Joint Graduate Assistantship Positions in Plasmonics and Metamaterials Design and Application

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We are seeking highly motivated students, with strong research interests, to pursue Ph.D. degrees starting from Fall 2016 in the areas of plasmonics or metamaterials design and modeling in the area of nano-optics.

Metamaterials are artificial media composed of engineered sub-wavelength structures, which cause them to have fascinating new electromagnetic properties that are not usually found in nature, and this research area is the fore-front of modern optics and optical technology. Optically chiral nanostructures have received a considerable amount of attention recently. This is largely due to intriguing phenomena associated with strong optical chirality, including negative refraction, repulsive Casimir forces, unusual spin Hall effects, and super chiral fields. The exciting properties of optically chiral nanostructures open up a wide array of potential applications in a variety of fields such as nanophotonics, biosensing, and nanofabrication, yet fabrication of plasmonic materials with strong optical chirality remains challenging, particularly for those structures operating in the visible regime. This joint project needs two graduate students who can focus on either experiment or theory:

1. Monte Carlo simulation of chiral metamaterial growth and numerical calculation of the optical properties: kinetic Monte Carlo simulation will be conducted to visualize the metamaterial growth mechanism and three dimensional structures, new design will be proposed, and finite difference time domain (FDTD) method will be used to solve Maxwell equations and predict the optical response.

2. Experimental fabrication and characterization of chiral metamaterials: based on the glancing angle deposition technique and two dimensional nanostructure template fabrication technique, different chiral nanostructures will be fabricated, and their optical properties, their sensing applications will be explored.

These research projects require students to be highly motivated and hard-working and are interested in physics, optical engineering, materials science, bioengineering, or Monte Carlo and simulation numerical calculations or related disciplines. Students with strong hands on experience are preferred and strongly encouraged to apply.

Interested students should directly send email to: zhaoy@physast.uga.edu or bill@physast.uga.edu.