

THOMAS PATRICK DOWNES

SKILLS

- Public speaking at variety of technical levels
- Scope customer engagements and deliver on budget
- HPC cluster administration and user support
- Infrastructure-as-code on-prem/AWS/Azure/Google
- Open source code management and CI/CD
- Python/shell/C/C++/Java/Go

EXPERIENCE

- 2022–present **Senior Software Engineer, Cloud HPC Toolkit**, *Google (Chicago, IL)*
- One of first hires for the Cloud HPC Toolkit, growing from 0 to \$XM per month
 - Designed and delivered user-friendly automated solution for provisioning multiple Terraform modules with cross dependencies and building custom images with Packer
 - Designed and delivered solution for provisioning NVIDIA H100 GPUs in Slurm clusters including documentation for NCCL configuration and benchmarks
 - Managed high-profile customers, including top 2 customers in GPU/AI/ML workloads
- 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
 - Create a custom autoscaler for Google Kubernetes Engine to reliably handle Spot preemptions at customer's extreme scale; a similar solution was later integrated into GKE
- 2019–2020 **HPC Cloud Consultant**, *Univa Corporation (Chicago, IL)*
- First hire in go-to-market field team for Navops Launch, a rules-based automation engine for bursting Univa Grid Engine (UGE) into major cloud providers
 - Lead customer demonstrations in series of Meetups to promote Navops Launch
 - Create Infrastructure-as-Code solutions that can be maintained by customers
- 2012–2019 **Senior Scientist**, *Center for Gravitation, Cosmology and Astrophysics (Milwaukee, WI)*
- Supervise a team that provides 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 6,000 CPU-core & 50,000 GPU-core 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
 - Developed expertise in configuration automation, virtualization, storage technologies and SAML federated identity management
- 2002–2011 **Graduate Student**, *The University of Chicago* and **Research Associate**, *Caltech*
- Built cryostats for characterization of low-temperature bolometric detectors
 - Designed and built electrical circuitry for operating SQUID sensors
 - Deploy astronomical instruments in Hawaii/Chile and analysis of noise-dominated data

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*