

## Education .....

**Graduate Student, Physics** — Cornell University, Ithaca, NY. *Enrolled Aug. 2014*

**Bachelor of Science, Physics** — Harvey Mudd College (HMC), Claremont, CA. *May 2014*

⇒ Total GPA of 3.779, major GPA of 4.000.

⇒ Graduated with high distinction and honors in physics.

⇒ Earned Dean's list all eligible semesters.

**High School Diploma** — Skyline High School, Sammamish, WA. *May 2010*

## Publications .....

J. Kent-Dobias & A. J. Bernoff, "Energy driven pattern formation in planar dipole-dipole systems in the presence of weak noise." *Phys. Rev. E* **91**, 032919 (2015).

J. Kent-Dobias, "Energy driven pattern formation in planar dipole-dipole systems." *HMC Senior Theses*, Paper 66 (2014).

## Research Experience .....

**Under Prof. Eun-Ah Kim** — Department of Physics, Cornell. *May 2015 — Present*

⇒ Proposed an experimentally accessible cold atom model which exhibits fractionalized charge excitations.

⇒ Used numeric exact diagonalization to study the model's plausibility.

**Under Prof. James Sethna** — Department of Physics, Cornell. *May 2014 — Present*

⇒ Studied the possibility of using coherent x-ray diffraction to image defect structure in metals.

⇒ Studied the structure and scaling behavior of damage at the tip of cracks in disordered brittle materials like concrete.

**Under Prof. Andrew Bernoff** — Department of Mathematics, HMC. *Jan. 2013 — Feb. 2015*

⇒ Theoretically studied the shape and stability of modulated phases in Langmuir systems.

⇒ Employed techniques from perturbation theory, asymptotic integration, and linear stability analysis.

⇒ Created a library of tools in C++ to analyze domains and perform nonlinear optimization on a high-dimensional, highly constrained parameter space.

**Under Prof. Sharon Gerbode** — Department of Physics, HMC. *Jan. 2012 — Sept. 2012*

⇒ Experimentally studied the behavior of impurities during phase changes in colloidal crystals.

⇒ Designed experiments and wrote software in MATLAB to analyze particle tracking data.

⇒ Performed a literature review of statistical hard-sphere fluid theory in order to assess its applicability to the colloidal problem.

## Awards .....

**Finalist, LeRoy Apker Award** — American Physical Society. *Aug. 2014*

An undergraduate physics achievement award to recognize outstanding achievements in physics by undergraduate students, and thereby provide encouragement to young physicists who have demonstrated great potential for future scientific accomplishment.

**Thomas B. Brown Memorial Award** — Department of Physics, HMC. *May 2014*

The Thomas B. Brown Memorial award for senior research in physics is awarded for research results, originality in conception or in execution of research, diligence, and clarity of oral and written reports.

**The Chavin Prize** — Department of Mathematics, HMC. *May 2014*

The Chavin Prize is awarded for outstanding senior theses in the mathematical sciences.

## Work Experience .....

**Teaching Assistant** — Physics Department, Cornell University. *Aug. 2014 — May 2015*

⇒ Lead recitation sections, wrote quizzes, graded homeworks and tests, and help office hours.

⇒ Taught Cornell's engineering mechanics and honors mechanics courses.

**Academic Excellence Facilitator** — Academic Excellence Program, HMC. *Apr. 2012 — May 2014*

⇒ Tutored students taking core courses in mechanics, electromagnetism, and special relativity.

⇒ Worked closely with faculty to improve both tutoring and lecturing.

**Systems Administrator** — Department of Computer Science, HMC. *May 2011 — May 2014*

⇒ Administered Linux and Mac OS servers and managed a large network of codependent systems.

⇒ Created and modified scripts written in Perl, Bash, and Python for a variety of system tasks.

**CCMS\* Lab Mentor** — Department of Mathematics, CGU.<sup>†</sup> *Jan. 2012 — May 2014*

⇒ Provided support for MATLAB, *Mathematica*, L<sup>A</sup>T<sub>E</sub>X, and Python for students and faculty throughout the Claremont Consortium.

**Physics Grader** — Department of Physics, HMC. *Jan. 2012 — May 2014*

⇒ Graded assignments for the Mechanics, Theoretical Mechanics, Electromagnetic Fields, and Fourier Series & Boundary Value Problems courses.

**Physics 18 Tutor** — Department of Physics, HMC. *Jan. 2013 — May 2013*

⇒ Tutored students enrolled in mechanics who have a poor background in or difficulty with physics.

**Math Grader** — Department of Mathematics, HMC. *Jan. 2012 — May 2012*

⇒ Graded assignments for the Linear Algebra and Differential Equations courses.

**Systems Consultant** — Department of Computer Science, HMC. *Sept. 2010 — May 2011*

⇒ Wrote documentation and provided on-site user support for desktop and server systems.

⇒ Led educational sessions on topics related to Unix administration and advanced usage.

## Test Scores .....

**GRE General** — 165 on Verbal Reasoning & 168 on Quantitative Reasoning. *Aug. 2013*

**GRE Subject** — 900 on Physics Subject. *Oct. 2013*

## Skills .....

### Computer Related

⇒ Experienced programming in the following languages (listed in order of proficiency):

*Mathematica*, C, C++, L<sup>A</sup>T<sub>E</sub>X, T<sub>E</sub>X, Python, Gnuplot, Igor Pro, MATLAB, Perl, CUDA, Bash.

⇒ Experienced in the use of many Unix variants, especially Arch Linux, Gentoo, and Mac OS.

### Physics & Mathematics Coursework

#### At Harvey Mudd College

⇒ Physics classes taken include Special Relativity, Mechanics, Gravitation, Electromagnetism, Modern Laboratory, Quantum Physics, Theoretical Mechanics, Statistical Mechanics, Quantum Mechanics,

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\* Claremont Center for the Mathematical Sciences

† Claremont Graduate University

Electromagnetic Fields, Biophysics, Optics Laboratory, General Relativity, Computational Methods in Physics, Fields & Waves, Topics in Quantum Theory, Readings in Stochastic Methods, Foundations of Field Theory, Solid State Physics, and Electrodynamics.

⇒ Mathematics classes taken include Linear Algebra I & II, Differential Equations, Single and Multi-variable Calculus, Probability & Statistics, Fourier Transforms & Boundary Value Problems, Discrete Mathematics, Mathematical Analysis I & II, Abstract Algebra, Differential Geometry, and Harmonic Analysis on Finite Groups.

**At Cornell University**

⇒ Physics classes taken include Classic Electrodynamics, Relativistic Quantum Field Theory I & II, and Statistical Physics I.

**Non-Academic Achievements** .....

- Eagle Scout** — Troop 636, Sammamish, WA. *Mar. 2008*
- 2nd Degree Black Belt** — True Martial Arts, Sammamish, WA. *Dec. 2008*