Bret Augustine Comnes
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Education

- **PhD in Applied Physics** September 2012 - Current
  Portland State University *Portland, OR*
  - Courses: Quantum Mechanics 617-618
  - TA: General Physics 202, Experimental Physics 315
- **Bachelor of Science in Physics** August 2006 - May 2011
  Humboldt State University (HSU) *Arcata, CA*
  - 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.