Christopher Richardson

4618 Autumnwood Ln – Lake Charles – Louisiana
(337)764-2451 • cricha5@gmail.com • United States Citizen

Education

Louisiana State University **Baton Rouge, LA, U.S.A.**
Ph.D. and BS in Physics *1996–2012*
Minor in Computer Science

American University of Sharjah **Sharjah, United Arab Emirates**
Courses in Computer Science *2000–2001*

Experience

Post-Doctoral Researcher **Liege, Belgium**
University of Liege *2012–2014*
Researching the theoretical connections and analogies between a macroscopic bouncing droplet system and quantum mechanics. Contract ends in October 2014.

- Responsible for writing and publishing papers on this [1] and related subjects [2].
- Responsible for modeling the systems in question in Mathematica, C, C++, using optimization methods such as multithreading with openmp.

Lab Instructor and Teachers Assistant **Baton Rouge, LA, U.S.A.**
Louisiana State University *2007–2012*
Taught first semester physics lab from January 2007 until May 2009. Taught second semester physics lab since August 2011 until August 2012.

- Responsible for designing requirements for and grading lab reports as well as creating the final exam.
- Because of extensive course work in quantum physics I was responsible for grading Dr. Jon Dowling's high level quantum course spring of 2011.

Research Assistant **Baton Rouge, LA, U.S.A.**
Louisiana State University *2009–2011*
Researched quantum fundamentals under Dr. Jon Dowling with funding from the Foundational Questions Institute (FQXI) and the U.S. Air Force.

- Published a paper [3] reexamining Popper's Thought Experiment in light of new experiments.
- Led an international team that published a paper[4] on using an entangled decoy states in QKD.

Research Assistant **Baton Rouge, LA, U.S.A.**
Louisiana State University *2006–2007*
Worked with Dr. Thomas Kutter on the T2K (Tokai to Kamioka) neutrino oscillation experiment.

- Designed, built and tested parts for the muon detector. This involved building scintillating detectors with embedded fiber optic cables running to photodiodes and testing these detectors using equipment such as oscilloscopes and coincidence counters.
- Traveled to CERN, where the yokes to house the detectors were located, to take measurements for the detectors fitment.
- Wrote C++ code to optimize the detectors fitment inside the yokes and used the Geant4 toolkit to model the particle interactions.

Web Application Developer **Baton Rouge, LA, U.S.A.**
Louisiana State University *2003–2006*
Responsible for the entire website of the Extension Disaster Education Network (EDEN).

- This included programing the front of the site with HTML and JavaScript but mostly involved programming the interface between the website and the database using .NET, Visual Basic and SQL.
- Responsible for synchronizing the website with an secure off-site facility to be used in case of outages resulting from disasters such as a hurricane.

International Conferences

2012 APS March Meeting, Boston, MA, U.S.A.:
Contributed a presentation on Popper's thought experiment[3] and a poster on quantum key distribution (QKD) with entanglement enhanced decoy states[4] .

2012 OSA QIM Conference, Berlin, Germany:
Presented a paper[4] on quantum key distribution (QKD) using entanglement enhanced decoy states.

2012 SPIE Defense, Security and Sensing, Baltimore, MD, U.S.A.:
Presented a paper[4] on quantum key distribution (QKD) using entanglement enhanced decoy states.

2014 DPG Spring Meeting, Berlin, Germany:
Presented a paper[2] which explores the role of linearity in quantum mechanics.

2014 Hydrodynamic Quantum Analogs IV, Rio de Janeiro, Brazil:
Presented our current research into the quantum analogues of the bouncing droplet system.

Selected Publications

[1]Chris D. Richardson, Peter Schlagheck, John Martin, Nicolas Vandewalle, and Thierry Bastin. On the analogy of quantum wave-particle duality with bouncing droplets. *arXiv:1410.1373*, 2014.

[2]Chris D. Richardson, Peter Schlagheck, John Martin, Nicolas Vandewalle, and Thierry Bastin. Nonlinear schrödinger wave equation with linear quantum behavior. *Phys. Rev. A*, 89:032118, Mar 2014.

[3]Chris D. Richardson and Jonathan P. Dowling. Popper's thought experiment reinvestigated. *International Journal of Quantum Information*, 10(03):1250033, 2012.

[4]Carl F. Sabottke and Chris D. Richardson et al. Thwarting the photon-number-splitting attack with entanglement-enhanced bb84 quantum key distribution. *New Journal of Physics*, 14(4):043003, 2012.

[5]Chris D. Richardson and Jonathan P. Dowling. On the uncertainty of the ordering of nonlocal wavefunction collapse when relativity is considered. *Quantum Studies: Mathematics and Foundations*, pages 1–8, 2014.

Other Skills

- I am a novice speaker of French and German.
- Although my most recent work has been in multithreading C and C++, I have also used or been educated in C#, Python, SQL, VisualBasic, Java, assembly language, linux use, scripting, version control with Git, scientific modeling packages such as GEANT4, iOS and OS X programming using Xcode, database management, Mathematica, LaTeX and others.
- I am handy with a wrench and soldering iron. A recent project resulted in a pair of analog tube amplifiers and matching speakers. I am currently fiddling with an Arduino and csound.