Laura A. Kinnischtzke, Ph.D.

INTERESTS

Instrument development, optical metrology, teaching and outreach, quantum photonics, solid-state microscopy, low-temperature physics, science communication

EDUCATION

Ph.D. Physics, October 2017, University of Rochester, Rochester, NY

Thesis: Quantum Dot Photonics

M.A. Physics, March 2013 (GPA 3.61/4.0), University of Rochester, Rochester, NY

B.S. Physics, May 2011 (GPA 3.61/4.0), University of Minnesota, Minneapolis, MN

EXPERIENCE

09/2017- Current **Director, Undergraduate Physics Laboratories**

▷ Physics Department, Hobart and William Smith Colleges, Geneva, NY

Developing curriculum for small group discussion and pre-laboratory lectures, and teaching laboratory sections for introductory physics, as well as grading lab reports.

07/2017- 08/2107 **Course Instructor**

▷ Summer Session, University of Rochester

Used self-paced methodology to create an environment where students achieved mastery of the course material for PHY 114: General Physics II. Guided students through self-study of course curriculum by holding extensive daily office hours, administering short quizzes and preparing a final exam.

05/2012- 08/2017 **Graduate Research Assistant**

▷ Nick Vamivakas Group, Institute of Optics, University of Rochester

Built confocal microscopes for photoluminescence spectroscopy of solid-state single photon emitters. Used electric and magnetic fields to characterize the light emission of InAs quantum dots and defect states in 2-D materials. Custom-interfaced the microscopes with Montana Instruments Cryostation and attoCube attoDry 1000 closed-cycle cryostats. Trained new graduate students in the operation of the cryostats and microscopes.

09/2011- 05/2012 **Graduate Teaching Assistant**

▷ Department of Physics and Astronomy, University of Rochester

Led weekly workshops, type-set homework solutions, graded homework and exams, and held weekly office hours for calculus-based introductory physics for life science majors.

01/2010- 05/2011 **Undergraduate Research Assistant**

▷ Allen Goldman Group, School of Physics and Astronomy, University of Minnesota

Built a liquid nitrogen cryostat to study temperature-dependent capacitance of ionic liquid DEME-TFSI. This research informed how the ionic liquid was used in superconductivity studies of electrostatically gated materials.

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06/2010- 08/2010 **REU (Research Experience for Undergraduates) Participant**
▷ Christine Berven Group, University of Idaho, Moscow, ID

Accepted into the NSF-sponsored summer program at the University of Idaho- Moscow. Experimentally studied conductivity of ZnO wires as they underwent annealing cycles. Investigated self- capacitance of single-electron transistors in MATLAB.

09/2010- 05/2011 **Undergraduate Teaching Assistant**
▷ School of Physics and Astronomy, University of Minnesota

Led weekly discussion and lab sessions, graded homework and exams, and held weekly office hours for calculus-based introductory physics course(s).

Technical Expertise

- ❑ **Lasers and optics:** Confocal microscopy, photo-luminescence and Raman spectroscopy, single mode diode laser operation, fiber coupling. Design, built and tested custom polarization-sensitive confocal microscope.
- ❑ **Cryogenic and Vacuum Systems:** Operation and maintenance of closed-cycle optical cryostat(s) at high vacuum, designed and built LN2 cryostat for capacitance spectroscopy
- ❑ **Software:** Windows/Microsoft Office, LabVIEW, OriginLab, MATLAB, LaTeX, Inkscape
- ❑ **Clean room (Class 1000):** Thin film e-beam evaporation, optical (contact) lithography, profilometry, optical microscopy, electronic device (diode) characterization

Outreach & Service

Rochester Museum and Science Center, Informal Science Educator
▷ Participated in training as an informal science educator
▷ Feature Presenter on the museum floor (2016)
▷ Presenter at 'Ladies In the Lab' event (2017)

University of Rochester, Institute of Optics and Department of Physics and Astronomy
▷ Assisted department in annual graduate student recruitment weekends (2014, 2015)
▷ Presenter for Summer School lab demonstrations (2013-2016)
▷ Participated in outreach events organized by U of R SPIE (2015-2017)
▷ Staffed Ask-A-Scientist stall at Brighton Farmer's Market (2017)

Honors, Awards, & Certificates

▷ Montana Instruments Cold Science Exploration: Student Conference Travel, 2017
▷ Com-Sci-Con Cornell attendee, June 2016
▷ Certificate of Training in Informal Science Education, 2016
▷ Department of Education GAANN Fellowship, 2011-2013

University of Minnesota
▷ Undergraduate Research Opportunities Program (UROP) participant, 2010-2011
▷ University Honors Program member, Fall 2009-2011
▷ Dean's List, 2007-2011

Professional Affiliations

American Physical Society, Optical Society of America, Center for Coherence and Quantum Optics (Univ. of Rochester)

Publications

3. "Graphene mediated Stark shifting of quantum dot energy levels "
L. Kinnischtzke, K. M. Goodfellow, C. Chakraborty, Y. Lai, S. F´alt, W. Wegscheider, A. Badolato, and A. N. Vamivakas *Applied Physics Letters* **108**, 211905 (2016).

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2. "Voltage-controlled quantum light from an atomically thin semiconductor"
   C. Chaktraborty, **L. Kinnischtzke**, K. M. Goodfellow, R. Beams, and A.N. Vamivakas, *Nature Nanotechnology* **10**, 507-511 (2015).
   * Article featured on the cover of the June 2015 issue of *Nature Nanotechnology*.

1. "Phase diagram of electrostatically doped SrTiO 3"
   Y. Lee, C. Clement, J. Hellerstedt, J. Kinney, **L. Kinnischtzke**, X. Leng, S. Snyder, and A. M. Goldman *Physical Review Letters* **106**, 136809 (2011).

Contributed Talks

5. "Imaging Potential Energy Landscapes with Quantum Dots"
   L. Kinnischtzke and N. Vamivakas
   American Physical Society (APS) March Meeting, New Orleans, LA, March 2017
4. "Graphene-based electrostatic control of InAs quantum dots"
   L. Kinnischtzke, K. Goodfellow, C. Chakraborty, Y. Lai, A. Badolato, S. Falt, W. Wegscheider, and N. Vamivakas
   Optical Society of America (OSA) Frontiers in Optics/Laser Science, Rochester, NY, October 2016
3. "Graphene mediated Stark shifting of quantum dot energy levels"
   L. Kinnischtzke, K. Goodfellow, C. Chakraborty, Y. Lai, A. Badolato, and N. Vamivakas
   American Physical Society (APS) March Meeting, Baltimore, MD, March 2016
   Baltimore, MD - March 2016.
2. "Magneto-photoluminescence study of InAs quantum dots emitting at 1150 nm"
   Y. Lai, T. Malhotra, **L.A. Kinnischtzke**, N. Vamivakas and A. Badolato
   American Physical Society (APS) March Meeting, San Antonio, TX, March 2015.
   Henry B. Gonzalez Convention Center, San Antonio, TX - March 2015.
1. "Towards a Spin-Photon Interface"
   University of Rochester SPIE Summer Colloquium Series, June 2014
   University of Rochester, Rochester, NY - June 2014.

References

References available on request.

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