

Overview of Qualifications

Excellent skills in communication and collaboration
Experienced in use of electromagnetic simulation techniques and tools
Skilled in all aspects of fabrication and characterization of micro and nano-structures
Can develop insightful physical models to characterize complex physical processes
Basic experience in designing and characterizing non-imaging optics

Education

PhD, Optics, University of Central Florida, expected May 2010
Master of Science, Optics, University of Central Florida, May 2006
Bachelor of Arts, Physics and Computer Science, Hanover College, May 2001
Product Design for Manufacturing and Assembly – Certificate Course, July 2000

Technical Skills and Tools

Laboratory Expertise: Characterization techniques: Optical microscopy, near-field microscopy, spectroscopic techniques, atomic force microscopy, scanning electron microscopy
Fabrication techniques: optical/electron-beam lithography, thin-film deposition and etching systems
Laser sources: Gas and diode lasers

Software Expertise: Programming: MatLab/Octave, Python, and BASIC. Basic knowledge of: C++, Java, and HTML.
Scientific Packages: Physics simulation (CST Studio Suite, COMSOL MultiPhysics), lithography mask design (LayoutEditor, L-Edit, CleWin), Optical design (OSLO, Code V), scientific (MPLI, Science Workshop)
Miscellaneous Packages: Dreamweaver, GoLive, and Photoshop

Experience

Research Experience: *Graduate Research Associate*, Near-Field and Nanophotonics Group, UCF (January 2004 to present)

- Currently investigating efficient excitation of surface plasmons on metal films
 - Simulated and developed model to elucidate significance of coupling between resonances for surface plasmon excitation via nanoparticle arrays
 - Modeled nanoparticle-induced surface plasmon damping using purely analytical calculations and compared with simulations
 - Developed nanoparticle array fabrication process using electron-beam lithography
 - Characterized nanoparticle arrays using spectroscopy
 - Set up leakage radiation microscopy system for characterizing surface plasmon excitation using nanoparticle arrays

Optical Engineer Co-Op, Grote Industries (June through August 2000)

- Designed novel tail lamp using diode laser as light source
- Tested high intensity discharge headlamps for compliance with Society of Automotive Engineers regulations, wrote a report detailing defective areas
- Tested tail-lamp reflexes for contamination, wrote report to promote better production practices

Education Experience: *Higher Education Intern*, Seminole Community College (January to March 2008)

- Team-taught studio-based Physics II class
- Guided students in hands-on activities
- Prepared and delivered short lectures to consolidate ideas introduced in hands-on sessions

Teacher–Science/Mathematics and Mentor, King George School (November 2001 to August 2003)

- Planned curriculum for, and taught, Math and Science courses
- Mentored students

Volunteer Teaching Assistant – Optical Properties of Materials, UCF (August to December 2006)
Teaching Assistant – Introductory Physics, UCF (August to December 2003)
Laboratory Assistant, General Physics Lab, Hanover College (September 1998 to April 2001)
Physics Tutor, Physics Department, Hanover College (September 1998 to May 2001)
Support Staff, Computing HelpDesk, Hanover College (October 1998 to May 1999)

Awards and Service Activities

Honors: *Graduate Travel Award*, for travel to present at Materials Research Society spring meeting (2007)
Summer Fellowship, UCF (Summer 2006)
CREOL Fellowship, as incoming graduate student into UCF (2004 to 2005)
Martin Physics Award, senior award for general excellence in Physics, Hanover College (2001)
Conklin Physics Award, sophomore award to promising Physics majors, Hanover College (1999)
Hanover Merit Scholar, Hanover College Academic Scholarship, Hanover College (1998 to 2001)

Service and Activities: *President* (September 2008 to 2009), *Member* (2005 to present), SPIE Student Chapter, UCF
Vice-President (2007 to 2008), *Treasurer* (2004-2005), CREOL Association of Optics Students, UCF

- Initiated guidance presentation for incoming graduate students on choosing an advisor
- Organized responsibilities and duties for conducting outreach tours of all laboratories at CREOL
- Organized Optics Day, an outreach event to expose UCF students to Optics

Judge, Senior Physics Division, Annual Florida State Science and Engineering Fair (April 2008)
Science and Technology Theme House, Hanover College (2000 to 2001)
President, International Club, Hanover College (November 1998 to May 1999)
Assistant Instructor/Member, Martial Arts Club, Hanover College (September 1998 to October 2001)

Scholarly Work

Peer-reviewed publications: **A. Ghoshal** and P. G. Kik, *Disambiguation of localized and propagating surface plasmon modes in a metal nanoparticle array coupled to a nearby metal film*, manuscript in preparation.
M. Hu, **A. Ghoshal**, M. Marquez, and P. G. Kik, *Single Particle Spectroscopy Study of Metal-Film-Induced Tuning of Silver Nanoparticle Plasmon Resonances*, under review, Journal of Physical Chemistry

A. Ghoshal and P. G. Kik, *Excitation of propagating surface plasmons by a periodic nanoparticle array: trade-off between particle-induced near-field excitation and damping*, Applied Physics Letters, 94, 251102 (2009)

A. Ghoshal, I. Divliansky, and P. G. Kik, *Experimental observation of mode-selective anticrossing in surface-plasmon-coupled metal nanoparticle arrays*, Applied Physics Letters, 94, 171108 (2009)

A. Ghoshal and P. G. Kik, *Theory and simulations of surface plasmon excitation using resonant metal nanoparticle arrays*, Journal of Applied Physics, 103, 113111 (2008)

G. Webb-Wood, **A. Ghoshal**, and P. G. Kik, *In-situ experimental study of a near-field lens at visible frequencies*, Applied Physics Letters 89, 193110 (2006)

Conferences presentations: **A. Ghoshal** and P.G. Kik, *Experimental demonstration of strong coupling between grating and particle resonances in metal nanoparticle arrays near a metal film*, Oral presentation, SPIE Optics and Photonics, San Diego (2009)

A. Ghoshal and P. G. Kik, *Optimization of surface plasmon excitation using resonant nanoparticle arrays above a silver film*, Oral presentation, SPIE Optics and Photonics, San Diego (2007)

A. Ghoshal, Grady Webb-Wood and P. G. Kik, *Optimization study of a 3D structured normal incidence plasmon coupler*, Poster presentation, Materials Research Society Spring Meeting, San Francisco (2007)

A. Ghoshal, G. Webb-Wood, C. Mazuir, and P. G. Kik, *Coherent far-field excitation of surface plasmons using resonantly tuned metal nanoparticle arrays*, Oral presentation, SPIE: Optics and Photonics, San Diego (2005)

Contributed presentations: G. Webb-Wood, **A. Ghoshal** and P. G. Kik, *Surface plasmon dispersion control in metallodielectric multilayers*, Poster presentation, Materials Research Society Spring Meeting, San Francisco (2007)

P. G. Kik, **A. Ghoshal** and G. Webb-Wood, *The influence of multilayer plasmon dispersion on near-field focusing at visible frequencies*, Oral presentation, Materials Research Society Spring Meeting,

San Francisco (2007)

A. Ghoshal, P. G. Kik, K. Kardivel and T. Nishida, *Tunable Plasmon Resonant Sensor Arrays*, Poster presentation, Materials Research Society Spring Meeting, San Francisco (2007)

G. Webb-Wood, **A. Ghoshal**, C. Mazuir, and P. G. Kik, *Experimental study of plasmon-mediated near-field focusing*, Oral presentation, SPIE: Optics and Photonics, San Diego (2005)

**Conferences
proceedings:**

A. Ghoshal and P. G. Kik, *Optimization of surface plasmon excitation using resonant nanoparticle arrays above a silver film*, Proc. SPIE 6641, 664119 (2007)

A. Ghoshal, G. Webb-Wood, C. Mazuir, and P. G. Kik, *Coherent far-field excitation of surface plasmons using resonantly tuned metal nanoparticle arrays*, Proc. SPIE 5927, 592714 (2005)

References

References are available upon request.