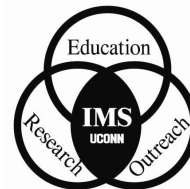




University of Connecticut Institute of Materials Science



IMS Associates Program Newsletter

Vol. 6, No. 2

August 9, 2002

New Facilities

Thermal Analysis Laboratory

IMS has recently acquired three new instruments from TA Instruments that will add to the capabilities of the Thermal Analysis lab. Included are a Q100 DSC, a Q500 TGA and a Q600 Simultaneous DSC-TGA. All three have been received and are presently being installed. All should be operational in the next few months.

The Q100 Differential Scanning Calorimeter is the latest generation of DSC offered by TA Instruments. This DSC has the improved Modulated DSC capability and has better than 0.2 microwatts sensitivity. The operating temperature range of the instrument is cooling system dependent. We have a two stage self contained Refrigerated Cooling System (RCS) that is frost free and provides programmed cooling from 550°C to -90°C. This DSC provides TA Instruments new, patent pending Tzero technology for enhanced resolution and baseline flatness. The new DSC cell design provides high precision and enhanced cooling control. This DSC has software controlled dual mass flow control with automated gas switching.

The Q500 Thermogravimetric Analyzer is a new, research grade TGA with High Resolution capabilities. The TGA has a dual range microbalance with 0-200 mg and 0-1 gram ranges and auto-switching between the ranges. Superior performance is achieved with this TGA because of its vertical balance design with a horizontal gas purge. This instrument also has software controlled, dual mass flow controllers with automated gas switching. Our Q500 has also been fitted with an autosampler for automated pan loading and unloading for up to 16 samples.

The Q600 Simultaneous DSC-TGA is a true heat flux DSC design utilizing a reference pan and sample pan. The temperature range for this unit is ambient to 1500°C with a balance sensitivity of 0.1 micrograms. The DSC is calibrated for the heat flow over the entire temperature range using sapphire. There is an automated furnace movement assembly and automated air-cooling. As with the other two instruments, this one has software controlled mass flow control and automated gas switching.

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New Facilities (cont.)

Mechanical Testing Lab

IMS is currently upgrading the Mechanical Testing Lab to a state of the art facility. Three existing servo-hydraulic testing machines are being retrofitted with the most powerful and advanced controllers and data acquisition systems available from Instron. In addition, IMS is bringing two Instron electromechanical machines into the lab. Other testing equipment, such as a MTS Nanoscope XP nano-indentor, is all ready in place. This facility will have increased capabilities and offer a wider range of loads for the testing of materials.

On the servo-hydraulic testing machines, Instron FastTrack 8800a controllers are replacing the older Instron systems. With this new system, the user operates the test machine with the same PC that is used to acquire data. Included in this upgrade are computer programs to custom design tests in tension, compression, fatigue and flex. The load cells for the three servo-hydraulic machines range from 1,000 to 20,000 lbs.

IMS is purchasing a new Instron 5800 series electromechanical test machine for the Mechanical Testing Lab. This machine uses controllers and software that are very similar to those used in the servo-hydraulic machines. Like the servo-hydraulic machines, the user operates the test machine and acquires data with the same PC. Tension, compression, and flex tests can be custom designed using the Instron software. This machine has a 10,000 lb. load cell. New to this lab is an Instron 4600 series electromechanical test machine that was transferred to IMS from another department within UConn. This machine is useful for testing at low loads because it has 20 lb. and 1,000 lb. load cells.

These upgrades and retrofits increase the overall capabilities of the Mechanical Testing Lab. Improvements in the controllers and data acquisition systems make these machines more versatile in the kind of tests that can be run and the type and format of the data that can be collected. All machines should be fully operational by the middle of September.

News from the SPE (Society of Plastics Engineers) Annual Technical Meeting

Shaw Wins SPE International Award

This is the most prestigious award SPE offers each year for technical achievement and leadership. Professor Montgomery Shaw, Distinguished Professor of Chemical Engineering and the Polymer Program, was honored with this award which carries with it a \$5,000 prize. The winner also presents a Plenary Speech at the conference. Dr. Shaw won the SPE Research Award in 1998 and is an SPE Fellow. The award cites

his achievements in polymer rheology and processing, polymer blends, microcellular foams, electrorheological materials, and dielectrics. He is recognized as one of the foremost authorities on the thermodynamics of polymer mixtures. What is also important to the members of the IMS Associates Program is that he is a frequent and willing consultant on interests and problems of member companies.

Weiss Wins SPE Research Award

The SPE Research Award honors achievement in research in polymer science and technology. An award of \$2,500 is presented to the winner. Professor Weiss is the A. T. DiBenedetto Distinguished Professor of Chemical Engineering and Director of the Polymer

Program. Major research areas are polymer blends and ionic polymers, among others. He is also Editor-in-Chief of SPE journals Polymer Engineering and Science and Polymer Composites. Bob won the SPE Education Award previously and is a Fellow of SPE.

Polymer Analysis Division Best Paper Award

Myer Ezrin and Gary Lavigne, coauthors of a paper "Analysis of Silicone Polymers at Trace Levels by Pyrolysis Gas Chromatography/Mass Spectroscopy" presented in the Polymer Analysis Division session on Combined Polymer Analysis Methods, received the best paper award of the Polymer Analysis Division.

Their paper was judged best unanimously by the judges who considered 36 papers presented by plastics professionals. The award carries with it a \$1,000 cash prize. The paper will be reprinted in the Division Newsletter. Copies are available on request from the IMS Associates Program.

Keynote Paper on Plastics Failure

The recent SPE Annual Technical meeting (ANTEC) featured an invited keynote review paper presented by Dr. Myer Ezrin, IMS Associates Program Director and an SPE Fellow, at the opening of the session on Case Studies of Plastics Failure. Copies of the

paper are available on request. The title of the presentation was "The Role of Fundamentals, Visual Observation and State-of-the-Art Instrumental Methods in Solving Plastics Failures."

UConn Student Chapter of ASM/TMS Wins Award

The University of Connecticut Student Chapter of the ASM/TMS (American Society for Metals/The Minerals, Metals and Materials Society) recently won the So-

ciety's Chapter of Excellence Award for Best Technical Programming. The faculty advisor is Dr. Leon Shaw. The Chapter Chair is Dan Goberman.

New Polymer Program Faculty Member

Dr. Lei Zhu is joining the Polymer Program in August. Zhu obtained his Ph.D. in Polymer Chemistry from the University of Akron with Stephen Cheng and has post-doctoral experience also at Akron. Zhu's research interests include polymer phase transitions in one-, two-, and three-dimensional nano-confined sys-

tems; structure and morphology of block co-polymer brushes at surfaces and interfaces; polymeric nanocomposites and nanotechnology for optical and electronic applications; and biodegradable block copolymers for responsive controlled drug delivery. He will be appointed as Assistant Professor in Chemical Engineering.

Symposium in Honor of Jim Knox on his Retirement

Professor Jim Knox retired this year after a most distinguished career in the field of protein crystallography and characterization of drug/enzyme interactions. The Polymer Science Program and the Molecular &

Cell Biology Department will be holding a symposium in Dr. Knox's honor on September 27, 2002. The speakers will be Jim's former students, friends and colleagues. Watch your mail for additional details.

Focus on Research

Beginning in this issue we will profile one of the active research areas at IMS in each issue of this newsletter. We start with Solid Freeform Fabrication.

Solid Freeform Fabrication (SFF) is a designation for a group of processes that produce three dimensional shapes from additive formation steps. SFF, also known as Rapid Prototyping (RP), does not implement any part-specific tooling. The three dimensional part is produced from a 3D representation devised in Computer Aided Modelling (CAD). This computer representation is a layer-by-layer slicing of the shape into consecutive two dimensional layers which can then be fed to the control equipment to fabricate the part. SFF entails many different approaches to the method of fabrication. Stereolithography (SL), selective laser sintering (SLS), laminated object manufacturing (LOM), and fused deposition modelling (FDM) are a few examples that today have commercial machines applying these techniques.

The UConn SFF program has several different focuses of research. Investigations using gas phase methods for depositing solid materials, selected area laser deposition (SALD), from the interaction of a directed laser beam and various gas precursors inside a vacuum

chamber, are ongoing. The research involves the formation of silicon carbide and silicon nitride and the optimizing of deposition temperature, gas pressures/ratios, scan parameters, and other process variables. A variation of SALD is a process called SALDVI where layers of powder are infiltrated by the decomposition of the gas phase into the powder. The SALDVI process has been used for SiC and Si₃N₄ infiltration of ceramic and metal powders. A third area of SALD related research is in joining of ceramics with the filler material deposited from the gas phase.

Two major new efforts are underway in the SFF. The first is to directly make dental prosthetics. This NSF funded effort involves laser fusing of multiple powders introduced by a newly designed SFF machine. The second is the creation of photonic crystals using monosized submicron spheres and a laser defining a lattice that operates to locate the spheres using the optical tweezer approach. This effort is done jointly with the nanomaterials optoelectronics laboratory.

This research program in IMS is led by Harris L. Marcus, Professor of Metallurgy & Materials Engineering and Director of IMS, and Leon Shaw, Associate Professor of Metallurgy & Materials Engineering.

Members Corner

In each newsletter we present short descriptions of one or two of our member companies. In this issue we focus on the Aearo Company and Laticrete International. John Salce and Don Nicholson of Aearo and Fran Quinn of Laticrete submitted the articles. We thank them for their contributions.

Aearo Company, formerly Cabot Safety Corporation, is one of the world's leading manufacturers and marketers of a broad range of personal protective equipment and energy-absorbing products.

Aearo Company is a one-source supplier of head and hearing protection; prescription and non-prescription eyewear and eye/face protection; respiratory products; and earmuff style communication devices for industrial applications in manufacturing, construction, mining, aviation, and other potentially haz-

ardous environments. Sold under the E-A-R, AOSafety®, and Peltor® brand names, these industrial products are available through a selective worldwide network of industrial safety distributors, and offer a well-earned reputation for quality, selection, dependability and customer satisfaction. The prescription safety eyewear labs in the United States, Canada, and United Kingdom combined with a network of thousands of local eyewear professionals and factory Dispensing Managers, provide prompt, quality prescription safety eyewear programs, products and services for industrial employees throughout the world.

Aearo Company also offers a full line of safety products for use in and around the home. Sold under the AOSafety brand name, these products are available in hardware stores and home centers; food, drug, and

sporting goods stores; and in a variety of other retail outlets.

Our E-A-R Specialty Composites business unit is recognized worldwide as a leading developer and producer of energy-absorbing materials used to reduce noise, vibration, and impact and to enhance human comfort. Focused on the OEM market, Specialty Composites' products can be found in a wide variety of applications in the transportation, footwear, recreational, national defense, and communication markets.

Since joining the Program in 1997, Aearo Company has utilized much of what the Associates Program offers. Over the years the Associates Program has assisted in Aearo Company's product development, material analysis and process verification activities. From the many seminars that are offered, to the open discussions with the knowledgeable faculty and to the wide assortment of material analysis instrumentation, the Associates Program has proven to be a most valuable resource to the company.

LATICRETE International, Inc., a world-wide manufacturer and marketer of materials and methods for the installation of ceramic tile and stone, is responsible for the development and introduction to the construction industry of thin adhesive mortars for bonding ceramic tile and stone. LATICRETE was founded in 1956 by Mr. Henry M. Rothberg whose interest in bringing the improvements of chemistry to the normal Portland cement-based mortar is the basis for the modern Adhesive Mortar Method.

During the late 1940's, Mr. Rothberg was managing a family tile, terrazzo and marble installation company. When the problems inherent to installing these materials with the traditional "full mortar bed" became more and more evident to him, he decided to dedicate himself to research into alternate methods of ceramic tile and stone installation.

The search brought him to the Chemical Division of the U.S. Rubber Company (Uniroyal) in Connecticut where Mr. Rothberg became a consultant to develop the use of latex in the area of ceramic tile installations. He developed a unique compound that had all the properties of natural rubber - elasticity, water resistance and durability, plus the properties necessary to make it viable to the construction industry: resistance to frost and heat damage, the ability to mix with Portland cement and remain plastic for adequate working

time and the ability to be stored in full or partial containers for extended periods of time without deterioration or spoilage. The new latex was introduced to the market as "LATICRETE®."

LATICRETE revolutionized installation techniques. The new material piloted the opening of the ceramic tile market towards new horizons. LATICRETE mortars were suitable for use in setting tiles of all types, including difficult products such as glass mosaics, and in difficult situations such as exterior facades and swimming pools.

In the 1950's, it was a difficult mission to convince users that Portland cement could be mixed with a liquid rubber to make a strong, durable mortar with all of the waterproof characteristics of Portland cement plus some of the flexibility and other benefits of adhesives. The new latex modified mortars would cure in thin applications, yet provide higher bond strength as well as the ability to resist thermal shock, physical vibration and all the ravages of wind, rain and frost that various climates could produce. After years of diligent promotion and education, the construction industry was finally ready to recognize the great benefits of the Latex Adhesive Mortar technology.

As awareness and acceptance of this truly problem-solving technology spread, so did the growth in the acceptance of ceramic tile and stone for flooring and facades.

When industry standards for the installation of ceramic tile and stone were established in many countries, they were far below the capabilities of the LATICRETE System Materials. The LATICRETE standards remain the highest in the construction industry today, actually 200% to 400% above the national standards of most countries. And, LATICRETE was the first organization in its sector to receive the ISO 9001 certificate.

LATICRETE has been a member of the IMS Associates program since 1996. We have worked closely with the faculty and staff on many projects ranging from designed experimentation to development of unique analytical techniques for evaluation of LATICRETE and competitive products in both product development and forensic studies.

LATICRETE® is a registered trademark of LATICRETE International, Inc

New Polymer Program Director

Professor C.S.P. Sung stepped down after serving four years as Director. Under her leadership, the Polymer Program recruited several outstanding new faculty members. Effective June 1, 2002, Robert A. Weiss, A. T. DiBenedetto Distinguished Professor of

Chemical Engineering, is the new Polymer Program Director. This is Bob's second tour of duty having previously served as Director from 1986 to 1992. He is also Editor-in-Chief of SPE journals Polymer Engineering and Science and Polymer Composites.

Fall Semester Starts

Fall semester 2002 classes start Wednesday, August 28, 2002. Some courses that may be of interest include the following.

CHEM-380	Polymer Synthesis	A. Asandei
CHEM-381	Polymer Physical Chemistry	M. Utz
CHEM-382	Polymer Characterization I	C. Sung
CHEG-351	Polymer Physics	R. A. Weiss/A. Dobrynin
CHEM-394-1	Conductive Polymers	G. Sotzing
CHEM-320-03	Surfaces, Interfaces & Complex Fluids II: Experiments and Applications	P. Mather
MMAT-316	Metallurgy and Mechanics of Fracture	E. Jordan
MMAT-320	Welding	T. Kattamis
MMAT-322	Microscopic Investigation of Materials	M. Aindow
MMAT-343	Corrosion	N. Greene

Some courses require pre-approval of the instructor. For further information please call Ed Kurz.

Department Seminars

Fall Seminar schedules have not been finalized at this time. We will send the schedules to our members for the Metallurgy and Materials Engineering Department and the Polymer Program when finalized. This information, and the seminar schedules for most departments, will also be available on the World Wide

Web. Abstracts of seminars are usually available about a week in advance. We can also put you in touch with the faculty member sponsoring the seminar to learn more about the specific seminar of interest. We suggest you call before attending to be sure the seminar has not been canceled due to illness or weather.

IMS Short Courses

This summer the IMS Associates Program offered one short course, An Overview of Surface Analytical Techniques presented by Dr. Kurz (Associate Director of the IMS Associate Program and Research Scientist) and Dr. Marcus (IMS Director and Professor of Metallurgy and Materials Engineering).

We plan to present two short courses next summer. Associates Program member companies will

receive one complimentary registration per course. Plans for possible courses are under development but include Thin Film Deposition And Characterization, Joining of Materials, Corrosion, and Materials Protection. During the fall semester we will distribute brief descriptions and request your comments and suggestions regarding these or other possible courses.

Short Course Registrations

In the past a small number of people have registered for short courses through the Associates Program and not attended. The Associates Program must still pay full price in this situation. Please note that participant substitutions can be made at any time and reg-

istration can usually be canceled at minimal cost until the day before the course. We understand that occasionally plans must change but request your assistance when such changes occur.

School of Engineering Sponsors Summer Workshop for Teachers

Twenty-two teachers from Connecticut and Massachusetts became students for a week during the da Vinci Project, a program geared to help teachers in grades seven through twelve integrate basic engineering concepts into their math and science classes. The project, sponsored by the School of Engineering, was held in Storrs in August. Teachers worked with engineering faculty learning engineering fundamentals and developing practical curricula and exercises to help them introduce students to engineering. Participants

selected one workshop from six areas of engineering specialization and spent the week immersed in the area. The majority of their time was spent conducting hands-on experiments. Robert Veith, director of the da Vinci Project said he hopes teachers will learn simple and effective ways of incorporating engineering into their classrooms. "A heightened understanding of engineering is a start, but it is just as important the teachers leave here with course modules and experiments that can be infused into their schools' curricula."

IMS Expansion-Construction Completion

Construction of the expansion to the IMS located on the plaza of the Gant complex is complete and the building is fully occupied and functional. The present building for the IMS was completed in the early 1970s. Since that time our growth has led to building rooms in the halls, converting three of the four seminar/class rooms into offices or laboratories, and serious overcrowding in the laboratories. IMS is very pleased that support from UConn 2000 was made available for construction of a 15,000 sq. ft. addition.

Funds are badly needed to equip this new space and to upgrade outdated laboratory equipment in our existing space. This is truly a "once in 30 years" opportunity. Approximately \$5M is needed. The new building and associated update of research equipment at IMS will be very important in projects that are of interest to IMS Associates Program member companies. Examples include small spot x-ray photoelectron spectroscopy and time of flight SIMS facilities. Each of these equipment groupings costs in excess of \$500,000. Several items will be available only at UConn in this re-

gion. As with all IMS facilities, they will be available to all Associates Program member companies.

We respectfully request that member companies and friends consider, as partners and close collaborators, a one-time gift for the re-equipping of the Institute. This new equipment will help IMS, which already has an excellent reputation, step forward as a national leader.

In our 30 year history IMS has not made such an appeal. This is truly a special time when we need to advance our mutual interests through this equipment and facilities.

For further information please contact:
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Polymer Program Advisory Board Meeting

The Polymer Program Advisory Board Meeting was held on May 21, 2002. As part of this meeting a poster session was held at IMS. Titles and authors are listed on page 10. Advisory board members viewed the

posters and awarded first, second and third place awards. The winners were Jeunghoon Lee, Ingrid Rousseau and Sung-Yeon Jang respectively.

Metallurgy & Materials Engineering Department Advisory Board Meeting

The Metallurgy and Materials Engineering Department Advisory Board Meeting was held on April 23, 2002. A poster session was held as part of this meeting also. Titles and authors are listed on page 11. Ad-

visory board members viewed the posters and awarded first, second and third place awards. The winners were Mike Pasquariello, Jie Wu and Zhigang Ban respectively.

Associates Program Annual Meeting

The Associates Program annual meeting was held on Wednesday May 22. Forty-five representatives from member companies joined IMS faculty, staff and students for the day's events. Titles and authors of presentations at the event follow.

T.T. Cheng, Associate Research Professor, Metallurgy and Materials Engineering
"Alloy Development - Is it just shake and bake?"

Mei Wei, Assistant Professor, Metallurgy and Materials Engineering
"Preparation of Bioactive Materials for Orthopaedic Applications"

Andrey Dobrynin, Assistant Professor, Physics
"Complex Fluids and Polymeric Nanomaterials"

Alex Asandei, Assistant Professor, Chemistry
"Novel Catalysts and Architectures in Polymer Synthesis"

Richard Parnas, Associate Professor, Chemical Engineering
"The Many Length Scales Important for Composites Processing and Final Properties"

Myer Ezrin, Director of the IMS Associates Program
"Status of the IMS Associates Program"

Nigel Sammes, Director of the Connecticut Global Fuel Cell Center
"The Connecticut Global Fuel Cell Center"

Process Control Short Course for Techs, Scientists, Engineers and Practitioners

Practical Process Control: October 15 and 16, 2002

This course begins with a firm foundation in the important fundamentals of PID control. We then move on to explore some of the advanced classical methods and techniques popular in current industrial practice. For all topics, you will gain hands-on experience in tuning controllers and testing algorithm performance. The course is designed for a mixed audience including those who have had some training in the past and seek a refresher course, and those who have not had much formal training but desire to learn more. There is little math presented because we focus on how to use methods rather than how to derive them.

For more information, visit
<http://www.controlstation.com/course.html>

Sample Preparation

In many projects that the Associates Program deals with, such as adhesion and coatings, surface analysis techniques are extremely important. The techniques used for such analysis, particularly GC/MS, Auger electron spectroscopy (AES) and x-ray photoelectron spectroscopy (XPS) are extremely sensitive to small amounts of material on the surface. It is important to make efforts not to contaminate these surfaces during sample preparation, collection and shipment. **Shipment in common plastic bags should be avoided!** Common plastic bags typically contain significant amounts of additives used to prevent the plastics from adhering to themselves and other materials. These additives will migrate to the sample during ship-

IMS Talent Show

Thanks to the efforts of Kim Post, June 7, 2002 saw the first IMS talent show held on the plaza outside IMS. Despite poor weather, spirits were high and a

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Please note that the Associates Program only offers financial assistance with registration to short courses sponsored by the IMS and does not offer assistance to those offered by other departments as is this course.

ment and at best make interpretation difficult and sometimes impossible. It is much better to ship such samples in common kitchen aluminum foil (not industrial aluminum foil which is often coated with an oil or other release agent). Samples can also be shipped in glass containers with aluminum foil over the opening under the cap.

Alternatively special polyester bags which do not contain such additives can be purchased. One source of such bags is the Kapak Corporation, 5305 Parkdale Drive, Minneapolis, MN 55416, 612/541-0730. Typical price is about \$200 per thousand depending on the exact size. Be sure to specify non-contaminating/non-plasticized material.

good time was had by all. We close this issue of the newsletter with a few images from the event (see back page of newsletter).

Polymer Science Program 2002 Poster Session

Advisor: A. Asandei

Moran, Isaac

Early Transition Metal Catalycol of Novel Polymer Synthesis

Advisor: A. Dobrynin

Junhwan Jeon

Monte-Carlo Simulation of Polyelectrolyte-protein Complex

Advisor: P.T. Mather

Kim, G.M.

Lefaux, Christophe

Liu, Changdeng

Kim, Byoung-Suhk

Rousseau, Ingrid

Wu, Jian

Relationship between Deformation and Indentation: Molecular composites
Spinning ESA

Shape Memory Polymer by Semi-crystal Thermoset

Nonionic Telechelic Polymers

Factors Affecting Electro-Actuation in Partially Neutralized Polyelectrolyte Gels

Interfacial Tension Between Polymer/Polymer System, Containing Liquid Crystalline Polymer (LCP)

Rojanapitayakorn, Pichet (w/ Weiss)

Optical Transparency and Crystallinity of High Orientated Poly(ethylene terephthalate)

Advisor: F. Papadimitrakopoulos

Chattopadhyay, Debjit

Length Fractionation and Organization of Solubilized single-wall carbon nanotubes: A Step Closer to Nanotube based Nanotechnology

Chen, Changqing

NMR study in ligand exchange of Alq3

Galeska, Izabela

Effect on Polymeric Additives on degradation of PLGA microspheres and release of Dexamethasone from Poly (vinyl alcohol) hydrogels

Hou, Shifeng

Laterally Compressive Drying of Colloidal Microspheres into Highly-Ordered 2-Dimensional Crystalline Arrays

Kim, Sejong

DNA Assisted Photonic Crystal Fabrication

Lee, Jeunghoon

Optoelectronic properties of CdSe nanocrystal films grown by alpha, omega-diamine

Li, Rongfu

Probing the Structure-Property Relationship of CdSe Nanocrystal by Controllable Etching

Mathai, Mathew

Understanding Bipolar Charge Transport in Alq3 OLEDs

Mwaura, Jeremiah

Spectroscopic Study on Degradation of OLEDs based on TB (III) Chelating Polyureas

Tipnis, Ritesh

Metalorganic Assemblies of 2,5-dihydroxy-1, 4-benzoquinone

Yang, Baocheng

Photoluminescent Properties of CdSe Nanocrystals in the Presence of Amines

Advisor: M.T. Shaw

An, Yuxian

Actuating Properties of Soft Gels with Ordered Iron Particles: Basis for a Shear Actuation Density and Elongation-at-break of Naturally and Artificially Aged Cables used in Nuclear Power Plants

Gasa, Jeffery

Gupton, Jonathan (w/ Weiss)

Miscibility and Conductivity of the SPS/PEO blend system

Liu, Zhizhong

Rheology of SPE/Squalane Solution

Chattopadhyay, Sruti

Corona-resistant insulation for Random Wound Motor System

Senador, Tony (w/ Mather)

Electrospinning vs. Electro spraying: Limits on the analogy between the two processes

Advisor: G.A. Sotzing

Lee, Kyunghoon

Thieno (3, 4-b) thiophene as a novel low oxidation crosslinking agent

Jang, Sung-Yeon

Poly (terthiophene) Networks via Electrochemical Crosslinking of Terthiophene Derivatized Norbornylene Monomers and Polymers

Jang, Sung-Yeon

An electrochemical artificial tongue utilizing intrinsically conductive polymers

Advisor: C.S.P. Sung

Kim, Minsun

Intrinsic UV Reflection and Fluorescence Studies for Water sorption in Polycarbonate, Polyurethane and Poly(ethylene terephthalate) films

Burdzy, Matthew

Moisture-Induced Property Changes in Epoxy Networks

Advisor: R.A. Weiss

Chun, YongSung

Sulfonated Poly(ether ketone ketone) membrane for fuel cell application

Lee, Hyuk-soo

Nano-composites derived from melt mixing a thermotropic liquid crystalline polymer and Zinc Sulfonated Polystyrene Ionomers

Tian, Jun
Wang, Yangbing (w/ Sotzing)
Bhiwankar, Nikhil
Xu, Liang
Guan, Rong

Small angle neutron scattering study on hydrophobically modified alkyl acrylamide polymers
Preparation of Conductive foams and their Application as Chemical Sensors
Ionomers in nanocomposites
Crystallization of PC in PC/ZnSPS blend
Miscibility Enhancement of Polystyrene/Poly (ethylene oxide) Blends by Sulfonation of Polystyrene

Advisor: Richard Parnas

Patil, Yatin (w/ Shaw)

Preliminary Developments in Interfacial Characterization of Nanoparticles

Advisor: T. A. P. Seery

Jordi, Mark

The preparation of novel organically coated silica nanoparticles for use in surface initiated polymerization

Metallurgy & Materials Engineering 2002 Poster Session

Advisor: Mark Aindow

Shen, Jessica

Thermal Barrier Coating with Improved Durability

Kang, Dafei

TEM Studies of Self-Assembled CdSe Nanocrystals

Shen, Jessica

Bond Coats with Thermal Barrier Coating for Improved Durability

Advisor: Pamir Alpay

Ban, Zhigang

Optimization of the Dielectric Response and Tunability of Barium Strontium Titanate Films via Epitaxial Stresses

Advisor: Harold Brody

Adibhatia, Sudhir

The Characterization of Solution Heat Treated A1-319 Alloys using S/V vs DAS Plots

Fang, Jian

Influence of Composition and Solution Treatment on the Tensile Properties of A1 319 Alloy

Li, Bin

Real Time Observation of Dendritic Solidification in Sn-13%Bi Alloy by Microradiography

Advisor: Eric Jordan

Sridharan, Swetha

Thermal Cycling of EB-PVD/(Ni,Pt)Al Thermal Barrier Coatings: PLPS Measurements and Microstructural Development

Xie, Liangde

Spraying Pattern of the Solution Precursor Plasma Spray Process

Advisor: Harris Marcus

Robson, Mark

Measurement of Instantaneous Dislocation Velocities and Dislocation Density of Single Crystal Cadmium

Wei, Haoyan

Solid Freeform Fabrication of Mo Powder Square Samples by SALDVI

Advisor: John Morral

Li, Yali

A Local Equilibrium Model for Internal Oxidation

Qian, Min

Computer Simulation of Solidification and Solution Treatment of Multi-component Alloy System

Yang, Hongwei

Computer-assisted Design of High Temperature MCrAlY Coatings

Advisor: Nitin Padture

Bansal, Pavitra

Mechanical Properties of Nanostructured Plasma-Sprayed Coatings on Metals

Wei, Xuezheng

Hydrothermal Synthesis of Perovskite Powders and Thin Film

Wu, Jie

New Low-thermal Conductivity Ceramics for Thermal Barrier Coatings"

Advisor: Leon Shaw

Dai, Kun

Parameterized Study on Multiple Material Laser Densification

Goberman, Daniel

Microstructural Development of A1203-TiO2 Plasma Sprayed Coatings Derived from Nanocrystalline Powders

Li, Xiaoxuan

Laser Densification of Porcelains for Rapid Prototyping of Dental Restoration

Luo, Hong

Micro structure and Properties of Thermally Sprayed Nanostructured Al203-TiO2 Coatings

Pasquariello, Mike

Synthesis of Nanostructured Silicon Carbide

Villegas, Juan

Light-weight, High-strength Aluminum-based Nanocomposites

Wang, Jiwen

Powder delivery in dental restoration

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Pictures from IMS Talent Show



Joanne Garton does a Scottish step dance



Jun Tian sings of his native China



Prof. Tom Seery sings "Danny Boy"



Prof. Doug Pease does "Muddy Waters"



Jim Koch (left) and Dan Goberman demonstrate Uechi-Ryu Karate



Chris Forrey, Cheryl Campo and Prof. Pat Mather team up for a little rock and roll. Later Prof. Mather closed the show with a great rendition of "Supermarket Blues."