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"Of all of our inventions for mass communication, pictures still speak the most universally understood language." - Walt Disney

OTD's Tech Transfer News

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Fourth Quarter Activity

Several innovators received plaques for their issued U.S. patents. Congratulations to **M. Anjanappa**, MENG, #7,160,730, *Method and Apparatus for Cell Sorting;* **T. Worchesky**, Physics, #6,549,708, *Dual-side Waveguide-based Wavelength Demultiplexer;* **B. Arnold**, Chemistry and Biochem, #6,872,786, *Molecularly Imprinted Polymeric Sensor for the Detection of Explosives;* **A. Kalivretenos**, Chemistry and Biochem, #7,229,835, *Amine Detection Method and Materials*; and **M. Summers**, Chemistry and Biochem, #7,183,300, *Inhibitors of HIV-1 Capsid Formation: Substituted Aryl Aminomethyl Thiazole Ureas and Analogues Thereof.*

OTD received seven Invention Disclosures this quarter. Thank you to: **R. Badugu**, **I. Kostov**, **G. Rao**, and **L. Tolosa**, CAST, *Optical Temperature Sensors Based on Ruthenium Dimine Complexes*; **V. Szalai**, and **M. Mendez**, Chemistry and Biochem, *Fluorescence Detection of Drug Interactions with Unmodified Quadruplex Nucleic Acids*; **G. Rao**, **I. Kostov**, CAST, *Integrated Oxygen Measurement and Control for Static Culture Vessels;* **A. Joshi**, **Z. Segall**, and **S. Dornbush**, CSEE, *A Learning Context Aware Media Player*; **J. Leach**, **I. Kostov**, **M. Acosta**, CBE, *Fluorescent Oxygen-sensing Microspheres*; **D. Phatak**, **F. Krautheim**, CSEE, *Controlled Reinstantiation Mechanisms*, and **T. Oates**, and **B.Bhatia**, CSEE, *Real-time Identification of Operating Room State from Video.*

Featured Technology

An invention submitted by **L.D. Tim Topoleski**, and **Oleg Vesnovsky**, from Mechanical Engineering, is this quarter's featured technology.

This technology, entitled *The Process of Sequential Ion Implantation and Deposition*, has resulted in three issued U.S. patents, including U.S. Patent No. 6,083,567.

This invention is a vacuum coating process for creating highly adherent coatings, typically of materials different from the substrate material.

Ions of the coating material are first implanted into the surface of the substrate, then a second set of ions of the same material are deposited on the implanted substrate

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Interview with a UMBC Inventor

Upal Ghosh is a Professor in the CEE Department

Prof. Ghosh, tell us a little about yourself and your background.

I am an associate professor in the department of Civil and Environmental

Engineering at UMBC. My research is in environmental engineering with a focus on the fate and effects of toxic contaminants in soils, sediments, and aquatic environments. My research uses multidisciplinary tools to investigate exposure and bioavailability of contaminants to organisms. The new understanding is used to develop novel remediation technologies. I have a B. Tech. in Chemical Engineering and M.S. and Ph.D in Environmental Engineering.

I understand that the Civil and Environmental Engineering program is relatively new. When did it start, and where are your labs located? How many graduate students do you have?

The Civil and Environmental engineering department at UMBC started in the Fall of 2002 with 3 faculty members. The department is focused on the areas of Environmental Engineering and Water Resources. Our offices and laboratories are located at the Technology Research Center. Currently, our faculty are advising 9 Ph.D students, 6 M.S. students, and 2 post doctoral researchers. Several UMBC undergraduate students are also employed as research assistants in our labs.

What types of projects do students work on in your lab?

My graduate students are involved in experimental research where we perform physical simulations of environmental conditions and study them in detail in a controlled setting. The focus is on understanding the biological, chemical, and physical processes that bind up or destroy the toxic compounds in environmental systems. As an engineering department we are interested in exploring the science and applying the knowledge to develop better technologies to address environmental problems. Students also use mathematical models to help interpret the experimental results. Some of our research is also conducted in the field in contaminated

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Interview with Upal Ghosh cont'd

sites such as the ongoing projects at Hunters Point Navy shipyard in San Francisco Bay, Eagle Harbor in Puget Sound Washington, and Grasse River in New York. Research in my lab is funded by several federal agencies including DOD, EPA, NSF, and several private companies such as Alcoa, Dow Chemical, Battelle, and Retec.

Can you tell us a little about your *Low-impact Delivery System for In-situ Treatment of Contaminated Sediment* patent application?

In collaboration with Dr. Charles Menzie from Exponent, we have developed a new approach for the delivery of amendments that are designed to bind up or degrade the contaminants in sediments in-situ. Unlike available delivery systems that rely on injection or mechanical mixing of the sediment, the low-cost and low-impact delivery system, named "Sedimite", makes use of material engineering aided by natural mixing processes such as bioturbation to work treatment materials into the biologically-active zone.

Have you conducted any studies of the Chesapeake Bay?

*One of my graduate students, **Katie DiBlasi**, is working on a project that is evaluating how different management practices employed by Baltimore City are impacting the way nutrients and other pollutants are released into the Chesapeake Bay with storm water. For example, we are looking at the generation of storm water pollutants from street dust and exploring whether street sweeping practices can reduce the amount of pollutants that are washed down into the Bay via rainfall.*

Have you tested the water in the ponds on campus? In particular, what is all that green stuff on Pig Pen Pond?

We have not tested the water in the ponds, but I did stop by the other day to see the "green stuff"

on Pig Pen Pond. It is made of small floating plants, Duckweed and Watermeal, that grow on stagnant waterbodies when there is an abundance of sunlight and nutrients in the water.

What do you like to do in your spare time?

Most of my spare time now is devoted to my family, especially my six month old son. When I do get some time, I like to keep up with my running. I ran a couple of marathons in the last few years. I also try to go camping with my family once a year.

Featured Technology cont'd

layer to form a "seed layer". A third set of ions of the same material are then implanted into the seed layer to form an intermixed layer. Finally, a fourth set of ions of the material are deposited on the intermixed layer to form the coating of the material on the substrate. The implanted and deposited ions are from a single ion source. The process is unique since it uses only one ion source for both implantation and deposition.

The materials for the coating layer and the substrate may be different, for example, they may both be electroconductive, or only one may be electroconductive. The coating may be functional or decorative. An example application would be creating electrical conductive coatings on glass or polymers, or creating a hard, wear resistant coating of chrome on steel without the need for electrochemical deposition.

The advantages of this technology are many, including environmentally clean coating processes, and creating highly adherent coatings (since the initial ion layer and the intermixed layer become part of the substrate) of a wide variety of materials on any other material.

Tim Topoleski

Oleg Vesnovsky

Wacky Patent

United States Patent

Waldemar Anguita

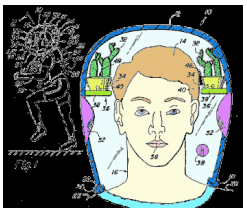
Greenhouse Helmet

Patent Number: 4,605,000

Date of Patent: August 12, 1986

Abstract

A greenhouse helmet consists of a dome containing plants secured within the dome worn completely over the head of a person so that the person can breathe in the oxygen given off by the plants.



The greenhouse helmet has air filters so that ambient air containing carbon dioxide will be filtered therethrough and mixed with carbon dioxide breathed out by the person to be used by the plants. The helmet contains hearing and speaking devices so that the person can hear and speak out through the helmet.

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