

Ethan Van Andel

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EDUCATION

University of California, Berkeley

PhD Candidate, Applied Mathematics — 2011-Present (Expected May 2017)

Calvin College

B.Sc. (Honors) Mathematics — 2007-2011

B.Sc. (Honors) Computer Science — 2007-2011

EXPERIENCE

Graduate Student Researcher, UC Berkeley

Berkeley, CA — 2012-Present

My graduate research at UC Berkeley focuses on researching, developing, implementing, and testing novel mathematical and computational methods for scientific and engineering simulations of elastic membranes

- Independently developed novel algorithm for elastic surface simulation with extensive parallel, high performance implementation in C++ and Python
- Developing 10,000+ line research software library
- Future applications include biomedical research, renewable energy, and flapping drone flight

Summer Student Researcher, Lawrence Berkeley National Labs

Berkeley, CA — 2012

With the LBNL Center for Computational Science and Engineering team I worked on BoxLib, a C++/Fortran framework for massively parallel (100,000+ nodes) numerical simulations of scientific and engineering problems

- Spearheaded design and implementation of new core architecture for BoxLib to enable more efficient, flexible, and scalable scientific simulations
- Collaboratively developed essential components of the dark matter cosmology code Nyx

Graduate Student Instructor, UC Berkeley

Berkeley, CA — Intermittently 2011-Present

Courses Taught:

- Math: Calculus, Multivariable Calculus, Numerical Methods for Partial Differential Equations
- Computer Science: Discrete Mathematics and Probability Theory

Director's Summer Program Researcher, National Security Agency

Fort Meade, MD — 2010

I had the privilege of participating in the NSA Director's Summer Program, a collaborative computer science and mathematics research program

- Developed a polished, maintainable Python code-base
- Employed genetic algorithms to optimize scientific algorithms for specific architectures

Summer Research Fellow, Calvin College

Calvin College, MI — 2009-2011

Developed several software packages, some of which are still used today.

- Developed and maintain the numerical Riemann mapping package for the Sage open-source mathematics software system
- Developed the Pykaryote package for the computational simulation of evolved irreducible complexity
- Developed the user interface and key components of the Android app "Alpha" - a schedule driven phone manager

Skills, Leadership,
Publications,

Presentations, and
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SKILLS

- C++ — High performance implementation skills in serial and parallel architectures
- Python — Skilled in both rapid prototyping and long term development
 - Winning team, 2008 Calvin College Coding Competition
- Other Programming: Java, MPI, OpenMP, NumPy, Cython, LAPACK, Blitz++, HTML
- Software: Linux, Windows, Google Docs, Microsoft Office, Matlab, Sage

LEADERSHIP

- Co-founder and former President of the UC Berkeley Student Chapter of the Society for Industrial and Applied Mathematics
- Leadership and service with a number of Berkeley area non-profits including writing a scheduling spreadsheet for my team that was subsequently adopted organization-wide

PUBLICATIONS

- Almgren, A. Bell, J. Lijewski, M. Lukić, Z. Van Andel, E. "*Nyx: A Massively Parallel AMR Code for Computational Cosmology*". ApJ, 765, 39, 2013.
- Bolt, M. Snoeyink, S. Van Andel, E. "*Visual representation of the Riemann map and Ahlfors map via the Kerzman-Stein equation*". Involve 3-4: 405-420, 2010.
- Van Andel, E. Almgren, A. Bell, J. Lijewski, M. "*Region-Based AMR for Exascale Numerical Simulation*" (Planned Title), In preparation.
- Van Andel E. Haarsma, L. et. all. "*Simulating evolution of protein complexes through gene duplication and co-option*". Submitted Sept 2015 to Journal of Theoretical Biology.

PRESENTATIONS

- Van Andel, E. "*Region-Based AMR: A New AMR Paradigm in BoxLib*." SIAM-CSE13 FastMath Minisymposium, Boston, MA. Feb 2013.
- Van Andel, E. "*Riemann Mapping in Sage*". Michigan Section of the MAA Annual Meeting, Kalamazoo, MI. May 2011.
- Chosen to brief the Director of NSA, 2010

REFERENCES

Available upon request.