

# THOMAS PATRICK DOWNES

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## SKILLS

- Team leadership and mentoring junior engineers
- Scope customer engagements and deliver on budget
- On-prem and Cloud infrastructure administration
- Certified Professional Cloud Architect (Google)
- Terraform/Packer/Ansible/Puppet/Chef
- Python/Go/shell/C/C++/Java

## EXPERIENCE

2022– present **Senior Software Engineer / Team Lead, Cluster Toolkit**, *Google (Chicago, IL)*

- Designed and implemented Terraform/Packer/Ansible/Python solutions for provisioning and scaling compute clusters, networking and storage
- Prioritized fast self-serve on-ramp, increasing Toolkit's monthly revenue from 0 to \$XXM
- Designed and implemented solutions for provisioning NVIDIA GPUs in Slurm clusters running LLM training models
- Develop repeatable playbooks for oncall and field support
- Drove feature development during proof-of-concept engagements resulting in multiple \$XM commitments to Google Cloud

2020–2021 **HPC Cloud Consultant**, *Google (Chicago, IL)*

- Scope and design high performance computing migrations to Google Cloud
- Manage colleague and partner deliverables during migration engagements
- Created a custom autoscaler for Google Kubernetes Engine to reliably handle Spot pre-emptions at customer's extreme scale; a similar solution was later integrated into GKE

2019–2020 **HPC Cloud Consultant**, *Univa Corporation (Chicago, IL)*

- Led professional services team migrating Univa customers to AWS, Azure, and Google
- Lead customer demonstrations in series of Meetups to promote Navops Launch
- Create Puppet and Python-based solutions that can be maintained by customers

2012–2019 **Senior Scientist**, *Center for Gravitation, Cosmology and Astrophysics (Milwaukee, WI)*

- Supervise a team providing services in support of LIGO research including software integration/containerization, distributed access to data, wikis, and database portals
- Responsible for the execution of the NEMO cluster, a CPU and GPU & computing resource on which to detect and analyze multiple sources of gravitational waves
- Responsible for managing maintenance and operations budget for the group's data center, including electrical/cooling systems and all contractor supervision and bid solicitation
- Contributed to the development of several grant applications, including a successful NSF award for a \$900k upgrade of NEMO computing cluster
- Lead LIGO's relationship with developers of the HTCondor cluster orchestration software
- Migrated on-premises web portal to highly-available solution using Kubernetes on AWS
- Built Puppet-based automation system used by the team to deliver and maintain critical research infrastructure
- Expertise in virtualization, storage technologies and SAML federated identity management

2002–2011 **Graduate Student**, *The University of Chicago* and **Research Associate**, *Caltech*

- Analysis of noise-dominated data to improve our understanding of cosmological history

## EDUCATION

2002–2009 **THE UNIVERSITY OF CHICAGO, KAVLI INSTITUTE FOR COSMOLOGICAL PHYSICS**  
**PhD Physics, MS Physics**

1997–2002 **UNIVERSITY AT BUFFALO – THE STATE UNIVERSITY OF NEW YORK**  
**BS Physics, BS Computer Science**, minor mathematics *summa cum laude*