

ENGINEERING News

Kazuo Inamori School of Engineering
Alfred University

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NYSTAR funds CACT nanotech facility Funds promote Clarkson and industrial collaboration

An \$1.8 million grant made to the Alfred University Center for Advanced Ceramic Technology (CACT) by the NYS Office of Science, Technology and Academic Research (NYSTAR) Center for Advanced Technology Development Program has been announced by NY Governor George E. Pataki.

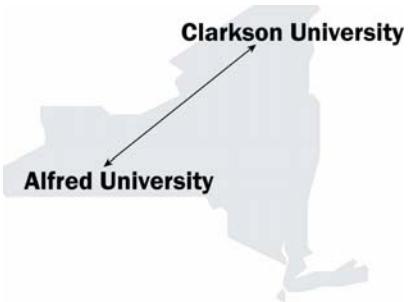
The funds, to "develop pilot plant facilities and expertise in the synthesis of nano-sized particles and subsequent processing and consolidation into nano-structured ceramic components with enhanced properties," will enable AU researchers, working with colleagues at Clarkson University's Center for Advanced Materials Processing, to develop molecular-sized building blocks for new materials, and use them to manufacture prototypes of electronic components.

Partner industries in the collaboration include Ferro Corporation, Ferronics, Inc., AVX, and Cooper Power Systems.

Remarked AU President Charles M. Edmondson, "This award from NYSTAR will complement the initiative we have already started with the \$10 million endowment from the Kyocera Corporation for the Kazuo Inamori School of Engineering." The University intends to use the income from the endowment to hire four professors who are experts in nanotechnology.

"This grant from NYSTAR's Center for Advanced Technology Program allows us to accomplish three things," said Dr. Vasantha Amaraloon, CACT director. "First, it allows us to strengthen our relationship with Clarkson University and its Center for Advanced Materials Processing." To better support NYS industries, NYSTAR encourages collaborative ventures between its Centers for Advanced Technology.

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Fractography of Glasses and Ceramics

July 9-12, 2006
Rochester, NY, USA

Abstract and manuscript guidelines are now available for submission of contributions to Fractography of Glasses and Ceramics V.

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CEER Advisory Committee to discuss new research

The Science Advisory Committee of the Center for Environmental and Energy Research (CEER) will meet at Alfred University on February 2, 2006 to review faculty proposals for CEER-funded graduate research at Alfred University, and to recommend projects for funding commencing in September 2006.

Congressional appropriations of federal Environmental Protection Agency funds for CEER, totaling \$500,000 in FY2005 and \$750,000 in FY2006, make possible significant grants for graduate research in the areas:

- 1) materials and processes for clean, renewable energy,
- 2) improvements in materials efficiency, environmental impact, and/or recycling.

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Tau Beta Pi inducts eight new members

Eight students of the Kazuo Inamori School of Engineering at Alfred University were inducted into AU's Tau Beta Pi chapter in early November. Inductees were Jared Friant (Junior, MSE), Daniel Griffin (Junior, MSE), Erin Hendrick (Senior, MSE), Brenden Hill (Junior, BMES), James Kelly (Junior, CES), Ryan Musson (Junior, CES), Brian Palmer (Junior, ME), and Brandon Striker (Junior, CES).

Tau Beta Pi, the second oldest Greek-letter honor society in America, is designed to "offer appropriate recognition for superior scholarship and exemplary character to students in engineering," and is similar in stature to Phi Beta Kappa in liberal arts.

To qualify scholastically, students must rank among the top eighth of the junior class, or the top fifth of the senior class of engineering students.

Vallone wins McMahon Achievement Award



Dr. A. N. Cormack (l), Dean, Kazuo Inamori School of Engineering, and Dr. Jim Shelby (r), McMahon Professor of Ceramic Engineering, with Janelle Vallone, 2005 recipient of the McMahon Achievement Award.

Janelle Vallone (Senior MSE) is this year's recipient of the John F. McMahon Memorial Achievement Award, presented annually to a student who completes an outstanding cooperative work experience.

Vallone completed her cooperative work-study experience at Sandia National Laboratories in Albuquerque, NM, from January-August, 2005.

"Overall, we were extremely pleased with Janelle's internship in terms of her breadth of activity, acceptance of responsibility, ability to get along in a team environment and

overall technical progress," wrote Dr. Timothy J. Gardner, manager of the Ceramics and Glass Department at Sandia. Gardner is a 1981 alumnus of Alfred University.

Vallone worked on two projects during her Sandia internship. The first, on a corrosion-resistant glass-to-metal seal for use in a hydrogen generation application, resulted in a proposal that impressed both Gardner and the customer.

For her second project, Vallone researched the aging of aerogel sols

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Engineering out of the box—and out in the cold!



Freshman students of the Inamori School of Engineering demonstrated their design abilities in the annual ENGR 160 rocket launch challenge, modifying a standard rocket kit to enable safe launch and recovery of precious cargo. Faculty and students gathered on the Alfred University practice field on a cold and gray Alfred morning in December for the event to find the most successful results and to celebrate the end of term!

ENGR 160, Freshman Seminar, required for all freshman engineers, addresses all aspects of engineering through a series of lectures and problem-solving activities.



Above: Dean Alastair Cormack (Left) congratulates 1st place winner William Clark, accompanied by Mr. Josh Hicks (Albion Central School). Below, the Dean congratulates Jerry Richard, accompanied by Mr. Brian Godfrey (Orchard Park High School)



Engineering and Materials Science Day 2005

Busses of western and central New York 11 and 12 grade students came to Alfred University campus October 27, 2005 to compete in the annual Engineering and Materials Science Scholarship exam. Students also toured the campus and enjoyed fun and interesting lab demonstrations in the Kazuo Inamori School of Engineering prior to the award presentation ceremony.

Over 100 students competed in the scholarship exams, choosing either the ceramic or general engineering science concentrations. The two top winners received \$4,000 (\$1,000 a year for four years) scholarships to AU's Inamori School of Engineering. First place winners received a \$50 cash award; second and third place winners received \$25 and \$15 cash awards, respectively.

First place honors went to William Clark (Albion Central School) and Jerry Richard (Orchard Park High School).

2nd place winners were Michelle Okoniewski (Alfred-Almond Central School) and Andrew Flye (Midlakes High School, Clifton Springs, NY). Fiona Cormack (Alfred-Almond Central School) and Katie Litts (Midlakes High School) received 3rd place honors.

The day also included a morning informational program for high school teachers and guidance counselors. Information on next year's Engineering and Materials Science Day and scholarship exam can be obtained from Marlene Wightman, Director of Continuing Education, wightman@alfred.edu.

AU Summer Institute in Science & Engineering 2006

When: July 16-20, 2006

Cost: \$525.

Application Deadline: May 19, 2006



At the 2005 Summer Institute, from left: students could produce actual ceramic products from both clays and advanced ceramic materials, learn what it's like to pour molten glass, learn how micro-computers can be used in robotic control, and made sol-gel glass microspheres by dropping glass frit into a bench burner flame.

The Alfred University Summer Institute in Science & Engineering is an opportunity to learn more about science and engineering, to sample life on a college campus and to meet other students with similar interests and academic ability.

The number of participants is kept small to allow for individualized attention and optimal use of equipment. We

expect to accept 50 students into the program this year. When not in class, students enjoy planned activities on campus as well as free time for relaxation. Living, dining and learning together, students have ample opportunity to get to know each other well and develop lasting friendships.

More information on the summer 2006 program can be found at

<http://www.alfred.edu/summer/html/scienceandengineering.html>. Application deadline is May 19, 2006.

AU also offers Summer Institutes for high school students in Astronomy, Creative Writing, Entrepreneurial Leadership as well as residential and commuter sports camps. For more information on these programs, go to <http://www.alfred.edu/summer>.

CACT reports new collaborations to the External Advisory Board

At the October 13, 2005, meeting of the Engineering Advisory Board of the Center for Advanced Ceramic Technology, Dr. Licio Pennisi presented a summary of the CACT's industrial collaborations.

New corporate interactions (since April 2005) resulting in short term research activities with engineering faculty include:

IIMAK (Amherst, NY) working with Dr. Bill LaCourse with Dr. David Earl – glass frit and frit digital imagery

Becton Dickson (Franklin Lakes, NJ) working with Dr. Pennisi – fracture analysis

Vishay Thin Films (Malvern, PA) working with Dr. David Earl - process analysis

New CACT affiliate companies include (with principal involved faculty):

Alfred Technical Services (Alfred, NY) working with Dr. David Earl

Chautauqua Metal Finishing (Ashville, NY) with Dr. David Earl

Greatbatch-Hittman (Columbia, MD) working with Dr. Steve Pilgrim

American Defense Systems (Hicksville, NY) working with Dr. Licio Pennisi

LazorTek (Denver, CO) working with Dr. Licio Pennisi

Redundant Materials (Clarence, NY) with Dr. David Earl

Ceragen (Alfred, NY) working with Dr. David Earl



Dr. Licio Pennisi

Image Print Technologies (New York, NY) with Dr. David Earl

The CACT Industrial Affiliates Program opens the doors of the Center for Advanced Ceramic Technology to ceramic companies interested in academic research and services.

Member companies receive services and resources relevant to specific manufacturing needs.

A unique industry-academic partnership, the Industrial Affiliates Program facilitates technology transfer from the laboratory to the marketplace and fosters interaction of industry and academic ceramic researchers.

To find out how CACT programs can help your business with research problems or technology transfer, contact Dr. Licio Pennisi, CACT Assistant Director, pennisi@alfred.edu.

CEER Summer 2005 Undergraduate research

The Center for Environmental and Energy Research (CEER) funded eight student research grants for Summer 2005. Projects included:

Recycling of amber glass. Jennifer J. Peek (Junior, CES) ; J. E. Shelby

Reduction of hazardous waste at AVX Olean, NY. Heidi M. Schulze (Senior, MSE); S. M. Pilgrim

Low-temperature Gd doped CeO₂ nanolayer electrolytes for solid oxide fuel cells. Patrick D. Willson (Senior, MSE); V. Amarakoon

Evaluation of microbial community structures and coliform persistence in the Alfred waste water treatment plant reed bed sludge treatment system.

Danielle A. Roe; J. Cardinale (Asst. Professor of Biology)

Synthesis and characterization of doped iron oxide electrodes for photo-assisted electrolysis of water. Stephen B. Sanford (Senior, MSE); V. Amarakoon

Solar-absorbing ceramics increasing the efficiency of environmentally-friendly energy production. Mark O. Naylor (Senior, GES); D. Edwards

Characterization and removal of AlN Laser slag. Kathryn L. Goetschius (Senior, BMES); A. Meier

Development of glass phosphors for white light emitting diodes. Stephanie L. Morris (Sophomore, CES); A. G. Clare

More information on these 2005 projects and all CEER activities can be found on their website at <http://ceer.alfred.edu>.

NYSTAR funds CACT nanotech

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"Second, this allows us to create the infrastructure we need at Alfred University to develop nano-structured ceramic components; produce them in our pilot plant and then test them," said Amarakoon. "The facilities at AU

and Clarkson will serve as industrial proving grounds for innovative production technologies to assist New York State industries in adopting new, more competitive technologies."

And finally, said Amarakoon, the grant "allows New York State companies to work with researchers at AU and

Clarkson to develop new technology for the manufacture and commercialization of new products."

CGR to meet in San Antonio, TX

The Industry-University Center for Glass Research (CGR) will hold its semiannual research meeting on January 11-12, 2006 in San Antonio, TX.

Representatives from CGR member companies will be attending: Johns Manville Int'l, St. Gobain Recherche, US Borax, US Silica, Ferro Corp., Owens-Illinois, and Corning Inc.

Faculty from Alfred University and the Pennsylvania State University will present research proposals to CGR membership for consideration for funding in 2006.

Attendees will also tour the facilities of the Southwest Research Institute on Wednesday afternoon with Dr. Vijay Jain.

CGR companies also include Cardinal FG and Osram Sylvania Inc.

CGR's mission is to advance the field of glass science and engineering through a research, education, and technology exchange driven by the cooperative efforts of academe, industry, and government.

CGR has three specialized university sites: basic and advanced glass research (Alfred University), glass surfaces and interfaces (The Pennsylvania State University), and refractories for glassmaking (University of Missouri-Rolla).

Companies interested in CGR membership may contact CGR Director Dr. Harrie Stevens, stevenshj@alfred.edu.

18th University Conference on Glass Science

Conference organizer, Dr. Matt Hall, assistant professor of biomaterials and glass science, has announced that the 18th University Conference on Glass Science is tentatively scheduled for May 20-23, 2007 at Alfred University. The topic of the conference is "Mass Transport in Glasses and Glass-Forming Melts."

Still in the planning stages, Hall is assembling an exciting group of invited speakers to lecture on topics such as gas diffusion, ionic conduction, fining of melts, and ion exchange. More details will be posted at <http://engineering.alfred.edu/outreach/conf/> as they are available.

Wightman honored for excellence in professional service to SUNY

Marlene Wightman, Director of Continuing Education and Industrial Outreach, NYS College of Ceramics, is a recipient of a 2005 SUNY Chancellor's Award for Excellence in Professional Service.

Wightman, who has been with the NYSCC since 1987 when she joined the Technology Transfer Office, has been "helping out" with conferences and summer programs from her first years on campus. In 1993, her hard work, extraordinary organizational skills and juggling ability were recognized with her promotion to Special Programs Coordinator. Dealing with short-courses, on-campus events and conferences and the Summer Insti-



Marlene Wightman

tute in Science and Engineering for high school juniors with skill and diplomacy, she was again promoted in 1997 to her current position.

Visiting lecturers, international visitors, corporate sponsors and generations of high school juniors have been welcomed to AU by Wightman and her assistant. The engineering faculty relies on her knowledge and contacts to coordinate needs for everything from a 1-day short course to a multi-day international conference. The American Ceramic Society and the SUNY Research Foundation have also requested her help to organize and run their own events!

"Marlene has made herself indispensable with her ability to organize special events, such as the McMahon Lecture, Engineering and Materials Science Day and the Inamori Dedication Symposium - all of which occurred in a single month! - as well as conferences and short courses. We are delighted that her dedication and skills have been recognized in this important way," said Dr. Alastair N. Cormack, Dean of the AU Kazuo Inamori School of Engineering.

Wightman is also on the road often, manning the AU/NYSCC booth at many technical exhibitions - congratulate her the next time you stop by!

CEER SAC meets

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Current members of the CEER Science Advisory Committee are:
S. Bala Krishnan, US Environmental Protection Agency Project Officer (ex-officio member)

Dr. Joseph H. Koo, KAI, Inc. and University of Texas at Austin, CEER SAC Chair
Dr. Louis Pilato, Pilato Consulting, CEER SAC Vice Chair
Dr. Chad Nelson, National Environmental Technology

Institute, University of Massachusetts, CEER SAC Secretary
Dr. Eldred Chimowitz, University of Rochester (Chemical Engineering)
William Reinhardt, New York State Energy Research and Development Authority (NYSERDA)

Inamori School of Engineering dedicated

The October 21, 2005, dedication of the Kazuo Inamori School of Engineering was commemorated by a special symposium. Dean Alastair N. Cormack, summed up the significance of the historic occasion with these remarks:

"Today represents one of the most significant milestones in the history of engineering at Alfred University, since the founding of the New York State College of Ceramics in 1900. We are here today to recognize the generosity of the Kyocera Corporation, the world's foremost fine ceramics company, and its support of our engineering programs.

Important academic events are traditionally celebrated with lectures and today's dedication of the Kazuo Inamori School of Engineering is no exception. For today's symposium we have gathered a select group of high-powered speakers, including Dr. Inamori himself, to mark this special occasion. As you can see from their abstracts,



Dr. Kazuo Inamori with this year's Inamori scholars. From left: Andrew Payne (Soph, CES), Erica Lobdell (Soph, BMES), Layla Mrozowski (Soph, BFA), Dr. Inamori, Devin Anderman (Sen, BFA), Kristine Peterson (Soph, BFA), and Pat Kreski (Jun, GES). Dr. Inamori established the Inamori International Scholarship Fund at Alfred University in 1996. This endowed fund supports outstanding scholars in ceramic engineering and ceramic art.

Fractography of Glasses and Ceramics V

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Conference Co-Organizers Professor Jim Varner (AU) and George Quinn (NIST) invite you to mark your calendars now, and plan to attend.

Invited speakers will include:

Professor Derek Hull – Keynote Speaker

Jan Dusza, PhD, Slovak Academy of Science

Terry Engelder, PhD, The Pennsylvania State University

S. Jill Glass, PhD, Sandia National Laboratories

Jack Mecholsky, PhD, University of Florida

Roger Morrell, PhD, National Physical Laboratory, UK

Janet B. Quinn, PhD, National Institute of Standards & Technology

George D. Quinn, National Institute of Standards & Technology

Keizo Uematsu, PhD, Nagaoka University of Technology

Sheldon Wiederhorn, PhD, National Institute of Standards & Technology

Trevor Wilantewicz, Rutgers University

Complete conference information updates are at

<http://engineering.alfred.edu/outreach/conf/fractography/>

To receive further information about Fractography of Glasses and Ceramics V, or to indicate your intention of presenting a paper, please send an email to

Marlene Wightman (wightman@alfred.edu).

each speaker will discuss developments and uses for fine ceramic materials in a diverse set of areas, none of which could be envisioned when the New York State College of Ceramics was established more than 100 years ago.

"Ceramic materials have been used in the service of mankind for thousands of years. One of the fascinating aspects of these materials is the increasing diversity of usage and application as scientists have increased their

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Dr. Inamori shows his delight on being welcomed to the "AU Kazuo Inamori School of Engineering Team" as he is presented with the first official school sweatshirt and matching baseball cap by Robert McComsey. Many gifts were exchanged after the dedication dinner to honor new friendships and to celebrate the dedication of the Kazuo Inamori School of Engineering.

Faculty research presentations:

The Kazuo Inamori School of Engineering was well represented at the 17th University Conference on Glass Science, and 1st International Materials Institute Workshop on New Functionality In Glasses (June 26-30, 2005, Penn State University, State College, PA).

Dr. Jim Shelby gave the invited talk, "Novel Applications of Hydrogen-Filled Hollow Glass Microspheres" (J. E. Shelby, M. M. Hall) on their current NSF-funded program.

Other presentations included: "Radiation Shielding using Hydrogen Filled HGMS/LDPE Composites" (M. M. Ashton-Patton, M. M. Hall, J. E. Shelby), "Diffusion Controlled Reactions of Molecular Hydrogen with Germanium Doped Silica" (E. M. Birtch, J. E. Shelby, J. M. Whalen), "Use of Lithium Alumino-borates in Making Hollow Glass Microspheres" (A. Geleil, M. M. Hall, J. E. Shelby), "Reduction of Nickel Ions in Oxide Glasses" (M. E. Miller, D. B. Rapp, J. E. Shelby), "Multilayer Colloid Formation in Soda

17th University Conference on Glass Science, and 1st International Materials Institute Workshop on New Functionality In Glasses, June 26-30, 2005
6th Pacific Rim Conference on Ceramic and Glass Technology - PacRim6 September 11-16, 2005

"Lime Silica Glass" (F. C. Raszewski, K. Murphy, J. E. Shelby)
"Preparation of Hollow Glass Microspheres from Sol-Gel Derived Glass for Application in Hydrogen Gas Storage" (M. L. Schmitt, J. E. Shelby, M. M. Hall)
"Volatilization of Boron from E-glass Melts" (M. J. Snyder, M. G. Mesko, J. E. Shelby)

The Kazuo Inamori School of Engineering also contributed at the American Ceramic Society's 6th Pacific Rim Conference on Ceramic and Glass Technology - PacRim6 (September 11-16, 2005, Maui, HI), with presentations from research groups of **Dr. Matt Hall**, **Dr. Alastair Cormack**, **Dr. David Earl**, **Dr. Vasantha Amarakoon** and **Dr. Jim Shelby**.

Dr. Doreen Edwards and Dr. Alastair Cormack presented the invited talks: "Crystal and Defect Chemistry of Semiconducting Fluorite-Related Oxides" (Invited) D. Edwards "Atomistic Modelling of Bioactive Glasses and their Surfaces" (Invited) A. N. Cormack and T.R. Zeitler

Other presentations included: "Porous Phosphate Glasses by Cooling-Induced Foaming" M. Wallace, C. A. Click (SCHOTT North America, PA) and M. M. Hall "Ab Initio Modeling of Glasses in the Sulfur-Selenium System" J. C. Mauro (Corning Incorporated, NY) and A. K. Varshneya "Cordierite Glass-Ceramic as a Bonding Material for Porous Alumina Products" P. Monteleone*, D. A. Earl, and D. B. Eveland (Refractron Technologies Corp., NY) "Materials Properties of Nano-Sized FeAlN Particles in Thin Films" Y. Liu, R. E. Miller, D. Li, Q. Feng, W. Votava, X. Wang*; R. Gray, J. Helfer (Biophan Technologies Inc., NY); K. Mooney (SUNY Buffalo) and P. Lubitz (Naval Research Laboratory) "Formation of Germanium Colloids in Vitreous Silica" (E. M. Birtch, J. E. Shelby, J. M. Whalen) "Properties of Fluorine-Doped Vitreous Silica" (J. E. Shelby, E. M. Birtch, J. M. Whalen)

Dedication

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fundamental understanding of these materials and their properties and engineers have applied this knowledge to make new materials and find new applications for them. The NYS College of Ceramics at Alfred University is at the forefront of furthering this knowledge and in educating the scientists and engineers of tomorrow so that ceramics can continue to be used in the service of humanity in the years ahead. We are proud to be associated so closely with Dr. Inamori and the company he founded and look forward to working together to find new uses and applications of fine ceramics."

McMahon Award

(Continued from page 2)

used to prepare optical films for flat panel displays, which Gardner says is a "high visibility program for our department and Sandia as a whole." Her work researched the effects of aging on film quality, using microscopy, ellipsometry and small-angle x-ray scattering (SAXS) as characterization techniques.

"Her efforts culminated in an excellent presentation of her work at the Sandia Student Intern Symposium in early August," wrote Gardner in nominating Vallone for the award.

The McMahon Achievement Award is named in honor of the late John F. McMahon, who served as dean of the New York State College of Ceramics at Alfred University from 1949 to 1965, and who is credited with strengthening the School of Engineering's ties with the ceramics and glass industry.

AU Engineering News is a print version of our on-line newsletter. For complete news and updates, go to <http://engineering.alfred.edu/newsletters/soe>

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At right, Robert McComsey (BS '66 CES), Chairman of the AU Board of Trustees, congratulates Dr. Kazuo Inamori at the unveiling of the commemorative plaque in his honor.



Kazuo Inamori School of Engineering dedication – a day of celebration at Alfred University

An appreciative crowd of dignitaries, guests, faculty and staff gathered for the dedication ceremony of the Kazuo Inamori School of Engineering on October 21, 2005. The auspiciously sunny fall day fit the mood of the day-long event that included a scientific symposium, reception, dedication ceremony and celebration dinner. The School has been named in honor of Dr. Kazuo Inamori, the founder and chairman emeritus of Kyocera Corporation.

For more pictures and Dean Alastair N. Cormack's remarks on this historic event, see story on page 6.



The ceremonial opening of the Kazuo Inamori School of Engineering – cutting the ribbon with ceramic scissors, of course! – are Dr. Inamori and McComsey with Dr. Charles Edmondson, President, Alfred University (far left); Mr. Makoto Kawamura, President and COO, Kyocera (2nd from right) and Dr. Alastair Cormack, Dean, the Kazuo Inamori School of Engineering.