Bret Augustine Comnes

Mobile: (707) 633-4552

Portland OR

Web: http://bret.io/

Education

PhD in Applied Physics

September 2012 - Current

Portland, OR

Portland State University

- Courses: Quantum Mechanics 617-618

- TA: General Physics 202, Experimental Physics 315

Bachelor of Science in Physics

August 2006 - May 2011

Arcata, CA

Humboldt State University (HSU)

Physics Coursework: Thermodynamics (Schroeder), Analytical Mechanics (Thornton), Electricity & Magnetism (Griffiths), Quantum Mechanics (Liboff, Griffiths), Optics (Hecht), Physics of Stars & Planets, Galaxies & Cosmology, Electronic Instrumentation (Horowitz, Hill), Scientific Programming

- Mathematics Coursework: Partial Differential Equations, Vector Calculus, Linear Algebra

Publications & Talks

"Sub-millimeter Positioning and Sensing for Short-Range Gravity Tests"

2011

Proceedings of the 25th National Conference on Undergraduate Research (NCUR)

Ithaca, NY

 Peer reviewed paper to accompany a presentation given at the 2011 National Conference of Undergraduate Research.

"Studying the Weak Equivalence Principal Below 50 Microns"

2011

Humboldt State University Physics Seminar

Arcata, CA

- Presented research results from HSU's gravitational research lab at the HSU physics department semi-weekly seminar.

Research Experience

PSU Nano-Optics and Structures Lab

September 2012 - Current

Research Assistant to Dr. Andres La Rosa

Portland, OR

- Implementing a digital image accusation system for a vintage Hitachi S4160 SEM.
- Investigating novel current limited tip etching processes for use in SPM probe fabrication.

HSU Gravitational Research Laboratory

May 2009 - September 2011

Research Assistant to Dr. C.D. Hoyle

Arcata, CA

- Assisted research to test the Weak Equivalence Principal and gravitational inverse-square law at sub-millimeter distance scales.
- Responsibilities included research and development of lab instrumentation, homebrew sub-millimeter
 position sensors and data acquisition and automation applications, electronic circuit design, optical
 instrumentation and signal processing systems for use inside of the experiment's vacuum chamber.
- Managed the scheduling and collaboration tools and Git repository used to organize the students participating in the project.

The Arecibo Legacy Fast ALFA Survey

November 2009

Research Assistant to Dr. David Kornreich

Arecibo, Puerto Rico

- Participated as an undergraduate researcher at the National Astronomy and Ionosphere Center (Arecibo Observatory) to assist with observations for the ALFALFA survey.
- Responsibilities included operating the one of the world's largest radio telescopes, data analysis using IDL and working live on scheduled research equipment.

Relevant Work Experience

Teachers Assistant

September 2012 - Current

Portland State University

Portland, OR

- First quarter teaching PSU's General Physics 202 course.
- Developed two new labs covering micro controllers using Arduino and FPGAs using a Digilent Nexys
 3 FPGA card for PSU's Experimental Physics 315 course.

Texbook Development Consultant

January 2012 - July 2012

Cardinal TS

Telecommute

- Provided consultation on mathematics and content interpretation to a team of developers creating a web-based mathematics textbook prototype for a well respected publisher.
- Developed javascript based mathematics demonstrations with no prior JS experience.
- Created working Mathematica prototypes to help convey and teach concepts to the development team.

Academic Assistant

January 2009 - May 2011

Humboldt State University

Arcata, CA

- Graded student homework and lab write-ups for an introductory electronics course for ~ 60 undergraduate physics and engineering students.
- Responsibilities included understanding the range of solutions to a given problem, applying a grading rubric to the work, entering grades into a database, managing a course wiki and following privacy guidelines.

Skills

Operating Systems, Languages, & Applications

- Proficient: Mathematica, LabVIEW, Windows, OS X, Unix, Git, Arduino
- Knowledgeable: LATEX, MS Office, SolidWorks, COMSOL, HTML/CSS/JS
- Familiar: Assembly, C, Matlab, VISA/GPIB, Python, Ruby, Haskell, sh, SVN, SQL, Vi, Emacs

Lab Skills: Oscilloscopes, function generators, lock-in amplifiers, National Instruments hardware, optical systems, lasers, motion control, instrumentation & design, PCB & circuit design, capacitive sensors, piezo electrics, general workshop equipment, FPGAs & embedded systems.

Miscellaneous: Demonstrated proficiency with public communication skills. Excellent troubleshooting and debugging skills. Adept at rapidly learning new languages and application suites. Local and remote collaborative skills. Excels at teaching others.

Interests

Academic: Applied physics, optics, QM, metrology, microscopy, gravity, embedded systems, computer science.

Personal: Programming, web technologies, bicycles, climbing, photography, music, radio.