

REBECCA HOLMES

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I'm a physics Ph. D. student doing research on quantum optics and the limits of human vision. After grad school (degree expected 2016) I want to solve technology & policy problems in space exploration and help humans get to Mars.

SKILLS

- **Research scientist** with experience in optics, quantum information, data acquisition & control, automation, electronics & detectors, data analysis, interdisciplinary collaboration, and problem-solving
- **Excellent written and oral communication skills** for technical and popular audiences
- Proven record of **preparing effective technical proposals and white papers**, and **editing** the work of others
- Strong background in **public outreach**, from museums to the web

EDUCATION

The University of Illinois at Urbana-Champaign

June 2011 - Present

Ph. D. in physics (expected December 2016)

Research advisor: Dr. Paul Kwiat, psychology collaborator Dr. Frances Wang

Thesis title: "Testing the lower limits of human vision with quantum states of light."

- Awarded a National Science Foundation Graduate Research Fellowship in 2012
- Winner of the 2015 Emil Wolf Outstanding Student Paper Competition (awarded by the Optical Society of America)

The University of North Carolina at Chapel Hill

August 2007 - May 2011

Bachelor of Science in physics, minor in creative writing

- Undergraduate research with the UNC Experimental Nuclear and Particle Astrophysics Group, the UNC PROMPT/SkyNet robotic telescope network, and the P-23 Weak Interactions Team at Los Alamos National Laboratory
- Supplemental Instruction TA for the Department of Physics & Astronomy
- Studied at Trinity College in Dublin, Ireland through the Transatlantic Science Student Exchange Program (Fall 2009)

EMPLOYMENT

Morehead Planetarium and Science Center

August 2007 - May 2011

Educator

Chapel Hill, NC

- Presented hundreds of live science demo shows and programs on current issues in science for K-12 school groups and the public

- As a summer science camp counselor in 2008, wrote a “How Things Work” summer camp curriculum for grades 2-4 and taught astronomy camps for middle schoolers
- Awarded the 2009 Jupiter Ball Fellowship to develop a weekend family science event about connections between science and art

PUBLICATIONS & PRESENTATIONS

- 2015 Optical Society of America Frontiers in Optics conference in San Jose, CA (technical talk)
- 2014 Visual Cognition and Human Performance brownbag lunch series at the University of Illinois Psychology Department in Champaign, IL (technical talk)
- 2014 Quantum Information and Measurement conference in Berlin (technical talk)
- 2013 Coherence and Quantum Optics X / Quantum Information and Measurement conference in Rochester, NY (poster)
- 2012 Midwest Cold Atom Workshop in Urbana, IL (technical talk)
- 2012 Optical Society of America CLEO:QELS conference in San Jose, CA (technical talk)
- S. MacMullin, G.K. Giovanetti, M.P. Green, R. Henning, R. Holmes, K. Vorren and J.F. Wilkerson, “Measurement of airborne fission products in Chapel Hill, NC, USA from the Fukushima Dai-ichi reactor accident,” *Journal of Environmental Radioactivity*, 112, 165-170 (2012).

OTHER ACTIVITIES & SKILLS

- Answering science questions from the public on the University of Illinois physics department’s “Ask the Van” website (full list of answers at <http://rebeccaholmes.net/askthevan/>)
- Teaching undergraduates about entanglement and experimental quantum optics in PHYS 403 “Modern Experimental Physics” (4 to 6 two-week sessions per year)
- Presenting science demos and talking to visitors at the Urbana farmer’s market with the Science at the Market program (2011 - present)
- Physics editor of *Carolina Scientific*, the UNC undergraduate science magazine (2010-2011)
- Selected to represent NASA and the United States at the International Year of Astronomy 2009 Opening Ceremonies at UNESCO headquarters in Paris (January 2009), and planned outreach activities on the UNC-Chapel Hill campus as a NASA Student Ambassador
- Web applications
 - o HTML, CSS/SCSS, Ruby on Rails, and static sites with Jekyll (GitHub: piscisvolans)
 - o Redesigned and wrote content for the Kwiat research group website at <http://research.physics.illinois.edu/QI/Photonics/>
- Writing poetry: <http://rebeccaholmes.net/poetry/>