Frank Berghaus

Rue des Charmilles 28B
1203 Geneva
frankberghaus.com
frank@frankberghaus.com

Frank specialises in scientific computing. He integrates novel software and technology solutions for large, distributed computing and storage infrastructure.

Experience

- **Argonne National Lab** **Chicago, IL, USA**
  Project Associate *2020 – present*

  - Developed C++ production software
  - Collaborated with small team of expert developers

- **CERN & University of Victoria** **Geneva, Switzerland**
  Project Associate *2018 – 2020*

  - Enabled the use of object stores in the worldwide LHC computing grid
  - Contributed to data management software
  - Integrated software mapping research workflows to data centres
  - Commissioned software that manages scientific workflows on local hardware
  - Built virtualisation framework for opportunistic use of large, mission critical resources

- **University of Victoria Victoria, BC, Canada**
  Research Associate *2013-2014* and *2017 – 2018*

  - Deployed elastic batch computing resources in a distributed cloud system
  - Included research and commercial cloud infrastructure in large computing systems
  - Operated a data federation sysetem
  - Integrated data federation with existing data and workload management systems

- **CERN** **Geneva, Switzerland**
  Fellow on Data Preservation *2015 – 2017*

  - Established long-term data management plans
  - Demonstrated data preservation practices
  - Evaluated the preservation technologies at CERN under ISO standards

- **University of Victoria** **Victoria, BC, Canada**
  Research Associate *2006 – 2013*

  - Analysed large and complex data employing advanced statistical inference tools
  - Contributed calibration and reconstruction software
  - Developed monitoring software for the liquid argon calorimeter

Skills

C++	Nine years programming experience	LINUX	21 years user and six years administrative experience
DevOps	Deploying and debugging software on distributed systems	PYTHON	Five years of development experience
Storage	Client side development for distributed storage systems	Networks	Service orchestration across restrictive and wide area networks
IT	Service management with cloud-init, Puppet and kubernetes	Communication	Liaison between expert groups to orchestrate service improvements

Education

- **University of Victoria** — **Victoria, BC, Canada**
  Faculty of Graduate Studies, Doctor of Philosophy — *2006 – 2013*
- **University of British Columbia** — **Vancouver, BC, Canada**
  Faculty of Graduate Studies, Master of Science — *2003 – 2006*
- **Saint Mary's University** — **Halifax, NS, Canada**
  Department of Physics and Astronomy, Bachelor of Science — *1999 – 2003*

PhD Dissertation

Title — *Search for Quark Compositeness in 7 TeV Proton-Proton Collisions with the ATLAS Detector at the Large Hadron Collider*

Committee — **Dr. Michel Lefebvre**, Dr. Rob McPherson, Dr. Randall Sobie, Dr. Stan Dosso

Masters Thesis

Title — *K2K Near Detector Laserball Calibration: Manipulator Motivation, Design and Results*

Supervisor — **Dr. Scott Oser**

Training

2016 *CERN School of Computing*, CEN-SCK, Mol, BELGIUM Scientific Computing and Programming

2015 *Training on ISO 16363*, CERN, Geneva, SWITZERLAND
Audit and certification of trustworthy digital repositories

2015 *Language Training*, CERN, Geneva, SWITZERLAND
French A1 & A2

Awards

2016 Graduate with "special distinction", CERN School of Computing.
2010 Eric Foster Graduate Scholarship in Physics, University of Victoria.
2005 UBC Award for Teaching Excellence as Teaching Assistant, University of British Columbia.
2003 Graduate Entrance Scholarship, University of British Columbia.

2002 TRIUMF Research Fellowship, University of British Columbia.
2002 Dr. C. Henry Reardon Scholarship, Saint Mary's University.
2002 The Monsignor Richard J. Murphy Scholarship, Saint Mary's University.
2001 NSERC Undergraduate Student Research Assistant Fellowship, Saint Mary's University.
2001 Shatford Trust, Saint Mary's University.
2000 First Place APICS Mathematics Competition, Atlantic Provinces Council on the Sciences.
2000 Achievement Scholarship until 2003, Saint Mary's University.

Selected Publications

2020 F. Berghaus et al. High-Throughput Cloud Computing with the Cloudscheduler VM Provisioning Service. *Comput. Softw. Big Sci.*, 4(1):4, 2020

2019 Martin Barisits et al. Rucio - Scientific data management. *Comput. Softw. Big Sci.*, 3(1):11, 2019

2017 Frank Berghaus. The case for preserving our knowledge and data in physics experiments. In *Proceedings, 13th Patras Workshop on Axions, WIMPs and WISPs, (PATRAS 2017): Thessaloniki, Greece, 15 May 2017 - 19, 2017*, pages 191–195, 2018

2014 Ian Gable et al. Dynamic web cache publishing for IaaS clouds using Shoal. *Journal of Physics: Conference Series*, 513(3):032035, 2014

Selected Presentations

2018 *Sim@P1: Using Cloudscheduler for offline processing on the ATLAS HLT farm.* 23rd International Conference On Computing In High Energy And Nuclear Physics. Sofia, Bulgaria. July 2018.

2017 *Federating distributed storage for clouds in ATLAS.* 18th International Workshop on Advanced Computing and Analysis Techniques in Physics Research. Seattle, USA. August 2017.

2016 *DPHEP Portal & LEP Progress.* Worldwide LHC Computing Grid Workshop. Lisbon, Portugal. Feb 2016.

Selected Open Source Projects

- Rucio   `https://github.com/rucio/rucio`
  Scientific data management   PYTHON

- Dynafed   `https://gitlab.cern.ch/lcgdm/dynafed`
  Ultra-scalable and light-weight data federation   C++

- Cloudscheduler   `https://github.com/hep-gc/cloudscheduler`
  High throughput computing in a distributed cloud environment   PYTHON

Professional references

- Prof. Randall Sobie   rsobie@uvic.ca
  Research computing at the University of Victoria

- Dr. Alessandro Di Girolamo   Alessandro.Di.Girolamo@cern.ch
  Distributed computing at CERN

- Dr. Rolf Seuster   seuster@uvic.ca
  ATLAS software development