

# The Latest on Russ College Research

*Research at the Russ College is as varied as it is dynamic. Here's a snapshot of what's going on in the College's research units.*

## Avionics Engineering Center

The Avionics Engineering Center is using the Russ College's FlexLab facility to support a new effort for telescope and optical system manufacturer L3-Brashear Systems of Pittsburgh, Pennsylvania. FlexLab will support L3-Brashear Systems in developing and testing control techniques to minimize vibration in optical systems structures such as large astronomical telescopes.

## Center for Advanced Materials Processing

Continuing to focus on the application of carbon nanofibers—an increasingly popular material used in products from electrically conducting polymers to artificial muscles—the Center for Advanced Materials Processing is also developing a way to make carbon nanofiber-reinforced polymer composites. The material has valuable mechanical, electrical, and thermal properties and thus many potential applications for industry.

## Center for Air Quality

The Center for Air Quality has established a state-of-the-art air monitoring station in Athens, Ohio, to monitor mercury, tiny pieces of soot, nitrous oxide, and sulfur dioxide emitted by the approximately 11 coal-fired power plants within a 60-mile radius of the Ohio River Valley Region and the many industrial and chemical facilities on the Ohio River. The station compiles comprehensive air quality data for the region and informs officials on national air quality issues and corporate mercury regulation.



Adam Lusardo, B.S.M.E. '05, fabricates a steel frame for an electrostatic precipitator.

## Center for Automatic Identification

Center for Auto ID researchers are collaborating with NASA to study tagging methods for components that go into spacecraft—smaller, more usable nano-codes are carried in chemical tags that can be decoded using x-ray fluorescence. The center is also collaborating with NASA on a magneto-optical imager that is able to read bar codes through painted surfaces.

## Center for Intelligent, Distributed, and Dependable Systems (CIDDS)

CIDDS's newly formed bioinformatics initiative is developing and improving software tools and algorithms to ease the study of protein data mined from plants, a science called proteomics. Proteomics researchers from Ohio University's Edison Biotech Institute and the Department of Environmental and Plant Biology look at the functions of proteins and how they interact to help identify ways to cure diseases like diabetes. They also investigate ways to strengthen a plant's structure to learn how plants can survive difficult conditions.

## Institute for Corrosion and Multiphase Technology

When oil companies hydrotest their underwater pipelines, microbes in untreated water such as seawater cause corrosion that leads to pinhole leaks in the lines. The tiny holes that result from such microbiologically induced corrosion could cause the pipelines to break, leading to environmental and financial disasters. The institute is now studying how to alleviate this potential pipeline damage.

## Ohio Coal Research Center

The Ohio Coal Research Center is teaming with the Russ College's Electrochemical Engineering Research Laboratory (EERL) to develop a new technology that can produce hydrogen on site from the electrolysis of ammonia, bypassing the need to store hydrogen, an extremely volatile gas. The EERL aims to develop a model for an ammonia-fueled engine that could be used in a car, producing a vehicle that could be up to 200 percent more efficient than a car powered by gasoline.

## Ohio Research Institute for Transportation and the Environment (ORITE)

Ohio's road weather information systems (RWIS) provide the Ohio Department of Transportation with pavement surface condition data used to optimize anti-icing strategies. On bridges, which tend to freeze more rapidly than pavement, some RWIS sites use bridge temperature simulators to estimate temperature conditions. ORITE is correlating all the temperature data taken from the instruments to determine whether the simulators accurately read the road conditions. 🌀