

# Benjamin Maxwell Ross

benross AT berkeley DOT edu

Academic Vita  
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## Education

(2010, expected) PhD in Applied Science and Technology  
University of California—Berkeley  
GPA: 4.00  
Advisor: Luke P Lee

(2007) M.S. Engineering Science  
Pennsylvania State University  
GPA: 3.97  
Advisor: Akhlesh Lakhtakia

(2007) Visiting scholar  
University of Edinburgh  
Advisor: Tom Mackay

(2006) B.S. Engineering Science, honors with highest distinction  
Minor in Mathematics  
Pennsylvania State University  
GPA: 3.98  
Advisors: Akhlesh Lakhtakia, Christopher Wronski

## Publications

### Journal Articles

- Benjamin M. Ross\*, Liz Y. Wu\*, “Omnidirectional Nanoplasmonic Antenna via Biologically Inspired Soft-Matter Transformation,” submitted
- Liz Y. Wu, Benjamin M. Ross, SoonGweon Hong, Luke P. Lee, “Bio-inspired Nanocorals for Decoupled Cellular Targeting and Sensing,” submitted.
- Benjamin M. Ross, John R. Waldeisen, Tim Wang, and Luke P. Lee, “Strategies for Core-satellite Biomolecular Sensors: Theory Based Design, *Applied. Phys. Lett.* in press.
- Liz Y. Wu\*, Benjamin M. Ross\*, and Luke P. Lee, “Optical Properties of the Crescent-Shaped Nanohole Antenna,” *Nano Letters* **9** (2009) 1956

- Benjamin M. Ross and Luke P. Lee, "Creating high density nanoantenna arrays via plasmon enhanced particle-cavity (PEP-C) architectures," *Optics Express* **17** (2009) 6860
- Benjamin M. Ross and Luke P. Lee, "Comparison of near- and far-field measures for plasmon resonance of metallic nanoparticles," *Optics Letters* **34** (2009) 896
- Benjamin M. Ross, Luke P. Lee, "Plasmon tuning and local field enhancement maximization of the nanocrescent," *Nanotechnology* **19** (2008) 275201.
- Benjamin M. Ross, Tom G. Mackay, Akhlesh Lakhtakia. "On negative-phase-velocity propagation in the ergosphere of a charged rotating black hole," *Optik* 2008 in press.
- Benjamin M. Ross, Akhlesh Lakhtakia, "Light pressure on chiral sculptured thin films and the circular Bragg phenomenon," *Optik* **119** (2008) 7-12.
- Benjamin M. Ross, Akhlesh Lakhtakia, "Maximizing net light pressure on a chiral sculptured thin film by selection of the vapor incidence angle," *Microwave and Optical Technology Letters* **49** (2007) 1407-1409.
- Benjamin M. Ross, Akhlesh Lakhtakia, Cliff J. Lissenden, "Maxwell stress distributions in chiral sculptured thin films due to obliquely incident plane waves," *Optics Communications* **275** (2007) 1-9.
- Benjamin M. Ross, Akhlesh Lakhtakia, Ian J. Hodgkinson, "Towards the design of elliptical-polarization rejection filters," *Microwave and Optics Communications* **259** (2006) 479-483.
- Benjamin M. Ross, Akhlesh Lakhtakia. "Bruggeman Approach for Isotropic Chiral Mixtures Revisited," *Microwave and Optical Technology Letters* **44** (2005) 524-527.

## Proceedings

- Benjamin M. Ross, Luke P. Lee, "Plasmon resonance differences between the near- and far-field and implications for molecular detection," Proceedings of SPIE (2009).
- Benjamin M. Ross, Liz Y. Wu, Luke P. Lee, "Plasmonic nanoflowers: bioinspired manipulation of plasmonic architectures via active polymers" Proceedings of SPIE (2009).
- Benjamin M. Ross, Luke P. Lee, "Nanocavity-nanoparticle mirror structure for optimization of local field enhancement," Proc. of microTAS (2008).
- Benjamin M. Ross and Akhlesh Lakhtakia, "Light pressure on chiral sculptured thin films," Invited Paper, *Proc. of SPIE* **6638** (2007) 66380M.

- X. Niu, B. Ross, C. Wronski, "Creation kinetics of the different light induced gap states in diluted protocrystalline a-Si:H thin films and corresponding solar cells," *Proceedings of 2007 Material Research Society Spring Meeting* (2007) A2.6
- Jingdong Deng, Benjamin Ross, Mathew Albert, Robert Collins, Christopher Wronski. "Characterization of the Evolution in Metastable Defects Created by recombination of Carriers by Photo-generation and Injection in p-i-n a-Si:H Solar Cells." *Proceedings of 2006 Material Society Spring Meeting*, (2006) 0910-A02-02.
- B. Ross, J. Deng, M. L. Albert, R. W. Collins and C. R. Wronski. "Evolution of metastable defects in intrinsic layers of a-si:H solar cells and corresponding thin film materials characterized by carrier recombination through midgap states." *Proceedings of the 2006 IEEE World Conference on Photovoltaic Energy Conversion*.

### Theses, popular science, other

- Benjamin M. Ross, Luke P. Lee, "Nano Satellites: Moon-shaped probes for exploring the cellular galaxy," *Nanotechweb* (2008)  
<http://nanotechweb.org/cws/article/lab/34501>.
- Benjamin M. Ross, "Stress distributions in chiral sculptured thin films due to radiation pressure," M.S. Thesis, Engineering Science and Mechanics, Pennsylvania State University, Spring 2007.
- Benjamin M. Ross, "Design of a Nano-Engineered Elliptical Polarization Rejection Filter for Optics," Undergraduate honors thesis, Engineering Science and Mechanics, Pennsylvania State University, Spring 2006.
- Benjamin M. Ross, Tom G. Mackay, Akhlesh Lakhtakia. "Effect of charge on negative-phase-velocity propagation of electromagnetic waves in the ergosphere of a rotating black hole," (2006) arXiv:astro-ph/0608412v1.

### Teaching

I have experience teaching "Analysis in Engineering Science" Engineering Science 404H

### Awards and Honors

NSF Graduate Fellowship  
 Berkeley Graduate Fellowship  
 Applied Science and Technology Power Award (2007)  
 Student Marshal (first in graduating class) (2006)  
 John W. Oswald Award for Leadership in Scholarship and Research (2006)  
 Gerald L. Bayles Memorial Scholarship for Academic Excellence (2002-2006)  
 Summer Undergraduate Discovery Grant (2005)

Richard P. McNitt Scholarship in Engineering Science (2004-2006)  
Morrow Scholarship, College Of Engineering (2002-2006)  
Graduate of the Dale-Carnegie public speaking program  
Member IEEE  
Member SPIE  
Member of Tau Beta Pi Engineering Honors Society  
Member of Society of Engineering Science  
Member of Golden Key International Honors Society

## Technical Coursework

### Engineering

Introduction To Engineering Design  
Computational Methods In Engineering 1  
Computational Methods In Engineering 2  
Equilibrium Mechanics  
Mechanics Of Motion  
Failure And Failure Analysis Of Solids  
Circuits & Devices  
Material Engineering  
Engineering Thermodynamics  
Electromagnetic Fields  
Electronic Properties And Applications Of Materials  
Mechanics Of Fluids  
Properties And Characterization Of Electronic And Photonic Materials  
Finite Elements  
Continuum Mechanics  
Microfabrication  
Wave Propagation And Scattering (Graduate)  
Engineering Thin Films (Graduate)  
Intelligent Control (Graduate)  
Engineering Education Seminar (Graduate)  
Biomimetic Engineering (Graduate)  
Plasmonic Materials (Graduate)  
Organic Electronics (Graduate)

### Mathematics

Calculus 1  
Calculus 2  
Matrices  
Calculus and Vector Analysis  
Ordinary And Partial Differential Equations  
Probability  
Advanced Calculus 1  
Advanced Calculus 2  
Discrete Math

Number Theory  
Mathematical Methods In Engineering (Graduate)

Physics

Mechanics  
Electricity & Magnetism  
Fluids & Thermal Physics  
Wave Motion & Quantum Physics  
Introduction to Modern Physics

Chemistry and Biology

Biology: Basic Concepts and Biodiversity  
Chemical Principles 1  
Chemical Principles 2  
Biomedical Materials (Graduate)  
Polymer Surfaces and Interfaces (Graduate)

Business

Introduction to New Product Development (Graduate)  
Advanced New Product Development (Graduate)  
Innovation, Creativity, and the Entrepreneur (Graduate)  
Topics in Open Innovation (Graduate)  
Technology, Innovation, Leadership (Graduate)  
Managing Innovation (Graduate)