ADITYA NILAKANTAN SHARMA
Department of Physics • University of Illinois at Urbana-Champaign
Urbana, IL 61801-3080
+1-201-274-9689 • *sharma21@illinois.edu*

Education

2007	B.S. *cum laude*, *Applied and Engineering Physics*	Cornell University	Ithaca, NY
2015	M.S., *Physics*	University of Illinois	Urbana, IL
	Ph.D., *Physics*	University of Illinois	Urbana, IL

Expected completion: February 2016
Thesis: *Exploring a high-dimensional Hilbert space using hyperentangled photons*
Advisor: Prof. Paul Kwiat

Work history

2008–Present	Department of Physics, University of Illinois *Research assistant, Kwiat Quantum Information Group*
2010–Present	Department of Physics, University of Illinois *Lab instructor, Advanced Undergraduate Lab*
Fall 2007	Department of Physics, University of Illinois *Teaching assistant, Introductory Electromagnetism*
2006–2007	Sibley School of Mechanical and Aerospace Engineering, Cornell University *Undergraduate research assistant, Kirby Microfluidics Lab*
Summer 2006	SpinX Technologies, Genève, Switzerland *Summer intern*
Summer 2005	Lamont-Doherty Earth Observatory, Columbia University *Intern, supervised by Dr. David Ho*

Research experience and skills

My Ph.D. work has centered on using hyperentanglement to study multipartite entangled states, especially the four-qubit bound-entangled Smolin state. This work involved:

- Generation of polarization- and orbital-angular-momentum- entangled photons by spontaneous parametric downconversion
- Quantum state tomography of photon polarization and orbital angular momentum
- Calculation of spatial and temporal effects of birefringent media on propagation of light
- Fabrication of holographic diffraction gratings
- LabVIEW programming (CLAD certified in 2012) for communication with lab instruments
- Feedback control systems for laser beam pointing stabilization
- Troubleshooting analog electronic circuits

Research interests

Quantum optics, nonlinear optics, quantum computing, quantum communication, entanglement

Awards

2003–2007	John McMullen scholarship, awarded by Cornell University
2003–2007	McMullen Dean's scholarship, awarded by Cornell University

Undergraduate students supervised

2009–2011	Vesselin Velev *Currently a graduate student at the Center for Photonic Communication and Computing at Northwestern University*
2011–2012	Mae Hwee Teo *Currently a PSI student at Perimeter Institute for Theoretical Physics*

Affiliations

2007–Present Member of American Physical Society
2010–Present Member of Optical Society of America

Conference presentations

- A.N. Sharma, J.T. Barreiro, P.G. Kwiat, "Using hyperentangled photons to prepare bound entanglement," *CLEO/QELS 2010* (OSA, 2010).
- A.N. Sharma, K.T. McCusker, J.T. Barreiro, P.G. Kwiat, "Using hyperentangled photon pairs to prepare bound entanglement," *QCMC* (2010).
- A.N. Sharma, K.T. McCusker, J.T. Barreiro, P.G. Kwiat, "A study of multipartite entanglement using hyperentangled photons," *FiO 2011/Laser Science XXVII* (OSA, 2011).
- A.N. Sharma, K.T. McCusker, J.T. Barreiro, P.G. Kwiat, "Using hyperentanglement to study multipartite entanglement," *CQO/QIM* (OSA, 2013).
- A.N. Sharma, K.T. McCusker, J.T. Barreiro, P.G. Kwiat, "Exploring a high-dimensional Hilbert space using hyperentangled photons," *DAMOP* (APS, 2015).

Nonacademic pursuits

2012–Present Member of Taekwondo at UIUC, currently blue belt
Sep. 2013 Shared 2nd place, David Mote Memorial Open Chess Tournament
Aug. 2012 Shared 3rd place, Indianapolis Open Chess Tournament, Under 1500 section
May 2012 Shared 5th place, Chicago Open Chess Tournament, Under 1300 section
Mar. 2012 Clear 1st place, Mid-America Open Chess Tournament, Under 1200 section
2008–2009 President/Treasurer of UIUC chapter of the Society for the Promotion of Indian Classical Music and Culture Amongst Youth