Nanostructured Carbon for Space Radiation Shielding

PI: Glen P. Miller  
Senior Personnel: Richard Johnson, Yvon Durant  
Funding: Defense Microelectronics Activity (DMEA) and Northrop-Grumman Corporation

Professors Glen Miller and Richard Johnson of the Chemistry Department and Professor Yvon Durant of the Materials Science Program are working with Northrop Grumman Corporation and DMEA to chemically modify fullerenes and carbon nanotubes so that they may be used for space radiation shielding of microelectronics in next generation satellites. Fullerenes are hollow, all carbon structures that have captivated the imagination of scientists since their first bulk synthesis in 1990. The most famous fullerene, buckminsterfullerene or buckyball, has the shape of a soccer ball and a special set of electrical, chemical and mechanical properties. Carbon nanotubes are similar to fullerenes in some respects, but they are shaped as cylindrical tubes with diameters from 1 to 20 nm and lengths from a few to thousands of nanometers.