

# Mike Pozulp

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## Personal Information

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Citizenship: U.S.

## Interests

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Scientific Computing, Monte Carlo, Compilers

## Education

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<b>University of California, Berkeley</b> PhD in Applied Science & Technology GPA: 4.00/4.00	Berkeley, CA	Expected May 2025
<b>The College of William &amp; Mary</b> Bachelor of Science, <i>magna cum laude</i> Major: Computer Science Minor: Economics GPA: 3.75/4.00	Williamsburg, VA	May 2015

## Presentations and Publications

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Lead author indicated by \*

- **“Heterogeneity, Hyperparameters, and GPUs: Towards Useful Transport Calculations Using Neural Networks”** (with P. Brantley, T. Palmer, J. Vujic). Accepted for presentation at *M&C 2021*. Raleigh, North Carolina. October 2021.\*
- **“Extending 1D Transport Using Neural Nets to GPUs”** (with P. Brantley). Accepted for presentation at *SNA+MC 2020*. Tokyo, Japan. May 2020.\*
- **“Transitioning the Scientific Software Toolchain to Clang/LLVM”** (with S. Dawson, R. Bleile, P. Brantley, M. McKinley, M. O'Brien, D. Richards). Accepted for presentation at *EuroLLVM 2020*. Paris, France. April 2020.\*
- **“Status of LLNL Monte Carlo Transport Codes on Sierra GPUs”** (with M. McKinley, R. Bleile, P. Brantley, S. Dawson, M. O'Brien, D. Richards). In *Proceedings of M&C 2019*, 2160-2165. Portland, Oregon. August 2019.
- **“1D Transport Using Neural Nets, SN, and MC.”** In *Proceedings of M&C 2019*, 876-885. Portland, Oregon. August 2019.\*
- **“Porting the Opacity Client Library to a CPU-GPU Cluster Using OpenMP4.5”** (with J. Kimko, R. Haque, and L. Grinberg). In *Proceedings of SC17*. Denver, Colorado. November 2017.
- **“Introduction to Monte Carlo.”** Presented at *LLNL's Computation Intern Seminar Series*, June, 2017 and *W&M Math Department Colloquium Series*, October, 2017.\*
- **“LLNL Monte Carlo Transport Research Efforts for Advanced Computing Architectures”** (with P. Brantley, R. Bleile, S. Dawson, N. Gentile, M. McKinley, M. O'Brien, D. Richards, D. Stevens, J. Walsh, and H. Childs). In *Proceedings of M&C 2017*. Jeju, Korea. April 2017.
- **“Optimizing Application I/O by Leveraging the Storage Hierarchy Using the Scalable Checkpoint Restart Library with a Monte Carlo Particle Transport Application on the Trinity Advanced Computing System”** (with G. Becker, P. Brantley, S. Dawson, K. Mohror, A. Moody, and M. O'Brien). In *Proceedings of SC16*. Salt Lake City, Utah. November 2016.\*
- **“Creating a Framework for Systematic Benchmarking of High Performance Computing Systems.”** In *Proceedings of SC14*. New Orleans, Louisiana. November 2014.\*

SNA+MC is the Joint International Conference on Supercomputing in Nuclear Applications + Monte Carlo.

EuroLLVM is the European LLVM Developers' Meeting.

M&C is the International Conference on Mathematics and Computational Methods applied to Nuclear Science and Engineering.

SC is the International Conference for High Performance Computing, Networking, Storage, and Analysis.

## Work Experience

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**Lawrence Livermore National Lab**

Livermore, CA

July 2015 - Present

Position: Computer Scientist

- Software development for the Monte Carlo Transport Project

**W&M High Performance Computing**

Williamsburg, VA

February 2012 - May 2015

Position: Undergraduate Assistant to High Performance Computing

- Developed a distributed-memory parallel N-1 and N-N I/O performance benchmark using MPI
- Performed STREAM memory benchmarking, code timing, and cycle counting
- Supported HPC applications with data visualization and performance refactoring
- Assembly/maintenance of diverse CPU + GPU distributed-memory compute clusters, totaling 900+ cores and 21 TFLOP/s theoretical peak performance
- Developed graphical tools for monitoring jobs and node statistics

**NASA Langley Research Center**

Hampton, VA

January - August 2014

Position: UAV Engineering Intern

- Developed ground control station that controls UAVs with MAVLink transmissions and collects ADS-B, GPS, and other RF data from UAVs to create a live display of UAVs in the local airspace
- Performed Hardware-In-The-Loop Simulation tests of ground control station using autopilot boards and commercial flight simulator
- Prepared hardware/software systems for multi-rotor and fixed-wing aircraft

**NASA Ames Research Center**

Moffett Field, CA

May - August 2013

Position: Supercomputing Research Intern

- Investigated performance scaling in four generations of Intel Xeon processors running the NASA Parallel Benchmarks on top-20 supercomputer Pleiades
- Researched effects of MPI communication traffic across Pleiades interconnect

**Computer Skills**

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- C/C++, Python, Java, R, Bash, MPI, OpenMP, CUDA, Git/Github, LLVM, LaTeX, PyTorch
- Linux, OS X, Windows, Solaris, Android, Web

**Fellowships, Research Grants, and Contracts**

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|---|----------------|
| • LLNL LEARN Research Funding (\$115,434)                   | 2020 January   |
| • W&M Small Hall Makerspace Grant Recipient (\$700)         | 2014 May       |
| • ACM Student Research Competition Travel Award (\$500)     | 2014 September |
| • Virginia Space Grant Consortium Grant Recipient (\$6,750) | 2013 June      |

**Honors, Prizes, and Awards**

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| • LLNL Computational Physics Monthly Recognition Award | 2021 July     |
| • LLNL Computational Physics Monthly Recognition Award | 2020 July     |
| • LLNL Code Development Bronze Star Award              | 2019 August   |
| • LLNL Computational Physics Monthly Recognition Award | 2018 November |
| • Stanford CS148 Raytracing Project, 2nd Place         | 2015 December |
| • NASA Ames Poster Contest, 1st Place                  | 2013 August   |

**Professional Development**

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|---|-------------------------|---------------------|
| • J34 Applied Computer Science Meeting    | Livermore, California   | 2020 February 24-27 |
| • LLVM Developer Meeting                  | San Jose, California    | 2019 October 22-23  |
| • NSSC Fall Workshop                      | Livermore, California   | 2019 October 7-9    |
| • M&C 2019                                | Portland, Oregon        | 2019 August 25-29   |
| • LLVM Developer Meeting                  | San Jose, California    | 2018 October 17-18  |
| • J34 Applied Computer Science Meeting    | Albuquerque, New Mexico | 2018 February 11-16 |
| • Supercomputing (SC)                     | Denver, Colorado        | 2017 November 12-17 |
| • DoE CoE Performance Portability Meeting | Denver, Colorado        | 2017 August 21-24   |

• Supercomputing (SC)	Salt Lake City, Utah	2016 November 13-18
• DoE CoE Performance Portability Meeting	Glendale, Arizona	2016 April 18-22
• ATPESC	St. Charles, Illinois	2016 July 31 - August 12
• Supercomputing (SC)	New Orleans, Louisiana	2014 November 16-21
• Supercomputing (SC)	Denver, Colorado	2013 November 17-22

## Technical Coursework

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### University of California, Berkeley

• Graduate Computer Architecture (CS 252A)	2021 Spring
• Numerical Solution of Differential Equations (MATH 228B)	2021 Spring
• Numerical Analysis (MATH 128A)	2020 Fall
• Nuclear Reactor Theory (NE 250)	2020 Fall
• Numerical Simulation in Radiation Transport (NE 255)	2018 Fall

### University of California, Davis

• Network Architecture & Resource Management (EEC 273/ECS 258)	2018 Fall
• Quantum Mechanics (PHY 115A)	2017 Spring
• Analytical Mechanics II (PHY 105B)	2017 Winter
• Analytical Mechanics I (PHY 105A)	2016 Fall

### University of California, San Diego

• High Energy Density Physics (MAE 207)	2017 Fall
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### Stanford University

• Partial Differential Equations in Engineering (CME 204)	2018 Winter
• Compilers (CS 143)	2016 Spring
• Introduction to Computer Graphics (CS 148)	2015 Fall

### The College of William & Mary

• Random Walks in Biology (APSC 456)	2015 Spring
• Reliability (CS 668)	2015 Spring
• General Physics II, Honors (PHYS 102H)	2015 Spring
• Analog Electronics (PHYS 252)	2015 Spring
• Ordinary Differential Equations (MATH 302)	2014 Fall
• General Physics I, Honors (PHYS 101H)	2014 Fall
• Digital Electronics (PHYS 351)	2014 Fall
• Finite Automata (CS423)	2013 Fall
• Operating Systems (CS 424)	2013 Fall
• Applied Financial Derivatives (ECON 415)	2013 Fall
• Probability (MATH 401)	2013 Fall
• Numerical Analysis (MATH 413)	2013 Fall
• Programming Languages (CS 312)	2013 Spring
• Systems Programming (CS 415)	2013 Spring
• Econometrics (ECON 308)	2013 Spring
• Multivariable Calculus (MATH 212)	2013 Spring
• Algorithms (CS 303)	2012 Fall
• Computer Organization (CS 304)	2012 Fall
• Intermediate Microeconomics (ECON 303)	2012 Fall
• Software Development (CS 301)	2012 Spring
• Database Systems (CS 321)	2012 Spring
• Intermediate Macroeconomics (ECON 304)	2012 Spring
• Linear Algebra (MATH 211)	2012 Spring
• Data Structures (CS 241)	2012 Fall
• Discrete Structures (CS 243)	2012 Fall