

AWARD ANNOUNCEMENT
THE 2007 NATIONAL GEM CONSORTIUM "MOST PROMISING PhD FELLOW AWARD"

THE 2007 RADIATION AND CLIMATE CARL STORM
RESEARCH FELLOW



Nicole Campbell is a Ph.D. candidate in Applied Physics at the University of Michigan. She received a Bachelor of Science in Electrical Engineering and minors in Mathematics and Physics from the University of Texas at Arlington in December 2002. Ms. Campbell's previous research experience spans from analog and digital design which she performed at National Semiconductor Corporation to electromagnetic scattering modeling, simulation, and product development which she performed at IBM Almaden Research Center and at the University of Michigan.

Ms. Campbell's current research involves characterization of scattering from foliage camouflaged targets (F-CaT). In order to solve the scattering problem it is divided into three parts: 1) modeling of propagation through and scattering from the forest, and 2) calculation, of scattering from the hard targets, illuminated by an arbitrary field and 3) analytical computation of scattering interaction between the hard target and foliage around it. This research has environmental as well as military applications.

Additionally, Ms. Campbell is working in the Climate Physics Technical group at Pacific Northwest National Laboratory in developing cloud property retrievals based on the 35 and 94 GHz radars at the Atmospheric Radiation and Measurement (ARM) tropical western pacific sites. Ms. Campbell's work involves applying radar and lidar data to calculating cloud property profiles in the tropics and from those profiles, calculating radiative fluxes and heating rates (that is, solar and terrestrial infrared fluxes and heating rates). Ms. Campbell is also designing an algorithm to transition smoothly between different retrieval algorithms utilized in the analysis of radar and lidar data. This new algorithm merges ground based observing systems with aerial systems to develop a combined cloud property retrieval algorithm that will apply several cloud property retrieval algorithms to data. After the completion of these algorithms they will be added to the arsenal of ARM algorithms available to scientists worldwide.

While part of the University of Michigan's Radiation Laboratory (RADLAB), Ms. Campbell's research focused on geophysical microwave remote sensing through the development of aspects of a multilayer canopy scattering model in order to solve radiative transfer equations, which include vegetation layer interactions. She significantly contributed to the development of a Multilayer Michigan Microwave Scattering Model (Multi-MIMICS)(2nd order) that is transferable to different ecosystems, has the ability to analyze overlapping layers of canopy and has the ability to distinguish between different types of vegetation in an area. The Multi-MIMICS model addresses the vertical non-homogenous nature of the forest while emphasizing the scattering for cross-backscattering coefficients.

While currently a graduate student at the University of Michigan, Ms. Campbell has been an elected member of the University of Michigan's student government for three years, and has served as Advisor to the Vice President of the University of Michigan for two years. Furthermore, Ms. Campbell has won numerous National Science Foundation awards, and is a National Society of Black Engineers Torchbearer. Ms. Campbell has won numerous awards for her research, as well as co-authored a physics media textbook for high school and junior high school students for Addison-Wesley publishing. In April 2007 Ms. Campbell received the Carl Storm Fellow award and was an invited presenter at the Radiation and Climate Research Conference. In October 2007 Ms. Campbell received "The Most Promising PhD Fellow Award" from the National GEM Consortium at the National GEM Conference for her outstanding achievements in research and her dedication to the inclusion of minorities in the STEM fields.