

## Virginia Nanotech Consortium at William & Mary

**Michael Kelley** ([mjkell@wm.edu](mailto:mjkell@wm.edu))

The National Science Foundation is funding development of an educational consortium among the research-oriented Virginia universities (UVa, VT, W&M, VCU, ODU, GMU) aimed at nanotechnology. The major near-term thrust is development and sharing of graduate courses. William & Mary contributes “Materials Science of Surfaces and Interfaces” – APSC 623, “Principles of Materials” – APSC 621 and “Characterization of Materials” – APSC 622.

William & Mary simplifies the process for students to obtain credit by providing W&M course numbers for the incoming offerings. The offerings in which students have expressed interest for Spring 2008 are below.

**APSC 691-20. CRN 25786. Nanophotonics** Introduction to interactions between electrons, holes, and photons. Discussion of the effects of quantization on the optical properties of nanoscale materials, including quantum dots, metal nanoparticles and quantum dots, and photonic crystals. Applications, such as surface plasmon resonance sensors, surface enhanced spectroscopy, near-field microscopy, and quantum dot molecular probes, will be covered.

**APSC 691-21. CRN 25787. Nanoelectronics.** This course presents the design and analysis of a variety of nano-devices and briefly examines some notable applications. Emphasis is on a deep understanding of the fundamental concepts and principles which apply to nanoscale devices, as contrasted with similar architectures at microscale.

**APSC 691-22. CRN 25788. Spintronics,** also known as magnetoelectronics, is an emerging technology which exploits the quantum spin states of electrons as well as making use of their charge state. The electron spin itself is manifested as a two state magnetic energy system. The understanding is developed of spin manipulation and interaction as an alternative to conventional electronic devices for next-generation computing.

**APSC 691-23. CRN 25859. Nanocarbon Materials.** The goal of this course is to introduce students to the state of the art in the area of advanced carbon nanomaterials including fullerenes, metallofullerenes, nanotubes and graphene, and their potential applications in nanotechnology. Students are expected to gain knowledge of structure, properties, fabrication and applications of carbonaceous nanomaterials. Structure control at the nanoscale and the effect of structure on properties will be discussed.

Further detailed information about the Spring 2008 courses can be found at:

[http://cgep.virginia.gov/nano\\_spring2008sch.php](http://cgep.virginia.gov/nano_spring2008sch.php)