

## Education

- **Bachelor of Science, College of Engineering Cornell University**—Ithaca, NY  
*August 2003 - May 2007*
  - Major: Engineering Physics
  - Minors: Applied Mathematics, Science and Technology Studies
  - Coursework focus: classical and modern physics, applied electrodynamics, nonlinear methods, solid state physics, fluid mechanics, nanocharacterization, numerical methods.
- **Master of Science, School of Engineering University of Washington**—Seattle, WA  
*January 2009 - June 2011*
  - Major: Electrical Engineering
  - Minors: Nanotechnology, Entrepreneurship
  - Coursework focus: applied electrodynamics, solid state physics, synthetic biology, multi-disciplinary studies in nanotechnology.
- **Doctor of Engineering Science, SEAS Columbia University**—New York, NY  
*June 2013*
  - Coursework focus: applied electrodynamics, solid state physics, synthetic biology, multi-disciplinary studies in nanotechnology.

## Representative Publications

- **Nonlinear polymer-clad silicon slot waveguide modulator with a half-wave voltage of 0.25 V**  
T. Baehr-Jones, B. Penkov *et al.*; Applied Physics Letters **92**, page 163303 (2008)
- **Silicon Nanophotonic Waveguides for the Mid-Infrared**  
T. Baehr-Jones, A. Spott, B. R. Ilic, B. Penkov, *et al.*; arXiv:0911.0949v1 (2009)
- **Synthetic Mycolic Acid Bilayers with Applications in Nanopore Sequencing**  
K. Langford, B. Penkov *et al.*; Biophysical Journal **98**, (3) page 422a (2010)
- **Silicon-on-sapphire integrated waveguides for the mid-infrared**  
T. Baehr-Jones, A. Spott, B. R. Ilic, B. Penkov, *et al.*; Optics Express, **18**, (12), pages 12127-12135 (2010)
- For a complete list, click this link.

## Patents

- **High-Speed All-Optical Memory** (*provisional*)  
T. Baehr-Jones, M. Hochberg, B. Penkov (2008)

## Conference Presentations

- **Cornell Engineering Research Showcase**—“On the fabrication of RF nanoscale cantilevers for MRFM”  
*September 2005*
- **Cornell Engineering Research Showcase**—“Magnetic resonance force microscopy and the fabrication of radiofrequency cantilevers”  
*May 2006*
- **Kavli International MRFM Summer School**—“RF cantilever position detection by quantum tunneling”  
*July 2006*
- **Cornell Undergraduate Research Board Spring Forum**—“RF cantilevers for MRFM”  
*April 2007*
- **Materials and Devices for Information Technology Research NSF STC Annual Meeting**—“Silicon electro-optic modulation at 0.25 V”  
*February 2008*
- **Biophysical Society Annual Meeting**—“Synthetic Mycolic Acid Bilayers: DNA Translocation above 400 mV”  
*February 2010*

## Fellowships and Awards

- **Rotary Scholar**—Merit-based undergraduate scholarship for exceptional service.  
*June 2003*
- **Gary Tompkins Scholar**—Merit-based undergraduate scholarship for exceptional achievement in social sciences.  
*June 2003*
- **Ted Roy Foundation Scholar**—Merit-based undergraduate scholarship.  
*June 2003*
- **Engineering Learning Initiatives Student Grant Program**—Awarded undergraduate summer research grant.  
*May 2005, September 2005*
- **NSF GRFP**—Awarded honorable mention during the 2009 Graduate Research Fellowship Program.  
*April 2009, April 2010*
- **Bonderman Fellowship** (*finalist*)—Finalist for UW Bonderman Fellowship.  
*2011*
- **IGERT Fellow**—Awarded Bioelectronics Integrative Graduate and Research Traineeship  
*June 2013*
- **ASEE NDSEG Fellowship**—Awarded NDSEG Fellowship  
*April 2013 – September 2016*

## Technical Skills

- **Nanofabrication**

- Cleanroom use in excess of 3500 hours; trained user at the Cornell NanoScience and Technology Facility, University of Washington NanoTech User Facility and Microfabrication Facility, and the Harvard Center for Nanoscale Systems.
- Furnace and PECVD deposition of amorphous silicon, silicon oxide, silicon nitride layers for MEMS and optical structures. Characterization of deposition rates, stress and uniformity.
- Photolithography with 248 and 365 nm (i-line) steppers, contact lithography, resist characterization.
- Dry etching, RIE and ICP, Bosch processing of high aspect ratio structures, dry through-wafer etching. HF vapor etching. Wet etching (KOH, metals) of features. Ion milling.
- Electron beam lithography on JEOL and Vistec systems, with feature sizes down to 10 nm. Positive and negative resist tones, for liftoff structures and waveguide etch masks. LayoutBEAMER proximity correction.
- Imprint lithography.
- Plasma-enhanced atomic layer deposition of thin oxides. Electroplating. Molecular vapor deposition.
- SEM, TEM, AFM analysis and verification of nanoscale systems. Ancillary verification techniques, such as stress measurement, profilometry, optical ellipsometry, optical microscopy, electrical measurement.

- **Optics**

- Experience planning, designing, maintaining and operating free-space optical test equipment.
- Carried out independent experiments, designing and testing components at exotic operating wavelengths.

- **Biology**

- Experience planning, designing and seeing through experiments in laboratory wet-bench biology.
- Protein design, protein expression and engineering, synthetic biology.

## Consulting

- Has worked one-on-one with personal clients to provide custom solutions to engineering problems in fabrication, nanoscale imaging and related areas.

## Technology Commercialization

- As an intern at the UW Center for Commercialization, worked with the Yager Lab on the MicroFluidics2.0 initiative. Assisted in seeking out markets and applications for a well-understood, novel technology.
- At Phoebus Optoelectronics, acted as a product manager for multiple concurrent SBIR grants; sought out market spaces, developed potential production and commercialization strategies.

## Teaching

- **Teaching Assistant**—AEP 264: Computer Instrumentation Design Lab  
*January 2007 – May 2007*
  - Tasked with oversight of two lab sections per week, preparation for exams and grading.
- **Course Leader**—NTUF Social and Ethical Implications Workshops  
*November 2010 – June 2011*
  - Led monthly workshop on social and ethical implications of nanotechnology research in conjunction with NNIN.

## Service and Leadership

- Boy Scouts of America: Eagle Scout  
*2002*
- Cornell Applied and Engineering Physics Society: Co-founder and Secretary  
*2006, 2007*
- Foundation for International Understanding Through Students: Board Member  
*2009*
- Graduate and Professional Student Senate: Executive Senator and Representative  
*2009*
- UW Graduate School Research Associate Panel: Panelist and Facilitator  
*2009, 2010*
- Physics Career Development Organization: Officer  
*2010*
- UW EE Graduate Student Association: Activities Coordinator  
*2009*
- UW Fulbright Selection Committee: Panelist  
*2010*
- CNF User Committee: Member  
*2012*