

Ron A. Pepino, Ph.D.

EDUCATION

University of Colorado, Boulder, CO Ph.D. (3.83 GPA) Theoretical Atomic Physics (July 2011)
ARC Program, CT Science Education Certificate (January 2005)
University of Connecticut, Storrs, CT B.S. (3.75 GPA) Physics and Mathematics (May 2003)

TEACHING EXPERIENCE

Associate Professor at Florida Southern College, Lakeland, FL (Aug '13 –Present)

- Developing a physics minor and major
- Courses taught: Physics I and II (calculus- and algebra-based), Modern Physics, and Quantum Mechanics
- Developing laboratory materials
- Mentoring students in undergraduate research projects

Visiting Assistant Professor at Rhodes College, Memphis, TN (Aug '12 –May '13)

- Taught Calculus-based physics I and II, with labs and Statistical Mechanics (out of Kittel and Kroemer)
- Mentored an undergraduate student research project (results presented at NCUR)

Adjunct Instructor at Red Rocks and Front Range Community Colleges, CO (Jan '12 –May '12)

- Taught 3 sections of algebra-based physics I and three corresponding labs

Student Teaching at Wilton High School (Jan '04 – February '04)

- Taught full course load of algebraic-based and calculus-based introductory physics

University of Connecticut Physics Department, Storrs, CT

Teacher's Assistant for 7 semesters (June '00 – January '03)

- Ran physics labs covering mechanics, electromagnetism, and optics (with and without calculus)

RESEARCH EXPERIENCE

JILA, Boulder, CO (August '11– January '12)

Postdoctoral Research Associate

- Constructed theoretical models for nonlinear open cavity quantum electrodynamics systems

University of Colorado, JILA, Boulder, CO

Research Assistant under Prof. Murray Holland, Professor of Physics (January '06 – July '11)

- Developed a comprehensive analogy between electronics and atom-optical open quantum systems
- Predicted transport properties of atoms traversing custom optical lattice structures

Harvard-Smithsonian Center for Astrophysics, ITAMP, Cambridge, MA

Research Assistant under Prof. Alex Dalgarno and Prof. Vasili Kharchenko (June '03 – May '04)

- Numerically modeled cometary X-ray emission with the Solar Wind Charge Exchange Mechanism
- Predicted spectral emission, photon yield, and X-Ray emission of solar wind interactions with the LISM

University of Connecticut Physics Department, Storrs, CT

Research Assistant under Prof. R. Mallett, Professor of Physics (Sept. '02 – May '03)

- Derived a linearized gravitational theory for the interaction of particles with arbitrary electromagnetic fields

University of Connecticut Mathematics Department, Storrs, CT

Research Assistant under Prof. P. J. McKenna, Professor of Mathematics (January '02 – May '03)

- Numerically modeled the Millennium Bridge (London) in order to explain structural problems

HONORS AND ACHIEVEMENTS

- Harvard's ITAMP Research Assistant appointment '04
- University Scholar (UConn's highest undergraduate distinction), Honors Scholar, Magna Cum Laude '03
- Winner of the Physics department's Katzenstein Prize (undergraduate physics thesis of the year) '03
- Pi Mu Epsilon (the National Mathematics Honor Society) '03

(HONORS AND ACHIEVEMENTS continued)

- New England Scholar '02
- UCONN's Annual Overall Calculus Competition: First Place '01 and '02, Third Place '03
- Phi Beta Kappa (the nation's oldest academic honor society) '02
- Sigma Pi Sigma (the National Physics Honor Society) '01

COMPUTER SKILLS

HTML, LaTeX, Maple, Mathematica, Math CAD, MATLAB, MS Office, Opendx

PUBLIC TALKS/PRESENTATIONS

1. **AAPT (2020)** *"Pedagogical Materials to Cure Misconceptions Connecting Special and General Relativity"*
2. **DAMOP (2018)** *"Approaching a Final Temperature Prediction of an Ensemble of Atoms Undergoing Cavity-Assisted Cooling in the Superradiant Regime"*
3. **Gordon Conference on Quantum Science (2016)** *"Generalized Photon-Assisted Tunneling"*
4. **DAMOP (2015)** *"Transport Enhancement of Bose Hubbard Systems via Barrier Modulation"*
5. **DAMOP (2010)** *"The Development of Atomtronics"*
6. **DAMOP (2009)** *"An Open Quantum System Study of Atomic Transport Through Time-Dependent Optical Lattices"*
7. **DAMOP (2008)** *"Atomtronics and Basic Logic: Constructing AND and OR Gates from Atomtronic Transistors"*
8. **SQuInT (2007)** *"Atomtronics: Creating Ultracold Atom Analogs of Electronic Circuits and Devices"*
9. **March Meeting (2007)** *"Atomtronics: Ultracold Atom Analogs of Electronic Circuits and Devices"*
10. **DAMOP (2007)** *"Atomtronics: Realizing the Behavior of Electronic Components in Ultracold Atomic Systems"*
11. **MAA (2002)** *"Nonlinear Problems Inspired by the Millennium Suspension Bridge"*

INVITED TALKS

1. **Laser-Tech (2015)** *"Ultracold Atom-Optical Analogs of Electronic Components and Devices"*
2. **FSC Math (2015)** *"Rigorous Approximations in Quantum Mechanics: Applications of Differential Equations"*
3. **FSC CHEM (2013)** *"Atomtronics and Quantum Optical Memory Elements"*
4. **Rhodes College (2013)** *"Investigating the Limitations of Quantum Memory Elements"*
5. **Naval Research Laboratory (2009)** *"Effective Off-Resonant Transport Through Modulated Optical Lattices"*
6. **Harvard (ITAMP) (2008)** *"Atom-Optical Analogs of Electronic Components and Devices"*
7. **UConn Physics (2007)** *"Developing Atomtronic Systems and Devices"*
8. **Harvard (ITAMP) (2007)** *"Atomtronics: Ultracold Atom Analogs of Electronic Circuits and Devices"*
9. **JILA (2007)** *"Introducing Atomtronics: Atom-Optical Analogs of Electronic Components"*

PUBLICATIONS

1. R. A. Pepino, and R. Mabile [A Misconception Regarding the Einstein Equivalence Principle and a Possible Cure Using the Twin Paradox](#) accepted for publication in *The Physics Teacher*
2. R. A. Pepino (2021) [Advances in atomtronics](#) *Entropy*, **23** (5), 534.
3. R. A. Pepino, W. P. Teh, and L. J. Magness (2016) [Transport Enhancement of Irregular Optical Lattices with Polychromatic Amplitude Modulation](#) *New J. Phys.* **18**, 013031
4. R. A. Pepino, J. Cooper, D. Meiser, D. Z. Anderson, and M. J. Holland (2010) [Open quantum systems approach to atomtronics](#) *Phys. Rev. A* **82**, 013640
5. R. A. Pepino, J. Cooper, D. Z. Anderson, and M. J. Holland. (2009) [Atomtronic circuits of diodes and transistors](#) *Phys. Rev. Lett.* **103**, 140405
6. Koutroumpa, R. Lallement, V. Kharchenko, A. Dalgarno, R. Pepino, V. Izmodenov, E. Quemerais. (2007) [Charge-transfer induced EUV and soft X-ray emissions in the heliosphere](#) *Astronomy and Astrophysics* **460**:1, 289-300
7. R. Pepino, V. Kharchenko, and A. Dalgarno, and R. Lallement. (2004) [Spectra of the x-ray emission induced in the interaction between the solar wind and the heliospheric gas](#) *The Astrophysical Journal*, **617**, 1347-1352

CONFERENCE PROCEEDINGS

1. R. A. Pepino, J. Cooper, D. Z. Anderson and M. J. Holland (2008) "Atom-Optical Analogs of Electronic Components and Devices" PROCEEDINGS OF THE DALGARNO CELEBRATORY SYMPOSIUM
Imperial College Press

STUDENT RESEARCH PRESENTATIONS

1. ACS FAME (2013) W. P. Teh **1st place undergraduate poster presentation**
2. ACS (2013) "*Enhancing Atomic Transport Across Off-Resonant Optical Lattices*" W. P. The
3. NCUR (2012) "*Enhancing Atomic Current in Energetically-Gapped Optical Lattices*" L. J. Magness