

TARA CUBEL LIEBISCH

04.07.1979 Born in Arlington Heights, IL USA

Married with two children born 20.06.07 and 06.09.10

EDUCATION

University of Michigan, Ann Arbor, MI.

M.S. and Ph.D. in Applied Physics, April 2007. Thesis title: *Study of Coherent Properties of Rydberg-atom Systems*

Mount Holyoke College, South Hadley, MA

B.A. in Physics with honors and German Studies May 2001. Thesis title: *How do Foams Age?: Modeling Coarsening Effects on Foam.*

University of Leipzig, Leipzig, Germany Academic Year 1999-2000. International Physics Studies Program.

INTERESTS

Rydberg physics, Rydberg chemistry, Laser cooling and trapping techniques, Metrology, Quantum physics applications for industry, Quantum information processing and cryptography, Teaching quantum physics, Infrastructure development to enable successful research, Career development of graduate students

SCHOLARSHIPS AND HONORS

National Research Council (NRC) Postdoctoral Fellowship (MAY 2009 - JUNE 2011)

Rackham Graduate School Regents Fellowship (SEP 2001 - SEP 2003)

Mount Holyoke Grant (SEP 1997 - MAY 2001)

Sigma Xi Scientific Research Society Member (2000)

NSF-STEMTEC Teaching Scholar (1999)

Mildred L. Sanderson Math Prize (1998)

PROFESSIONAL EXPERIENCE

FEB 2016 – PRESENT **Scientific Manager**, Center of Integrated Quantum Science and Technology (IQST)

FEB 2014 – FEB 2016 **Postdoctoral Researcher**, University of Stuttgart, 5. Physikalisches Institut, *Ultracold Rydberg chemistry in a Bose-Einstein condensate*

JUNE 2009 – JUNE 2011 **National Research Council Postdoctoral Fellow**, NIST Boulder, Time and Frequency Division, *Laser Cooling for Compact Physics Packages*

FEB 2008 – MAY 2009 **Postdoctoral Researcher**, NIST, Boulder, Time and Frequency Division, *Microcell NMR Gyroscope*

SELECTED PUBLICATIONS

- ◊ “Controlling Rydberg atom excitations in dense background gases” **T. Cubel Liebisch**, M. Schlagmüller, F. Engel, F. Boettcher, H. Nguyen, J. Balewski, G. Lohead, K.M. Westphal, K.S. Kleinbach, T. Schmid, A. Gaj, R. Löw, S. Hofferberth, T. Pfau, J. Perez-Rios and C.H. Greene to appear in *J. Phys. B Rydberg Topical Review* (August 2016)
- ◊ “Ultracold Chemical Reactions of a single Rydberg atom in a dense gas,” M. Schlagmüller, **T. Cubel Liebisch**, F. Engel, K.S. Kleinbach, K.M. Westphal, F. Böttcher, U. Hermann, R. Löw, S. Hofferberth, T. Pfau, J. Perez-Rios and C.H. Greene *Phys. Rev. X* **6**, 031020 (2016)
- ◊ “Probing a scattering resonance in Rydberg molecules with a Bose-Einstein condensate,” M. Schlagmüller, **T. Cubel Liebisch**, H. Nguyen, G. Lohead, F. Engel, F. Boettcher, K.M. Westphal, K.S. Kleinbach, R. Löw, S. Hofferberth, T. Pfau, J. Perez-Rios and C.H. Greene *Phys. Rev. Lett.* **116**, 053001 (2016)
- ◊ “Observation of mixing between singlet and triplet scattering channels in Rb_2 Rydberg molecules,” F. Boettcher, A. Gaj, K.M. Westphal, M. Schlagmüller, K.S. Kleinbach, R. Löw, **T. Cubel Liebisch**, T. Pfau, and S. Hofferberth *Phys. Rev. A* **93** 032512 (2016)
- ◊ “Atom number amplification in a magneto-optical trap via stimulated light forces,” **T. Cubel Liebisch**, E. Blanshan, E. Donley, J. Kitching, *Physical Review A* **85**, 013404 (2012)
- ◊ “Nuclear Quadrupole Resonances in Compact Vapor Cells: The Crossover Between the NMR and the Nuclear Quadrupole Resonance Interaction Regimes,” E. Donley, J.L. Long, **T. Cubel Liebisch**, E.R. Hodby, T.A. Fischer, J. Kitching, *Physical Review A* **79**, 013420 (2008).
- ◊ “Double-Resonance Spectroscopy of Interacting Rydberg-Atom Systems,” A. Reinhard, K.C. Younge, **T. Cubel Liebisch**, P.R. Berman, G. Raithel, *Physical Review Letters* **95**, 253201 (2008).
- ◊ “Rydberg-Rydberg Collisions: Resonant Enhancement of State Mixing and Penning Ionization,” A. Reinhard, **T. Cubel Liebisch**, K.C. Younge, P.R. Berman, G. Raithel, *Physical Review Letters* **100**, 123007 (2008).
- ◊ “Cold Rydberg Atoms,” J. Choi, B. Knuffman, **T. Cubel Liebisch**, A. Reinhard, and G. Raithel, *Advances in Atomic, Molecular and Optical Physics* vol. 54 ch. 3.
- ◊ “Level shifts of Rubidium Rydberg states due to binary interactions” A. Reinhard, **T. Cubel Liebisch**, B. Knuffman, and G. Raithel *Physical Review A* **75**, 032712 (2007).

- ◊ “Atom Counting Statistics in Ensembles of Interacting Rydberg Atoms,” **T. Cubel Liebisch**, A. Reinhard, P.R. Berman, G. Raithel, Physical Review Letters 95, 253002 (2005).
- ◊ “Coherent Population Transfer of Ground-State Atoms Into Rydberg States,” **T.Cubel**, B.K. Teo, V.S. Malinovsky, J.R.Guest, A.Reinhard, B.Knuffman, P.R.Berman, G.Raithel, Physical Review A 72, 023405 (2005).
- ◊ “Simple pressure-tuned Fabry-Perot interferometer,” E. Hansis, **T. Cubel**, J.-H. Choi, J. R. Guest, G. Raithel, Rev. Sci. Instrum. 76, 033105 (2005).
- ◊ “Autler-Townes Spectroscopy of the $5S_{1/2}$ - $5P_{3/2}$ - $44D$ Cascade of Cold ^{85}Rb Atoms.” B.K. Teo, D. Feldbaum, **T. Cubel**, J. R. Guest, P. R. Berman, G. Raithel, Physical Review A 68, 053407 (2003)
- ◊ “Adaptive Beam Combining and Interferometry using Photorefractive Quantum Wells” 12. D.D. Nolte, **T. Cubel**, L.J. Pyrak-Nolte, and M.R. Melloch, J.Opt.Soc.Am.B 18 195 (2001).

OUTREACH

Referee for Physical Review since 2007

Meet Science, University of Stuttgart (February 2015 – April 2016) Initiated and headed a mentoring program for women professors, postdocs, PhD and master students at the University:

Girls Day, University of Stuttgart, (March 27th 2014) Organized and presented an interactive talk for 20 5-6th grade girls about what atoms are.

Physics Olympiad, FOCUS Center, University of Michigan, Ann Arbor MI (January 2006-May 2006) Designed and coordinated ElectroLauncher event at the annual Physics Olympiad where 16 high schools compete.

Women in Science and Engineering Summer Program, (Summer 2004) Taught 30 high school girls basic physics in a team by demonstrating and designing various physics experiments in electromagnetics, rocket design, electronics, and thermodynamics.

Mentor, Applied Physics Program, University of Michigan, (2003-2006)