

# RAMESH ADHIKARI

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## PROFESSIONAL APPOINTMENTS

- Assistant Professor, Department of Physics, Jacksonville University. August, 2016 -
- Research Assistant, Department of Physics, University of Massachusetts Amherst. 2012-2016

## EDUCATION

- **Univeristy of Massachusetts Amherst** Amherst, MA  
PhD, Physics September, 2016  
Dissertation: Study of Charge Transport Mechanism in Microbial Nanowires
- **Univeristy of Massachusetts Amherst** Amherst, MA  
MS, Physics February, 2014
- **Berea College** Berea, KY  
BA, *magna cum laude*, Physics & Mathematics May, 2011

## AWARDS, GRANTS AND HONORS

- **Faculty Development Award**, Jacksonville University: Awarded to travel and present at 2017 AAPT Winter Meeting. 2016
- **Graduate Student Travel Grant**, University of Massachusetts, Amherst: Awarded to fund travel to recognized conferences for presentations of results of research conducted during graduate work. Maximum of six grants offered annually. 2016
- **Arthur Quinton TA Award**, University of Massachusetts, Amherst: Awarded annually to an outstanding Teaching Assistant. 2012
- **Waldemar Noll Prize in Physics**, Berea College, KY: Presented annually to the senior Physics major with the highest scholastic standing in the major field. 2011
- **Inducted in Phi Kappa Phi**: National collegiate honor society with invitation only membership for top 10% of graduating seniors. 2011
- **Lilli Brann Scholarship in Physical Sciences**, Berea College, KY: Awarded annually to a student in the physical sciences who has demonstrated superior scholarship in his or her chosen field. 2010
- **First position for oral presentation at Kentucky Academy of Sciences (KAS) Annual Meeting**, Western Kentucky University, Bowling Green, KY. 2010
- **Inducted in Sigma Pi Sigma and Pi Mu Epsilon Honor Societies**: National honor societies that honor students with outstanding scholarship in Physics and Mathematics respectively. 2010
- **Second position for oral presentation at Kentucky Academy of Sciences (KAS) Annual Meeting**, University of Kentucky, Lexington, KY. 2008
- **Mahatma Gandhi Scholarship**, Embassy of India in Kathmandu, Nepal: Awarded annually as monthly stipends for up to two years to students selected on the basis of academic performance at national school leaving certificate (SLC) examinations in Nepal. 2004-2006

## PROFESSIONAL RESEARCH EXPERIENCE

- Graduate Research Assistant, University of Massachusetts, Amherst, MA. May, 2012 - Current
  - Project: Charge transport through microbial nanowires.
  - Project: Understanding mechanism of degradation of perovskite solar cells.
  - Project: Organic fluropolymers for corrosion protection.
- Lee Teng Intern, Fermi National Accelerator Laboratory (Fermilab), Batavia, IL June-August, 2010
  - Project: Quench localization in superconducting radio-frequency cavities.
- Research Intern, University of Kentucky, Lexington, KY June-August 2009
  - Magnetic shielding techniques for neutron electric dipole moment (EDM) experiment.

- Research Intern, Berea College, Berea, KY June-August 2008  
– Study of periods of variable stars.

## PROFESSIONAL TEACHING EXPERIENCE

- iCons Teaching Assistant, University of Massachusetts, Amherst, MA. January-May, 2013  
– Facilitated student driven learning, multidisciplinary teamwork, peer-to-peer mentoring and problem solving at student centered Integrated Concentration of Science (iCons) class on renewable energy.
- Head Graduate Teaching Assistant, University of Massachusetts, Amherst, MA. August- December, 2012  
– Supervised teaching assistants (TAs), planned and presented lesson plan for the lab courses and ensured grading standards are consistent among TAs in charge of different sections.
- Graduate Teaching Assistant, University of Massachusetts, Amherst, MA. August 2011- May 2012  
– Lab instructor for electronics and introductory physics, tutoring and grading.
- Teaching Assistant, Berea College, Berea, KY. August 2007- May 2011  
– Lab instructor for introductory physics classes, grading, tutoring and lab setups.

## OTHER LEADERSHIP, SERVICE AND OUTREACH ACTIVITIES

- Train graduate students in the department to use various equipments such as Stratasys 3D printer, impedance spectrometer, thermal evaporator and AFM for their research. 2011 - Present
- Mentor and hold discussion sessions for REU students, and new graduate students. 2011 - Present
- Organize annual lab tours and perform nanotechnology demonstrations for: 2011 - Present  
– ScienceQuest: Annual event for 10 - 12<sup>th</sup> graders from across Northeast.  
– Nanotechnology Institute: Summer institute for high school STEM teachers.
- Member of experimental High Energy Physics Faculty Search Committee Spring, 2016
- Admission Committee Member in Physics Department Spring, 2015
- Member of experimental Condensed Matter Physics Faculty Search Committee Spring, 2014
- Member to President, Berea College chapter of Society of Physics Students August 2008 - May 2011  
– Developed and executed organization operation skills such as managing accounts, fund-raising, engaging members, organizing visits to research universities, and promoting public understanding of science through participatory activities while leading Society of Physics Students chapter for multiple years with service in various positions starting from a member to a president.
- International Student Orientation Team Leader 2009, 2010  
– Organized group activities to promote social interaction between the members of incoming class and adjustment to their life to new academic and social culture.

## PATENTS (Pending)

- Microbial nanowires with increased conductivity and reduced diameters.(US Serial No.: 62/194,329) 2015  
Derek Lovley, Nikhil S. Malvankar, **Ramesh Adhikari**, Yang Tan, Joy Ward, Kelly Nevin

## PUBLICATIONS

### Published

1. Y. Tan\*, **R.Y. Adhikari\***, N.K. Malvankar, S. Pi, J. E. Ward, T. L. Woodard, K. P. Nevin, Q. Xia, M. T. Tuominen and D.R. Lovley “Synthetic Biological Protein Nanowires with High Conductivity”, *Accepted in Small - In press.* \* **Co-first authors.**
2. Y. Tan, **R.Y. Adhikari**, N.K. Malvankar, J. E. Ward, K. P. Nevin, T. L. Woodard, J. A. Smith, O. Snoeyenbos-West, A. E. Franks , M. T. Tuominen and D.R. Lovley “Low Conductivity of *Geobacter uraniumireducens* Pili Associated with Electron Shuttling Mechanism for Extracellular Electron Transfer”, *Frontiers in Microbiology*, 7, 980 (2016).
3. **R.Y. Adhikari**, N.S. Malvankar, M. T. Tuominen and D.R. Lovley “Conductivity of individual *Geobacter pili*”, *RSC Advances*, 6, 8354-8357 (2016).
4. T. C. Bayram, N. Orbey, **R.Y. Adhikari** and M. T. Tuominen “Fluoropolymer Based Formulations as Protective Coatings in Oil/Gas Pipelines”, *Progress in Organic Coatings*, 88, 54-63 (2015).
5. M. Bag, L. A. Renna, **R.Y. Adhikari**, S. Karak, F. Liu, P. M. Lahti, T. P. Russell, M. T. Tuominen and D. Venkataraman “Kinetics of Ion Transport in Perovskite Active Layers and its Implications for Active Layer Stability”, *Journal of the American Chemical Society (JACS)*, 137 (40), 13130-13137 (2015).

6. K. K. Yee, Y. L. Wong, M. Zha, **R.Y. Adhikari**, M. T. Tuominen, J. Hec and Z. Xu “Room-Temperature Acetylene Hydration by a Hg(II)-laced Metal-Organic Framework”, *Chemical Communications*, 51, 10941-10944 (2015).
7. S. Malkowski, **R.Y. Adhikari**, J. Boissevain, C. Daurer, B.W. Filippone, B. Hona, B. Plaster, D. Woods and H. Yan ”Overlap Technique for End-Cap Seals on Cylindrical Magnetic Shields”, *IEEE Transactions on Magnetics*, 49(1), 651-653 (2013).
8. S. Malkowski, **R. Adhikari**, B.Hona, C. Mattie, D. Woods, H. Yan and B. Plaster “Technique for High Axial Shielding Factor Performance of Large-scale, Thin, Open-ended, Cylindrical Metglas Magnetic Shields”, *Review of Scientific Instruments*, 82, 075104 (2011).

## SKILLS & TECHNIQUES

- **Nanofabrication in Cleanroom Environment:**
  - **Fabrication:** E-Beam Lithography, Photolithography with Mask Alignment, Nano-imprint Lithography
  - **Process:** E-beam and Thermal Evaporation, Atomic Layer Deposition (ALD), Reactive Ion Etching (RIE), Plasma Enhanced Chemical Vapor Deposition (PECVD), Electroplating
  - **Characterization:** AFM, SEM, TEM, Ellipsometer, Profilometer, Two- and Four-Point Probe Measurements in Probe Station, Electrochemical Impedance Spectrometer (EIS), UV-Vis, FTIR, XRD
- **Low Noise Transport Measurement:** Experienced in performing low signal electrical transport measurements and improving signal to noise ratio by using lock-in and shielding techniques.
- **Instruments Installation and Maintenance:** Installed and maintain EIS and AFM. Maintain vacuum systems such as evaporator and SEM. Write operational instructions and train users.
- **Electronics:** Experienced in designing and building analog electronics involving MOSFETs, operational amplifiers and logic gates, with some precision circuits and low noise techniques.
- **Automation of Experimental Processes:** Experienced in automating experimental processes, improving measurement precision and reducing data extraction time using LabVIEW, C++ and Python.
- **Computer Skills:** Python, LabVIEW, C++, R,  $\LaTeX$ , Linux, HTML.
- **Building prototypes:** Using 3D printer for building prototypes and machining techniques such as milling, drilling, band saw, lathe and sandblasting to build parts for experiments.

## PRESENTATIONS

### Talks

- American Physical Society (APS) Meeting, Baltimore, MD March, 2016
- Kentucky Academy of Science (KAS) Annual Meeting, Western Kentucky University, Bowling Green, KY. November, 2010
- KAS Annual Meeting, Northern Kentucky University, Highlands Height, KY. November 2009
- KAS Annual Meeting, University of Kentucky, Lexington, KY. November 2008

### Posters

- North American Center for Research on Advanced Materials (NORA) meets BASF Challenges, Cambridge, MA. November, 2015
- Materials Research Science and Engineering Centers (MRSEC), UMass Amherst, MA. October, 2015
- Gordon Research Conferences (GRC) - Applied & Environmental Microbiology, Mt. Holyoke College, South Hadley, MA July, 2015
- Center for Hierarchical Manufacturing (CHM), University of Massachusetts, Amherst, MA. March, 2015
- Gordon Research Conferences (GRC) - Nanostructure Fabrication, University of New England, Biddeford, ME July 2014

## PROFESSIONAL ASSOCIATIONS

- American Physical Society (APS), Member
- American Association of Physics Teachers (AAPT), Member