

ENGINEERING News

Kazuo Inamori School of Engineering
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CACT celebrates 20 years of success!

The Center for Advanced Ceramic Technology at Alfred University celebrated its successful 20 years of service to New York State industry, cutting the cake at the annual Scholes Award Lecture Luncheon on March 27th.

The CACT was one of the first Centers for Advanced Technology (CAT's) created in 1987 by the State of New York to speed technology transfer from the state's public and private universities to the marketplace. There are now 15 CATs in New York State, which are funded through the New York State Office of Science, Technology & Academic Research (NYSTAR). Each CAT receives additional funding by forming partnerships with New York State industry.

CACT's mission is to help New York State companies retain and create jobs, and increase their productivity and profitability. Our focus is collaborative research, industry education and training, along with outreach and networking.

The focus at Alfred University's CACT is advanced ceramic materials and processing – electronic ceramics; high-temperature structural ceramics, photonic ceramics and glasses; bioceramics and glasses; whitewares; advanced manufacturing processes, including nanostructured processing capabilities; computer modeling and simulation; and electromagnetic processing.



Serving up the CACT birthday cake was NYSTAR's Joanne Schwart, left, assisted by CACT EAB chairman Robert Locker (Corning, Inc), CACT Director Vasantha Amarakoon and AU President Charles Edmondson.

Misture named first Inamori Professor

Dr. Scott T. Misture, professor of materials science and engineering, has been named the first Inamori Professor by the Kazuo Inamori School of Engineering at Alfred University.

In 2005, a \$10 million gift from the Kyocera Corporation in honor of its founder, Dr. Kazuo Inamori, endowed four Inamori Professorships in the School of Engineering; Inamori Professors are to be top researchers in materials science, particularly in the areas of nanotechnology and biomedical materials.



Dr. Scott Misture

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Zachary Egidi

Egidi is 2008 Scholes Scholar

Zachary Egidi (Sophomore BMES) is the 2008 Scholes Scholar. The Scholes Scholar is recognized for having the highest grade point average of the Freshman year. The recipient, announced annually at the Scholes Award Lecture, was presented with a framed certificate by Dean Alastair Cormack and received a gift certificate to the Campus Bookstore!

MRS posters highlight Graduate research

A feature of the day's event surrounding the annual Scholes Lecture was the Graduate Student Research poster competition, held immediately after the Scholes Lecture luncheon, March 27, 2008. This annual competition is sponsored by the Alfred University section of the Materials Research Society (MRS).

For the members of the CACT Engineering Advisory Board (EAB) and CANY, the poster display served as an excellent overview of current graduate research in the Inamori School of Engineering as well as a great social gathering for professional networking. Approximately fifteen posters were entered in the competition.

Judging the competition were our 2008 Scholes Lecturer, Dr. Kathleen Richardson, Professor and Director, the School of Materials Science and Engineering, Clemson University; and EAB chairman Dr. Robert Locker, Senior Development Associate, Corning Incorporated.

The three winning presentations were:

High pressure hydrogen storage in hollow glass microspheres
Pete Wachtel (MS Glass Science)



Dean Alastair Cormack examines research posters while, at the rear, winner Matt Brophy explains his work.

Perovskite oxynitride synthesis and phase stability
Matt Brophy (PhD Ceramics)

The effect of composition on the structural stability and electrical properties of BSCF
Jae-il Jung (PhD Ceramics)

Crawford to Germany on DAAD Professional Internship

Graduate student Andy Crawford (PhD, Glass) will leave soon after the end of the current term to begin a 4-month professional internship with SENTECH Instruments GmbH (Berlin, Germany). This internship is also supported by the German Academic Exchange Service (DAAD) through their RISE-professional program (www.daad.de/rise-pro/en).

SENTECH Instruments develops and manufactures advanced instrumentation for Thin Film Metrology and Plasma Process Technology. While with Sentech, Crawford will be working in their research laboratory using

various optical methods to characterize solid state materials, especially semiconductors and solar cells.

His work will apply the methods of both laser and spectroscopic ellipsometry, reflectometry, and FT-IR spectroscopy to investigate thin film solar cells and thin films for silicon wafers - specifically roughness of the surfaces and morphology of transparent conductive films.



Grad student Andy Crawford works on glass characterization in SOE's Hall of Glass Science

Crawford, who coaches the Alfred University track and cross country teams when not working in the lab, definitely plans on running a few races during his stay and hopes to enjoy the German food, beers and culture!



GreenAlfred! - new student group focuses on local change

Alfred University students are making the earth's pollution problems their own, forming the club called GreenAlfred to take action across campus to save energy, increase awareness of ways to recycle and help the environment.

Club president Andrew Iovich (senior, MSE) is currently in contact with the Allegany County recycling coordinator to make improvements with waste management on campus. One major goal for this school year is to implement and maintain outdoor recycling in public areas across campus.

Last year GreenAlfred set up recycling at Hot Dog Day and plans to do it again this year on a larger scale. Hot Dog Day events span Friday, April 25 and Saturday, April 26, 2008.

The members of GreenAlfred are also working with others on campus to help accomplish their mission, "to

(Continued on page 5)

Fun challenges highlight AU Engineers Week

2008 February 17-23, 2008

Engineers Week at Alfred University was celebrated with fun and challenging competitions. - activities included a Rube Goldberg Competition, a classic Pine-wood Derby and an Egg Drop Challenge!

Contests encouraged open competition, most providing an odd assortment of materials to all entrants to encourage creative thinking to solve engineering challenges within a limited time. At the Egg Drop Challenge, competitors were treated to a demonstration of ice cream making using liquid

nitrogen and encouraged to enjoy!

Founded in 1951 by the National Society of Professional Engineers, Engineers Week is celebrated annually by thousands of engineers, engineering students, teachers, and leaders in government and business. The National Engineers Week consortium includes more than 100 engineering, scientific, and education societies and corporations dedicated to enhancing the public understanding of the engineering profession.



Materials Advantage's Eric Walton and Victoria Knox make LN₂ ice cream for Egg Drop Contestants.

Engineers in AU Sports

All-American honors for AU Skiers Pfeiffer, DeGolyer

Sophomore Lauren Pfeifer (MSE) and freshman Elissa DeGolyer have earned 2nd-team All American Honors from the US Collegiate Ski Association, leading the AU Women skiers to an overall 6th place finish at Nationals (March 5-8 in Sunday River, ME).

In addition, Pfeifer was named an USCSA Academic All-American during the post-championship awards.

Pfeiffer is a two-time Mideast regional champion, placing first in both the slalom and giant slalom, in the late-February competition at NY's Toggenburg Mountain and Labrador Mountain.



Pfeiffer in her first run of the Giant Slalom during the USCSA Mideast Championships at Labrador Mountain.

Kwiecien named Empire 8 Men's Tennis Player of the Week

Sophomore Gary Kwiecien (BMES), of the Alfred University men's tennis team, was named Player of the Week by the Empire 8 Conference March 24, 2008.

Kwiecien was honored for his play in two matches last week. In a 9-0 win at Pitt-Bradford, Kwiecien won his second singles match and teamed with freshman Nick Schneider (MSE) to take first doubles. In an 8-1 win at Elmira, Kwiecien won second singles and again teamed with Schneider to claim first doubles.



Gary Kwiecien

Parietti leads solid performance at ECAC Track Championships, Engineers anchor outdoor track

Senior Justin Parietti (MSE) was Alfred University's top performer at the March 7-8 ECAC indoor championships meet, placing sixth in the 1,000m run. With teammate Travis Swan, and fellow engineers Dan Howard (freshman) and Matt Karczewski (senior EE), AU placed 10th in the 4x880 yd relay. Parietti, Karczewski and Swan teamed with Lee Consolo for a 15th place finish in the Distance Medley relay. (A Distance Medley Relay is made up of a 1200 meter leg, a 400 meter leg, an 800 meter leg, and a 1600 meter

leg - in that order - 4000m!)

The action now moves to outdoor track and field. In the season-opening Rochester Invitational, Karczewski placed 8th in the 3,000m steeplechase, while Jesse Schuster (sophomore MSE) took 11th. Of the top-10 finishers, engineers Dan Ohart (senior ME) took second in javelin; Matt Phillips (sophomore CES) turned in a solid 11.97s in the 100m dash; and freshman Casey Townsend was 9th in the triple jump at 11.12m.

In women's track, senior Ashley Johnson (ME) placed 3rd in the 10,000m run.

Men's and women's track and field teams for both indoor and outdoor seasons are coached by graduate student Andy Crawford (PhD, Glass Science).



Matt Karczewski hands off to Dan Howard in the 4 x 800m relay at the ECAC championships.

Richardson presents 2008 Scholes Award Lecture

Alfred University's Kazuo Inamori School of Engineering was pleased to welcome alumna Dr. Kathleen Richardson, Professor and Director, the School of Materials Science and Engineering, Clemson University, Clemson, SC, to the podium of Harder Hall Auditorium on Thursday, March 27, 2008, to present the 2008 Samuel R. Scholes Award Lecture. She spoke to a capacity crowd of students, faculty and guests on "Design, Fabrication and Integration of High Index Contrast Chalcogenide Glass Waveguides on a Silicon Platform."



From left, AU trustee Dr. Elizabeth Judson (AU CE '82), Verco Materials; Dr. Alix Clare; and Dr. Kathleen Richardson.



Dan Egidi, 2008 student Scholes Awardee, enjoys the luncheon with his proud grandparents. At left, Dr. David Rossington, professor emeritus of ceramic science.

Richardson, an AU Trustee, currently runs the Glass Processing and Characterization Laboratory (GPCL) within the Center for Optical Materials Science Engineering and Technology (COMSET) at Clemson where her team carries out synthesis and characterization of novel glass and glass ceramic materials for optical applications. Her research programs examine the role of structure/property relationships in a range of glass and ceramic media and in addition to supervising research programs in infrared glasses for use in integrated optics applications, her group also has industrial and government supported research programs evaluating materials for molded optics, the use of non-

oxide glasses in chem-bio planar sensors, and in nano-composites for advanced detection applications.

The lecture was followed by the Scholes Award luncheon at Susan Howell Hall, attended by members of the Ceramic Association of New York (CANY), Western New York Section of the American Ceramic Society, and Center for Advanced Ceramic Technology's Engineering Advisory Board (CACT EAB) as well as AU researchers, faculty and guests. Richardson was presented with the 2008 Scholes Award, fabricated of classic Steuben Glass and was congratulated by her colleagues, family and friends.

A particularly welcome friend and colleague was Dr. Alexis Clare, professor of glass science, who has recently rejoined the faculty on a part time basis while she completes her recovery from a serious accident last summer.

Richardson's lecture and the following award luncheon were just part of a day devoted to honoring and advancing research and scholarship in materials science at AU. The day included presentations of graduate research and recognition of undergraduate excellence as well as meetings of CANY and CACT EAB.

The History and Philosophy of the Science Lecture Series was established in 1982 by alumni of Alfred University to honor the late Dr. Samuel R. Scholes for his contributions as a scholar, educator, administrator, and glass scientist. The Scholes Lecture is presented each spring semester during undergraduate seminar.



Dr. Kathleen Richardson at the podium in the newly renovated Harder Hall Auditorium.



Dr. Sam Scholes Jr., professor emeritus of chemistry, congratulated Richardson on her achievements.

CANY and SOE honor high school scholars

The Ceramic Association of New York and the Kazuo Inamori School of Engineering honored twenty outstanding high school juniors at CANY's Spring Meeting held at Alfred University, March 27, 2008.

The CANY Scholastic Recognition Award for Juniors is given to recognize a student who demonstrates a solid mathematical and scientific background while also excelling in English. Students are nominated by their high schools.

The CANY Scholars were accompanied by their parents and/or teachers. Prior to the evening awards dinner, the group toured the AU campus and facilities.

Honored as 2008 CANY Scholars:

Alana Amalfi-Valvo, Our Lady of Mercy HS

Bradley Booth, Mohawk Central School

Steven Broughton, Wellsville HS

Patrick Burke, Irondequoit HS

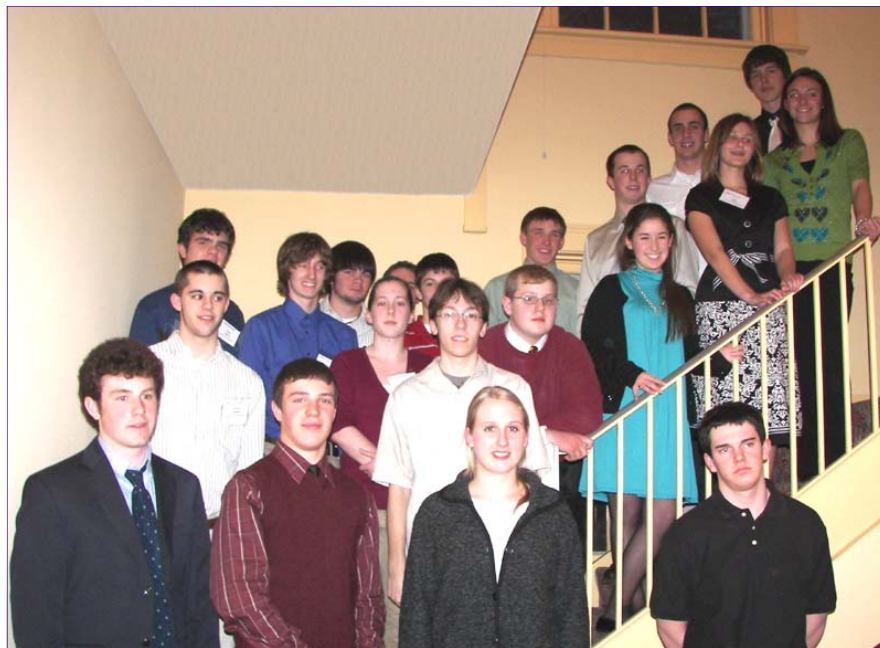
David Cooper, Andover Central School

Richard D'Amato, McQuaid Jesuit HS

Ryan Dempsey, Whitesville Central School

Ben Einhouse, Forestville Central School

Nicholas Gardner, Thomas A. Edison HS



Cheryl Guild, Alfred Almond HS

Shane Kellogg, York Central School

Andrew Lanphere, Honoye Falls-Lima HS

Salvatore Mattina, Starpoint HS

Matthew Misiaszek, Stockbridge Valley

Central School

Jessica Mosolf, Addison Central HS

Jared Rogosienski, Franklinville Central School

Matthew Sharkey, Notre Dame HS

Erik Wake, Avoca Central School

Kelly Walling, Hammondsport Central School

Katie Wyant, Jasper-Troupsburg Central School.

Misture

(Continued from page 1)

Misture leads a well-funded research group with five graduate students, one postdoctoral scholar, and a visiting professor. Current research includes a NYSTAR-funded program to develop solid oxide fuel cells; National Science Foundation and CEER-EPA funded projects on the mechanisms and structure of oxide photocatalysts; and

several projects for industry.

Misture's previous honors have included receipt in 2000 of a CAREER Award, presented by NSF to promising young scientists. Misture is a Fellow of the International Centre for Diffraction Data ICDD, as well as a member of its board of directors and a contributing editor to its publication. He has also served as a member of the executive committee of the Spallation Neutron

Source and High Flux Isotope Reactors Users Group; chair of the American Crystallographic Association SIG on powder diffraction; and a member of the executive council on the International X-Ray Analysis Society. Misture has authored or co-authored more than 95 publications.

Misture, an AU alumnus (BS 1990 CES, PhD 1994 Ceramic Science) joined the faculty in 1996.

GreenAlfred

(Continued from page 2)

advance the recycling system throughout campus, to pursue alternative energy, and to promote sustainability." As part of AU's campus-wide Earth Day observance,

GreenAlfred will co-sponsor an acoustic musical concert at the environmentally friendly Moka Joka cafe in Harder Hall on April 22nd.

AU's President Edmondson has recently signed the President's Climate

Commitment, firmly establishing AU's pledge to address the University's environmental impact.

Varner co-organizes "Towards Ultrastrong Glasses"

Congress and Exhibition on Advanced Materials and Processes
1-4 September 2008
Nürnberg, Germany

Dr. Jim Varner, professor of ceramic engineering and materials science, is co-organizer of a special symposium on the development of ultrastrong glasses, a structural materials symposium at the September 2008 Congress and Exhibition on Advanced Materials and Processes in Nürnberg, Germany (<http://www.mse-congress.de>).

Varner and co-organizer Dr. Lothar Wondraczek (Corning European Technology Center, Corning SAS, Avon, France) are developing a program that will focus on recent progress in understanding how glasses break, different timescales of failure, and



Dr. Jim Varner

how such knowledge could be used to develop stronger glasses. Part of the symposium will explore the relationship between glass structure and strength, and what needs to be done to achieve stronger glasses.

Topics will include fracture of glasses, fatigue and theoretical strength, strategies towards ultrastrong glasses and glass ceramics, structure/strength relationships, and new applications.

The symposium will feature international leaders in glass research and structural theory. Varner, a leader in the mechanical behavior and fractography of glass, is himself a contributor, as is Dr. Alastair Cormack, Dean of the Inamori School of

Engineering, a leading authority on the use of computer-based atomistic simulations to tackle problems in inorganic solid state chemistry, particularly the structure and ion transport properties of inorganic silicate glasses.

The conference is a joint initiative of the German materials societies; the symposium also has the cooperation of two technical committees of the ICG: TC03 (Structure of Glass; Dr. Adrian Wright, University of Reading, UK (retired), Chair) and TC06 (Mechanical Properties of Glass; Varner, AU, Chair).

The preliminary program will be available May 31, 2008 at <http://www.mse-congress.de>.

CEER reports research results

The Center for Environmental and Energy Research at Alfred University (CEER) has posted their current research progress on-line at ceer.alfred.edu.

The current US EPA grant of \$1.2M, from congressional appropriations for FY2005 & 2006, supports 11 graduate research projects with seven faculty, including



Dr. W. Carty

Emissions Reduction of Commercial Glassmaking Using Selective Batching
 (W. Carty)



Dr. D. Edwards

Novel Glass-Ceramic Gas Separation Membranes
 (S. Misture)



Dr. R. DeRosa



Dr. J. Cardinale

Tunneled Titanate Photocatalysts for Environmental Remediation and Hydrogen Generation
 (D. Edwards, S. Misture)

(* completed project)

Material and Environmental Sustainability in Ceramic Processing
 (W. Carty)*

Robust, Spectrally Selective Ceramic Coatings for Recycled Solar Power Tubes
 (W. Carty, D. Edwards)*

Recycling of Silicon-wafers Production Wastes to SiAlON Based Ceramics with Improved Mechanical Properties
 (J. Varner, D. Earl)*

Microarray for Contaminated Water Analysis
 (J. Cardinale, R. DeRosa)*

Magnesium Rich Coatings for Corrosion Control of Reactive Metal Alloys
 R. DeRosa)

Recovery and Purification of Hydrogen from Mixed Gas Streams
 (J. Shelby)

The Use of Fly Ash in the Production of SiAlON Based Structural Ceramics
 (J. Varner)

Nanoscale Layered Photocatalysts
 (S. Misture, D. Edwards)

CEER establishes partnerships with industry in conducting research and disseminating information. One objective of its programs is to assist companies in maintaining a sound industrial base and infrastructure without sacrificing the quality of our environment. CEER was established in 1997; its funded projects have resulted in thirteen master's degree dissertations and over 20 journal publications.

Glass research presentations at ACerS GOMD

Glass and Optical Materials Division Meeting (ACerS)

Tucson, AR, May 18-21, 2008

Advanced research in glass at Alfred University and the Inamori School of Engineering will be presented at the upcoming meeting of the American Ceramic Society's Glass and Optical Materials Division. The diverse presentations include:



Dr. Jim Shelby



Dr. Alastair
Cormack



Dr. Bill
LaCourse

Multi-nuclear NMR examination of sodium scandium silicate glasses

Randall Youngman, Carrie Hogue (Corning Incorporated, USA); James Shelby (AU).

MgO in silicate glasses: physical properties and molecular dynamic structure simulations

Alastair Cormack (AU); Trevor Wilantewicz (Rutgers University); William C. LaCourse (AU).

Membranes for the recovery purification of hydrogen streams

John S. Rich, James E. Shelby.

High pressure storage of hydrogen in hollow glass microspheres

Peter F. Wachtel, James E. Shelby.

Color variations due to gold nanoparticles in fully- and partially-developed photosensitive glass

William C. LaCourse, Jesse Karkheck.

Hollow glass microspheres for the separation of hydrogen from mixed gas streams

John S. Rich, James E. Shelby.

Properties of $K_2O-Rb_2O-GeO_2$ glasses

Stephanie Morris, Melissann M. Ashton-Patton, James E. Shelby.

Continuously broken ergodicity and the glass transition

John C. Mauro (Corning Incorporated); Prabhat K. Gupta (The Ohio State University); Roger J. Loucks (Physics, AU).

Enthalpy landscape model of the selenium glass transition

John C. Mauro (Corning Incorporated); Roger J. Loucks.

Conductivity of mixed alkali germanate glasses

Melissann M. Ashton-Patton, James E. Shelby.

Mechanisms of nucleation and growth in cerium containing photosensitive glasses

Josh Bartlett, William C. LaCourse

CGR Spring meeting scheduled for Tucson

The NSF Industry-University Center for Glass Research (CGR) has announced its Spring 2008 meeting to be held in conjunction with the Glass Manufacturing Industry Council (GMIC) immediately following the ACerS Glass and Optical Materials Division meeting in Tucson, AZ, May 18-21, 2008.

CGR members represent all areas of glassmaking plus refractory manufacturers; national laboratories; and other government laboratories. Established at the New York State College of Ceramics at Alfred University in 1985, the CGR has established a research site for refractories for

glassmaking at the University of Missouri-Rolla and a site for glass surfaces and interfaces at the Pennsylvania State University.

Contact CGR Director Harrie Stevens, stevenshj@alfred.edu, for more information on CGR programs and membership.

CGR

Energy Short course becomes DOE web resource

Energy Relevancy of the Glassmaking Process (Energy Practices for Engineers and Plant Personnel), originally developed by the Center for Glass Research under contract to the United States Department of Energy, has been repackaged into web-based teaching modules as a greater service to industry.

The content was developed by Dr. Alix Clare, professor of glass science; Arvind Thekdi, E3M Inc.; Elliot Levine,

US DOE; Dr. Tom Seward, former director of the CGR; Dan Wishnick, Consultant; Ron Ott, Oak Ridge National Laboratories; and Jim Shell, consultant.

The three modules include:

- Glass properties
- Production techniques
- Energy Usage - tools and techniques to monitor and improve Energy utilization

The original short course - presented by Clare, Thekdi and Wishnick in 2007 at Alfred University - has been converted into teaching modules for the web by Dr. Harrie Stevens, CGR director, and will soon be available through the US Department of Energy website.

Short Courses for 2008

For those interested in increasing their expertise in the fields of materials, ceramics and glasses - or those just being introduced to the subject - Short Courses are a good option. These intensive courses for 2008 offer a chance to update your knowledge of the field in a short period of time - and they're filling up fast!

Short Courses range from detailed, in-depth examinations of very specific topics to broader introductory classes. We can even design a class for your company's needs! For more information about Short Courses, contact Marlene Wightman, Director of Continuing Education and Outreach, wightman@alfred.edu, tel: 607-871-2425.

Ceramic Processing

June 2-4, 2008

Fundamentals of Ceramics

June 9-11, 2008

Instructor: Dr. William M. Carty is a Professor of Ceramic Engineering, in the Kazuo Inamori School of Engineering, New York State College of Ceramics, Alfred University. Dr. Carty teaches both engineering courses in ceramic processing and whitewares and teaches Ceramic Science for the Artist. His research interests are in ceramic processing of traditional and advanced ceramic materials, microstructure tailoring and evolution, and the identification of defects and their elimination.



Dr. William Carty

These two courses are completely revised by the instructor for 2008, complete course information is posted at engineering.alfred.edu/shortcourses.

Fracture Analysis of Glasses and Ceramics

Class now full, wait list only!

June 16-19, 2008

This course covers the examination and interpretation of markings on fracture-exposed surfaces of glasses and polycrystalline ceramics, and the analysis of crack systems, i.e., fractography. Further, it covers using fractography in failure analysis, strength testing, and fracture-mechanics testing.



Dr. Jim Varner

Reserve early; this course usually fills up fast!. Class limit of 18

Instructors: Dr. James Varner is a Professor of Ceramic Engineering in the Kazuo Inamori School of Engineering, New York State College of Ceramics, Alfred University.

George Quinn is a Ceramic Engineer with the National Institute of Standards and Technology, Gaithersburg, MD.

Introduction To Glass - Filling up fast!

June 23-25, 2008

This course is intended to serve as a brief introduction to the essential features and properties of inorganic glasses. The material will be presented in a manner that is suitable for managers and engineers/scientists who may work in the glass field but do not have a significant background in glass science and engineering.

The short course will cover basic principles of glass formation and glass structure; phase separation in glass; and basic properties of glass - including thermal, mechanical, chemical, and optical properties.

Instructor: Dr. Matthew M. Hall is an Assistant Professor of Biomaterials and Glass Science in the Kazuo Inamori School of Engineering at Alfred University. He received his B.S. degree in Ceramic Engineering at the University of Missouri-Rolla and his M.S. and Ph.D. degrees in Glass Science at Alfred University.



Dr. Matt Hall

Introduction to Phase Diagrams

June 25-27, 2008

This course is intended to provide the student with a basic appreciation for the practical importance of phase diagrams, particularly with reference to ceramic materials. The course will briefly cover the essential features of phase diagrams; the remainder of the course will then focus on developing the student's abilities to analyze and interpret binary and ternary phase diagrams. The lectures will be supplemented with periodic in-class exercises.

Instructor: Dr. Matthew M. Hall

For complete course information on all courses go to engineering.alfred.edu/shortcourses.

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

AU Engineering News is edited by Dr. Anna E. McHale. Questions or comments about our newsletter can be sent to her at soeeneews@alfred.edu.

You may also contact us at:

**Kazuo Inamori School of Engineering
Alfred University
2 Pine Street
Alfred, New York 14802-1296**