

# Joshua H. Gurian

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## Education

University of Virginia

Ph.D. Physics, 2010

Dissertation: Multiphoton microwave ionization of Rydberg atoms

Advisor: Thomas F. Gallagher

M.A. Physics, 2009

Wesleyan University

B.A. Physics with High Honors, 2004

Thesis: Metastable argon atoms and the Portable Rydberg Generator

Advisor: Thomas J. Morgan

## Professional Experience

Dynavac

Senior Scientist, March 2013 - Present

A.L.P. Lighting Components

Optical Science Consultant, September 2012 - February 2013

University of British Columbia

Invited Visiting Researcher, April 2012 - July 2012

Laboratoire Aimé Cotton, Université Paris-Sud 11, Centre National de la Recherche Scientifique (CNRS)

Chercheur Postdoctoral, February 2010 - January 2012

## Academic Experience

University of Virginia, Department of Physics

Research Assistant, Thomas F. Gallagher, Spring 2005 - Fall 2009.

Teaching Assistant, Principles of Physics I, Fall 2006.

Teaching Assistant, Premeds: Intro to Physics Principles II, Spring 2006.

Teaching Assistant, Principles of Physics I, Fall 2005.

Wesleyan University, Department of Physics

Research Assistant, Thomas J. Morgan, Spring 2001 - Spring 2004.

Teaching Assistant, General Physics II, Spring 2004.

Teaching Assistant, General Physics I, Fall 2003.

Teaching Assistant, Computational Physics I: Tools and Concepts, Fall 2002.

## Publications

### Journal Articles

H. Sadeghi, A. Kruyen, J. Hung, J. H. Gurian, J. P. Morrison, M. Schulz-Weiling, N. Saquet, C. J. Rennick, & E. R. Grant, *Dissociation and the Development of Spatial Correlation in a Molecular Ultracold Plasma*, *Phys. Rev. Lett.* **112**, 075001 (2014). DOI: 10.1103/PhysRevLett.112.075001

Selected for Editors' Suggestion

J. H. Gurian, P. Cheinet, P. Huillery, A. Fioretti, J. Zhao, P. L. Gould, D. Comparat, and P. Pillet, *Observation of a resonant four-body interaction in cold cesium Rydberg atoms*, *Phys. Rev. Lett.* **108**, 023005 (2012). DOI: 10.1103/PhysRevLett.108.023005

H. Maeda, J. H. Gurian, and T. F. Gallagher, *Population transfer in the Na  $s - p$  Rydberg ladder by a chirped microwave pulse*, *Phys. Rev. A* **84**, 063421 (2011). DOI: 10.1103/PhysRevA.84.063421

H. Maeda, J. H. Gurian, and T. F. Gallagher, *Population transfer by multiphoton ARP*, *Phys. Rev. A* **83**, 033416 (2011). DOI: 10.1103/PhysRevA.83.033416

J. H. Gurian, K. R. Overstreet, H. Maeda, and T. F. Gallagher, *Connecting field ionization to photoionization via 17- and 36-GHz microwave fields*, *Phys. Rev. A* **82**, 043415 (2010). DOI: 10.1103/PhysRevA.82.043415

J. H. Gurian, H. Maeda, and T. F. Gallagher, *KHz dye laser system for high resolution laser spectroscopy*, *Rev. Sci. Instrum.* **81**, 073111 (2010). DOI: 10.1063/1.3462978

Selected for Virtual Journal of Ultrafast Science **9**, 8 (2010).

H. Maeda, J. H. Gurian, and T. F. Gallagher, *Nondispersing Bohr Wave Packets*, *Phys. Rev. Lett.* **102**, 103001 (2009). DOI: 10.1103/PhysRevLett.102.103001

Selected for accompanying Viewpoint: C. R. Stroud, Jr., *An astronomical solution to an old quantum problem*, *Physics* **2**, 19 (2009). DOI: 10.1103/Physics.2.19

Selected for Editors' Suggestion

*Reply*, *Phys. Rev. Lett.* **103**, 149302 (2009). DOI: 10.1103/PhysRevLett.103.149302

H. Maeda, J. H. Gurian, D. V. L. Norum, and T. F. Gallagher, *Coherent Population Transfer in an Atom by Multiphoton Adiabatic Rapid Passage*, *Phys. Rev. Lett.* **96**, 073002 (2006). DOI: 10.1103/PhysRevLett.96.073002

*Invited Talks*

Many-Body Rydberg Interactions - Towards Quantum Computing with Giant Atoms, University of San Francisco, San Francisco, CA (2012).

Resonant four-body interaction in cold Rydberg atoms, Albert-Ludwigs-Universität Freiburg, Freiburg, Germany (2011).

Direct observation of a resonant four-body interaction in cold Rydberg atoms, Centre for Quantum Technologies, National University of Singapore, Singapore (2011).

From One to Many Photons: Connecting field ionization to photoionization via GHz microwave ionization of Rydberg atoms, Albert-Ludwigs-Universität Freiburg, Freiburg, Germany (2010).

IAPP Kickoff: Cold Electron Beams, Orsay Physics, Fuveau, France (2010).

Multiphoton Microwave Ionization of Rydberg Atoms, Laboratoire Aimé Cotton, Orsay, France (2010).

Multiphoton Microwave Ionization of Rydberg Atoms, University of Virginia, Charlottesville, VA (2009).

From One to Many Photons: Microwave Ionization of Rydberg Atoms, Wesleyan University, Middletown, CT (2009).

Multiphoton Microwave Ionization of Li Rydberg Atoms, University of Virginia, Charlottesville, VA (2008).

WESeminar: In Pursuit of Excellence, Wesleyan University, Middletown, CT (2004).

*Proceedings*

A. J. Bourque and J. H. Gurian, High reflectivity large scale telescope mirror coatings via long throw sputtering, Proc. SPIE 9151, Advances in Optical and Mechanical Technologies for Telescopes and Instrumentation, Montreal, Canada (2014).

S. D. Smith, P. Glenn, L. Monteiro, J. H. Gurian, G. S. Ash, High Precision Thin Film Deposition via Direct Through-Planet Optical Monitoring, SVC TECHCON, Chicago, IL (2014).

J. H. Gurian, P. Cheinet, P. Huillery, A. Fioretti, J. Zhao, P. L. Gould, D. Comparat, P. Pillet, Observation of a resonant four-body interaction in cold cesium Rydberg atoms, ITN-COHERENCE, Heidelberg, Germany (2011).

J. H. Gurian, H. Maeda, and T. F. Gallagher, Final state distributions of Li Rydberg atoms at high scaled microwave frequency, 42nd Annual Meeting of the APS DAMOP, Atlanta, GA (2011).

J. H. Gurian, P. Huillery, Y. Bruneau, P. Cheinet, A. Fioretti, D. Comparat, and P. Pillet, Multi-grid experimental apparatus for the study of ultracold Rydberg-Rydberg interaction, 42nd Annual Meeting of the APS DAMOP, Atlanta, GA (2011).

Y. Bruneau, J. H. Gurian, A. Fioretti, D. Comparat, P. Pillet, L. Kime, B. Rasser, P. Sudraud, Using cold atoms as a bright cw source for monochromatic ion and electron beams, 42nd Annual Meeting of the APS DAMOP, Atlanta, GA (2011).

P. Cheinet, J. H. Gurian, P. Huillery, Y. Bruneau, A. Fioretti, P. L. Gould, J.-M. Zhao, D. Comparat, and P. Pillet, Observation of resonant 4 body process with cold Rydberg atoms, 43rd Congress of the European Group on Atomic Systems, Fribourg, Switzerland (2011).

A. Fioretti, D. Comparat, J. H. Gurian, Y. Bruneau, L. Kime, and P. Pillet, Monochromatic ion and electron beams by ionization of cold atoms, JNTE 10 - French Symposium on Emerging Technologies for Micro-nanofabrication, Palaiseau, France (2010).

Y. Bruneau, J. H. Gurian, L. Kime, A. Fioretti, D. Comparat and P. Pillet, Ultracold ion and electron beams based on cold atoms, Ultracold Atoms, Metrology and Quantum Optics, École de Physique des Houches, Les Houches, France (2010).

J.H. Gurian, K.R. Overstreet, H. Maeda, and T.F. Gallagher, Strong coherent coupling of many levels across the ionization limit via 17 and 36 GHz microwave fields, 41st Annual Meeting of the APS DAMOP, Houston, TX (2010).

J. H. Gurian, H. Maeda, and T. F. Gallagher, Connecting field ionization to photoionization via 17 GHz microwave fields, 40th Annual Meeting of the APS DAMOP, Charlottesville, VA (2009).

H. Maeda, J. H. Gurian, and T. F. Gallagher, Nondispersing Bohr wave packets using circularly polarized microwave fields, 40th Annual Meeting of the APS DAMOP, Charlottesville, VA (2009).

J. H. Gurian, H. Maeda, and T. F. Gallagher, One to five photon microwave ionization of Li Rydberg atoms, 39th Annual Meeting of the APS DAMOP, State College, PA (2008).

H. Maeda, J. H. Gurian, and T. F. Gallagher, Population transfer in Na s-p Rydberg ladder by chirped microwave pulse, 38th Annual Meeting of the APS DAMOP, Calgary, Canada (2007).

H. Maeda, J. H. Gurian, D. V. L. Norum, and T. F. Gallagher, Coherent Population Control of Rydberg Atom by Adiabatic Rapid Passage, Ultrafast Phenomena XV, Pacific Grove, CA (2006). DOI: 10.1007/978-3-540-68781-8\_178

H. Maeda, J. H. Gurian, D. V. L. Norum, and T. F. Gallagher, Coherent population transfer by multiphoton adiabatic rapid passage, 37th Annual Meeting of the APS DAMOP, Knoxville, TN (2006).

H. Maeda, J. H. Gurian, D. V. L. Norum, and T. F. Gallagher, Intuitive and counter-intuitive multiphoton adiabatic rapid passage, 37th Annual Meeting of the APS DAMOP, Knoxville, TN (2006).

J. D. Wright, P. A. Walker, J. H. Gurian, M. van Lier-Walqui, J. M. Lambert, H. Flores-Rueda, and T. J. Morgan, Recurrence Spectroscopy of Autoionizing Rydberg Argon, 35th Annual Meeting of the APS DAMOP, Tucson, AZ (2004).

## Honors and Awards

University of Virginia

University of Virginia Society of Fellows Junior Fellow, 2008.

Outstanding Graduate Teaching Assistant Award, Physics, 2007.

National Science Foundation IGERT:SELIM Fellow, 2004.

Wesleyan University

Bertman Prize, 2004.

Van Dyke Award, 2001.

## Certifications

Laser certification

Sirah Matisse TS Ti:sapphire, 2010.

Machine shop certification

University of Virginia, 2005.

Wesleyan University, 2001.

## References

Available by request.

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