

# Rebecca M. Holmes

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## Current position

*Postdoctoral research associate*  
Space Science and Applications Group (ISR-1)  
Intelligence and Space Research Division  
Los Alamos National Laboratory, Los Alamos, NM

## Areas of specialization

Optics • Single-photon applications • Aerospace

## Experience

Summer 2010 Intern at LANL, Los Alamos, NM (Neutron Science & Technology Group, P-23)  
2007-2011 Student Educator at Morehead Planetarium & Science Center, Chapel Hill, NC

## Education

2017 PhD in Physics, The University of Illinois at Urbana-Champaign  
2011 BSc in Physics, Creative Writing minor, The University of North Carolina at Chapel Hill

## Grants, honors & awards

2012 National Science Foundation Graduate Research Fellow  
2015 Optical Society of America Emil Wolf Outstanding Student Paper Prize

## Publications & talks

### JOURNAL ARTICLES

2017 Palmer, D.M. and Holmes, R.M., "ELROI: A license plate for your satellite," in submission to *Journal of space and rockets*, 2017.

2017 Holmes, R., Vitoria, M., Wang, R. F., and Kwiat, P. G., “Measuring temporal summation in visual detection with a single-photon source,” *Vision Research*, vol. 140, 2017, pp. 33–43.

2011 MacMullin, S., Giovanetti, G. K., Green, M. P., Henning, R., Holmes, R., Vorren, K., and Wilkerson, J. F., “Measurement of airborne fission products in Chapel Hill, NC, USA from the Fukushima Dai-ichi reactor accident,” *Journal of environmental radioactivity*, vol. 112, Oct. 2012, pp. 165–70.

#### PRESENTATIONS

2016 2016 International Conference on Quantum Communication, Measurement and Computing (poster)

2015 R. Holmes, et al. in Frontiers in Optics 2015, OSA Technical Digest (online) (Optical Society of America, 2015), paper FTu5B.5. (talk)

2014 Visual Cognition and Human Performance lunch series at the University of Illinois Psychology Department in Champaign, IL (talk)

2014 R. Holmes, et al. in Research in Optical Sciences, OSA Technical Digest (online) (Optical Society of America, 2014), paper QTu2A.2. (talk)

2013 R. Holmes, et al. in The Rochester Conferences on Coherence and Quantum Optics and the Quantum Information and Measurement meeting, OSA Technical Digest (online) (Optical Society of America, 2013), paper W6.06. (poster)

2012 2012 Midwest Cold Atom Workshop in Urbana, IL (talk)

2012 R. Holmes, et al. in Conference on Lasers and Electro-Optics 2012, OSA Technical Digest (Optical Society of America, 2012), paper QTu1E.8. (talk)

#### OTHER PUBLICATIONS

2017 “Feature: Local Realism Is Dead, Long Live Local Realism?” *Physics World* (June 2017)

2016 “Feature: Seeing Single Photons,” *Physics World* (December 2016)

## Projects

2017-present Optical characterization, modeling, and data analysis for ELROI, a low-resource optical satellite “license plate” for Space Objection Identification (SOI) based on single-photon detection

2016-2017 Graduate mentor for the single-photon detector annealing payload on CAPSat, a University of Illinois undergraduate CubeSat mission supported by the NASA Undergraduate Student Instrument Project initiative

2011-2017 Thesis research: testing the limits of human vision with quantum states of light, using a heralded single-photon source based on spontaneous parametric downconversion (NSF grant PHY 519407)

## Professional skills

Python • MATLAB • LabVIEW • Web development • Technical and popular writing

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