

The Newsletter of the New York State Center for Advanced Ceramic Technology

## NYSTAR head addresses AU commencement

**D**r. Russell W. Bessette, MD, executive director of the New York State Office of Science, Technology & Academic Research (NYSTAR) addressed Alfred University's 165th commencement on May 12, 2001.

Bessette told students that people who make real differences and effect meaningful change represent a small minority of society. He encouraged AU graduates to strive to be among that select group.

"People are key. You are key," Bessette said during his speech. "For a whole range of human activities, a large percentage is produced by a small fraction. It is your task to become one of those disproportionate contributors."

It is an appropriate message coming from Bessette who, as executive director

of NYSTAR, faces the challenge of leading the effort to increase New York State's presence in the world of high technology. NYSTAR was formed to grow New York State's leadership position in high technology and economic development, in part by partnering with the state's public and private research universities and academic centers, including Alfred University. The University is among the consortium recently awarded \$3.8 million in funding through NYSTAR to create an Advanced Research Center in photonics.

The future will bring with it significant advances in technology and the way people live, Bessette said. "In this rapidly changing world, you must expect the

unexpected. You must be prepared to embrace change," he said.

Prior to his appointment in January to executive director of NYSTAR, Bessette maintained a private practice in plastic and reconstructive surgery for fifteen years. Bessette was a clinical professor in the Department of Surgery (Reconstructive Plastic Surgery) at the State University of New York at Buffalo School of Medicine, and received an Educator of the Year Award from the School.

Bessette was director of the Instrument and Devices Clinical

Laboratory at the Center for Advanced Technology at Buffalo from 1985 to 1989,

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*Dr. Russell W. Bessette, MD, Executive Director of the New York State Science, Technology & Academic Research, addressed Alfred University's 165th commencement on May 12, 2001.*

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## AU at forefront of photonics program

**T**he New York State Office of Science, Technology & Academic Research (NYSTAR) has funded an innovative program for the education of students toward employment in high technology industries using the photonics industry as a model.

Alfred University is lead institution in this effort, partnered with Rochester Institute of Technology and Alfred State College. The three-year NYSTAR awards total approximately \$3.8 million, including \$850,000 for AU faculty development in photonics.

The operating premise of the program is that the high technology industries (their short time-to-market limits their capacity for on-the-job training) cannot afford the long learning curves of traditionally

educated graduates. The new program will expose the students to multidisciplinary, multilevel teams with management, budget and manufacturing problem-solving. Students will apply high technology devices, measurement and quality control. Graduating to industry, their learning curve should be significantly reduced.

Projects will be mentored both by industry and faculty. Corporate involvement in the project design and management is an essential feature for keeping the experience relevant.

Coming Incorporated is the first corporate partner who has provided funding, equipment and mentoring support to get this program started. For more information, please contact Alexis G. Clare ([dare@alfred.edu](mailto:dare@alfred.edu))

# CACT seed projects connect faculty with industry

**DR. JAMES VARNER**

by **Karen M. Russell**

The search for increased strength and reliability in whitewares is a continuous effort. In a new CACT/WRC seed project, Dr. James Varner and a graduate student will be performing a thorough analysis of the effect of glaze variables on the mechanical strength of two glazed whiteware bodies. A commercial alumina body and a commercial quartz body will be used, representative of a wide range of bodies



*Dr. James Varner*

actually used in the whiteware industry.

The proposed work will have three main objectives. First, the effect of glaze thickness on mechanical flexure strength; second, the effect of the coefficient of thermal expansion (CTE) mismatch between glaze and body; and third, to identify the strength limiting flaws in all combinations of glaze thickness, CTE mismatch and body type. Comprehensive fractography of

broken specimens will also be included in the proposed work.

Planned work builds on the large body of past studies in CEMS, numerous theses and research projects of our prestigious faculty and graduate students. The overall results will provide a strong baseline for future work in developing whitewares with higher strengths and increased reliability. (*varnerjr@alfred.edu*)

*Karen M. Russell is a senior majoring in ceramic engineering*

**DR. HERBERT GIESCHE AND DR. HOLLY SHULMAN**

by **Cheryl Junker**

Dr. Herbert Giesche and Dr. Holly Shulman (Ceralink, Alfred, NY) are collaborating on a CACT seed project to help standardize available processing information on the topic of microwave and millimeterwave heating of ceramics.

Microwave heating is a fast, uniform firing method. Its benefits include improved properties and the potential for



*Dr. Herbert Giesche*

new materials, e.g. dense nanoceramic structures. Heating is by a direct

microwave-coupling to the material; however, the interaction may be influenced by the position and load size in the chamber.

The project goal is to perform a mapping analysis of the microwave furnace

chamber in order to understand its process characteristics.

The indirect ceramic firing technology of 2001 will soon seem like "the old days" compared to the efficiency of microwaves and millimeterwaves. (*giesche@alfred.edu* or *shulman@alfred.edu*)



*Dr. Holly Shulman*

*Cheryl Junker is a junior majoring in ceramic engineering*

**DR. SCOTT MISTURE AND DR. DAVID EARL**

by **Krista Carlson**

Dr. Scott Mixture and Dr. David Earl are collaborating on "Statistical Analysis of Cation Substitution Effects on the Ionic Conductivity of Aurivillius Phases," a project to develop new ceramic oxide ionic conductors that can be used for electrochemical devices such as solid oxide fuel cells. The structures of the materials of interest, Aurivillius phases, include perovskite blocks between  $\text{Bi}_2\text{O}_2$  sheets.

The CACT funded seed project will investigate the effects of the type and amount of the three types of cation substitution: in the  $\text{Bi}_2\text{O}_2$  layers, in the perovskite-like layers, and in both layers. A



*Dr. Scott Mixture*

statistical approach will be used to gain a thorough description of the effects of ionic substitution on two critical performance parameters: the temperature at which fast ion conduction

occurs and the magnitude of the ionic conduction.

The project will combine existing work from both Mixture's and Earl's groups, providing the opportunity to integrate Earl's expertise in statistical design and analysis of experiments with Mixture's current research on ionic conduction in Aurivillius phases. In contrast to Mixture's



*Dr. David Earl*

existing NSF-funded work, this project will develop the technological aspects of chemistry-performance correlations by providing clear mathematical descriptions of the effects of chemistry on the conduction. Chris Say, an MS student in CEMS, will also be involved in the project, applying statistical experimental design to understand the effects of cation replacement on the ionic conduction of the candidate materials.

The project is funded by the CACT center and Eastman Kodak Company. (*mixture@alfred.edu* or *earlda@alfred.edu*)

*Krista Carlson is a sophomore majoring in glass engineering science with an astronomy minor.*

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## CACT seed projects

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### DR. ALAN GOLDSTEIN

by Karen M. Russell

Dr. Alan Goldstein, Fierer Chair and Director, AU Biomedical Materials Engineering Science program, has received a CACT grant to visit the faculty and staff of SUNY Stony Brook's Center for Sensor Systems. Goldstein's goal is to develop a collaboration between Centers focusing on biosensors and utilizing AU's growing BMES program.

Currently, BMES has significant research aimed at developing novel methods to encapsulate enzymes, antibodies, and other

biomolecules in nanoporous and microporous glasses, novel biomolecule-glass composites for unique and important sensor applications especially in the area of biomedical diagnostics. Through the planning grant, the scientists will explore the possibility of a full collaboration in their complementary areas.

Goldstein will visit Stony Brook, evaluate the possibilities

for collaboration, develop a plan of action, and then act as the catalyst to bridge the over 300-mile separation of the two CATs.

If both Centers express a mutual interest, a proposal will be created and presented either to a government agency or to an industry to develop a biosensor system based on glass-encapsulated enzymes or antibodies. ([fgoldste@alfred.edu](mailto:fgoldste@alfred.edu))



Dr. Alan Goldstein

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### DR. CASPAR MCCONVILLE

by Christina Deitch

Dr. Caspar McConville, a materials researcher in transmission and scanning electron microscopy, is working on "Microstructural Investigation of Multilayer Electronic Capacitors" in conjunction with the Electronic Materials division of the Ferro Corporation. Funding for one CEMS graduate student to work on this project has been provided through the CACT seed projects program.

McConville and the graduate researcher will be investigating multilayer barium titanate/palladium capacitors as used in



Dr. Caspar McConville

various electronic applications. The relationship between microstructural features of the capacitors and the electrical properties of those capacitors will be studied using primarily TEM, but also using SEM and X-ray diffraction.

TEM analysis of the atomic level of structure will enable expanded understanding of its relationship to electrical properties. The researchers are especially interested in the grain boundaries of the ceramic layers and the interfaces between the ceramic and metal layers. This information will enable Ferro to optimize

the capacitors by varying processing techniques or the composition of the capacitor-layer materials.

McConville is excited about this opportunity to highlight the usefulness of microstructural techniques for investigating and optimizing industrial components. Increased understanding of the composition and microstructure factors that influence the properties of these complex component materials will lead to further industrial collaboration opportunities. ([mconville@alfred.edu](mailto:mconville@alfred.edu))

*Christina Deitch is a sophomore majoring in glass engineering science.*

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### DR. ALAN MEIER

In many electronic applications, copper is direct-bonded to alumina. However, as electronic components become smaller and the power requirements increase, thermal management becomes a major issue. Aluminum nitride (AlN) has potential as a replacement for alumina to meet these more severe requirements.

Copper does not wet or react with AlN. Reactive brazing using metal additions provides the ability to form an intermediate layer between the AlN and Cu, providing improved wetting and adhesion while still maintaining a ductile layer for minimization of CTE mismatch stresses.



Dr. Alan Meier

Based on the results of a previous CACT Seed Project (CACT Advances Vol. 12.2, Summer 2000), Meier's team showed that both Ag-Cu-Ti and Ag-Cu-Zr alloys exhibit acceptable wettability on AlN. Variation in wetting behavior was observed for AlN substrates

with different additive chemistries. In addition, in preliminary joining studies, bond strengths of up to forty percent of the monolithic fracture strength of AlN were obtained with copper bonded to AlN with Ag-Cu-Ti alloys. A continuously bonded interface was also obtained for Cu-AlN systems joined with Ag-Cu-Ti

brazing alloys. However, a very thick Zr-rich reaction product layer was observed and the bond strengths were significantly lower for the Ag-Cu-Zr alloy.

The current study will extend the work completed with the Ag-Cu-Ti and Ag-Cu-Zr reactive brazing alloys for the AlN-Cu system. Microstructural development and reaction kinetics will be evaluated for these systems; microstructure will be related to the mechanical performance of the interface. The optimum processing conditions will be determined and related to the microstructures developed. Finally, the effect of reaction product formation on the thermal conductivity of the system will be evaluated. ([meier@alfred.edu](mailto:meier@alfred.edu))

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# CACT board is introduced to new visions for CAT

The semiannual meeting of the CACT External Advisory Board was held at AU prior to the Samuel R. Scholes Lecture on the morning of April 19, 2001. Attendees included board members, CACT staff, and CEMS faculty. Board members were updated on CACT projects and their outcomes, and introduced to the new visions for the CAT (Center for Advanced Technology) program statewide that have resulted from the formation of The New York State Office of Science Technology & Academic Research (NYSTAR).

CEMS faculty members Dr. Doreen Edwards and Dr. Scott Misture spoke on NSF initiatives that have grown out of

CACT seed projects -- each is a recipient of a NSF Career award based on research that was initially funded by the CACT. Their projects focus on emerging technologies that have commercial potential, yet are too new to attract industrial support; two examples demonstrating how good things can grow when seeds are planted and nurtured.

Eight new seed projects were introduced by CACT Director Dr. Vasantha Amarakoon. Amarakoon also highlighted CACT projects that leverage funding from other government sources, including the CACT's track record of successful interaction with NYSERDA.

Dr. Licio Pennisi updated the board on

activities in the Industrial Affiliates Program, which has grown to include eleven New York State companies. Dr. William Walker presented some examples of successful short-term projects, noting that these are often "long term projects conducted in short spurts," which allow companies increased flexibility in using CACT resources to achieve their goals.

In his concluding remarks, Amarakoon noted that three years ago, the CACT made a major effort to visit companies across the state, and that effort has paid off. "We don't have to go out looking anymore -- they are coming to us."  
*(famarakoo@alfred.edu)*

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# Dr. Helmut A. Schaeffer delivers Scholes Lecture

By Aubree Buchtel

Dr. Helmut A. Schaeffer was the Scholes Lecturer for the 2001 year. His lecture, presented April 19, 2001, "Scientific and Technological Challenges of Industrial Glass Melting," dealt with the issues of energy saving, waste gas cleaning and process automation to improve glass quality. He also spoke about the impact of oxidation state on glass melt properties and characterization and control of the redox and polyvalent element states of the glass using electrochemical measurements for an improved glass quality.

Schaeffer graduated from the Technical University of Berlin in 1965 with a physics diploma. He earned his PhD in Physical Chemistry from the University of Wurzburg in 1969. In 1980, he completed his Habilitation in Material Science from the University of Nurnberg-Erlangen. Schaeffer has many professional affiliations, including the Max-Planck-Institute for Silicate Research, Wurzburg, and the Institute of Materials Science, Department of Glass and Ceramics, University of Nurnberg-Erlangen. He is currently the Managing Director of HVG (Research Association of the German Glass Industry) and DGG (German Society of Glass Technology). Schaeffer is also a member of the German Society of

Glass Technology, German Society of Physics, German Ceramic Society, and American Ceramic Society. He has published over 70 papers and is the editor of "Glass Science and Technology-Glastechnische Berichte." The most recent of his many career awards was being made an honorary member of the Czech Glass Society in 1999.

The Scholes Lecture was established to honor Dr. Samuel R. Scholes, Sr. by the alumni of Alfred University in 1982. In 1932, Scholes established the first glass science program in the United States at the NYS College of Ceramics. Scholes served as dean (1946-1948), associate dean (1948-1952), head of the department of

glass technology and professor of glass science (1932-1946) at Alfred University.

Because of his contributions, AU awarded Scholes an honorary Doctor of Science degree. Scholes published several books during his career in glass, helping to standardize the process of glassmaking in the United States. The Scholes Library of Ceramics and the lecture series were named in honor of his interest in history and philosophy of science. For further information, please contact Marlene Wightman at [wightman@alfred.edu](mailto:wightman@alfred.edu).

*Aubree Buchtel graduated in May 2001 with a BS in ceramic engineering and will become a graduate student in Fall 2001 at NYSCC.*



*In conjunction with the annual Scholes Lecture, a sophomore student with an outstanding academic record is selected to earn the "Scholes Scholar" designation. This year's winner was Jennifer Shuler, for achieving a perfect 4.0 for her first four semesters in CEMS. Pictured, left to right, are Samuel Scholes, Addison Scholes, Scholes Lecturer Dr. Helmut Schaeffer, James Scholes and 2001 Scholes Scholar Jennifer Shuler.*

## CANY/CAMP holds joint meeting at Clarkson

CANY is making a major effort to connect with the over 500 New York State companies involved with ceramics and glass. Therefore, Clarkson University and the Center for Advanced Materials Processing (CAMP) hosted CANY for a June 11-12 meeting in Potsdam, NY. CANY members got the opportunity to learn what Clarkson has to offer as far as research and education related to ceramics and other materials; ceramic professionals from the northern part of the state had the opportunity to learn what CANY has to offer.

The meeting began with a reception and dinner - an informal opportunity for

attendees to get to know each other. The following morning, the meeting began with a brief overview by CAMP Director S.V. Babu, followed by several Clarkson faculty members giving brief presentations of their research.

Dr. Egon Matijevic began the presentations with a talk on synthesis and particle technology, that was followed by a talk on polymer nanocomposites by Dr. Greg Campbell. Dr. Richard Partch discussed chemical control of particle surfaces, and Dr. Don Rasmussen spoke on materials processing. Dr. Babu gave an overview of CAMP research on chemical-mechanical planarization.

Clarkson graduate student Jason Keleher presented his research on disinfectant materials -- novel powder additives to kill bacteria in concrete. The final talk of the meeting was on hot gas filtration by Dr. Goodarz Ahmadi. The presentations were followed by laboratory tours, including brief talks and demonstrations on chemical mechanical planarization, powder synthesis, particle surface modification and particle size analysis.

For more information on Clarkson University research and the CAMP, contact Ed McNamara ([mcnamara@clarkson.edu](mailto:mcnamara@clarkson.edu)). For more information on CANY, contact Mrs. Diane Vossler ([vossler@alfred.edu](mailto:vossler@alfred.edu)).

## AU hosts CANY spring meeting

The spring meeting of the Ceramic Association of New York (CANY), held at AU on April 19, 2001.

Innovation in education and research was stressed by all speakers.

CEMS Professor Dr. Alexis Clare spoke on her recent NYSTAR proposal, "Integrated Research and Educational Program for Photonics and Other High Technology Industry," combining the efforts of academe and industry to provide a hands-on educational experience. (See story on page 1)

Dr. Herbert Giesche, also of CEMS, presented "Nanomaterials for Advanced Applications: Synthesis, Hierarchical Assembly, Processing and Functionalization," recently submitted to NYSTAR in collaboration with Clarkson University and Rensselaer Polytechnic Institute, with significant support from industry. Nanotechnology is expected to revolutionize materials on a scale exceeding that of the silicon technology that is the basis for microelectronics.

Ceralink, Inc. president Dr. Holly Shulman talked about her new enterprise located in the Alfred CCIC. The company establishes connections between emerging technologies and potential users to

facilitate technology transfer, initially in the area of microwave and millimeter wave processing of ceramics. Ceralink expects to maintain a close connection with the CACT and CEMS through sponsored projects, affiliate membership, and employment of CEMS students.

Mr. Wayne Brown, R&D manager at Meadow River Enterprises, Lewisburg, WV, spoke on "University-Industry (small business) Partnerships -- A New Integrated Multidisciplinary Hands - On Strategy for Education and Research," highlighting an innovative approach to education and research, modelled in part on a project conducted by his company with the CACT and CEMS. Three graduate students, two professional scientists and a large number of undergraduate students worked together on this project which was coordinated by a faculty member and an Alfred-based project engineer employed by Meadow River Enterprises, with highly successful results.

The final speaker, Dr. Amar Choudry, Head of Avionics Program at the Institute of Industrial and Maritime Technology, Amsterdam, Holland, spoke about "Technology Challenges in Aerospace Materials." ([vossler@alfred.edu](mailto:vossler@alfred.edu))

### NEW CACT TRANSFER OF TECHNOLOGY CENTER

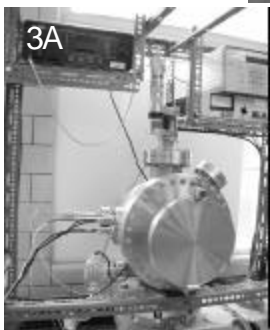
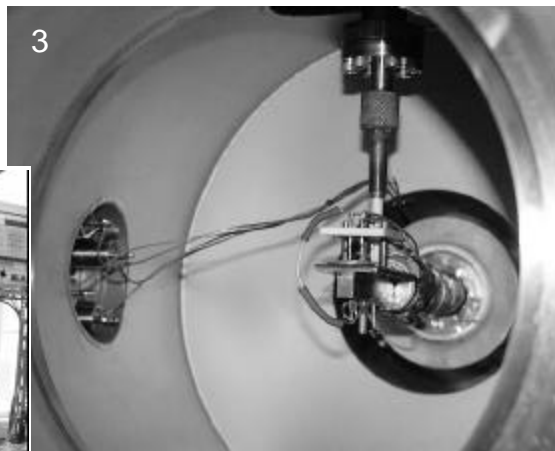
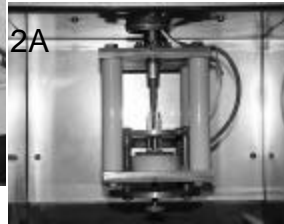
A pilot plant for ceramics manufacturing is being set up at the Alfred Ceramics Corridor Innovation Center (CCIC) with donations of equipment from NYS ceramics and glass industrial partners. The purpose of the Transfer of Technology Center is to:

- Provide extension testing services to industry
- Implement faculty and graduate research results on a pilot plant scale
- Collaborate with current CCIC tenants for the purpose of developing new technology/processes
- Increase CACT - ceramic industry collaborations

While some equipment has already been promised by CACT industrial partners, manufacturing equipment (pilot plant scale) is being sought by the CACT to implement the technology transfer program at the CCIC.

For further information, please contact Dr. Vasantha Amarakoon at [famarakoo@alfred.edu](mailto:famarakoo@alfred.edu).

# CEMS acquires new equipment



CEMS recently acquired several new pieces of equipment for research and teaching uses. Counterclockwise from top: 1) Optical interferometer, the Zygo NewView 5000, for the measurement of surface roughness; 2) Labview™ driven apparatus for measuring induced polarization and strain as a function of electric potential (-150°C to +200°C, 0-10 kV,  $\mu$ Hz to 15kHz); 2A) Closeup of sample mount showing Fotonic™ sensor; 3) Measurement station for determining AC-dielectric properties, high-field induced polarization and strain as a function of electric potential (15K to 298K, 0-10kV,  $\mu$ Hz to 15Hz [high field], 10Hz to MHz [weak field]); 3A) He-Displex® vacuum chamber; 4) 3-D Systems UV lithographic rapid prototyping equipment, pictured with operator Fran Williams, electronic ceramics technician; 5) Interior view of a 4-head rapid prototyping machine, pictured to the right in the previous photo. The heads are independently controlled to deposit up to four materials on demand.

For additional information, contact Dr. Licio Pennisi at [pennisi@alfred.edu](mailto:pennisi@alfred.edu).

# New faculty enrich CEMS research offerings

by Rebecca Cochran

**D**r. Carl Boehlert and Dr. Caspar McConville are both new additions to the CEMS faculty as assistant professors. Both of them have remarkable backgrounds and experiences to contribute to these positions.

Boehlert will be conducting research on the microstructure and phase transformations of advanced metallic alloys. He aims to contribute to the establishment of metallurgy in the curriculum and research in CEMS.

Boehlert received his BS at Cornell University and he proceeded to earn his MS and PhD degrees in Materials Science and Engineering at the University of Dayton, where he studied the physical metallurgy of advanced titanium alloys and their composites. After leaving Dayton, Boehlert worked for two years in the Mechanical Engineering Department of Johns Hopkins University. There he researched the physical metallurgy of titanium-aluminum intermetallic alloys and used advanced microsample testing techniques to understand the mechanical behavior of single-crystalline materials.

Before coming to AU, Boehlert worked at Los Alamos National Laboratory as a research associate within the Nuclear

Materials Technology group studying microstructural evolution and phase transformation behavior. One of the most interesting techniques he learned there is orientation-imaging microscopy, a scanning electron microscopy (SEM) technique, used to measure crystallographic texture of materials. At Alfred University, he hopes to further develop this technique for understanding the microstructural evolution of materials.

McConville will be focusing on furthering his research and teaching within the area of microstructural analysis, emphasizing the importance of the relationships between microstructure and properties enabling a deeper understanding of the materials being studied.

McConville received his BS and MS in Ceramic Science and Engineering at Staffordshire University in the United Kingdom. He earned his PhD in Engineering Materials from the University of Sheffield, also in the UK. He has been employed in CEMS for the past two years as a transmission electron microscope (TEM) Technical Specialist, working with CEMS faculty on research problems in electronic ceramics and nanomaterials. He also taught a graduate class focusing on

the TEM. This experience improved his teaching techniques and helped him develop new methods for explaining concepts and instructions for the use of the equipment.

McConville has worked with industry on projects concerning the microstructures and phase transformations of clays after firing, seeing first-hand the need for work that is relevant to problems actually faced in industry. McConville observed that the science behind many industrial processes is often poorly understood and the application of materials science techniques can often improve products.

Both Boehlert and McConville are excited to bring their outstanding expertise to CEMS. Innovative research and teaching will bring students new opportunities as the CEMS program expands. The enthusiasm and knowledge of our newest faculty members will be integral to the continuing eminence of CEMS at Alfred University.

For further information, please contact [boehlej@alfred.edu](mailto:boehlej@alfred.edu) or [mconville@alfred.edu](mailto:mconville@alfred.edu).

*Rebecca Cochran is a junior majoring in ceramic engineering.*

## CEMS CD-ROM business card is introduced

**A** new CD-ROM business card, created to showcase the School of Ceramic Engineering and Materials Science, was distributed to potential graduate students and interested professionals at the American Ceramic Society 2001 Annual Meeting.

You might ask yourself "What is a CD-ROM business card?" With dimensions slightly larger than a standard business card, it's basically a 3" mini disk with the top and bottom trimmed off. The card functions just like a normal CD: it holds about 50MB of information and can be used in CD-ROM



*A size comparison: business card CD vs. a standard sized CD*

drives with both PC and Macintosh computers (not slot loading CD drives). Carlos C. Chang, a double major in Fine Arts and Materials Science and Engineering, was the "Production and Flash Projector Creator" using Flash 5.0.

The CD contains information about CEMS faculty, facilities, graduate education, and the research centers. The first production run of cards quickly disappeared at the conference; there are plans in the works for a second, larger batch. For further information or to request a copy of the

CD-ROM, please contact Luke Schulze at [schulzle@alfred.edu](mailto:schulzle@alfred.edu).



*A CEMS CD-ROM business card was introduced in April, 2001. Although the first batch disappeared quickly, plans are in the works to have more available.*

# Onoda honored as ACerS 2001 Sosman awardee

by Aubree Buchtel

Many CEMS faculty and students from Alfred University attended the 103rd Annual Meeting and Exposition of the American Ceramic Society, held at the Indiana Convention Center and RCA Dome in Indianapolis, Indiana on April 22-25, 2001.

American Ceramic Society's 2001 Sosman Award was presented to Dr. George Onoda. The Sosman Memorial Lecture was one of several plenary lectures presented at the annual convention. The award is in recognition of an individual's significant contributions to advanced basic science in the field of



*The annual Sosman Award was presented to Dr. George Onoda at the 103rd Annual Meeting of the American Ceramic Society, which was held in Indianapolis, Indiana.*

ceramics; the Sosman Award is the highest recognition of scientific accomplishment given by the Basic Science Division of the American Ceramic Society. The title of

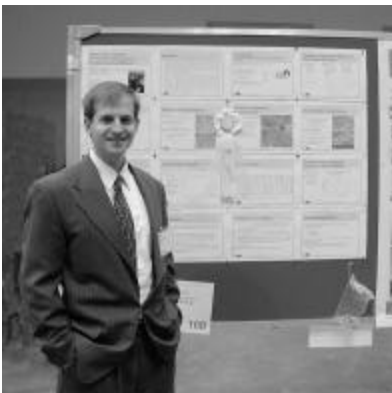
Onoda's lecture was "Dilatancy and Plasticity in Ceramic Processing." He spoke about the modern concepts for dilatancy and plasticity and their impact on ceramic processing science.

Dr. George Onoda has had a phenomenal career. He is currently an adjunct professor at Alfred University and consultant in ceramic science and technology. He earned his BS and MS Materials Science and Engineering degrees at the University of California at Berkeley and his ScD in Materials Science and Engineering at the Massachusetts Institute of Technology. He is founding Director of the Ceramic

Processing and Characterization Consortium at the National Institute of Standards and Technology, and founding Director of the Whitewares Research Center at Alfred University. He was an IBM Fellow at IBM's Thomas J. Watson Research Laboratory and a professor at the University of Florida. He also has advised many well-known PhD students and post-docs in the field of ceramics.

Onoda is a fellow of the American Ceramic Society, and recipient of the Frontiers of Science Lectureship through the American Ceramic Society. He also received the John Francis McMahon Award from Alfred University and the IBM Outstanding Achievement Award for basic research. Onoda has co-edited three textbooks and currently has approximately 100 publications in ceramics and physics. ([onoda@infoblvd.net](mailto:onoda@infoblvd.net))

*Aubree Buchtel graduated in May 2001 with a BS in ceramic engineering, and will become a graduate student in Fall 2001 at NYSCC*



*The 103rd Annual Meeting and Exposition of the American Ceramic Society was held April 22-25, 2001 at the Indiana Convention Center and RCA Dome in Indianapolis, Indiana. Many members of our CEMS faculty, staff and students attend the meeting each year. Above left, Marlene Wightman, Director of Continuing Education, showcases the new CEMS CD-ROM business card (see article on page 7). Above right, shown from left to right, Dr. Vasantha Amarakoon, CACT Director; Dr. Charles Edmondson, President of Alfred University, and Dr. Ronald Gordon, Dean of the School of Ceramic Engineering and Materials Science, are shown with the School of Ceramic Engineering and Materials Science booth display at the convention. In photo at left, CEMS undergraduate student Edward Bongio is shown with his student poster. Bongio's effort won third place in the student poster competition.*

# Amarakoon speaks at David Payne Symposium

by Cheryl Junker

On April 21st, 2001, Dr. Vasantha Amarakoon was an invited speaker at a symposium honoring Dr. David Payne, Dr. Amarakoon's former professor and advisor, on the occasion of Dr. Payne's 60th birthday. The symposium took place at the University of Illinois at Urbana-Champaign, where Dr. Payne has been a faculty member since 1974, and a full professor since 1981. On this occasion, colleagues and former students from as far away as Japan (and Alfred) returned for the Saturday conference.

The day included a series of lectures on electro-active devices and electronic



Dr. Vasantha Amarakoon, Director of the Center for Advanced Ceramic Technology, right, was an invited speaker at a symposium which honored his former professor and advisor, Dr. David Payne, left, for his 60th birthday.

ceramic materials and a tour of the ceramics labs at the university. Amarakoon delivered a lecture entitled "Life After Urbana-Champaign: Teaching, Research & Administration at Alfred University". (famarakoo@alfred.edu)

Cheryl Junker is a junior majoring in ceramic engineering.

# Edwards receives NSF grant

by David Fogelman

Dr. Doreen Edwards, Assistant Professor of Materials Science, has recently been chosen to receive a National Science Foundation Career Development Grant. The award is worth \$400,000 over the five-year period 2001-2005.

Edwards will use the funds to support one graduate student and two undergraduates per year. The goal of her research is to investigate the ion transport properties of  $\beta$ -Gallia rutile (BGR) intergrowths and to incorporate this research into external industrial and scientific applications, as well as the undergraduate and graduate curriculum. This grant is unique in its dual nature; both research interests and educational goals are pursued.

The research is focused on defining phase stability and functionality of BGR intergrowths as well as investigating ionic transport in certain pure-phase materials. This research will yield a better understanding of ion transport in one-dimensional systems and phase stability in complex oxide systems. Ultimately, this research will lead to the development of materials which could be used for battery electrodes, gas and chemical sensors, and

solid electrolytes.

The educational aspect of this grant is geared toward challenging undergraduate and graduate students to enhance their classroom instruction by creatively solving complex, open-ended problems. Edwards will also work to develop laboratory instruction modules for use in both the College of Ceramics and AU's Summer Institute for Science and Engineering for high school juniors.

Edwards received her PhD from Northwestern University in 1997, when she joined Alfred University's faculty. She is respected by colleagues and

peers as an accomplished researcher, and held in high regard by students for being a friendly, approachable, and extremely resourceful instructor. She firmly believes that practical research experience augments a student's education, and views this grant as a golden opportunity to put that belief into practice.

(dedwards@alfred.edu)

David Fogelman is a senior majoring in both ceramic engineering and computer science.



Dr. Doreen Edwards

## NEW YORK STATE CENTER FOR ADVANCED CERAMIC TECHNOLOGY

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SPECIAL THANKS TO DR. WILLIAM WALKER AND TO LUKE SCHULZE FOR ASSISTING WITH THE WRITING AND THE GRAPHICS.

# Research and faculty news...

**Dr. Rebecca DeRosa** is principal investigator on a newly awarded \$200,000 National Science Foundation development grant. Funded under NSF's Course-Curriculum and Laboratory Improvement (CCLI) program, the two year award will be used to upgrade and expand FTIR and other spectroscopy instrumentation and develop new courses for CEMS and AU chemistry students.



*Dr. Rebecca DeRosa*

The 2001 John F. McMahon Award for Teaching was presented to **Dr. Linda Jones** by Keramos, the ceramic honors society, making this her 6th teaching award. Presented to her at AU's Honors Convocation ceremony on April 6, 2001, this award is based on clarity in instruction and compassion for students. In 2000 she



*Dr. Linda Jones*

was the recipient of the Ruth Berger Rubenstein Memorial Award for Excellence in Teaching and in 1999 she

won the State University of New York's Chancellor's Award for Excellence in Teaching.

**Dr. Alan Meier** was also the recipient of a teaching award: the Joseph Kruson Trust Fund Award for Excellence in Teaching, which was also presented to him during the AU Honors Convocation ceremony on April 6, 2001. This award is based on a vote by members of the junior and senior classes and the faculty. The award is given to eight members of the Alfred University faculty each year.

**Dr. Alastair Cormack** is co-organizer of the NATO Advanced Study Institute, "Computational Materials Science," at Il Ciocco, Lucca, Italy, which runs from September 9-22, 2001.



*Dr. Alastair Cormack*

**Dr. William Carty** will be giving the keynote address at the joint meeting of the American Ceramic Society Whitewares and Materials Division and the Canadian Ceramic Society fall meeting. The meeting will be held September 23-25, 2001 in Toronto, Canada.

# AU Provost appointed

**P**resident Charles Edmondson has announced the appointment of Dr. David F. Szczerbacki as Provost and Vice President for Academic Affairs at Alfred University. Prior to this appointment, Szczerbacki



*Dr. David Szczerbacki*

served as the Dean of the AU's College of Business since 1993. He has also been acting dean of the College of Engineering and Professional Studies since 1996, and was involved in the creation of the Center for Environmental and Energy Research. During his tenure as acting dean, the mechanical engineering and electrical engineering programs in the College of Engineering and Professional Studies gained accreditation from the Accreditation Board for Engineering and Technology (ABET).

Szczerbacki joined the faculty at Alfred University in 1981, becoming full professor in 1990. He received Alfred University outstanding teaching awards in 1987 and 1990, and in 1996 received the Faculty Friend Award from the Alfred University Alumni Association. He held the J. Henry Smith Endowed Research Fellowship in the College of Business from 1987 to 1993.

Since 1995, Szczerbacki has been Chairman of the Board of Alfred Technology Resources, Inc., the non-profit corporation that operates the Ceramic Corridor Innovation Centers, high-technology incubators located in Alfred and near Corning. He also served on the College council for Alfred State College from 1989 to 1998.

Szczerbacki is a graduate of Gannon University, and earned his PhD in public policy from SUNY Buffalo.

## NYSTAR head

*from page 1*

and was the executive director of the Buffalo Technology Transfer Center at Sisters Hospital from 1997 to 1999. He has served on the New York State Public Health Council since 1995 and has been chairman of the Council since 1996.

He is a past president of the Erie County Medical Society, the American Society of Temporomandibular Joint Surgeons and the University of Buffalo Medical Alumni Association. He is a past member of the Associate of Academic Chairmen of Plastic Surgery. Bessette served on President George Bush's transition team for the National Institutes of Health, and has served on several statewide medical committees.

An alumnus of Manhattan College,

Bessette holds Doctor of Medicine and Doctor of Dental Surgery degrees from the State University of New York at Buffalo.

Dr. Ronald Gordon, dean of the School of Ceramic Engineering and Materials Science, characterized Bessette as "a scholar, a leader, an accomplished researcher and visionary."

"NYSTAR hopes to make New York State the premier center for technological economic development," Gordon said. "Under Dr. Bessette's leadership, these goals are achievable."

Bessette was also awarded an honorary Doctor of Science Degree from Alfred University.

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# Short courses continue to be offered at NYSCC



The New York State College of Ceramics at Alfred University has offered short courses since 1974. The program is coordinated by Marlene Wightman. This summer, several on-campus short courses were offered. In addition to on-campus courses, on-site courses are offered for individual companies which will be tailor-made for their specific needs. Pictured above left is Dr. David Earl, teaching a course entitled, "Statistical Design & Analysis of Experiments." Above right, Dr. James Varner (along with Dr. George Quinn of NIST, not shown) conducts the course entitled, "Fracture Analysis of Glasses & Ceramics." For further information, contact Marlene Wightman at [wightman@alfred.edu](mailto:wightman@alfred.edu), or visit our website at [nyscc.alfred.edu](http://nyscc.alfred.edu).

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## CACT offers many options for research needs

**Analytical Services:** A full range of standard ceramic analytical testing of specific samples is available on a per-test fee basis.

**Short-term Proprietary Research** (\$6,000-7,500/month): Typically projects involving small development and "firefighting" problems are covered by this option, which is designated to address immediate problems or needs in a timely manner. A faculty member will supervise the program and, if desired, may also be retained as a consultant.

**CACT Affiliates Program** (\$15,000-\$20,000/year): An industry/university partnership that facilitates technology transfer through faculty/technical staff consultations; analytical testing services; preferred access to research; short courses and seminars; access to library, computer, economic development services; and assistance with grant applications and business start-up.

**CACT Associates Program** (\$4,500-\$12,000/year): An expanded internship

program links undergraduate ceramic engineering, materials science, and glass science students with NYS companies for a summer or a semester. Also available are faculty/technical staff consultations; cooperative senior thesis projects; short term research projects; and analytical testing services.

**Non-proprietary Research Contract Services** (\$57,000-\$59,000/year with graduate student; \$73,000-\$75,000/year with post-doctoral fellow): The company specifies a research topic with a duration of twelve months or more. Research is published as a graduate thesis, with a short delay in the publication of results, if appropriate. A faculty PI supervises the research and serves as the primary contact between the company and the CACT.

**Proprietary Research Contract** (\$75,000-\$76,000/year with graduate student; \$97,000-\$99,000/year with post-doctoral fellow): The company specifies a research problem with a duration of twelve months or more. The company retains all rights to consequent data and

technology, except for agreed publication criteria for the graduate's thesis (published only with the company's written authorization.) A faculty PI supervises the research and serves as primary contact between the company and the CACT.

**Graduate Fellowship** (\$35,000-\$37,000/year, minimum requirement; a three-year commitment is preferred to ensure completion of PhD research): The company submits a general area of research; a faculty PI, who supervises the graduate student, determines the specific problem to be addressed. The CACT retains all rights to patents, and the research will be published in the open literature with no need for prior approval from the company for whom the fellowship is named.

For further information, contact Dr. Vasantha Amarakoon at [famarakoo@alfred.edu](mailto:famarakoo@alfred.edu).



*AU President, Dr. Charles Edmondson, at left, addressed the alumni at a reception during the 103rd Annual Meeting and Exposition of the American Ceramic Society, which was held April 22-25, 2001 at the Indiana Convention Center and RCA Dome in Indianapolis, Indiana. See page 8 for other photos and information regarding this meeting*

## Upcoming events...

### Meetings:

McMahon Lecture, CANY Fall meeting,  
CEMS Liaison Board meeting --  
October 2001

Center for Glass Research meeting --  
January 14-16, 2002

### Conferences:

Advances in Fusion and Processing of  
Glass (co-organizers Dr. James Varner and  
Dr. Thomas Seward), Rochester, NY --  
July 27-30, 2003

NCM9: the 9th International Conference  
on the Structure of Non-Crystalline  
Materials (Chair: Dr. Alastair Cormack,  
[cormack@alfred.edu](mailto:cormack@alfred.edu)), Alfred/Corning, NY --  
July 2003



# Advances

The Newsletter of the New York State Center for Advanced Ceramic Technology

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