYSTEM - AN EMPIRICAL STUDY

**Karen Walsh** (University of Exeter)

The enforcement of patent rights in Europe can be a complicated process. When a user discovers that their patented invention is being infringed across Europe, a lengthy and costly situation emerges if they choose to enforce their rights. Most infringement cases will involve a counterclaim for invalidity, destroying chances of a cross border decision, and potentially resulting in numerous actions being filed in a number of countries across Europe. The result for users is more cost and less legal certainty. Discussions around the enforcement of patent rights in Europe have centred on the introduction of a unitary patent and a centralised patent court (in whatever form that might be) to harmonise the system.

However, at the time of writing the implementation of such a system has not yet been achieved. Recent delays are just the latest chapter in the historical context of decades of attempts with multiple proposals being put forward. Given this track record, it is time to investigate alternative methods to harmonise the patent system, the pros and cons of harmonisation itself, and in turn, improve certain issues with the enforcement of patent rights in Europe. Previous research has shown that judicial dialogue and cooperation has been assisting with the harmonisation of the European patent system. The question thus posed is whether this informal process could be harnessed and used to its fullest potential.

Following interviews with judicial stakeholders from across Europe, this paper examines how judicial dialogue works in practice, if/when it is used, what would help with this method of soft harmonisation, and what would stand in its way. With that context in mind, the paper makes suggestions as to the way forward for patent law in Europe, with or without a unitary patent and centralised patent court, and one that takes national diversity into account.

## → CALCULATIVE PATENTS

**Dan Burk** (University of California, Irvine)

Patents are legal delinquents. A growing body of empirical evidence demonstrates that patents repeatedly fail to fulfill the responsibilities they have been assigned in fostering innovation. But I argue here that in their moments of misbehavior, we can catch a glimpse of the social roles patents play when no one is watching. Drawing on insights from the sociology of markets, I argue that patents are surreptitiously performing functions familiar from the grocery store, the vegetable stand, or the barber shop. I suggest that patents are calculative, not in the mathematical sense, but in the sociological sense of structuring and facilitating market relations. This approach to discovering the social roles of patents opens the door to a new examination of patent purposes, and to understanding some otherwise inexplicable characteristics of patent law.

## PARALLEL SESSIONS V

→ Parallel SESSION V - HA

Thursday, 9 September 2021

9:00 - 10:00

Themed session

ROOM HYBRID A - SALON DE ACTOS

### FRONTIERS IN EMPIRICAL TRADEMARK RESEARCH (II)

**Chair:** Carolina Castaldi (Utrecht University)

#### Presentations:

#### → TRADEMARK DEPLETION IN A GLOBAL MULTILINGUAL ECONOMY: EVIDENCE AND LESSONS FROM THE EUROPEAN UNION

**Barton Beebe** (New York University School of Law) and **Jeanne Fromer** (New York University School of Law).

The many national and regional trademark systems of the world are progressively integrating into a de facto global trademark system as firms increasingly adopt global branding strategies. Global integration presents significant challenges for trademark law and policy, the most urgent of which is the problem of trademark depletion. Businesses around the world are facing mounting difficulties finding brand names that will be effective throughout the global marketplace, including in every one of its many languages, but that have not yet been claimed by another entity somewhere in that marketplace. The result is rising barriers to entry, incomplete market integration, and escalating consumer search costs. To explore the scope of this problem and possible responses to it, this Article presents an empirical study of trademark depletion in a microcosm of the global trademark system: the European Union trademark system. We use recently released data from the European Union Intellectual Property Office (EUIPO) and multiple other datasets to systematically study all 1.9 million trademark applications filed at the EUIPO from 1996 through 2018. We show that levels of trademark depletion in the European Union exceed even those in the United States. Very high proportions of the most frequently used words in the five major European languages—English, German, French, Italian, and Spanish—are already claimed as trademarks. We demonstrate how this condition is exacerbated by what we call the “reverse Babel problem” in multilingual trademark systems, in which the registration of a word mark in one language may effectively block registrations of translationally-equivalent words in multiple other languages. We further reveal that the EU trademark system is coping with the problem of trademark depletion by permitting worsening levels of trademark crowding, in which increasing numbers of closely-similar, if not confusingly-similar, marks are allowed to coexist in the marketplace.

#### → REGISTERING “BLACK LIVES MATTER” AND “BLM”? AN EMPIRICAL REVIEW OF TRADEMARK APPLICATIONS AND CONSIDERATIONS FROM AN IP AND SOCIAL JUSTICE PERSPECTIVE

**Irene Calboli** (Texas A&M University School of Law).

This paper presents an empirical review of the trademark applications that have been filed with the USPTO for the terms “Black Lives Matters”. While a few applications are for entities working in areas related to the BLM Movement, a large number are for unrelated goods and services, including promotional products. This trend is not surprising and follows previous episodes of “opportunistic filings” for terms that have become popular (and profitable).

In the past year, however, after years of complaints leading nowhere, companies, sports clubs, and others business have abandoned their trademarks when these marks could be construed as racist or disparaging. Examples in this respect include Aunt Jemima and the Washington Redskins. Accordingly, how could the terms “Black Lives Matters” now be registered by individuals unrelated to the movement and be used on unrelated, and possibly inappropriate (or offensive) goods and services?

The purpose of this paper is to examine the extent of the problem—the growing number of applications—and consider the existing mechanisms that could prevent the registration of these marks. In particular, following the Supreme Court’s decisions in *Tam* and *Brunetti*, these applications can no longer be challenged under the former prohibition to register scandalous, disparaging, and immoral trademarks. Still, the USPTO refused a application in 2017, stating that the terms “Black Lives Matters” “convey an informational social, political, religious, or similar kind of message,” in addition to the fact the applicant was not using the terms to identify an actual source of goods and services—thus based on the failure to function doctrine.

Based on this precedent, this paper supports that all applications including these terms should be refused. This position would reflect and can certainly be justified on a social justice and public interest approach to the interpretation of the legal principles at the basis of trademark registrations.

### → FROM PATENTS TO TRADEMARKS: TOWARDS A CONCORDANCE MAP

**Milad Abbasiharofteh** (Utrecht University), **Carolina Castaldi** (Utrecht University) and **Sergio Petralia** (Utrecht University).

Trademarks are emerging as a salient data source across different research domains. Most studies so far have documented a strong correlation between patent and trademark activity at the firm level but have not tracked the specific relations between patent and trademark registrations. To tackle this issue, we aim at mapping patents into trademarks (i.e., a patent-trademark concordance map) to identify and further explore the market diffusion of new patented technologies. The concordance also contributes to innovation management research aiming to investigate the missing link between investment in technology and generation of economic value. Using the open data from EUIPO between 1996 and 2020, we exploit the information from nice classes and goods and service descriptors (gs-descriptors) to provide a more detailed characterization of the markets where trademarks get filed. We utilize information regarding gs-descriptors to identify the thematic boundaries within each class, hence defining ‘sub-classes’ within broad Nice classes. After tokenization, removing stop words, and extracting stems of words; we use NLP methods to transform gs-descriptors to numeric. Using K-means clustering we identify a varying number of thematic focuses within each class depending on the size and technological diversity of trademarks. The next step concerns linking patent classes to the expanded list of trademark classes. We identify such links by finding semantic similarities between gs-descriptors and unique titles and abstracts of 16 million patents in the PATSTAT Global (version 2020) dataset. The suggested concordance is validated using firm-level data (IPR-bundles). Our patents-trademarks concordance map exhibits a high degree of granularity (more than 40,000 relations between 662 CPC technological codes and 616 HDB-cluster codes) and outperforms already existing technology-goods/services concordances. This study tackles several methodological issues that have hindered researchers from drawing relations between patents and trademarks.

### → GREEN EU TRADEMARKS

**Francisco Garcia-Valero** (EUIPO).

The study had examined the description of goods and services of the trade marks registered in the EUIPO since its creation (1996), to determine the presence of “terms” related to the protection of the environment and to the sustainable development in line with the European Green Deal.

An inventory of “Harmonised Green Terms” has been defined based on the “Harmonised Database” (HDB), the internationally agreed list of standardised description of the goods and services. In addition, the green terms have been classified into 35 green categories, arranged into nine groups.

On this basis, a predictive model (the “Green TM Classifier”) has been developed that will allow inferring whether the terms covered by any trade mark application can be considered as “green term”, even if the description is not in the inventory of “Harmonised Green Terms”. The algorithm will not only decide if the terms are green, it will also classify them in one of the green categories.

The study will present temporal, geographical and sectorial statistics illustrating adoption of the green products or their categories.

It will also discuss other possible promising applications of the model in future research.

A major limitation in trade mark studies is the low detail of the Nice classification, and its inadequacy outside the registry procedures for which it was conceived. However, the description of goods and services of trade marks (a well-organized set on the other hand) offers great possibilities for semantic studies; a field that has already demonstrated its successes in the study of patents. What is needed are specific algorithms and, in this study, there is a first proposal.

## → Themed SESSION V - HB

Thursday, 9 September 2021

9:00 - 10:00

Themed session

ROOM HB - MENENDEZ PIDAL

**Chairs:** Ingrid Schneider (University of Hamburg)

### **Presentations:**

#### → **MONEY ON MY MIND - TOWARDS FAIR REMUNARATION IN DIGITISED MUSIC INDUSTRY CONTRACTS**

**Jozefien Vanherpe** (KU Leuven).

Over 400 million people currently have a paid subscription to a premium music streaming service, averaging a total number of yearly streams surpassing a trillion. In 2020, a single song garnered 1.6 billion streams on Spotify alone. The most successful artist has collected over 36 billion streams so far. The amount of revenue amassed by music streaming on a global level is simply staggering. However, the distribution of such revenues within the music value chain more often than not leaves both composing and performing musicians to draw the short straw. While the fairness of streaming revenue division has been questioned in the past, this issue was fully brought to the fore in the wake of the COVID-19 pandemic, due to the temporary annihilation of the live performances sector and the ensuing increased reliance of musicians on streaming income. Online campaigns in favour of a redistribution of revenues such as #BrokenRecord and #MakeStreamingFair have gained significant traction within the music community and show the need for ambition in tackling these issues.

Taking account of the particular contractual dynamics in the digitised music industry, this paper focuses on the commitments in terms of remuneration for music publishers and record companies in relation to compositions and (fixated) performances as harmonised by Articles 18 and 20 Digital Single Market (DSM) Directive, referring to the applicable legal framework in Belgium, France, Germany and the Netherlands where relevant. It analyses and reviews legal obligations relating to the amount of remuneration required. On this basis and taking due account of both the artistic and commercial interests involved, the paper conceptualises a duty of ‘fair’ remuneration that may contribute to achieving a fair(er) balance in the digitised music industry.

## → AUTHORSHIP AND COPYRIGHT OWNERSHIP IN COMPLEX CONSTRUCTION PROJECTS - FACILITATING THE DEVELOPMENT OF SUSTAINABLE CITIES AND ARCHITECTURE

Sander Nysten (University of Antwerp).

At the end of 2019, the European Commission announced “The European Green Deal” to emphasize the EU’s commitment in tackling climate- and environment-related challenges which will affect current and future generations. One of the pillars of this endeavor is the “New European Bauhaus”: an environmental, economic and cultural project that combines design, science and policy in a variety of areas in order to achieve more sustainable cities and a cleaner construction sector. Considering their significant carbon emissions, our cities and buildings are a big part of these global societal problems, but they are also inevitably a major part of the solution.

In tackling these complex problems, collaboration between various construction experts, disciplines and stakeholders is nevertheless essential. In this contribution, I analyze authorship, joint authorship and copyright ownership - from the perspective of Belgian, Dutch and American copyright law - in this increasingly collaborative and interdisciplinary construction environment.

I propose a graphically supported framework based around five key variables which position any creative collaboration on a spectrum in terms of intensity of collaboration and on a timeline detailing the creative process that connects the author and the work. These five key variables are: (i) presence of authorship, (ii) number of authors contributing to the final work, (iii) intent to collaborate among authors, (iv) divisibility of the work, and (v) interdependence of the work’s components. As such, this analysis on the allocation of copyright contributes to a better understanding and management of complex, multi-actor construction projects.

## → BATMAN FOREVER? THE ECONOMICS OF OVERLAPPING RIGHTS

Franziska Kaiser (HEC Lausanne & WIPO) and Alexander Cuntz (WIPO).

Overlapping intellectual property rights, in our case copyright and trademarks, can have market expansion effects but also lower the incentives for creative reuse and follow on innovation. We test this in the context of comic characters, covering close to 40 years of reuses and franchises in books, movies and video games. In this setting, we explore the role of ‘fuzzy boundaries’ of legal frameworks, using a series of U.S. Supreme Court decisions as a quasi-natural experiment to identify the effect of trademark registrations on reuse and sales. At large, we find negative effects of additional trademarks. Characters appear less often in comic book reprints and they enter fewer franchise productions, which translates into lower total sales. We discuss the role of strategic hold-up in explaining results and draw tentative policy conclusions.

## → SECURING CREATIVITY AND FAIR REMUNERATION FOR CREATOR IN THE DIGITAL ERA: FROM CONTRACTUAL PROTECTIONS TO REMUNERATION RIGHTS AND BEYOND

Christophe Geiger (University of Strasbourg) and Silvia Scalzini (Luiss Guido Carli University).

The remuneration for creators is at the core of copyright’s rationales. Indeed, copyright provides incentives for authors to create for the benefit of society, by securing them a fair remuneration for the use of their works and by fostering the well-functioning of (fair) markets. Remuneration secures personal autonomy of creators, allowing them to create and to express themselves freely. Furthermore, the remuneration for creators benefits from strong fundamental rights. Despite the importance of securing a fair remuneration, the distribution of the revenues for the exploitation of works protected by copyright (and of performances) is, however, not always fair for creators and artists. The digital single market

strategy has finally paved the way to the acknowledgement of the need to find stronger and harmonized strategies to secure fair remuneration for authors and performers, by introducing for the first time copyright-contract rules as an element of “fairness” of copyright focused markets (Directive (EU) 2019/790 of 17 April 2019). This paper argues that a genuine implementation of the remuneration rationale of copyright law can only be the result of the combination of several mechanisms and explores whether unwaivable right(s) to equitable remuneration may be a viable alternative in order to secure the effectiveness and the efficiency of the principle especially in digital settings. The paper concludes with an illustration of a setting where a statutory-remuneration-right eventually in the form of a statutory license might be a future proofing solution in order to generate fair earnings for creators, while at the same time allowing re-uses of works and, ultimately, fostering creativity. Indeed, the implementation of a right to equitable remuneration for the initial creator for online commercial creative uses could be a workable option in order to design the future of copyright law in the digital era by safeguarding its rationales and its engine.

## → Parallel SESSION V - HC

Thursday, 9 September 2021

9:00 - 10:00

Themed session

ROOM HYBRID C - MARIA ZAMBRANO

**Chair:** David Wehrheim (IESE Business School)

### Presentations:

#### → MARKET SIZE AND RESEARCH: EVIDENCE FROM THE PHARMACEUTICAL INDUSTRY

**Dennis Byrski** (Max Planck Institute for Innovation and Competition), **Fabian Gaessler** (Max Planck Institute for Innovation and Competition) and **Matthew Higgins** (David Eccles School of Business, University of Utah)

New scientific knowledge constitutes an important input for innovation and technological progress. However, the incentives for the production of scientific knowledge in the public sector may not align with the incentives for investments in innovation by the private sector. To this end, we investigate the responsiveness of upstream research to changes in downstream markets by exploiting the effects of quasi-experimental variation in market size introduced by Medicare Part D. In contrast to prior literature documenting a link between market size and drug development, we find no causal relationship between market size and research over the decade following implementation of Medicare Part D. These findings hold when we consider the nature of research as well as the type of scientist affiliation. We find, however, a very limited response by corporate scientists conducting applied research. Our results remain robust to demographic changes, public research funding, and new research opportunities.

#### → INTRAFIRM NETWORK CENTRALITY AND KNOWLEDGE RECOMBINATION IN A HIRING CONTEXT

**Li Liu** (University Carlos III of Madrid)

This paper explores firms’ dynamic knowledge recombination in the hiring context by studying the inventors’ choices about which pieces of knowledge to recombine after the firm hires an external inventor. Specifically, I study new hires’ choices for pieces of knowledge to recombine from the hiring firms’ prior knowledge (new hire absorption) and incumbents’ choice for pieces of knowledge to recombine from the new hires’ prior knowledge (incumbent absorption). I investigate the role of a

centralized intrafirm network in the hiring firm on new hire absorption and incumbent absorption. I argue that, a centralized intrafirm network (as opposed to a decentralized network) in a hiring firm will facilitate the new hire to absorb more knowledge from the hiring firm's prior knowledge because the knowledge flow pattern in a centralized firm allows the new hire to learn more efficiently. I also argue that a centralized intrafirm network (as opposed to a decentralized network) in a hiring firm facilitates incumbents to absorb more knowledge from the new hire, since the centralized network pattern allows both central inventors and other incumbents to absorb more knowledge from the new hire. I use the Heckman selection model to address the non-random mobility issue. I test my hypothesis with patent data in the drug industry and find support for my hypothesis. This paper extends our understanding of knowledge recombination in a hiring context by exploring how the intrafirm network affects both new hires' and incumbents' dynamic knowledge recombination following a hiring event that shapes the hiring firms' research trajectory. Practically, this paper suggests that managers may strategically form certain types of intrafirm networks before hiring to facilitate post-hiring knowledge recombination and thus shape firm research trajectory.

### → RATIONAL INDUSTRIAL POLICY: STANDING ON THE SHOULDERS OF GIANT GNOMES?

**Charlotte Guillard** (University College London), **Ralf Martin** (Imperial College London), **Pierre Mohnen** (Maastricht University), **Catherine Thomas** (London School of Economics and Political Science) and **Dennis Verhoeven** (Bocconi University)

The existence of knowledge spillovers creates a wedge between an innovation's private and total economic returns, and therefore a market failure for R&D. Variation in the size of this market failure creates potential for vertical industrial policy in which some 'areas' of innovative activity, for instance Biotechnology or Aerospace, are favored over others. In this paper, we examine this potential by developing an indicator for the rate of return to R&D support in a given area. We first introduce Patent Rank, an algorithm inspired by Google PageRank that allows to estimate the value of an innovation's knowledge spillovers using the patent citation network and private return estimates. We then employ a model of innovation that uses private and spillover value distributions in an area to estimate the marginal rate of return to a subsidy. Our results provide a clear argument in favor of targeted industrial policy, with return rates for fields such as Wireless and AI being about 3 times larger than for fields such as Chemical Engineering and Machine Tools. Our results also make a compelling case for supranational coordination of industrial policy, especially for smaller countries.

### → INSTITUTIONAL OWNERSHIP AND THE NATURE OF CORPORATE INNOVATION

**Sampsa Samila** (IESE Business School), **Markus Simeth** (Copenhagen Business School) and **David Wehrheim** (IESE Business School)

This paper analyzes whether institutional ownership affects the rate and nature of corporate innovation. We explicitly consider the heterogeneity of firm innovation by differentiating upstream scientific research from downstream development using novel scientific publication and patent indicators. Our analysis shows that greater presence of institutional owners has a negative impact on scientific research, whereas there is no effect on downstream development. Consistent with a short-term orientation of institutional owners, we further show that scientific research is associated with lower short-term operating performance but higher long-term firm value. These findings support the view that capital markets in general, and institutional owners in particular, can induce myopic firm behavior.



Thursday, 9 September 2021

9:00 - 10:00

Themed session

ROOM ONLINE A

**Chair:** Stuart Graham (Scheller College of Business, Georgia Institute of Technology)

**Presentations:**

→ **TECHNOLOGICAL KNOWLEDGE ABSORPTION CAPABILITIES IN LATIN AMERICAN BIO- PHARMACEUTICAL SECTOR. THE CASE OF BRAZIL AND MEXICO**

**Alenka Guzmán** (Universidad Autónoma Metropolitana Iztapalapa) and **Marco Antonio Pérez Mendez** (Universidad Autónoma Metropolitana Iztapalapa)

The aim of this paper is to estimate the technological knowledge absorption capabilities in the Mexican and Brazilian bio-pharmaceutical sectors and to discover the factors that foster them, in order to improve country health conditions. The proposal for estimating technological absorption and innovation capabilities in the bio-pharmaceutical sector of Latin American countries is the lag time with which USPTO patent applications from Brazil and Mexico cite previous patented novelties as proxy variables, lagtimePatcit. Through a proposed Poisson model, we find that with some differences, the technological absorption and innovation capabilities of the Mexican and Brazilian bio-pharmaceutical sectors (lag time citation -BwPatCit) are still low. Though differing in dimension and direction, the innovation variables affecting them are: research team size, gender, patent assignee, academic science-technology links, foreign inventors and cited patent value. Technological knowledge stock was significant for Brazil only. The findings enable us to propose policies to foster bio-pharmaceutical innovation and impact positively on population health.

→ **PROCUREMENT INSTITUTIONS AND ESSENTIAL DRUG SUPPLY IN LOW- AND MIDDLE-INCOME COUNTRIES**

**Lucy Xiaolu Wang** (Max Planck Institute for Innovation and Competition) and **Nahim Bin Zahur** (Queen's University)

Ensuring essential drug supply in low and middle-income countries (LMIC) is among the most pressing global challenges today, with complicated issues regarding intellectual property (IP) rights, supply chain management, and local production capacity. Among many efforts, international procurement institutions have played important roles in reducing coordination failures in global drug supply by centralizing procurement and delivery within and across regions. Despite wide recognition of the advantages of centralized procurement, we have limited understanding of the tradeoffs involved in using different procurement institutions. This paper provides a systematic analysis of price, quantity, delivery, and quality of essential drugs supplied in over 100 LMIC during 2007-2017 across four therapeutic areas and five major procurement institution categories. We find that centralized procurement institutions generate lower prices and faster deliveries than direct purchases from manufacturers, especially when pooling across larger geographic areas and for widely-used drugs with stable demand over time. However, centralized procurement institutions also procure a larger share of older generations, off-patented drugs, and a smaller set of options than in decentralized channels. Our results suggest a tradeoff between cost-saving and newer drug diffusion in the procurement process.

## → TRIPS COMPLIANCE AND SECONDARY PHARMACEUTICAL PATENTS: THE CASE OF ARGENTINA

Eduardo Mercadante (LSE), Bhaven Sampat (Columbia University) and Ken Shadlen (LSE)

Argentina began to patent pharmaceutical products in 2000, in compliance with the World Trade Organization's Agreement on Trade-Related Aspects of Intellectual Property Rights (TRIPS). How countries design and implement their new pharmaceutical patent systems conditions the effects that TRIPS has on competition, prices, and access to medicines. One important dimension of TRIPS implementation is how countries address "secondary" patents, e.g., patents that cover alternative structural forms of known molecules, revised formulations and compositions, or new medical uses. In 2012, Argentina adopted restrictive examination guidelines that aim to limit the grant of secondary pharmaceutical patents. This paper evaluates the effectiveness of Argentina's revised guidelines by estimating the likelihood of pharmaceutical patent applications being granted by the Argentinian Patent Office (INPI).

## → Parallel SESSION V - OB

Thursday, 9 September 2021

9:00 - 10:00

Themed session

ROOM ONLINE B

**Chair:** Jussi Heikkilä (Jyväskylä University School of Business and Economics)

### Presentations:

## → BUYER-SUPPLIER NETWORKS AND INNOVATION: THE ROLE OF SHARED TECHNOLOGICAL KNOWLEDGE

Shubhobrata Palit (Georgia Institute of Technology), Manpreet Hora (Georgia Institute of Technology) and Soumen Ghosh (Georgia Institute of Technology)

We focus on the available technological knowledge spillovers available in a firm's supplier network and examine the conditions under which a buyer firm's innovation performance benefits from such knowledge. Specifically, we examine how technological distance, technological breadth, and extent of global sourcing interrelate in influencing a firm's innovation performance. Using a panel data on buyer-supplier relationships, patenting activities of firms and accounting information, we verify the hypothesized relationships. Our sample consists of an unbalanced panel of 940 firm-year observations derived from a buyer-supplier relationship data of 266 unique buyer firms. Embedded in this buyer-supplier relationship data are 928 unique supplier firms and 9590 buyer-supplier pairs spanning over four years. We find that innovation performance is better when firms have high technological breadth and/or low high technological distance. The results also show that the relationship between global sourcing and innovation performance changes with technological distance.

## → THE MOBILITY OF PROLIFIC INVENTORS FROM MEXICO AND BRAZIL: AN ANALYSIS OF USPTO PATENTS IN THE PERIOD 2000-2016

Samuel Rosas Reyes (Universidad Autónoma Metropolitana)

The growing importance of knowledge-intensive goods and services in global markets has caused economic agents to be interested in achieving high competitiveness based on the innovative capacity of their research teams. In this context, the objective of this project is to explore the mobility trajectories of

prolific inventors (IP) from Mexico and Brazil through an analysis of the USPTO patents in the period 2000-2016. To achieve this end, the methodology of Latham, Le Bas and Volodin (2010) was replicated, where the mobility of Prolific Inventors was quantified based on the number of movements made by type of mobility: geographical, organizational and technological. This research addresses the theoretical approaches about the implications of mobility in the productivity of Prolific Inventors (PI), recognizing their role as key agents in the production of knowledge and their impact on the innovation process. Among the results, it was found that the main determinants of the mobility of IPs in Mexico and Brazil are: the incursion of IPs in national and foreign companies, the type of patent owner and the technological specialization of the inventor's country of origin. The results of the correlation analysis were for the case of the Mexican PIs that: The more internationalized the inventor's work, the higher his level of productivity. The more workplaces the inventor has been in, the higher his level of productivity and the more specialized the inventor, the lower his level of productivity. In the case of Brazilian IPs, it was found that: The more internationalized the inventor's work, the greater the number of his patents. The more places the inventor has worked, the lower his productivity will be, and the less specialized the inventor, the lower the number of his patents.

### → INDUSTRY DYNAMICS IN THE IPR SERVICE SECTOR: EVIDENCE FROM FINLAND

**Jussi Heikkilä** (Jyväskylä University School of Business and Economics) and **Mirva Peltoniemi** (Jyväskylä University School of Business and Economics)

We describe how the IPR service sector has evolved in a European open economy, Finland, over the period 1990-2020. Finland provides a particularly interesting case as Finland became a member of the European Union in 1995 and is among the most innovative countries and among the top countries with respect to IPR protection. We focus on the following research question: How has 1) globalization, 2) European integration and 3) digitalization impacted the Finnish IPR service sector between 1990 and 2020? While previous studies have mainly focused on patents and patent attorneys/agents, this paper extends the analysis to other IPRs, namely trademarks, design rights and utility models. We use mixed methods to obtain a detailed and comprehensive understanding of the evolution of the Finnish IPR service sector over the period 1990-2020. The quantitative analysis relies on patent, utility model, design right and trademark register data of the Finnish patent office, EPO and EUIPO. The qualitative analysis comprises semi-structured interviews of the Finnish IPR service companies registered in official patent, trademark and design attorney registers. Our analysis provides new insights on the industry dynamics of IPR service companies including the evolution of the competitive environment and service innovations during a period characterized by globalization, European integration and digitalization.

### → Themed SESSION V - OC

Thursday, 9 September 2021

9:00 - 10:00

Themed session

ROOM ONLINE C

### PROTECTION AND MANAGEMENT OF TRADE SECRETS - VIEW FROM PROCEDURAL LAW AND ECONOMICS

**Chair:** Katharina Behrend (University of Oxford)

**Summary:** This panel examines trade secrets from a managerial and economic perspective.

## **Presentations:**

### **→ SCHRÖDINGER'S IP: EMPIRICAL EVIDENCE FROM DISPUTED TRADE SECRETS AND THEIR PATENTS**

**Nicola Searle** (Institute for Creative (ICCE))

This paper tests and builds theory of the use of trade secrets and patents in firms' innovation and appropriation protection strategies. Using a novel database of stolen trade secrets and their corresponding patents, the research develops a unique, empirical approach to informing our understanding of the trade secret-patent mix. The analysis suggests patents and trade secrets work closely together, that patents associated with disputed trade secrets have higher pendency and family size, and the patent-trade secret relationship evolves over the timeline of an innovation. Case studies highlight the complex R&D and commercial environment in which trade secrets operate, suggesting that the patent-trade secret relationship is far more complex than the literature currently reflects.

### **→ THE EMPLOYEES' ROLE IN FORMING PROCEDURES FOR TRADE SECRET MANAGEMENT**

**Haakon Thue Lie** (Dehns)

Firms use trade secrets to create competitive advantages. However, the knowledge can also be part of knowledge the employees consider their own. Further, this knowledge plays a role in wage formation and workforce mobility. We investigate the role of the employees in establishing the process by using survey data from 1060 Norwegian firms in 2020. We asked about how the firms formed their procedures: involvement from the employees or by management. Around 90 per cent has routines formed by the management, and interestingly 45 per cent also has routines initiated by the employees. Our conceptual contribution is to connect these findings with workforce mobility.

### **→ A COMPARATIVE ANALYSIS OF STANDARDS FOR AND TRENDS IN TRADE SECRET PROTECTION USING THE TRADE SECRET PROTECTION INDEX**

**Mark Schultz** (University of Akron School of Law)

Trade secret protection is a growing international concern for governments and businesses. Using an empirical approach, this paper assesses trends in trade secret protection worldwide. The paper's analysis is based on an indicator for the strength of trade secrets protection, the Trade Secrets Protection Index (TSPI) that the author of this paper co-developed as part of a project of the Organisation for Economic Co-operation and Development (Schultz and Lippoldt, 2014).

The current paper will present and analyse the results of a significant update to and expansion of the TSPI. The original TSPI covered the period 1985 - 2010 for 37 economies. We have collected the data necessary to update the TSPI through 2020 and to expand its coverage to at least 50 economies.

The TSPI aggregates about three dozen objective elements constituting the protection of trade secrecy into 5 categories to produce an index that ranks each country on a scale of 1 - 5. The TSPI enables the measurement of the variation in strength of available protection for trade secrets across countries and time. The authors have found that while components of the index such as "definitions and coverage;" and "specific duties and misappropriation" have converged, wider variance remains in other factors such as "enforcement, investigation & discovery;" and "system functioning and related regulation."

## → COMPULSORY TRADE SECRET LICENSES

David Levine (Elon Law)

The unprecedented COVID-19 (COVID) pandemic has brought to the forefront many challenges associated with exclusive rights, information sharing, and innovation. How do we get effective diagnostics, treatments and vaccines quickly and safely to the public? More specifically, how do we ensure that sufficient quantities of these health products are produced, that they are affordable, and that they are equitably distributed globally? Among many challenges on the road to this outcome is the difficult question of how to handle trade secrets, namely, information that is valuable because others do not know it.

This paper explores the possibility of the almost unheard-of compulsory trade secret license as a potential solution to this critical problem, and how it could be structured for optimal implementation and efficacy. Trade secrets are everywhere in the battle to defeat COVID, from clinical data to pharmaceutical manufacturing processes. Potential trade secrets include manufacturing processes, test data, medical formulas, genomic information, cell lines and other biological resources. Similarly, data about the effectiveness of medicines and vaccines are trade secrets. Even “negative information” - information about what does not work - can be a trade secret. This information is essential to the rapid development of, and access to, safe and effective COVID diagnostics, treatments and vaccines worldwide.

If adopted for purposes of addressing this unprecedented public health crisis, compulsory trade secret licensing could be extended to any number of other areas where trade secrecy has been a barrier to more rapid innovation, from climate change to energy production, or where products and services are prohibitively costly for consumers. Because empirical studies have shown that few blanket modes of behavior or application apply to trade secrets broadly, and because trade secrets are considered on an individualized and sector level, compulsory trade secret licensing is a logical advance in open innovation modeling

## PARALLEL SESSIONS VI

### → Parallel SESSION VI - HA

Friday, 10 September 2021

9:00 - 10:00

Themed session

ROOM HYBRID A - SALON DE ACTOS

**Chair:** Laurent Manderieux (Bocconi university)

**Presentations:**

### → RE-INVENTING LICENSES OF RIGHT

Gabriela Lenarczyk (Institute of Law Studies, Polish Academy of Sciences)

Considering the current global health crisis caused by the novel coronavirus SARS-CoV-2, specifically the large and small-scale actions taken by many entities across sectors with a goal to develop and manufacture crisis-critical products as rapidly as possible, and seeing how innovation has not only preserved, but thrived during the pandemic, it becomes discernible that the global IP regime is in the midst of a paradigm shift towards greater access to protected work. Exercising the exclusivity conferred by the intellectual property right not to exclude, but to grant freedom to use, has become a powerful tool in the fight to provide a rapid response to the challenges posed by the pandemic.

Patent law has always, to some extent, relied on private ordering mechanisms, extralegal forums and forms of dispute processing, to mitigate problems which are systemic to the operation of the patent system. Individual initiatives which “open up patents” by way of nonassertion covenants or institutional arrangements such as patent pools or clearing houses have been set up to remedy issues related to patent thickets or more generally the so-called “tragedy of the anticommons”. This paper aims to demonstrate how the LoR instrument, a proverbial “golden mean” between public law and private ordering mechanisms, can be re-invented in the light of a growing number of initiatives targeted at opening up intellectual property by first discussing the common characteristics of LoR schemes, with a particular focus on relevant Polish, British and German provisions, analysing its current efficiency and popularity among patent proprietors and finally providing *de lege ferenda* postulates.

### → ECONOMIC IMPACT OF COVID-19 CRISIS IN IPR-INTENSIVE INDUSTRIES

**Gabriela Lenarczyk** (Institute of Law Studies, Polish Academy of Sciences)

This paper analyses the economic impact of the COVID-19 crisis on industries that intensively use different intellectual property rights (IPRs) including trade marks, designs, patents and copyright. The analysis is based on the most timely available data from Eurostat, the Short-Term business Statistics (STS) covering all sectors of the economy during 2020 and on previous research from the European Union Intellectual Property Office (EUIPO) and the European Patent Office (EPO). Economic performance in the European Union as well as in some of the larger Member States of industries that use IPRs more intensively than the rest of the economy is monitored on a monthly basis with a 2 month delay and compared with the change in Gross Domestic Product (GDP). A medium-term analysis follows to study the impact of the 2009 financial crisis to better understand the cyclical behaviour of IPR-intensive industries.

### → THE WORLD HAS A UNIQUE OPPORTUNITY: ACCELERATING TECHNOLOGY TRANSFER AND VACCINE PRODUCTION THROUGH PARTNERSHIPS

**Xiaolan Fu** (University of Oxford), **Diego Sanchez-Ancochea** (ODID, University of Oxford), **Ines Hassan** (International Science Council) and **Peter Buckley** (University of Leeds)

It is widely recognized that the global roll-out of vaccines is crucial to defeating the pandemic. However, the lack of technical know-how and manufacturing infrastructure for production are constraining the speedy provision of vaccines globally. This is true even if the intellectual property rights of Covid-19 vaccines are waived temporarily. We propose that to accelerate technology transfer and global vaccine production, joint ventures between global Covid-19 vaccine manufacturers and local pharmaceutical companies should be promoted to create regional manufacturing hubs. These joint ventures should be supported financially by “global North” countries, international organisations and host country governments. We believe that this approach will incentivize pharmaceutical companies to share not only their patents but also tacit production knowledge because the risk and cost of setting up new facilities will be shared. Although changes to intellectual property rights are welcome, the joint venture approach will have a more significant impact on vaccine production in the near future. Following these policy proposals will not only help protect the global community from Covid-19, but also will present a rare window of opportunity to stimulate the life science industry in the “global South”, supporting sustainable economic and technological development.

→ **INTERNATIONAL INTELLECTUAL PROPERTY GOVERNANCE AND "VACCINE DIPLOMACY": REVISITING THE RULES OF THE IP GAME FOR FLUID KNOWLEDGE CREATION AND TRANSFER?**

**Laurent Manderieux** (Bocconi university) and **Gabriele Gagliani** (Bocconi university)

This paper argues that contrary to what most observers seem to imply, the concept of IP protection may end up further reinforced by the new "vaccine diplomacy" that has emerged with Covid19 whereas, at the same time, there is a momentum for a swift evolution of the way the IP system addresses knowledge creation in fast-evolving scientific contexts: innovation policies aiming at modernizing the legal framework on licensing (university/business to State and university/ business) as well as ownership of inventions offer a margin for boosting knowledge creation and transfer.

Indeed, the unexpected de facto alignment of interests of "vaccine powers" (OECD Countries, Russia and China) in favor of a pro-active vaccine production and distribution, shows a reply, albeit expected to be slow, to requests for new rules of the game for IP advocated by India, South Africa, and many developing countries, as well as civil society groups. Yet, this reply takes into account, for most vaccines developed, the strong connection between the private sector and the government resulting in an overlap of (some) public and private interests and the use of vaccines as "State-controlled" inventions as their research received large public funding. This is why the reflection should now focus on the management of IP for knowledge transfer in fast-evolving science, where there is large space for modernization: scenarios do exist for updated and harmonized licensing rules in the EU and in the international community, both in compulsory licensing and voluntary licensing, as well as revised ownership schemes of inventions (whether patentable or not) that would reply to queries from civil society. TRIPS-compliant legal options offered to policy-makers in order to boost science-industry links will be categorized and described in the article, depending on the alignment or absence thereof of the international community in reforming IP access for promoting science.

→ **Parallel SESSION VI - HB**

Friday, 10 September 2021

9:00 - 10:00

Themed session

ROOM HYBRID B - MENENDEZ PIDAL

**Chair:** Marco Giarratana (IE Business School)

**Presentations:**

→ **COMPOSITE VALUE INDEX OF TRADEMARK INDICATORS: A MARKET VALUE ANALYSIS USING TOBIN'S Q**

**Grid Thoma** (Computer Science Division, University of Camerino)

The paper analyses how Thoma's (2019) composite value index of trademark indicators can be employed to appraise firm market capitalization using Tobin's q market value model. To this end, the multivariate econometric analysis considers typical financial variables of a firm's knowledge assets, such as R&D investment and advertising expenditures, and several types of IP related variables, including not only trademarks but also utility patents, international patent applications, design patents, and relative value weighted IP measures. This paper demonstrates that the analysed composite value index provides a very significant and accurate valuation tool for predicting firm market capitalization.

## → EXPORTER RESPONSES TO SHOCKS: THE ROLE OF TRADEMARKS

**Michael Falk** (IP Australia)

We estimate the sensitivity of export entry, export revenue and export diversification to changes in tariffs, real exchange rates and firm's foreign trade mark holdings, using customs and firm microdata for a panel of 8,937 Australian manufacturing firms from 2005 to 2017. Standard models of international trade assume that tariffs changes and movements in the real exchange rates will induce identical responses from exporters. However, available evidence shows that exports are far more sensitive to tariff changes than to exchange rate movements. We predict and show that after filing trade marks in export markets, firms are more likely to enter the market, perform better post-entry, become more resilient to exchange rate shocks, and tend to expand their exports more in response to tariff reductions. These findings suggest that, by incorporating micro-level indicators of intellectual property activity, workhorse models of international trade can be improved to answer important policy questions.

## → GREEN TECHNOLOGIES, COMPLEMENTARITIES AND POLICY

**Nicolò Barbieri** (Department of Economics and Management, University of Ferrara, Ferrara, Italy), **Alberto Marzucchi** (Gran Sasso Science Institute - Social Sciences, L'Aquila, Italy) and **Ugo Rizzo** (Department of Mathematics and Computer Science, University of Ferrara, Ferrara, Italy)

The present study explores the technological interdependencies between green and non-green inventions. First, we look at whether inventive activities in climate-friendly domains depend on patenting in related technological domains that are not green. Based on patent data filed over the 1978-2014 period, we estimate a spatial autoregressive model using co-occurrence matrices to capture technological interdependencies. Our first finding highlights that the development of green technologies strongly relies on advances in other green and non-green technological domains, whose relevance for the green economy is usually neglected. Building on this insight, we detect the non-green complementary technologies that co-occur with green ones and assess whether environmental policies affect this particular instantiation of technologies at the country level. The results of the instrumental variable approach confirm that while environmental policies spur green patenting, they do not displace the development of the non-green technological pillars upon which green inventions develop.

## → IS ACCOUNTING NON-DISCLOSURE AN ISOLATING MECHANISM? THE RELATION BETWEEN FIRM DIVERSIFICATION DISCLOSURE AND TRADEMARK USE AND VALUE

**Marco Giarratana** (IE Business School) and **Elvira Scarlat** (IE Business School)

By exploiting a change in U.S. regulations that forced firms to reveal sales information about their product segments, this study tests the effects of this information disclosure on the diversification and the economic value of firms' trademark portfolios measured by a CAR model. Some companies investigated in this study indicated that they were single-segment firms, but with the new standard, they reveal their multi-product segment nature. Our regressions, which use as control firms that consistently represent single-segment actors both before and after the new standard, suggests a strategic use of accounting non-disclosure, which was substituted after the regulation with a more intense use of intellectual property rights in the form of trademarks. The evidence on stock market returns indicates some synergies between the two mechanisms.



→ Parallel SESSION VI - HC

Friday, 10 September 2021

9:00 - 10:00

Themed session

ROOM HYBRID C - MARIA ZAMBRANO

**Chair: Cesare Righi** (Universitat Pompeu Fabra)

**Presentations:**

→ **ARE PATENT OFFICES SUBSTITUTES ?**

**Elise Petit** (Université Libre de Bruxelles), **Bruno van Pottelsberghe de la Potterie** (Université Libre de Bruxelles) and **Lluís Gimeno-Fabra** (Université Libre de Bruxelles)

This paper provides a first in-depth empirical analysis on whether and to which extent patent offices examination services can substitute each other. This is investigated with an original dataset comprising 7.200 PCT patents filed simultaneously in Japan, the USA and Europe. The quantitative analysis suggests that patent offices do rely on each other's work when identifying prior art. An office that receives a PCT application previously examined by another International Search Authority (ISA) is significantly more efficient (it searches into up to 37% less technology classes, publishes up to 33% less citations, and reduces its communications with the applicant by up to 43%). Moreover, the availability of a prior international search report changes the citation behaviour of subsequent offices: they generally rely more on international citations and provide more complete reports upfront at the beginning of the examination process. Further substitution could take place, as the work of patent offices still overlaps: around 55% of technology classes searched and at most about 70% of backward citations are duplicates of prior examination work. Finally, while PCT has generated clear efficiency gains between the EPO, JPO, and USPTO, there are still significant discrepancies in the outcomes of the three examination processes.

→ **PATENT EXAMINATION SPILLOVERS AGAINST GRANTING AT THE FIRST OFFICE ACTIONS: AN EMPIRICAL STUDY ON THE TRILATERAL PATENT OFFICES**

**Tetsuo Wada** (Gakushuin University)

Patent examiners follow detailed examination manuals during prosecution. They should allow a patent application unless they can provide legitimate and written reasoning to reject it, such as lack of novelty and inventive steps. If an examiner obtains a piece of a prior art information from a result of prior art search conducted by another patent office, the information could become a new ground of rejection. The availability of prior art information from another patent office, therefore, can be a determinant of non-granting. By way of considering the outcomes of prior art search produced and propagated across patent offices as examination spillovers, this proposal describes first evidence on the effect of patent examination spillovers between the trilateral offices, specifically, spillovers from the European Patent Office (EPO) to the United States Patents and Trademark Office (USPTO) as well as to the Japan Patent Office (JPO). I argue that the causal effect of examination spillovers can be evaluated by limiting empirical attention to the allowance (granting) at the first office actions at the USPTO and the JPO with the European A3/A4 search reports, which are issued approximately around the timing of the first office actions by the USPTO and the JPO within the same international patent families.

→ **PATENTING INVENTIONS OR INVENTING PATENTS ? STRATEGIC USE OF CONTINUATIONS AT THE USPTO**

**Cesare Righi** (Universitat Pompeu Fabra) and **Timothy Simcoe** (Boston University)

Continuations allow inventors to claim technology developed after the original filing date of a patent, leading to concerns about inadvertent infringement and hold-up. For researchers seeking to study this practice, a key challenge is the difficulty of linking patent applications to potentially infringing technology. We use the link created by disclosure of standard essential patents (SEPs) to analyze the relationship between standard publication -- a key observable milestone in technology development -- and continuation filing. More than half of the SEPs in our data are filed after standard publication. There is a substantial increase in continuation filings immediately after standard publication, and this increase is larger when the initial patent examiner is more lenient. We also find that claims in SEP continuations are more likely to be rejected for double patenting (indicating an effort to change the scope of previous patents), and that keywords in the claims of SEPs linked to the same standard become more similar after standard publication. Overall, these findings suggest widespread use of continuation procedures to opportunistically “invent patents” that are infringed by already-published standards.

→ Themed SESSION VI - OA

Friday, 10 September 2021

9:00 - 10:00

Themed session

ROOM ONLINE A

## INTELLECTUAL PROPERTY FOR SUSTAINABILITY TRANSITIONS

**Chairs:** Dr Frank Tietze, Innovation and IP Management (IIPM) Lab, University of Cambridge (UK), Prof. Anjula Gurtoo, Indian Institute of Science Bangalore (India), Dr Pratheeba Vimalnath, Innovation and IP Management (IIPM) Lab, University of Cambridge (UK)

**Summary:** The transition to global sustainable development is an urgent challenge. In 2015, countries globally adopted the Sustainable Development Goals to end poverty, protect the planet, and ensure prosperity for all as part of a new sustainable development agenda. Effective transitions to sustainability require innovations with complex diffusion and adoption processes. The accompanied evolutionary technology development processes involve complex and intertwined IP related issues. The role of IP for effective transitions to sustainability however remains insufficiently understood. This session brings together partners from the IPACST project - IP Models for Accelerating Sustainability Transitions ( [www.ip4sustainability.org](http://www.ip4sustainability.org)) involving leading IP and sustainability researchers from UK, German, Swedish and Indian universities. IPACST is a major, three-year international and interdisciplinary research project that started in 2018 and brings together the fields of sustainability, IP and innovation management, together with political sciences and engineering to transform our understanding of the role played by different Intellectual Property (IP) models in sustainability transitions. This project contributes to the integration of these fields through frameworks that conceptualize (i) which, (ii) how and under (iii) what conditions IP models accelerate sustainable transitions, in connection with sustainable business models and empirical analysis.

### Presentations:

## → RESPONSIBLE INTELLECTUAL PROPERTY STRATEGIES: INSIGHTS FROM CASE STUDIES OF SUSTAINABLE COMPANIES

Pratheeba Vimalnath (University of Cambridge), Frank Tietze (University of Cambridge), Elisabeth Eppinger (HTW Berlin University of Applied Sciences Library: Hochschule für Technik und Wirtschaft Berlin Hochschulbibliothek), Akriti Jain (Indian Institute of Science), Anjula Gurtoo (Indian Institute of Science) and Ekaterina Kushnir (Lund University)

Research, development, and diffusion of sustainable innovations targeted towards addressing global challenges such as climate change, poverty, inequality, and other global challenges involve complex intellectual property (IP) related questions. Though IP rights (IPR) has been a proven policy instrument to incentivize innovation, the idea of using IP including formal IPR such as patents, trademarks, and copyrights, and informal IP assets like know-how and data, as a strategic tool to facilitate sustainability remains debatable. In this paper, we aim to address the following research questions: What are 'responsible IP strategies' for sustainability? What are the relevant dimensions to consider for building responsible IP strategies? The theory of responsible research and innovation (RRI) offers guidelines on considerations and dimensions for governing science and innovations responsibly such that the innovators and societal stakeholders are mutually responsive to each other's expectations of a better future. Despite the close ties between IP and innovation, there is a lacuna of insights around how one should responsibly think about IP strategy that governs the innovations supporting sustainable development goals (SDGs). Based on evidence from a set of five in-depth case studies of IP strategies used by sustainable companies, we identify five dimensions namely sustainability by choice, alignment, inclusivity, flexibility, and boundary spanning as defining characteristics of responsible IP strategies. The dimensions of responsible IP strategy provide a framework for managerial decision-making to responsibly design IP strategy for achieving sustainability goals. In terms of policy implications, the dimensions indicate that responsible IP strategies require support beyond what the current IPR system offers and emphasizes the need for strategic focus in policy initiatives around IP for sustainability.

#### → IPR STRATEGIES FOR SUSTAINABILITY: INCUMBENTS AND NEWCOMERS

**Elisabeth Eppinger** (HTW Berlin), **Pratheeba Vimalnath** (University of Cambridge), **Akriti Jain** (Indian Institute of Science Bangalore India), **Ekatarina Kushnir** (Lund University, International Institute for Industrial Environmental Economics), **Anjula Gurtoo** (Indian Institute of Science) and **Frank Tietze** (University of Cambridge)

**Abstract:** Sustainability transitions require innovation and phase out of established technologies and manufacturing practices. Incumbents and newcomers are two main groups of actors that play a key role for innovating and diffusing sustainable innovations. While newcomers are found more promising to provide radical solutions, incumbents are often considered to be less willing to change as they have invested in current infrastructure and technology. With IPR having a key role in the growth of businesses and the diffusion of innovation, we investigate how incumbents and newcomers use their IPR for sustainable products and technologies. Drawing on case studies from sustainable businesses in manufacturing, the results show a willingness for licensing and active sharing of IPR in specific fields. Though the licensing market appears to be dysfunctional. Based on the findings, implications for IPR policies are suggested to leverage IPR for sustainability transitions.

#### → CAN INTELLECTUAL PROPERTY CREATE A LARGER SOCIAL IMPACT? - AN EMPIRICAL ANALYSIS

**Akriti Jain** (Indian Institute of Science Bangalore India), **Anjula Gurtoo** (Indian Institute of Science Bangalore India), **Elisabeth Eppinger** (HTW Berlin), **Pratheeba Vimalnath** (University of Cambridge, Institute for Manufacturing) and **Frank Tietze** (University of Cambridge, Institute for Manufacturing)

With the adoption of the global 2030 agenda of SDGs, organizations worldwide are changing their Intellectual Property (IP) strategies to address significant issues of environmental sustainability and social development. Although researchers have pointed out the association between IP policy and welfare at the national level and innovation and social sustainability at the firm level, there are indications that IP strategy at the firm level can also have significant social sustainability implications. While prior studies explore the macroeconomic national-level association between IP policy and social welfare, the literature on microeconomic, firm-level IP strategy's association with social sustainability is scant. The present study aims to identify and analyse IP strategies adopted by companies to generate and diffuse sustainable technologies that have a larger social sustainability impact. The study also analyzes critical contextual

conditions that influence the firm's choice of selection of a particular IP strategy for technologies with larger social sustainability impact. Adopting an exploratory research design and a multiple case study approach, the study finds that companies adopt a combination of selective sharing of IP assets with a fully open approach to IP sharing (when they intend to encourage stakeholder engagement and partnership for sustainability practices) for social sustainability. Some firms - when founded already with a strong sustainability commitment - treat their competitors as stakeholders to jointly change the sector and provide sustainable solutions. With this mindset, they are strongly committed to sharing IP. The study contributes to the wider debate on the relationship between IP and sustainability, where there is limited discussion on social sustainability implications of microeconomic firm-level IP strategy. By providing case-based findings on the IP strategies for social sustainability, the study advocates the adoption of selectively open IP sharing strategy by firms to ensure widespread reach of technologies, products and services with wider social sustainability.

### → AN EMPIRICAL INVESTIGATION OF INTELLECTUAL PROPERTY FOR SUSTAINABILITY AND ITS RELEVANCE TO IPR POLICY

**Pratheeba Vimalnath** (University of Cambridge), **Frank Tietze** (University of Cambridge), **Akriti Jain** (Indian Institute of Science), **Anjula Gurtoo** (Indian Institute of Science) and **Elisabeth Eppinger** (HTW Berlin University of Applied Sciences Library: Hochschule fur Technik und Wirtschaft Berlin Hochschulbibliothek)

Intellectual property (IP) is a well-established global policy instrument for innovation and diffusion of novel technologies based on established legal systems, but also a strategic instrument for IP owners to manage relationships and collaborative innovation processes. The role of IP for sustainability however is not well understood. The IP models relevant to facilitate green innovations are not adequately recognized and addressed. Further, lack of evidence-based insights hinders structured policy discussions. In this paper, we aim to explore: which IP models exist of relevance to sustainability and the conditions under which certain IP models are preferred over others? We investigate the IP rights, particularly patent, usage by a set of award-winning green innovators who received the European Inventor Award (EIA), a prestigious international prize awarded annually by the European Patent Office, for their inventions that made significant economic, social, or environmental contributions. Evidence shows that IP can be an effective strategic instrument for IP owners to meet sustainability goals and IP can effectively facilitate and accelerate sustainability transition if shared (e.g., licensed). The findings thus indicate that the IP policy level discussion should move beyond incentivizing innovations through exclusivity towards facilitating IP sharing and collaborative approach to IP for sustainability.

### → Parallel SESSION VI - OB

Friday, 10 September 2021

9:00 - 10:00

Themed session

ROOM ONLINE B

**Chair:** Emilio Raiteri (Eindhoven University of Technology)

### Presentations:

### → DO PATENT SUBSIDY POLICIES SIGNAL TO DRIVE PATENTING PROPENSITY?

**Runhua Wang** (The University of Science and Technology Beijing)

It is commonly agreed that the patent explosion in China results from various government funding and government subsidies, especially patent subsidy policies. This study argues that the trivial patent subsidies

did not work by their financing effects but rather their signaling effects to drive patenting propensity in China. It is the first study dissecting patent policies' signaling effects varying by the policy designs. This study first theoretically discusses the signaling effects adjusted by the design of patent subsidy policies by taking the policies in Beijing and Shanghai as examples. Patent subsidies in Beijing were ex-ante and not conditioned upon patent issuance; the subsidies in Shanghai were ex-post and conditioned upon patent issuance. An adjusted version of the patent subsidy policy in Shanghai reduced the magnitude of the reimbursement but subsidized patent attorney fees for addressing patent quality. Theoretically, innovation ability, invention quality, and signaling effects of patent subsidy policies determine patenting propensity. The effects of the former two factors on patenting propensity are stronger in an ex-post subsidy system than an ex-ante subsidy system. The signaling effects extended to innovation-constrained firms in an ex-ante subsidy system should be stronger than an ex-post subsidy system. This study then empirically explores and compares the signaling effects in Beijing and Shanghai on small and medium enterprises ("SMEs"). The data do not only prove the existence of signaling effects on strengthening the association between R&D intensity and patent applications but also show inframarginal patent applications under the signaling effects. Beijing's ex-ante patent subsidy policy sent strong signals to innovation-inactive SMEs. Shanghai's ex-post patent subsidy policy extended strong signals to the SMEs in the industries not relying on patents. These signals suggest not only the effectiveness of patent subsidy policies but also distortion effects of the subsidy policies and a misallocation of social resources.

## → PATENT ENFORCEMENT AND INNOVATION

**Marek Giebel** (Copenhagen Business School)

Does patent enforcement foster or impede innovation? While one of the main functions of the patent system is to foster innovation, the actual impact of the enforcement of patent rights on innovation is still under debate. I exploit patent infringement litigation in the United States to identify the effect of patent enforcement on cumulative innovation. The results imply that citations by subsequent patents increase after a case is filed in a court. While citations increase during the litigation period, the relative effect size decreases in the years following the closure of the case. The degree of the increase of subsequent citations is higher for technologies that are characterized by a higher degree of novelty, narrower protection and higher information transmission through the case. Consequently, signals about the value of the technology and reductions in asymmetric information seem to be particular drivers of the increase in citations. Although there is a general positive effect, subsequent citing patents have a low degree of novelty and are close to the litigated patents in terms of technological proximity and general similarity.

## → BUYERS' WORKLOAD AND R&D PROCUREMENT OUTCOMES: EVIDENCE FROM THE U.S. AIR FORCE RESEARCH LAB

**Emilio Raiteri** (Eindhoven University of Technology) and **Leonardo Giuffrida** (ZEW)

Does workload constitute a bottleneck to an agency's mission, and if so, to what extent? We ask this question in the context of the US government's procurement of R&D services. We link tender, contract, patent, and office records to the identity of the contracting officer responsible for the procurement process to estimate how workload in the federal acquisition unit affects the execution of R&D contracts. The identification comes from unanticipated retirement shifts among contracting officers, which we use as an instrument for the workload. We find a large increase in patenting at the extensive margin when the same officer faces a declining workload. In our sample, an additional contracting officer in the procurement unit fixing its procurement budget and the number of purchases leads to a 2 percentage point increase in the probability for an R&D contract to generate patents.

Friday, 10 September 2021

9:00 - 10:00

Themed session

ROOM ONLINE C

**Chair: Christophe Geiger** (CEIPI - Université de Strasbourg)

**Presentations:**

→ **COPYRIGHT USERS AND TRANSFORMATIVE USES: A CROSS-CULTURAL EMPIRICAL STUDY**

**Branislav Hazucha** (Hokkaido University School of Law)

At the present, the user-generated content on the internet often relies on a handful of copyright exceptions for transformative uses, such as parody, criticism, and research. However, many internet users habitually receive takedown notices from copyright holders that the former's content infringes the latter's exclusive rights protected by copyright law, although the former consider such uses as legitimate and covered by copyright exceptions. Moreover, there are several considerable differences in the scope of such copyright exceptions between various jurisdictions. This Paper examines how the general public living in different cultural and social environments and traditions perceives the wrongfulness or rightfulness of various types of transformative uses. It relies on an online survey (2,000 respondents) conducted in 4 countries with different legal and cultural traditions, i.e. Germany, France, Japan and the U.S. (500 respondents from each jurisdiction). The results of collected data show several commonalities and differences between respondents living in different cultural and social environments and traditions. The public views are consistent with some approaches towards parody and other copyright exceptions, and they defy the others. For example, contrary to the U.S. courts' approach towards parody and consistently with the European case law, the respondents perceive humorousness as key feature of parody. Similarly, contrary to the U.S. courts' judgments and consistent with the French judgements on parody in the case of appropriation art, the public does not perceive the fame of the copyright user or original work as any crucial factor.

→ **ENFORCING COPYRIGHT THROUGH ANTITRUST? THE STRANGE CASE OF NEWS PUBLISHERS AGAINST DIGITAL PLATFORMS**

**Giuseppe Colangelo** (University of Basilicata and Stanford Law School)

The emergence of the multi-sided platform business model has had a profound impact on the news publishing industry. By acting as gatekeepers to news traffic, large online platforms appear to be unavoidable trading partners for news businesses and may exert substantial bargaining power in their dealings. Concerns have been raised that this bargaining power imbalance may threaten the viability of publishers' businesses. Notably, digital infomediaries are accused of capturing a huge share of the advertising revenue by free-riding on the investments made in producing news content. Moreover, by affecting the monetization of news, the dominance of some online platforms is deemed to have contributed to the decline of trustworthy sources of news. Against this background, governments have been urged to intervene in order to ensure the sustainability of the publishing industry. The EU has decided to address publishers' concerns by introducing an additional layer of copyright as a means to encourage cooperation between press publishers and online services. And the French Competition Authority has recently accused Google of adopting a display policy aimed at frustrating the objective of the domestic law implementing the EU legislation, hence requiring Google to conduct negotiations in good faith with publishers and news agencies on the remuneration for the reuse of their protected content. The Australian Competition and Consumer Commission has instead embraced a regulatory approach,

developing a mandatory bargaining code. The aim of this paper is to analyze the different solutions advanced in order to assess their economic and legal justifications as well as their effectiveness.

## → ARTIFICIAL INTELLIGENCE-BASED COPYRIGHT ENFORCEMENT: A THREAT TO FREEDOM OF EXPRESSION, INNOVATION AND ARTISTIC CREATIVITY IN THE ONLINE WORLD

**Christophe Geiger** (CEIPI - Université de Strasbourg) and **Bernd Justin Jütte** (University College Dublin)

In 2019, the Copyright in the Digital Single Market Directive (CDSMD) modified the liability EU's regime for online intermediaries: Uploads of infringing works by their users now result in direct liability for online content-sharing providers (OCSSPs), which have to make best efforts to avoid that infringing content is made available. To comply with these obligations, OCSSPs will have to install artificial intelligence-based filtering (so-called 'upload filters'). These automated filtering systems pose serious threats to fundamental rights of users, rightsholders and platforms.

This paper first outlines the relevant fundamental rights affected by an obligation to monitor and filter for infringing content. Second, it examines the compatibility of these obligations with fundamental rights and general principles of EU law. Third, it assesses mechanisms to safeguard the right of users of online content-sharing services. The analysis demonstrates the difficulty of striking a balance between the different fundamental rights in the normative framework of Article 17 CDSMD and argues that the norm constitutes an unjustified and disproportionate infringement of EU fundamental rights. Moreover, Art. 17 does not comply with primary EU law by failing to determine with sufficient precision the balance between the multiple fundamental rights affected and to provide for effective harmonization.

The paper proposes a fundamental rights-compliant framework for platform liability. It argues, that determining what is content is made available online should not be left to automated filtering systems or to private actors. It is suggested that an independent institution at EU level should monitor the implementation and application of copyright enforcement in a fundamental rights compliant manner, ensure that disputes arising in relation to uploaded content are settled impartially and efficiently, issue guidelines for the interpretation of the CDSMD, develop best practices together with stakeholders, provide for empirical data to assess its impacts, and to recommend improvements to policy makers.

## PARALLEL SESSIONS VII

### → Parallel SESSION VII - HA

Friday, 10 September 2021

9:00 - 10:00

Themed session

ROOM HYBRID A - SALON DE ACTOS

**Chair:** **Elena M. Tur** (Eindhoven University of Technology)

### Presentations:

#### → THE CO-EXISTENCE OF PATENT-POOLS

**Stefan Lobin** (Goethe University) and **Uwe Walz** (Goethe University)

Many industries, in particular high-tech industries, have experienced the (re-)emergence of patent pools that potentially co-exist with each other. In this paper, we provide a theoretical framework which allows us to understand the main determinants of co-existing patent pools. In this framework, we discuss the decision to create competing patent pools against the background of the trade-off between decreasing returns to patent pool size and a profit-reducing competition effect. We show that co-existence which

allows to serve vertically segmented markets is more likely to be observed with a larger patent universe, with substantial technological dispersion as well as stronger concave patent value functions. Furthermore, we show that if the co-existence of pools emerges in equilibrium, then welfare always dominates a common pool and sometimes even in the absence of pools altogether.

## → COOPERATION, COMPETITION AND PATENTS: UNDERSTANDING INNOVATION IN THE TELECOMMUNICATION SECTOR

**Tatiana Rosa** (Universidad Católica de Chile)

Many modern innovations depend on interconnectivity, which require technology standards as a common language to successfully link up. This paper develops and estimates a structural model to understand how competition between firms affects their incentives to cooperate by supplying technologies to a common standardization process. I study these incentives empirically by focusing on the standardization of the mobile telecommunications technologies. In the model, firms face two decisions. They decide whether to join a group to develop a component of the system and, in that case, how much effort to exert. When making these choices, firms consider 1) how their effort increases the common value, 2) how much of this common value they can privately appropriate through their patents, and 3) their capacity to profit from the technology in the downstream part of the market. In this setting, patents have an ambiguous effect on the development of a common innovation. On the one hand, they alleviate the free-rider problem and induce firms to exert more effort. On the other hand, they bias firms' participation towards groups with less competition over patented technologies even where their effort may be less valuable. To study the net effect of these forces in equilibrium, I estimate the model using a novel dataset on 3G and 4G technologies. I also show that the enforcement of royalty-free clauses reduces firm participation and effort, ultimately delaying the completion of the initial releases of 4G by almost 1 year.

## → NPEs, PATENT QUALITY AND LITIGATION STRATEGIES ACROSS EUROPEAN JURISDICTIONS

**Cecilia Maronero** (University of Bordeaux), **Andrea Vezzulli** (University of Insubria) and **Valerio Sterzi** (University of Bordeaux)

This research aims to study NPEs' patent litigation activities in the European patent market linking together, in a novel way, the characteristics of patents asserted by NPEs and the choice of the jurisdiction where to initiate the infringement lawsuit (forum shopping). Our objective is to investigate the impact of heterogeneous European legal regimes (i.e. injunction-based or fee-based) on NPEs' patent assertion strategies. We present evidence based on a comprehensive dataset of infringement actions based on patents filed at the European Patent Office (EPO) and initiated in the five major patent litigation systems in Europe, namely Germany, the UK (England and Wales), France, Italy, and The Netherlands during the period 2007-2020. Our preliminary findings suggest that NPEs adapt their litigation strategies, thus choosing a different legal regime according to specific patent quality characteristics.

## → OVERCOMING INEFFICIENCIES OF PATENT LICENSING: A METHOD TO ASSESS PATENT'S ESSENTIALITY FOR TECHNICAL STANDARDS

**Rudi Bekkers** (Eindhoven University of Technology), **Elena M. Tur** (Eindhoven University of Technology), **Joachim Henkel** (Technical University of Munich), **Tommy Van der Vorst** (Dialogic), **Menno Driesse** (Dialogic) and **Jorge Contreras** (University of Utah)

Patents that are essential to a technical standard are key assets for both developers and implementers of the standard. Many standard setting organisations (SSOs) seek to ensure that all such patents be made



available to licensees under fair, reasonable and non-discriminatory conditions, and frequently also stipulate that such patents be explicitly declared. But while many patents are declared to be potentially essential, little is known about which of these are actually essential. Absence of (transparent) information on essentiality has significant social costs. Responding to calls for such data from industry, courts and policy makers, several commercial studies and a few academic papers have attempted such assessments, but each has limitations. This paper reports on the technical feasibility of a system of expert assessment for patent essentiality. Twenty-eight experts, including many patent examiners, performed a total of 205 assessments, spending a total of 176 working days. Comparing their outcomes to a high-quality (yet not perfect) reference point, we conclude the accurate assessments, at a price level that allows large scale testing, are certainly technically feasible, and identify routes to further improvement.

→ Parallel SESSION VII - HB

Friday, 10 September 2021

9:00 - 10:00

Themed session

ROOM HYBRID B - MENENDEZ PIDAL

**Chair:** Caterina Sganga (Sant'Anna School of Advanced Studies)

**Presentations:**

→ **SCI-HUB AND ACADEMICS: SURVEY EVIDENCE FROM EU COUNTRIES**

**Giulia Rossello** (Sant'Anna School of Advanced Studies) and **Arianna Martinelli** (Sant'Anna School of Advanced Studies)

Notwithstanding the cost reduction brought by the digital era in managing editorial activities, access to scientific journals remains costly. Nowadays, journal fees constitute a barrier to access the scientific literature that might profoundly affect less wealthy institutions, also in Europe.

In response to the increasing need of accessing scientific literature, Alexandra Elbakyan founded Sci-Hub in 2011, providing free access to research papers worldwide. However, the Sci-Hub website appears to violate the copyright of academic publishers. Although illegal in most countries, Sci-Hub is widely used in developed and developing contexts reaching more than 400,000 requests per day in 2019.

Notwithstanding the revolutionary impact that Sci-Hub might have on the academic world, very little empirical research systematically investigates how and why academics of various disciplines use Sci-Hub. Most empirical evidence is either concentrate on aggregate country data on Sci-Hub downloads or it relays on small samples.

To fill this literature gap, we design a large survey to explore different drivers behind the use of Sci-Hub. In particular, we examine how factors such as the perception and knowledge of the copyright law, moral attitudes, and past behavior, as well as product characteristics, academic norms, and values, might explain the use of Sci-Hub.

Our target population are academics working in Germany, Hungary, Ireland, Italy, The Netherlands, and Sweden. In particular, our survey will be distributed online to 130211 academics of all disciplines and academic ranks. Our results will allow us to examine the use of Sci-Hub and to determine the possible heterogeneity given by academic field, institutional arrangements, and academic job rank. Our expected empirical evidence could not only contribute to the policy debate about access to scientific knowledge but also help the design of future re-negotiation agreements between academic institutions and large publishers.

## → END-USER FLEXIBILITIES IN DIGITAL COPYRIGHT LAW - AN EMPIRICAL ANALYSIS OF END- USER LICENSE AGREEMENTS

**Peter Mezei** (University of Szeged) and **István Harkai** (University of Szeged)

In the platform age, copyright protected contents are primarily disseminated over the internet. This model poses various challenges to the copyright regime that was mainly designed in and for the analogue age. One of these challenges is related to the fair balance between the interests of rightholders and other members of the society. Copyright norms try to guarantee this balance by granting high level of protection for rightholders and preserve some flexibility for end-users. These flexibilities range from statutory limitations and exceptions; resales; or complaint-and-redress mechanisms. Platforms, with their private norms, especially end-user license agreements, might effectively enforce that balance in their role as intermediaries in the chain of (e-)commerce.

The present paper, completed within the frames of the reCreating Europe H2020 project, we focused on how these private norms allow for or diminish the exercise of user flexibilities. We collected, analysed and compared seventeen private ordering practices. The analysed platforms include streaming sites with or without host function for end-users; online video game stores and other online market places; and social media.

Our empirical examination demonstrates that the intermediaries, in line with their technical nature and business model, offer substantive flexibilities for their consumers, on the one hand, and they meaningfully limit the possibilities and decrease the expectations of end-users by restricting certain uses and providing limited access to contents, on the other hand. Based on our findings, we measured the flexibility of the selected platforms, and we provide for the state of the art of platform flexibility in the period that preceded the implementation deadline of the Copyright in the Digital Single Market Directive of the European Union.

## → BETWIXT EU AND NATIONAL: THE PRESENT AND FUTURE OF COPYRIGHT FLEXIBILITIES

**Giulia Priora** (Sant'Anna School of Advanced Studies) and **Caterina Sganga\*** (Sant'Anna School of Advanced Studies)

Copyright flexibilities are often considered the quicksand of EU copyright regulation. Much emphasis has been put on the fragmented landscape of exceptions and limitations across the Member States, and uncertainties persist with regards to the protection of end-users' fundamental rights and freedoms, especially in the digital environment. However, recent legislative and judicial developments at EU level pave the way towards a new regulatory approach towards copyright flexibilities, highlighting the importance of their effective and consistent application throughout the Union, and their key role in achieving copyright's objectives of societal and cultural flourishing. The article focuses on and contextualizes this specific evolution within EU copyright law. It investigates whether, along with the interventions by the EU legislator and the Court of Justice of the EU, a common legal understanding of copyright flexibilities is arising from the national copyright legal systems. To do so, it outlines the current state of the art of copyright flexibilities, and points at prospective future developments at national and EU level, electing the regulation on (i) non-commercial private uses, (ii) educational and research uses, and (iii) cultural heritage preservation as insightful case studies in light of the ongoing process of modernization of EU copyright rules. By illustrating strengths and pitfalls of the current legal approach towards copyright flexibilities in the EU, the analysis builds a solid assessment on some pressing issues and viable ways ahead in the making of a balanced, effective, and sustainable EU digital copyright.

→ Parallel SESSION VII - HC

Friday, 10 September 2021

9:00 - 10:00

Themed session

ROOM HYBRID C - MARIA ZAMBRANO

**Chair:** Peter Neuhäusler (Fraunhofer Institute for Systems and Innovation Research ISI)

**Presentations:**

→ **INTELLECTUAL PROPERTY REGISTERS: HOW TRANSPARENT IS INTELLECTUAL PROPERTY OWNERSHIP ANYWAY?**

**Arina Gorbatyuk** (KU Leuven and Research Foundation - Flanders)

Typically, judges, legislators, academics and practitioners focus on assessing which inventions and creations can be protected by intellectual property (IP) protection. Whereas much attention is paid to the question “who can own WHAT?”, the question “WHO owns what?” has largely been neglected.

Undoubtedly, it is important to find the answer to the first question, as it provides clarity for inventors and creators on the inventions and creations that can be protected. In practice, however, determining the answer to the second question is of equal importance. Currently, the level of transparency of IP ownership is limited: the information is either not registered or is not timely updated. Yet, it is essential for third parties who are interested in the IP to be able to track the IP owners as only the IP owners can decide whether and to whom they will grant a license or sell the IP. Without correct information on the IP owners in a register third parties need to invest additional resources to identify and track the owner involved, which may complicate or delay the exchange of knowledge and the innovation process.

In this paper we (1) explore the function of (tangible and intangible) property registers; (2) review the value of IP transparency for the functioning of IP system as a ‘social contract’; and (3) assess the current level of transparency in IP registers.

→ **THE OWNERSHIP OF ACADEMIC INVENTIONS**

**Elodie Carpentier** (GREThA, Université de Bordeaux) and **Nicolas Carayol** (GREThA, CNRS & Université de Bordeaux).

After the success of the Bayh-Dole Act in the US, the university ownership regime was adopted in many countries, with diverging consequences on academic invention. In this paper, we investigate the reasons for such a divergence. We use a panel dataset of 118,000 professors and researchers employed at French universities over the years 1995- 2016 and assess how the implementation of the regime affected academic invention. We use a Coarsened Exact Matching to pair institutions that implemented the regime with similar institutions that did not, run difference-in-differences regressions and find that the regime increased by 33% academics’ propensity to invent. We conclude that the flexibility, common to France and the US, and government support in the transition from one regime to the other, are the key success factors in the implementation of the university ownership regime.

→ **RUSSIAN INNOVATION IN THE ERA OF PATENT GLOBALIZATION**

**Svitlana Lebedenko** (European University Institute)

The launch of the Russian Sputnik vaccine in 2020 echoed the launch of the Soviet Sputnik satellite in 1957 and reminded the world once again that Russia is a sophisticated technological power. Most inventions in the Soviet Union were managed by the system of inventor’s certificates which ensured open flows of

knowledge among the scientific networks behind Russia's industrial development. Inventions in today's Russia are managed by the globalized institution of patents which can create high barriers to entry in innovation markets. This article argues that the globalized institution of patents has been compromised in Russia because the barriers to entry that patents create are not justified in the absence of well-functioning markets. The danger of the institutional mismatch is lost opportunities for Russia to grow knowledge and to diversify its economy. Western property rights in innovation in the hands of crony capitalists lead to a paradoxical effect of much deeper state control of innovation.

## → MIXED TYPES OF IPR PORTFOLIOS AND THEIR EFFECTS ON FIRM PERFORMANCE

**Peter Neuhäusler** (Fraunhofer Institute for Systems and Innovation Research ISI) and **Rainer Frietsch** (Fraunhofer Institute for Systems and Innovation Research ISI)

This paper aims to take a closer look at the IPR portfolios of companies and their effects on financial performance. By applying a newly matched dataset of firm data from BvD's ORBIS and the EU Industrial R&D Scoreboard, patent data from PATSTAT and trademark data from the EUIPO, we first of all create a categorization of firms by differentiating pure patent or trademark users and mixed types (more trademarks than patents and vice versa) and analyze how this correlates to firm performance measures, like for example profit growth. Furthermore, we aim to answer the question whether firms are operating complementary or supplementary patent-/trademark profiles and whether this moderates the effects on firm performance. In order to identify complementary or supplementary patent-/trademark portfolios, we created a concordance scheme of patents and trademarks at the level of 35 (WIPO) technology fields based on a newly generated, keyword-based classification of trademarks. Besides descriptive analyses, we will test our assumptions with the help of a series of multivariate regression models

## → Parallel SESSION VII - OA

Friday, 10 September 2021

9:00 - 10:00

Themed session

ROOM ONLINE A

**Chair:** Devanshi Saxena (University of Antwerp)

### Presentations:

## → PATENT LAW AND GREEN ENERGY INNOVATION

**Caoimhe Ring\*** (University of Oxford)

The impending climate crisis calls for innovative climate-friendly, or 'green', solutions to rapidly decarbonise energy production. Public sector actors are taking on an expanded role, with 'mission-oriented' green innovation policies. This response, in public emergencies, is paradigmatic. It is typically coupled with weakening, or outright suspension, of patent law. Amongst legal scholars, the theoretical predictions are that patents may under-provide for, or stymie, green innovation altogether. But conspicuous in these accounts is an appraisal of the nature and determinants of green innovation itself. Consequently, it is difficult to speculate what the impacts of patent law reform might be without regard to the specificities of green innovative activity. In response, this conference paper contributes an interdisciplinary perspective on the nature of green energy innovation. This suggests that patents are less relevant at the early stages of green innovation, at invention, but there are open questions about its impacts on technology commercialisation and diffusion. Oversight of these particularities creates the potential for conceptual errors and problematic assumptions green innovation and patent law. Namely, it is difficult to see the merits of patent suspension while so little is understood about its potential impacts

on green innovation. Moreover, by contrast to theoretical predictions, it seems that significant numbers of entrepreneurs are patenting green technologies. Arguably, there is a need to understand why entrepreneurs patent green technologies, and whether patents are having impacts on green technology commercialisation, before advocating patent law reform. The primary contribution of this paper is to proffer a detailed study of green energy innovation. It raises questions on the role of patents in green technology commercialisation and diffusion: looking at licensing, financing, and mechanisms to procure equitable access to green energy technologies. Its findings are relevant to energy decarbonisation strategies and practitioners working with green energy entrepreneurs.

### → PROFITING FROM SUSTAINABLE INNOVATION? AN EMPIRICAL STUDY OF INNOVATIONS BY SME'S

**Pablo Morales** (Vrije Universiteit Amsterdam), **Carolina Castaldi** (Utrecht University), **Meindert Flikkema** (Vrije Universiteit Amsterdam) and **Ard-Pieter de Man** (Vrije Universiteit Amsterdam)

Conventional appropriation literature suggests intellectual property (IP) protection mechanisms and complementary assets play a crucial role in obtaining returns from innovation. However, sustainable innovators face a paradox: they must craft commercially successful innovations that benefit both the firm and society. In light of this challenge, questions arise about how, to what extent, and even whether IP protection mechanisms and complementary assets play a role in capturing value from sustainable innovations. Based on a sample of sustainable innovation award entries, we measure the extent to which IP protection mechanisms and complementary assets are applied to profit from sustainable innovations. We also examine the extent of their contribution to a sustainable innovation's commercial success. Our findings raise questions about the role of complementary assets in the exploitation of sustainable innovation. To the best of our knowledge this is the first study to investigate the above. While lead time advantage contributes thereto, a sizeable portion of innovators benefit from neither formal intellectual property rights nor complementary assets. This may imply that sustainable innovations present a boundary condition for the widely accepted profiting from innovation framework.

### → CONSERVING BIODIVERSITY THROUGH GEOGRAPHICAL INDICATIONS AN EFFECTIVE LEGAL APPROACH

**Devanshi Saxena** (University of Antwerp) and **Christine Frison** (UCLouvain and University of Antwerp)

In 2018, the Food and Agricultural Organization published a study following an empirical assessment of 9 agriculture related geographical indications (GIs) across the globe (Vandecandelaere et al 2018). Though the main focus was on studying the economic impacts on agriculture related GIs, it also concluded that in the presence of some key success factors, GIs can be a useful tool for sustainable development. In this article, we argue that while GIs can potentially have these positive externalities, they cannot be guaranteed in the legal protection envisaged under GI protection laws which tend to be rather flexible on environmental commitments. In fact, GI protection also carries risks that can further degrade the ecological environment, the quality of the product and as a result also harm the economic interests of communities it sets out to protect. These positive externalities and risks have been documented by researchers already and we provide a state of the art on the link between GIs and biodiversity conservation. We will further argue that from a legal perspective, GI laws need to be strengthened and that something more than intellectual property protection is needed if the objective of GI protection for a product or a region is biodiversity conservation. GI law can borrow from other fields of the law, specifically environmental law, to strengthen its potential and governments and policy makers need to look beyond the minimum standards envisaged under the TRIPS Agreement if GIs are to fulfil their multidimensional and multifunctional role (here, conservation of biodiversity). Finally, we also differentiate GIs from third-party certification standards. The results of this exercise are two-fold,

evaluation of GIs as a tool to protect biodiversity and environmentally sustainable production practices through a legal analysis and recommendations for what the GI law will have to guarantee to achieve this.

→ Parallel SESSION VII - OB

Friday, 10 September 2021

9:00 - 10:00

Themed session

ROOM ONLINE B

**Chair:** Irene Calboli (Texas A&M University School of Law)

**Presentations:**

→ **DIGITAL CONSUMER CONTRACT LAW WITHOUT PREJUDICE TO COPYRIGHT: EU DIGITAL CONTENT DIRECTIVE, REASONABLE CONSUMER EXPECTATIONS AND COMPETITION**

**Liliia Oprysk** (University of Bergen)

The EU Digital Content Directive sets out to facilitate the cross-border distribution of digital content and ensure a high level of consumer protection by harmonising certain aspects concerning contracts for the supply of digital content. The Directive acknowledges the variety of licensing agreements involved in the distribution of digital content, such as between the holders of intellectual property rights, intermediaries and end-users. It is recognised that the consumer's use of digital content could be restricted under end-user licensing agreements pursuant to intellectual property rights; at the same time, the Directive is without prejudice to other EU law, including copyright. Rather, under Art. 10, the consumer is entitled to remedies from the trader of digital content for lack of conformity where restrictions resulting from a violation of intellectual property rights prevent or limit the use of the content. As the traders of digital content frequently are not the owners of intellectual property rights but rely themselves on a licence, the question arises as to the potential implications of Art. 10 for digital content markets. This paper discusses two such potential implications. The first is whether the efforts to safeguard reasonable consumer expectations could be undermined by the Directive leaving the arrangements between traders and intellectual property right holders out of scope. The second is whether Art. 10 could reinforce the network effects and dominant position of the established players on the market.

→ **PATENTS AS OBJECTS OF PROPERTY: TOOLS AND RULES FOR START-UPS' INNOVATION**

**Letizia Tomada** (University of Copenhagen)

The provisions governing the property aspects of patents play an important role in either facilitating or hindering transactions that involve intellectual property assets. In particular start-ups and small scale businesses more and more often use patent rights not only in their exclusivity function, but also as property rights generating revenues from assignments, licences and other possible forms of exploitation. In light of the developments over the last decade within the European patent law landscape, the paper analyses to what extent the implementation of a unitary patent with unitary effect, as envisaged by Reg. (EU) 1257/2012, would contribute to fostering the uses of patents as assets thereby lowering the related transaction costs and enhancing start-ups innovation.

→ **RIGHT TO A TRADE NAME AS AN INTELLECTUAL PROPERTY RIGHT**

**Helena Pullmannová** (Masaryk University in Brno, Faculty of Law)

The entrepreneur's right to his trade name is protected in principle in every country in the world. The obligation to protect the rights to trade names of foreign entrepreneurs in its territory derives explicitly from Article 8 of the Paris Convention for the Protection of Industrial Property, which binds states parties to this Convention and in addition WTO members.

The Czech Republic protected the rights to trade names of foreign and domestic entrepreneurs in its territory as rights of absolute nature until 2001. After that, this (absolute) legal protection was granted only to entrepreneurs who have been registered in the Czech Commercial Register. From this moment on, the rights to the trade names of entrepreneurs who were not be registered in the Czech Commercial Register, have been protected (only) by a prohibition of unfair competition. This manner of protection was taken over by the new Civil Code (with effect from 1 January 2014).

The way how, the rights to trade names of foreign entrepreneurs in the territory of a contracting state of the Paris Convention (or member states of the WTO) should be protected is decisive for finding an answer to the question whether the Czech Republic violates its international obligation follows from Article 8 of the Paris Convention by not granting rights to trade names of foreign entrepreneurs in its territory an absolute legal nature.

Nevertheless, if Czech law does not allow foreign entrepreneurs who can be regarded as EU entrepreneurs to obtain the same level of protection as the Czech law provides to domestic entrepreneurs (i.e., to register its designation in the Czech Commercial Register), it can be said without further ado that the Czech Republic violates its international obligations (or more precisely EU law), with regards to prohibition of discrimination on grounds of nationality in EU relations.

→ Parallel SESSION VII - OC

Friday, 10 September 2021

9:00 - 10:00

Themed session

ROOM ONLINE C

**Chair:** Lorena D'Agostino (University of Milan - Bicocca)

**Presentations:**

→ **TECHNOLOGICAL AND MARKETING CAPABILITIES OF INCUMBENT FIRMS AS SOURCES OF OPPORTUNITIES FOR SPINOUTS**

**Aliasghar Bahoo Torodi** (Bocconi University), **Keld Laursen** (Copenhagen Business School) and **Salvatore Torrisi** (University of Milano-Bicocca)

The entrepreneurship literature suggests that increases in the level of incumbent firms' technological or market knowledge enhance the likelihood of spinout generation. In this paper we examine whether conditional on new venture spawning the imbalance between the spawning firm's level of technological and market capabilities affects the strategic direction of the new venture. Specifically, we look at whether the new venture becomes a market diversifier (spinout in a market segment different from that of the parent firm) or a technology diversifier (spinout in a technological field different from that of the parent firm). We build on the corporate coherence approach and hypothesize that if the parent firm's market dimension is narrow, market diversifier spinouts will be more likely to exploit opportunities. Similarly, we hypothesize that if the parent firm's technology dimension is narrow technology diversifier spinouts will be more likely to exploit opportunities. We extend the corporate coherence argument to predict also that market diversifier spinouts are more likely to be spawned by technologically diversified parent firms, which are active in a few product-market segments, and that technology diversifier spinouts are more likely to be spawned by technologically focused parent firms, which are active in various market segments. We analyze biotech industry data to test our hypotheses.

## → IP IN-LICENSING AND OPEN INNOVATION ORIENTATION OF ENTREPRENEURIAL VENTURES: A CASE FROM A CROWDFUNDING MARKETPLACE

**Kristofer Erickson** (University of Leeds), **Fabian Homberg** (Luiss Business School) and **Martin Kretschmer** (CREATe, University of Glasgow)

Emerging research suggests that firms adopting an “open” posture (e.g. regarding intellectual property inputs) may also find it advantageous to embark on further user-led innovation later in product development (Stanko & Henard, 2017; Miguel Molina et al., 2019; Santoro et al., 2020). This paper seeks to empirically test the relationship between IP in-licensing and the proclivity for open innovation by examining the behaviour of entrepreneurs using the crowdfunding marketplace Kickstarter. A firm’s IP posture relates to the extent of borrowing or in-licensing from external open or proprietary IP in the initial development of a product. Open innovation orientation refers to the extent to which firms are open to further input of ideas from users of the product as it develops. Drawing on a dataset of entrepreneurial ventures that used original, proprietary, or open inputs in developing products, we examine whether open innovation behaviour differs between ventures depending on the IP posture taken at the moment of product inception. Data about projects launched on Kickstarter in 2015 and re-examined in 2021 provides the opportunity to observe the level of open innovation carried out by entrepreneurs during and after product launch. These data also permit the researchers to study whether IP posture or open innovation orientation are associated with long-term success or failure-to-deliver of crowdfunded goods, a related topic of importance to research on crowdfunded innovation (Mollick, 2015; Tosatto et al., 2019). The study of the relationship between intellectual property in-licensing and open innovation behaviour enables us to address a conundrum in existing innovation literature, which is that openness to external inputs at both ends of product development potentially exposes firms to appropriability challenges (Pisano & Teece, 2007). Are firms that borrow from free and open IP inputs differently inclined to engage in external innovation with users?

## → MARKET-RELATED INNOVATION AS A RESPONSE TO CHINESE COMPETITION

**Lorena D’Agostino** (Dipartimento di Economia, Metodi Quantitativi e Strategie di Impresa, University of Milan - Bicocca) and **Stefano Schiavo** (University of Trento)

The literature on the effects of competition on innovation has documented that firms may react to increasing import penetration by upgrading product quality and investing in innovation activities (i.e. ICT, patents). A less studied approach relates to investments in downstream intangibles as a response to mounting competition from low-wage countries. This aspect is particularly important since intangibles (e.g. patents, trademarks, algorithms, reputation) are playing a growing role in shaping the competitive advantage of firms. In this paper, we argue that trademarks are a market-related innovation response of highly innovative large firms in industries more exposed to import. We show that technological leaders are more likely to use trademarks to defend from and pre-empt Chinese competition; we also provide evidence that import competition increases the use of trademarks that incorporate both services and goods, in line with the servitization of economies. Our hypotheses are tested on a panel of the world most innovative companies from the JRC-OECD COR&DIP© database, which provides financial data and trademarking activities in the years 2009-2014.



## PARALLEL SESSIONS VIII

→ Parallel SESSION VIII - HA

Friday, 10 September 2021

9:00 - 10:00

Themed session

ROOM HYBRID A - SALON DE ACTOS

**Chair:** Johnathon Liddicoat (University of Cambridge)

**Presentations:**

→ **PHARMACEUTICAL PATENTS AND ADVERSIAL EXAMINATION**

**Dmitry Karshtedt** (George Washington University Law School)

Proposals to improve the work quality of the U.S. Patent and Trademark Office (PTO) continue to generate vigorous debate. On one hand, several scholars argue that the short times allotted to the examination of patent applications and the agency's other operational constraints yield numerous patents of questionable validity, and conclude that the PTO must be fixed. On the other hand, a noteworthy dissenting view defending the PTO's "ignorance" as "rational" holds that examination should appropriately function only as a coarse filter because most patents are never enforced or licensed, and that devoting substantial resources to ascertaining validity is only sensible after an issued patent has actually proven to be valuable. This Article does not take a side in this debate, but instead uncovers a point of potential agreement between these two positions. It argues that there is a class of patent applications—those intended to support the marketing of branded small-molecule pharmaceutical products—that one can predict with some degree of confidence to turn into commercially important patents. In short, it stands to reason to allow interested third parties, such as generic manufacturers, to participate in the pharmaceutical patent examination process as early as possible, and this Article sets forth such an adversarial proceeding. The Article's proposed reform should result in better performance by the PTO in a critical technological area, help prevent issuance of low-quality pharmaceutical patents thanks to efforts by motivated outsiders, and cut down on the waste and errors caused by repetitive adjudication.

→ **THE FUTURE PROSPECTS OF IP LAW AND INNOVATION IN 'SUSTAINABLE GLOBAL VALUE CHAINS': PRELIMINARY IDEAS FOR THE ROLE OF LAW IN GOVERNANCE STRATEGIES**

**Ayse Irem Kirac** (University of Antwerp)

The paper examines: (1) the role of intellectual property (IP) law and innovation in the production and distribution of 'value' and 'value-added' in chain structures, (2) the prospective contribution of IP law and innovation to the consolidation of sustainable 'Global Value Chains (GVCs)' and (3) the role of law in governance regimes in GVCs. On the basis of these three examinations, the paper aims to discuss the advantages and disadvantages of 'alternative governance regimes' with respect to IP protection in the consolidation of sustainable GVCs. The paper also aims to make certain preliminary suggestions for the role of law in the development of future governance strategies for the IP protection and the value-distribution in sustainable global value chain structures.

→ **RECONSIDERING REPOSITIONING INCENTIVES: AN EMPIRICAL LEGAL ANALYSIS OF MARKET PROTECTION FOR NEW THERAPEUTIC INDICATIONS**

**Johnathon Liddicoat** (University of Cambridge)

In Europe, companies that show their authorised drugs have new therapeutic indications can receive an extra year of market protection. This extra year of market protection is often referred to as the "+1", and the process of developing new therapeutic indications for authorised drugs is commonly known as "repositioning". Market protection is a type of regulatory IP that stops competitors from marketing generic versions of the drug.

Commentators typically describe the +1 as incentivising companies to show their drugs treat new diseases or medical conditions. However, this study develops a method to analyse what types of repositioning receive the +1 and reveals that the +1 is only awarded half the time for treating new conditions. The other half of the time it is awarded for treating expanded patient cohorts of conditions the drugs were already authorised to treat, which this paper calls same-condition repositioning.

This paper evaluates the risks and costs of same-condition repositioning compared to new-condition repositioning. The evaluation shows that, generally speaking, same-condition repositioning is less risky and less expensive than new-condition repositioning. This conclusion is also supported by a recent empirical study on the +1 that shows the introduction of the extra protection failed to increase the proportion of repositioned drugs.

This paper considers four law reform options to pare back the circumstances that the +1 is awarded for same-condition repositioning. Ultimately, this study concludes that a prevalence criterion should be inserted into the +1. The prevalence criterion would serve as a coarse but functional assessment of whether extra market protection is needed to ensure the financial viability of SC repositioning.

→ Parallel SESSION VIII - HB

Friday, 10 September 2021

9:00 - 10:00

Themed session

ROOM HYBRID B - MENENDEZ PIDAL

**Chair:** Abel Lucena (University of the Balearic Islands)

**Presentations:**

→ **PATENT STOCKS OR INVENTORS THAT MATTER IN KNOWLEDGE SPILLOVERS? AN ANALYSIS OF INDIAN PATENTS**

**Md Danish** (Indian Institute of Technology Indore) and **Ruchi Sharma** (Indian Institute of Technology Indore)

This study explores the knowledge spillovers performance of firms located in India. We use citation data of the patents granted by the United States Patent and Trademark Office (USPTO) to the Indian assignees during 1990-2019. The study uses negative binomial models to estimate the 'direct' (knowledge gains from US patent stocks) and 'indirect' (knowledge gains from US patent stocks that have a family in India) knowledge spillovers performance at inventor, firm, and technology level. The study finds that US inventors greatly enjoy knowledge spillovers in both the direct and indirect mechanisms. Similarly, the US and Indian firms gain a significant amount of knowledge spillovers but US firms enjoy a greater magnitude of knowledge spillovers. The study also confirms that family patents significantly facilitate indirect knowledge spillovers mechanism to the foreign firms and technologies. The study also finds that the share of US inventors per Indian inventor is directly related to the firm's knowledge spillovers performance. Therefore, we conclude that both the patent stocks and the inventor's expertise play a significant role in gaining knowledge from patent documents.

## → DETERMINING TECHNOLOGY LEADERSHIP IN 5G THROUGH PUBLICATIONS, PATENTS AND STANDARDS

**Magnus Buggenhagen** (Technical University Berlin | IPlytics) and **Knut Blind** (Technical University Berlin | Fraunhofer)

Publications, patents, standard-essential patents (SEPs) and standard contributions are important indicators for the drivers in the technology development of 5G. However, current 5G technology reports often predominately draw on patent data to establish technology leadership, ignoring the importance of publications and standard contributions. Therefore, we examine 5G technology leadership in publishing, patenting, and standardization, and compile a unique dataset to first identify leading organizations per category and second identify possible correlations and interdependencies. We find that for companies offering fair, reasonable and non-discriminatory (FRAND) licensing conditions related to standard-essential patents their publication, patent and standard contribution counts highly correlate. Our findings suggest that technology leading companies strategically manage the triple frontier of publishing, patenting and standardizing in a coordinated way.

## → THE EFFECT OF OPPORTUNISTIC LITIGATION ON STRATEGIC ALLIANCE FORMATION

**Miryam Martin-Sanchez** (University of the Balearic Islands) and **Abel Lucena** (University of the Balearic Islands)

We examine how the presence of opportunistic lawsuits shapes the firms' propensity to form strategic alliances. Opportunistic litigation refers to patent infringement allegations filed by patent assertion entities (PAEs). We reason that sued companies involved in opportunistic lawsuits deviate resources devoted initially to exploit their business models, to face arising litigation costs. In this paper, we use the idea that firms use their strategic alliances to obtain valuable resources for leveraging their business model. Then, we hypothesize that, in the event of opportunistic lawsuits, accused companies form strategic alliances to mitigate the negative impact on their resources derived from high litigation costs. Using a novel data on litigation activity, alliance formation, patent portfolio, financial indicators, and corporate structure for the US, our results confirm that companies being sued by PAEs form more strategic alliances than companies without such litigations. Also, the analysis reveals that this result is particularly strong if the sued company faces complex lawsuits or liquidity constraints. Simultaneously, we find that firms with a greater level of profitability and efficiency are involved in more alliance agreements because of opportunistic litigation. Taken together, these results underscore the irony of alliances: firms need resources to get resources.

## → Parallel SESSION VIII - HC

Friday, 10 September 2021

9:00 - 10:00

Themed session

ROOM HYBRID C - MARIA ZAMBRANO

**Chair:** **Miryam Martin-Sanchez** (University of the Balearic Islands)

### **Presentations:**

## → HOW DOES PATENT LITIGATION BY PATENT ASSERTION ENTITIES IMPACT INVENTION ACTIVITY?

**Aija Leiponen** (Cornell University) and **Zhe Xue** (Cornell University)

Patent Assertion Entities (PAEs) can enhance invention by creating a market for patents or reduce invention by making the returns to invention uncertain. We empirically examine the impact of patent enforcement by different types of entities, including Patent Assertion Entities, on invention in US patent classes. We construct a new database of litigation and invention and estimate difference-in-difference models to identify the net impact of patent litigation on invention. We find that, in the current US economy and legal system, patent litigation within specific technology classes reduces invention in the same classes. We also find that litigation by PAEs leads to a significantly larger negative impact on invention, compared to litigation by product companies, and suggest that this is because PAEs' interest in financial rather than in-kind settlements reduces the available internal finance for invention. The negative impact of litigation has grown in recent years.

### → LITIGATION VERSUS SPILLOVERS

**Heesang Ryu** (ESSEC Business School)

This paper studies how patent litigation affects innovation and technology spillovers across firms. Using a unique data set on patent litigation from the United States, this paper shows that litigants are active innovators and share complementary knowledge assets with each other, creating spillovers. However, as a result of litigation, firms reduce follow-on innovation, thus impeding the effects of spillovers. Moreover, litigants fall behind the frontier, resulting in a divergence of productivity growth, which suggests a reduction of their role as intermediaries of knowledge diffusion. These findings imply that litigation, in contrast with the original objective of the intellectual property rights (IPRs) enforcement systems, can obstruct technological diffusion, which not only decreases cumulative innovation and spillovers, but also slows down productivity growth.

### → OPPORTUNISTIC LITIGATION AND SPILLOVER EFFECTS ON STRATEGIC ALLIANCE PARTNERS

**Miryam Martin-Sanchez** (University of the Balearic Islands) and **Abel Lucena** (University of the Balearic Islands)

Intellectual property literature has identified the detrimental effects of opportunistic litigation on accused companies. However, the extant literature has overlooked the potential negative consequences on other actors not directly involved in litigation. We fill this gap by examining whether the allegations of patent infringement against one party in an alliance triggers negative spillover effects on the non-accused partners. Building on theory regarding adverse events, we provide evidence of the heterogeneity of the spillover effects. Our empirical results determine that as technological overlap among partners increases, the non-accused firms experience greater market discounts if the alliance is horizontal. Likewise, R&D alliances and more complex lawsuits are also factors that impact negatively on the stockholders' perceptions of the non-accused partner firm.

### → Parallel SESSION VIII - OA

Friday, 10 September 2021

9:00 - 10:00

Themed session

ROOM ONLINE A

**Chair:** Joachim Henkel (Technical University of Munich)

**Presentations:**

## → SEPS LICENSING ACROSS THE SUPPLY CHAIN: AN ANTITRUST PERSPECTIVE

**Oscar Borgogno** (Bank of Italy - University of Turin) and **Giuseppe Colangelo** (University of Basilicata)

The rise of the Internet of Things (IoT) and the development of 5G are set to add a new layer of complexity to the current practice of standard essential patents (SEPs) licensing. While, until recently, the debate has centred on the nature of fair, reasonable and non-discriminatory (FRAND) commitments and the mechanisms to avoid hold-up and reverse hold-up problems between licensors and licensees, a new hotly-debated issue has now emerged. At its core is the question of whether SEP holders should be required to grant a FRAND licence to any implementer seeking a licence, including component makers (so-called 'licence-to-all' approach), or if they should be allowed freely to target the supply chain level at which the licence is to be granted (so-called 'access-for-all' approach). After providing an up-to-date overview of the current legal and economic debate, the paper focuses on the most recent antitrust case law dealing with the matter on both sides of the Atlantic and argues that no sound economic and legal bases which favour licence-to-all solutions can be identified.

## → PARTICIPATION IN SETTING TECHNOLOGY STANDARDS AND THE IMPLIED COST OF EQUITY

**Xin Deng** (University of Nottingham), **Cher Li** (University of Nottingham) and **Simona Mateut** (University of Nottingham)

This paper empirically investigates the financial market's reaction to firms' participation in developing standards coordinated by Standard Setting Organizations (SSOs). We present the first causal evidence on the influence of SSO membership over a firm's implied cost of equity capital - the discount rate applied by investors to its expected future cash flows. Our analysis utilizes a panel of 3,350 U.S. public firms and their memberships in 183 SSOs operating in Information and Communications Technologies (ICT) fields between 1996 and 2014. We find that participation in SSOs results in a significantly lower cost of equity for member firms, using exogenous variations from SSO closures and instrumental variables. This reduction is more pronounced for a firm's first SSO membership, in ICT firms, among members of most influential SSOs and in certain technology domains. We empirically document the contingent role of three potential mechanisms identified by our conceptual framework - technological uncertainty, market uncertainty and information environment - through which SSO membership can affect financial outcomes.

## → HOW TO LICENSE SEPS TO PROMOTE INNOVATION AND ENTREPRENEURSHIP IN THE IOT

**Joachim Henkel** (Technical University of Munich)

Communication standards such as LTE and Wi-Fi constitute enabling technologies for a multitude of innovations related to the Internet of Things (IoT). The high degree of fragmentation on the side of device makers raises the question of how—i.e., on which level of the value chain—essential patents (SEPs) covering IoT standards should be licensed. I present empirical evidence on the matter from a qualitative study comprising interviews with 18 individuals from 12 firms of different sizes and industries, focusing on entrepreneurial firms but also including larger device makers and SEP licensors. I also review and discuss economic arguments presented in the literature. I conclude that device-level licensing poses serious problems to device makers, in particular to SMEs, due to: A lack of resources and pertinent legal and technical competence; high transaction costs; and uncertainty regarding cost and patent clearance. As a consequence, device-level licensing would likely have a chilling effect on innovation and entrepreneurship in the IoT. On a more general level, I show that the effectiveness of enabling technologies hinges on the organisation of the market for technology. Policy makers should ensure that IoT SEP licensing is simplified. I propose two additional principles for IoT SEP licensing: Licensing at a value chain level where transaction costs are minimal; and licensing in a way that promotes downstream innovation and entrepreneurship.

Friday, 10 September 2021

9:00 - 10:00

Themed session

ROOM ONLINE B

**Chair:** Jessica Silbey (Boston University School of Law)

**Presentations:**

→ **THE GREAT BRITISH CAKE OFF: BEYOND CUTHBERT AND COLIN TO A CONSIDERED FOOD MARK?**

**Kim Barker** (Open University Law School (UK))

Significant judgments at both an EU and UK level have been handed down which appear to challenge the protective boundaries of intellectual property protection for non-traditional, and olfactory marks. These include decisions in *Hotel Chocolat v Waitrose*; *Toblerone v Twin Peaks*; *Nestle v Cadbury*; and *Nestle v EUIPO*. These are all contentious - and high-profile decisions dealing in *Lancome*, and *Smilde*; add to the confused system of protection. The decisions in the long running *Nestle v Cadbury* litigation, together with the controversial decision relating to the legal protections awarded to Rubik's Cubes in *Simba Toys* have added to concerns judicially voiced through cases relating to the protectability of *Toblerone* chocolate bars, and *London Taxi Cabs*.

The public spat between supermarkets in the UK over the 'caterpillar cake' have reignited these issues and provoked discussions of why one caterpillar cake can prevent another. This paper critiques the legal tensions surrounding different food items, exploring the legal connotations of the 'cake off', but also the meme 'wars' which have followed Marks & Spencer's case against Aldi, lodged in April 2021. The intermingled issues of copyright, parody, trade mark, and passing off present some unique challenges not only for the product but also the branding. Is it time to move beyond siloed IP rights? Is the 'Great British Cake Off' the start of a sea change in the protective IP sphere for food?

This paper will consider associated issues including the role of leading case law given the change to the well-established requirements, before concluding whether the protective regime has become unconventional, or simply more straightforward. The argument presented here considers whether or not the IP system has finally bitten off more than it can chew, and will assess whether Colin or Cuthbert, or both, can co-exist in the 'cake' environment!

→ **HOW SHOULD THE UK'S IP REGIME ADAPT WITH EMERGING ARTIFICIAL INTELLIGENCE (AI) TECHNOLOGY?**

**Shobana Iyer** (Swan Chambers)

On 23 March 2021 the UK Intellectual Property Office's (UKIPO) published the response to its call for views on artificial intelligence (AI) and intellectual property (IP). The aim of the call for views was to understand the relationship between AI and IP, by considering a wide range of questions covering patents, copyright, trade marks, designs and trade secret. The government states that many responses painted a positive future where AI supports human creativity and innovation and supports technological advances. But there were also concerns that AI could unfairly compete with the human creators that IP is designed to protect and reward. The consensus was that the UK's current IP laws are able to meet most of the IP challenges presented by AI and that AI itself should not own IP, but there were differences in opinion about whether inventions or copyright works created by AI should benefit from IP protection. There were also suggestions on how IP could better encourage and support the use and development of AI. This paper will firstly summarise the responses focusing on the issues with regards to patents and copyrights (which

appeared to be the main IP areas of concern) followed by the actions proposed by the UK Government which is said to be dedicated to advancing the UK's AI sector as a priority in order to encourage innovation.

## → HOW WE LOST OUR CREATIVE MINDS - COPYRIGHT AND NEUROSCIENCE

**Ewa Laskowska-Litak** (Uniwersytet Jagielloński)

The rise of the machines and their even more intensive application in our daily life should not surprise us, as well as the fact that they are considered more and more often as creators rather than conquerors. The impulse for my proposal was a question that emerged after the publication of the image created entirely by a computer program. The problems I would like to tackle in this paper will relate to the interface between law, philosophy and new technologies: having studied the concept of copyright's subject matter and the normative and aesthetic proposals for its definition I would like to present them against a new, nomen omen, original context: neuroscience. For that reason I decided to divided the proposal into four parts, whereas the first one is considered as an introduction to the main problems with regard to the question of creativity and copyright's subject matter, the second and the third - the presentation of research I conducted and the final - a short but essential presentation of my own concept in respect to copyright's paradigm and the notion of creativity.

## → INVESTIGATING DESIGN

**Jessica Silbey** (Boston University School of Law) and **Mark McKenna** (University of Notre Dame)

Design is ascendant on a global scale. This is true for the design of products as well as in “design thinking.” The increasing economic significance of design has been reflected in an explosion of design patent applications and increasing amount of design litigation in the United States. Despite design's growing importance, relatively little is known by legal scholars and policymakers about designers or the design process. That lacuna is particularly striking in light of the empirical turn in modern intellectual property scholarship. This paper addresses that gap and is drawn from original data collected over several years interviewing and observing designers where they work. Studying designers and the regulation of design work is relevant not only because design is economically and culturally relevant, but because as a legal subject matter design has been an enduring puzzle in intellectual property law. For example, laws protecting design reflect persistent disagreements about the reasons for refusing protection to functional features. Others debate the core subject matter of the protected “design” arguing from archetypal output and processes. This Article investigates these puzzles from inside design practice. The data comes from two years of qualitative empirical research interviewing designers, observing where and how they work, and listening to the explanations of their practice. Our designers describe their goals and design excellence in ways that diverge sharply from the distinctions the relevant areas of IP law attempt to draw and in other ways are uncomfortably misaligned with IP doctrine.

## 8. EPIP PhD WORKSHOP

Wednesday, 8 September 2021

9:00 - 13:30

PhD workshop

ROOM: PLENARY - SALÓN DE ACTOS

The EPIP 2021 PhD Workshop is sponsored by the U.S. Patent & Trademark Office and organized by Laurie Ciaramella (Télécom Paris - Institut Polytechnique de Paris & Max Planck Institute for Innovation and Competition) and Valerio Sterzi (University of Bordeaux). The workshop is divided into three parts: a masterclass session, a session during which the students will receive career advice, and a session where they will present and receive feedback on their work.

- **09:00** — Welcome by the organizers: Laurie Ciaramella and Valerio Sterzi  
Introductory words by Andrew A. Toole, USPTO Chief Economist
- **09:15** — Part 1. Masterclass Session
- **10:45** — Break
- **11:00** — Part 2. Development Roundtable
- **12:00** — Part 3. Students' projects
- **13:30** — Lunch

In the masterclass session, two speakers will cover topics related to markets for patents. Stefania Fusco (University of Notre Dame) will comment on the waiver of patents on COVID-19 vaccines and the existing flexibilities provided by the TRIPS agreement to guarantee access to key IP and vaccines to people in low and middle-income countries. Carlos Serrano (Pompeu Fabra University) will discuss the markets for patents of failed companies.



**STEFANIA FUSCO**

Senior Lecturer, University of  
Notre Dame

Stefania Fusco's research concentrates on intellectual property law and finance. She



**CARLOS SERRANO**

Associate Professor, Universitat  
Pompeu Fabra

Carlos Serrano is an Associate Professor of Economics and Management at the Universitat



earned a J.S.D. from Stanford Law School where she was also a Kaufmann Fellow and a Transatlantic Technology Law Forum Fellow. She is a Senior Lecturer in Law at Notre Dame Law School, where she teaches courses in Copyright Law, Trademarks, Design Law, International Intellectual Property and Corporate Finance.

Pompeu Fabra. His research focuses on the market for patents, the venture capital industry, and the value and use of patents for technology startups. His research has been published in top tier journals in economics, management, and finance and has been presented at numerous universities and government agencies.

In the development roundtable, students will receive career advice and exchange views with Stefania Fusco (University of Notre Dame), Francesco Lissoni (University of Bordeaux), Malwina Mejer (European Commission) and Carlos Serrano (Pompeu Fabra University).



**MALWINA MEJER**

**European Commission**

Malwina Mejer works as Economic Analyst at the European Commission, DG for Internal Market, Industry, Entrepreneurship and SMEs since 2013. During her tenure, she has provided economic evidence for European Commission policy initiatives in the area of intellectual property including unitary patent, the EU trademark reform of (2015) and manufacturing waiver for supplementary protection certificates (2019). Her current assignment focuses on geographical indication protection and licensing of standard essential patents.

Malwina graduated with a PhD in Economics from the Université libre de Bruxelles (Belgium). She is also a graduate of the Advanced Studies



**FRANCESCO LISSONI**

**Professor, University of Bordeaux**

Francesco Lissoni is Professor of Economics at GREThA, the Groupe de Recherche en Économie Théorique et Appliquée of Bordeaux University (France) and a longstanding Fellow of ICRIOS, the Invernizzi Center for Research on Innovation, Organization, and Strategy of Bocconi University (Milan, Italy). A graduate of the University of Manchester, Prof. Lissoni has also spent time visiting the Sloan School of Management (MIT), the École Polytechnique de Lausanne (EPFL), the University of Melbourne and Swinburne University, also in Melbourne, as well as the Venice International University. He sits in the Scientific Board of EPIP (European Policy for Intellectual Property) and has consulted for

Program in International Economic Policy at the Kiel Institute for the World Economy (Germany). Her research have been published in leading economic journals (Oxford Economic Papers, Research Policy).

ANVUR, the Italian National Agency for the Evaluation of Universities and Research, on Third Mission issues.

Finally, the third part will provide students with the opportunity to discuss previously-submitted PhD projects with senior scholars and EPIP board members: Stefan Bechtold (ETH-Zurich), Irene Calboli (Texas A&M University School of Law), Christoph Grimpe (Copenhagen Business School), Martin Kretschmer (University of Glasgow), Francesco Lissoni (University of Bordeaux), Ernest Miguelez (University of Bordeaux), Emilio Raiteri (Eindhoven University of Technology), Carlos Serrano (Universitat Pompeu Fabra), Stefan Wagner (ESMT Berlin), Esther van Zimmeren (University of Antwerp).

Attending the EPIP PhD workshop 2021 is free of charge to PhD students registered to attend the EPIP 2021 Conference and advance registration is required. For any question about the workshop please contact [phdworkshop@epip2021.org](mailto:phdworkshop@epip2021.org).

## 9. LIST OF PARTICIPANTS

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Marcos	Antón Tejón	Spain	University of Malaga
Tanya	Aplin	United Kingdom	King's College London
Veneziano	Araujo	Brazil	Universidade Federal de Sao Paulo
Christian	Archambeau	Spain	EUIPO
Carolina	Arias Burgos	Spain	EUIPO
Ana	Arredondo	Spain	OEPM
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Sam	Arts	Belgium	KU Leuven
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Jaime-Luis	Aso Roca	Spain	Universitat Autònoma de Barcelona
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Federica	Baldan	Belgium	University of Antwerp
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Kim	Barker	United Kingdom	The Open University
Stefan	Bechtold	Switzerland	ETH Zurich
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Rudi	Bekkers	Netherlands	Eindhoven University of Technology
Nahim	Bin Zahur	Canada	Queens University
Joern	Block	Germany	Universität Trier
Christophe	Bonté	France	MESRI
Oscar	Borgogno	Italy	Bank of Italy
Samuel	Brand	United Kingdom	Intellectual Property Office
Benjamin	Buettner	Netherlands	Eindhoven University of Technology
Magnus	Buggenhagen	Deutschland	Technical University Berlin   IPlytics GmbH
Dan	Burk	United States	University of California, Irvine
Dennis	Byrski	Germany	Max Planck Institute for Innovation and Competition
Irene	Calboli	United States	Texas A&M University School of Law
Elodie	Carpentier	France	GREThA / UNIVERSITY OF BORDEAUX/CNRS
Clara	Casado	Spain	CSIC Instituto de Políticas y Bienes Públicos, IPP
Carolina	Castaldi	Netherlands	Utrecht University
Claire	Castel	Spain	EUIPO
Ana	Castro	Spain	CSIC Deputy Vice-presidency for Knowledge Transfer
Marta	Cervera Martinez	Spain	Consejo General del Poder Judicial
Satyaki	Chakravarty	United States	University of North Carolina Greensboro
Yeyoung	Chang	Japan	Dokkyo University
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