and its dependence on crystallographic orientation and surface roughness on the atomic scale. They also reveal how repeated contact between surfaces leads to nucleation and progression of damage at the nanoscopic dimensions, and why real crystals exhibit unusally high local strength for defect nucleation beneath a free surface when subjected to nanoscale contact.

With such insights gained from the bubble model, the researchers formulated a mechanistic theory for defect nucleation at surfaces during nanoindentation. The researchers have since used the bubble system to explore how defects form for a variety of surface conditions.

They have experimentally simulated the effects of atomic-level surface roughness on defect nucleation at surfaces. Although soap bubbles have long been used to study deformation of bulk metals, this work attempts the quantitative simulation of nanoscale contact deformation and defect nucleation at surfaces. By monitoring the defect nucleation characteristics in the bubble experiments as a function of surface asperity dimensions and the radius of the indenter tip, Suresh and his colleagues were also able to identify the conditions governing the nucleation of defects either at surfaces or in the interior for different local contact geometries. With the information obtained on homogeneous defect nucleation beneath the surface when the asperity dimension is comparable to or larger than the indenter tip radius, they were then able to rationalize why many metals exhibit unusually high local strengths near surfaces prior to the onset of defect nucleation during nanoindentation when the surface is penetrated by an indenter to a depth of only a few tens of nanometers.

"Our ultimate goal is to use them to predict how defects will form on the nanolevel, because such defects can affect the performance of these surfaces and nanoscale devices," said Suresh.

$LiNbO_3$ Crystals Reduced in Vacuum Show a Photorefractive Response Time in the Order of 100 ms

Photorefractive crystals have different applications in optics including optical storage, coherent optical amplification, and phase conjugation. In many photorefractive materials, it is possible to write a holographic grating with a response time of less than a second. However, in the case of lithium niobate, the response time is slow, of the order of several minutes, in contrast with predictions from theoretical calculations. A group of researchers from Nankai University in China has demonstrated a method that improves this condition in $LiNbO_3$. According to their latest results published in the July 1 issue of *Optics Letters*, the application of a reducing treatment on a near-stoichiometric crystal significantly decreases its response time in the order of 100 ms.

A high-purity $LiNbO_3$ single crystal grown by the Czochralski method and with 49.6 mol% Li_2O was reduced in vacuum at 950°C for 5 h. The resultant, near-stoichiometric sample had blue-shifted absorption edge as compared with the as-grown crystal. Holographic gratings were written in the sample using an argon ion laser of 514.5-nm-wavelength light at an optical intensity of ~1.6 W/cm^2. Measurements of the diffraction efficiency as a function of the intensity of an incident He-Ne laser beam and the correspondent diffracted beam were performed. The diffraction efficiency quickly increased to a maximum when the experiment started and after the beams were turned off it decreased to zero as the light-induced grating decayed. The corresponding time constants for grating and dark decay were 122 ms and 182 ms. The incident light caused a temperature increase during the holographic grating that increased the dark conductivity, and also reduced the diffraction efficiency. The dependence of the diffraction efficiency with light intensity showed that the maximum value increased with increasing light intensity and the stationary value had an optimal point. Under the effect of an external electric field, the diffraction efficiency was greatly increased. In these conditions, the potential for the use of $LiNbO_3$ crystals in optical applications is significantly enhanced.

SIARI S. SOSA

Parameter-Free Quasi-Particle Calculations Reveal CaB_6 as a Semiconducting Material

The materials classification of CaB_6 has been shifted from semi-metal to semiconductor by a group of researchers from the University of Twente, Catholic University of Nijmegen, and Eindhoven University of Technology. The most commonly accepted electronic structure model for this alkaline-earth hexaboride has been so far provided by the full-potential linearized augmented plane-wave (FLAPW) method. CaB_6 is classified as a semi-metal by this model, due to a small overlap between the valence and the conduction band in the χ direction.

When CaB_6 is doped with minute amounts (~1%) of lanthanum, the system displays unexpected ferromagnetic behavior. This material has a particularly high Curie temperature of 900 K. Because this is an odd behavior for a semi-metal matrix, the research team reexamined the validity of the semi-metal model for CaB_6. As reported in the July 2 issue of *Physical Review Letters*, using the GW approximation (expanded Green's function and Coulomb screening in a perturbation series) and applying the quasi-particle condition, very good overall agreement with the FLAPW model was obtained. The results indicated lower electron and hole effective masses by an average of 10%. However, at χ, the conduction band shifted upward while the valence band moved downward, opening a small bandgap of ~0.8 eV. According to the research team, CaB_6, instead of being a semi-metal, is a semiconductor. The researchers reported experimental phenomena that also support this new finding. For example, resistivity in CaB_6 increases as the temperature decreases, which is identified as classical semiconductor behavior.

According to the researchers, ferromagnetic behavior in La-doped CaB_6 is especially encouraging because it opens the possibility of creating a new class of devices using magnetic semiconductors. $Ca_{0.99}La_{0.01}B_6$ is an especially good candidate for studies, they said, due to its room-temperature stability as suggested by the extraordinarily high Curie temperature.

JUNE LAU

Generalized Titanate Ceramic Waste Form Developed for Processing Radioactive Waste with Various Compositions

A titanate ceramic phase assemblage has been developed to immobilize a wide range of nuclear-waste stream compositions. As reported in the May issue of the *Journal of the American Ceramic Society*, waste loadings of 42–50 wt% were achieved for a variety of waste-stream compositions, with leach rates comparable to those of reference grade Synroc C.

According to Ewan Maddrell, a research associate with British Nuclear Fuels at Sellafield, United Kingdom, the processing method that the research team used led to dissolution of significant amounts of the fuel assembly components together with the fission products. This resulted in waste streams rich in zirconium, iron, chromium, and nickel and gave rise to variable waste-stream compositions depending on the fuel assembly design of each reactor.

To reduce the large volume of highly active waste generated by the process, the researchers blended some of these waste-

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stream components with a mixture of TiO_2, CaO, and BaO, achieving an overall phase assemblage similar to Synroc C. The powders were calcined in N_2-5%H_2 and subsequently mixed with 2 wt% titanium and hot isostatically pressed (HIPed).

X-ray diffraction experiments on the HIPed samples demonstrated the flexibility of the new waste form to accommodate different waste stream compositions by variation of the phase fractions and in some cases phase compositions. All samples contained zirconolite, hollandite, perovskite, and loveringite, $Ca(Ti,Fe,Cr,Zr)_{21}O_{38}$, along with various metal phases. The relative amount of these phases and the composition of the loveringite phase serve as the buffer to handle a variety of waste compositions.

The leaching experiments gave leach rates for cesium, barium, and molybdenum that were comparable to those of Synroc C, consisting mainly of zirconolite, perovskite, and hollandite. It is produced by mixing the waste stream with TiO_2, Al_2O_3, BaO, CaO, and ZrO_2.

Maddrell said, "We make use of species that enter the waste stream during dissolution of spent nuclear fuel, which is an effective way of decreasing the volume of high level waste that is produced and avoids the currently used shear/leach process. The flexibility of the resulting phase assemblage will allow the reprocessing of fuel from different reactors without any changes in the processing conditions."

CORA LIND

News of MRS Members/Materials Researchers

Peter G. Brown has been appointed President and CEO of Leeman Labs, Inc. He plans to build on the core competence of the company in the areas of ICP emission and mass spectrometry and mercury analysis. His research interests have focused primarily on elemental and isotropic optical emission and mass spectrometry.

Joachim Burghartz has been appointed as scientific director of a new thematic DIMES (Delft Institute of Microelectronics and Submicrontechnology) at Delft University of Technology. The four themes are high-frequency technologies for communication, integrated microsystems, nano-electronics, and large-area electronics.

Robert W. Cahn of Cambridge University has been awarded the **Luigi Losana Gold Medal** by the Associazione Italiana di Metallurgia (AIM) in recognition for his distinguished contributions to the advancement of metals science and technology.

Alan Campion of The University of Texas has been awarded a **Guggenheim Fellowship for 2001** for spectroscopic studies of molecules adsorbed on solid surfaces.

Robert J. Cava, associate director of Princeton Materials Institute and professor of chemistry and materials at Princeton University, has been elected as a member of the U.S. **National Academy of Sciences** in recognition of distinguished and continuing achievements in original research.

Sidney S. Charschan (Levittown, Pennsylvania) has received the **George M. Wilkening Award** from the Laser Institute of America for "contributions that led to the recognition and acceptance worldwide of the American National Standards Z136 Safe Use of Lasers Series." Charschan shares the award with Myron Wolbarsht (Durham, North Carolina).

Charles B. Duke, vice president and senior research fellow of Xerox Research and Technology in Xerox Corp., Webster, N.Y., has been elected as a member of the U.S. **National Academy of Sciences** in recognition of distinguished and continuing achievements in original research.

Derek Fray has been appointed as head of the Department of Materials Science and Metallurgy at Cambridge University.

Michal Freedhoff has accepted a staff position with Congressional representative Edward J. Markey (D-Mass.) where she will work on a variety of issues related to energy, the environment, and global security.

Alice P. Gast has been named vice president for research and associate provost at the Massachusetts Institute of Technology. She will coordinate policy regarding research and graduate education and oversee the Institute's large interschool laboratories. Gast will also serve as the Robert T. Haslam Professor of Chemical Engineering.

Arthur C. Gossard, professor of materials, electrical, and computer engineering in the Materials Department at the University of California—Santa Barbara, has been elected as a member of the U.S. **National Academy of Sciences** in recognition of distinguished and continuing achievements in original research.

Alan J. Heeger, professor of physics at the University of California—Santa Barbara, and chief scientist and chair of the board at UNIAX Corp., Santa Barbara, has been elected as a member of the U.S. **National Academy of Sciences** in recognition of distinguished and continuing achievements in original research.

Arthur Heuer, the Kyocera Professor of Ceramics in the Department of Materials Science and Engineering at Case Western Reserve University (CWRU), has been appointed **University Professor**. University Professor is the highest scholarly rank in the University. The title acknowledges a long and distinguished academic career. Heuer is acknowledged for his pioneering studies in ceramics and for his contributions to education in ceramics. He joins only three others in the history of CWRU to become University Professor—Harland Wood, Frederick Robbins, and Herman Stein. Heuer is the first engineer so recognized.

Colin Humphreys has been elected as president of the Institute of Materials at Cambridge University, beginning in December 2001.

Martha Krebs has been named the founding director of the California NanoSystems Institute (CNSI) and University of California—Los Angeles (UCLA) associate vice chancellor for research. She will direct operations of CNSI, which will conduct research into the manipulation of structures atom-by-atom to engineer new materials, devices, and systems. CNSI is a joint enterprise of UCLA and UC—Santa Barbara.

James S. Langer of the University of California—Santa Barbara has been elected Vice President of the U.S. National Academy of Sciences. His four-year term runs from July 2001 through June 2005.

Rick Lusignea has been named as President and Chief Operating Officer of Triton Systems, Inc. (TSI). He will oversee the strategic direction of the company, which is to create breakthrough, value-added, high growth, specialty materials. His main area of research has been in liquid-crystal polymers.

Satyabrata Patnaik, a postdoctoral fellow with Materials Science and Engineering Professor David Larbalestier in the University of Wisconsin—Madison College of Engineering's Applied Superconductivity Center, received second-place honors and $20,000 in the **2000 Merrill Lynch Innovation Grants Competition** for his proposal outlining his PhD thesis results to improve current-carrying capacity of high-temperature superconducting wires—specifically bismuth-based cuprate (BiSSCO) superconductors.

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Julia M. Phillips has been named as director of the Physical and Chemical Sciences Center at Sandia National Laboratories in Albuquerque, New Mexico.

Tom Picraux has been named as executive director of materials research at Arizona State University. He started in the newly created post on May 1. He will coordinate major materials efforts spread across several departments in the College of Liberal Arts & Sciences and College of Engineering & Applied Sciences, and will make a strong push for new multidisciplinary research projects supported by federal and corporate sponsors. Picraux will also serve as co-director of the Center for Solid State Science in the College of Liberal Arts and Sciences and co-director of the Center for Solid State Electronics Research in the College of Engineering and Applied Sciences.

Gary Prinz has been appointed as the director for the Institute for Nanoscience, a new program within the Naval Research Laboratory. He will begin by providing technical oversight of the design of the new Nanoscience Building and identifying the research equipment needed for the new facility. The Institute has been established to conduct multidisciplinary research at the intersections of the fields of materials, electronics, and biology.

Gary Purdy has been appointed as director of McMaster Centre for Peace Studies at McMaster University.

Lyle H. Schwartz has been selected as the director of the Air Force Office of Scientific Research (AFOSR). He will be responsible for the management of the basic research investment for the U.S. Air Force.

Arun Seraphin has accepted a majority staff position with the Senate Armed Services Committee where he will work on a variety of funding and policy issues related to the Department of Defense's science and technology programs.

James Varner of Alfred University has been named an honorary member of the German Society of Glass Technology for his long-time, diverse support of Germany's glass scientists and engineers.

George Weatherly has been named chair of the Materials Science and Engineering Department at McMaster University.

Myron Wolbarsht (Durham, North Carolina) has received the **George M. Wilkening Award** from the Laser Institute of America for "contributions that led to the recognition and acceptance worldwide of the American National Standards Z136 Safe Use of Lasers Series." Wolbarsht shares the award with Sidney S. Charschan (Levittown, Pennsylvania).

Sukant K. Tripathy, Professor of Chemistry at the University of Massachusetts—Lowell, passed away Tuesday, December 12, 2000, in a swimming accident in North Kohala at Polulu Beach, Hawaii. He was attending the Poly Millennial 2000 Conference in Waikola, Hawaii.

Sukant was born in Chakradharpur in the state of Bihar, India, and graduated with a BSc and MSc degree in physics from the Indian Institute of Technology, Kharagpur. He received his PhD degree in macromolecular science and engineering from Case Western Reserve University in 1981. Sukant worked at GTE first as a member of the technical staff and then as manager of the organic and polymer materials sciences department from 1981 to 1986. He joined the chemistry faculty at UMass Lowell in 1986 and was the founding director for the Center for Advanced Materials since 1992. In addition, he served as the Provost and Vice Chancellor for academic affairs at UMass Lowell from 1994 to 1996.

The University of Massachusetts—Lowell held a memorial service on the afternoon of Thursday, February 15, and a day-long technical symposium on Friday, February 16, to honor the memory of Prof. Tripathy—an inspirational teacher, scientist, and mentor to students and colleagues.

Sukant was a very creative scientist who enjoyed multidisciplinary research. He was recognized as a world-leading researcher in the area of electronic and optical properties of polymers. He was awarded the 1993 Carl S. Marvel Creative Polymer Chemistry Award by the American Chemical Society (ACS) Division of Polymer Chemistry for his contributions in this area of research. During his research career he published more than 250 refereed research papers and held two dozen patents. Dr. Tripathy and his co-workers were active participants in Materials Research Society (MRS) meetings and conferences organized by other professional societies. His effort and vision led to the establishment of a well-recognized research program in the area of materials science at the University of Massachusetts—Lowell.

At Case Western his doctoral work involved investigation of conformational states of polymers. At GTE Laboratories his research interests shifted to optical and electronic properties of conjugated polymers and their processing into ultrathin films (using Langmuir-Blodgett techniques). After his move to UMass Lowell, Sukant made significant contributions in the area of second-order nonlinear optical properties of polymeric materials. In 1993, he and his colleagues discovered the phenomenon of light-induced mass transport in azo-functionalized polymers well below glass-transition temperatures. In the last four years, Sukant and his coworkers made important contributions in the area of enzymatic synthesis of template-directed polyphenols and polyanilines and electrostatic layer-by-layer assemblies of ionic polymers and proteins with interesting optical and electronic properties. Recently, he also had an active research program in the area of polymer light-emitting diodes and polymeric as well as dye-sensitized photovoltaics.

Sukant was not only a very creative scientist and a very capable research manager, but also an extremely warm and helpful person. He established close friendships with a multitude of professional colleagues throughout the world. His scientific creativity, charm, and friendship will be sorely missed by his colleagues and friends and he will continue to inspire us for many years to come.

Sukant Tripathy is survived by his wife Susan Thompson and children, Sheila, 13, and Aneil, 10, of Acton; and by his parents, two brothers, and a sister who live in India.

An ACS symposium to honor his memory will be held at the ACS meeting in Chicago in August 2001.

JAYANT KUMAR
Department of Physics and Center for Advanced Materials
University of Massachusetts—Lowell

The **American Ceramic Society** (ACerS) has announced 2001 awards.

Yet-Ming Chiang, Massachusetts Institute of Technology, and **Harold Ackler**, Symmorphix Inc., received the **Ross Coffin Purdy Award** for their paper entitled "Effect of Initial Microstructure on Final Intergranular Phase Distribution in Liquid-Phase-Sintered Ceramics," which was published in the January 1999 issue of the *Journal of the American Ceramic Society*.

Sossina M. Haile, California Institute of Technology, received the **Robert L. Coble Award for Young Scholars**, which recognizes an outstanding scientist who is conducting research in academia, industry, or a government-funded laboratory.

L. Eric Cross, The Pennsylvania State University, has been honored with a **Distinguished Life Membership**, which is the Society's most prestigious grade of membership in recognition of a member's contribution to the ceramics profession.

John W. Cahn, National Institute of Standards and Technology, has been elected as an **Honorary Member**, which recognizes business, technical, or public service achievements in the ceramic arts and sciences.

Robert E. Newnham, The Pennsylvania State University, has received the **W. David Kingery Award**, which recognizes distinguished lifelong achievements involving multidisciplinary and global contributions to ceramic technology, science, education, and art.

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Ravishankar Narayanan and **C. Barry Carter**, both of the University of Minnesota, received the **Roland B. Snow Award**, which is presented to the Best of Show winner of the Ceramographic Competition, an annual exhibit to promote the use of micrographs and microanalysis as tools in the scientific investigation of ceramic materials.

George W. Scherer, Princeton University, received the **Brunauer Award**, which recognizes the best paper presented at the ACerS Meeting.

Zdeněk P. Bažant, Northwestern University, received the **Della Roy Lecture Award** with the presentation, "Concrete Durability Scaling & Hygro-Thermal Coupling."

Klaus Prume and **Rainer Waser**, Institut für Werkstoffe der Elektrotechnik, received the **Edward C. Henry Best Paper Award**, which recognizes an outstanding paper reporting original work in the *Journal* or *Bulletin of the American Ceramic Society* during the previous calendar year on a subject related to electronic materials.

Richard E. Tressler, The Pennsylvania State University, received the **Arthur L. Friedberg Memorial Lectureship**, with the presentation, "Commercialization of Advanced Structural Ceramics & Ceramic Matrix Composites: Successes & Challenges."

Delbert E. Day, University of Missouri—Rolla, received the **Arthur Frederick Greaves-Walker Award**, which recognizes an individual who has rendered outstanding service to the ceramic engineering profession and who, by life and career, has exemplified the aims, ideals, and purpose of the National Institute of Ceramic Engineers (NICE).

The following members have been named **ACerS Fellows: Kathleen B. Alexander** of Los Alamos National Laboratory; **Rüdiger Dieckmann** of Cornell University; **Alexandra Navrotsky** of the University of California—Davis; **Steven R. Nutt** of the University of Southern California; **Robert R. Reeber** of the U.S. Army Research Office; **Ralf Riedel** of Technische Hochschule Darmstadt, FB Material FG Disp. Festoffe; **Thomas R. Shrout** of The Pennsylvania State University; and **Steven J. Zinkle** of Oak Ridge National Laboratory.

Recipients of the second- and third-round of the **Canada Research Chairs Program** have been announced in April and June, respectively. The program is to establish 2000 Canada Research Chairs in universities across the country by 2005. Among the recipients are:

Neil Branda of Simon Fraser University for refining light-sensitive materials for use in data storage and exchange;

Mark R. Freeman of the University of Alberta for research on nanoscience and nanotechnology;

Stephen Loeb of the University of Windsor for research on supramolecular chemistry and functional materials;

Ian Manners of the University of Toronto for developing a new range of metal-based polymers and testing them for various applications in nanotechnology;

Sylvie Morin of York University for the study of metal depositing on metal and semiconductor surfaces; and

George Sawatzky of The University of British Columbia for research on the physics and chemistry of nanostructured materials.

NACE International has announced 2000 awards.

Naoto Hagiwara of Fundamental Technology Laboratory, Tokyo Gas Company, Ltd. received the **A.B. Campbell Award** for the most outstanding manuscript published in the Society's journal, *Materials Performance or Corrosion*, "Fracture Toughness of Line Pipe Steels Under Cathodic Protection Using Crack Tip Opening Displacement Tests."

George Schick received the **F.N. Speller Award** for providing extensive contributions in the prevention of corrosion and development of corrosion protection methods in the telecommunications industry.

Roger C. Newman of the University of Manchester Institute of Science and Technology (UMIST), United Kingdom, received the **W.R. Whitney Award** for his well-established international reputation, justly merited by his contributions in introducing and testing microscopic models in various branches of corrosion science including passivation, pitting, de-alloying and stress-corrosion cracking.

Alvin Goolsby (Houston, Texas) received the **Technical Achievement Award** for research in corrosion, cathodic protection, flaw detection and measurement and for considerable experience in instrument development and nondestructive testing, internationally.

Charles C. Nathan (Houston, Texas) received the **Technical Achievement Award** for his many years of contributions to corrosion inhibition and control in the oil and gas production and refining industries.

Alan Turnbull (Teddington, Middlesex, United Kingdom) received the **Technical Achievement Award** for outstanding contribution to corrosion science related to his quantification of the chemistry and electrochemistry in pits, crevices, and in stress corrosion and corrosion fatigue cracks.

Te-Lin Yau (Albany, Oregon) received the **Technical Achievement Award** for his many contributions to corrosion and metallurgical engineering in the development and application of reactive metal alloys, principally zirconium, for a wide range of process industries.

The following members have been named **NACE Fellows: Gustavo A. Cragnolino** (San Antonio, Texas) for his outstanding and sustained contributions to the corrosion research areas related to nuclear power generation and to radioactive-waste disposal and storage systems; **Howard Lee Craig** (Richmond, Virginia) for a lifetime of distinguished contributions in research, the development and evaluation of testing methods, and the education and mentorship of colleagues in corrosion engineering; **Otto H. Fenner** (Webster Groves, Missouri) for recognition of continuous improvement in controlling corrosion in chemical plants, especially by the use of fiberglass-reinforced plastic equipment; **John H. Fitzgerald III** (Grosse Pointe Park, Michigan) for recognition of his knowledge of cathodic protection and his educational work in teaching and writing, thus enhancing the spread of corrosion control; **Albert L. Hendricks** (Green Bay, Wisconsin) for outstanding contributions to corrosion control by protective coatings formulation, specification, application, inspection, and personnel training; **James F. Jenkins** (Cambria, California) for extensive contributions to the field of corrosion science and engineering in the areas of research, engineering, education, and application of technology to solve problems; **Hector A. Videla** (La Plata, Buenos Aires, Argentina) for recognition of his pioneering and sustained research in the field of biocorrosion and biofouling of metals and alloys of industrial usage, his active transfer of knowledge to the academic and industrial personnel, and for his leadership in the development of the understanding of biocorrosion in Latin America and several countries of Europe.

Recipients of university research grants from the **Natural Sciences and Engineering Research Council** (NSERC) of Canada have been announced in May. Among the recipients are:

Robert Birgeneau (Toronto), advanced annealing and characterization facility;

Clifford Champness (McGill), electronic and photovoltaic properties of chalcogenide semiconductors;

Jeffrey Dahn (Dalhousie), curved

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position sensitive detector for combinatorial materials science and *in situ* methods;

Karoly Dalnoki-Veress (McMaster), micromechanical properties of polymer films; optical characterization facility for polymer thin films;

Georges Denes (Concordia), novel tin-based fluoride-ion conductors and other materials;

Richard Dunlap (Dalhousie), nanostructured and disordered materials;

Raymond Egerton, Mark Freeman, Joel Haber, Larry Heaman, Douglas Ivey, Alkiviathes Meldrum, and **Zhenghe Xu** (Alberta University), image-acquisition system for an analytical TEM;

James Forrest (Waterloo), dynamics of polymer surfaces; structure and dynamics in thin polymer films;

Patrick Fournier (Sherbrooke), acquisition of materials growth equipment; growth and physical properties of oxides—crystals and thin films, toward new devices and nanostructures;

Mark Gallagher (Lakehead), atomic structure of ultrathin films; sputter ion gun for sample cleaning;

Peter Grutter (McGill), application of scanning probe techniques to nanoscience; equipment for nanoelectronics; nanoelectronics;

Louis-André Hamel (Montréal), transient charge transport in semiconductors;

Béla Joos (Ottawa), membranes, networks and solids under stress;

Jan Jung (Alberta), magnetic and transport properties of superconducting thin films;

Gilles Lamarche (Ottawa), studies of giant diamagnetic materials;

Roger Lessard (Laval), holography, optical, and system design for photonic application;

Turab Lookman (Western Ontario), multiscale modeling of complex functional materials;

Ludvik Martinu (École Polytechnique), fabrication and testing of novel optical coatings and optical film systems;

Remo Masut (École Polytechnique), vapor-phase epitaxy of III-V semiconductor heterostructures on compliant substrates; and with **Patrick Desjardins**, **Richard Leonelli**, and **Sjoerd Roorda**, urgent repair and upgrade of existing metalorganic vapor-phase epitaxy system;

Caroline Mitchell (Saskatchewan), instrument for low-energy electron diffraction and Auger electron spectroscopy; nanostructured surfaces: formation, electronic and structural properties, and interaction with biomolecules;

Alexander Moewes (Saskatchewan), soft x-ray spectroscopy of advanced materials using synchrotron radiation;

Allan Morrish (Manitoba), novel magnetic materials with applications;

Francois Schiettekatte (Montréal), dynamics of implantation defects in semiconductors/tribology of self-implanted metals; *in situ* deep-level transient spectroscopy for implantation defects in semiconductors;

Ishiang Shih (McGill), development of compound semiconductors for photovoltaic cells and thin-film transistors;

John Vail (Manitoba), theory and simulation of point defects in crystalline materials;

Vance Williams (Simon Fraser), the design and synthesis of organic materials;

James Wuest, Michel Armand, and **Julian Zhu** (Montréal), optical microscope for applications in materials science;

Michael Wolf (British Columbia), metal-containing conjugated polymers and molecule-based sensors;

Zuo-Guang Ye and **Ross Hill** (Simon Fraser), a complex dielectric spectrometer for the studies of relaxer ferroelectric and amorphous materials; and

Martin Zinke-Allmang (Western Ontario), phase separations on and near surfaces.

The **U.S. Office of Naval Research** (ONR) has announced Young Investigator Program Awards for Fiscal Year 2001.

Nikhilesh Chawla (Arizona State University) will investigate the elevated temperature mechanical behavior of discontinuously reinforced aluminum alloys, in particular the interactions occurring during combined creep and fatigue loading.

Wilson K.S. Chiu (University of Connecticut) will investigate the use of chemical vapor deposition to produce a hermetically sealed carbon coating on carbon fibers, utilizing annealing to reduce residual stresses.

Panagiotis D. Christofides (University of California—Los Angeles) will investigate algorithms for optimization and real-time control of thermal-spray processes, and the microstructure and properties of nanostructured coatings produced thereby.

Chris Diorio (University of Washington) will seek to create reprogrammable silicon synapse transistors, which will lead to small, efficient, "smart" silicon chips that have the ability to learn.

David Goldhaber-Gordon (Stanford University) will fabricate semiconductor nanostructures and investigate the transport of spin-polarized electrons subjected to magnetic fields generated by currents in nanoscale wires.

Aaron L. Odom (Michigan State University) will pursue a novel approach to making a series of new catalysts for polymerization reactions.

Linda J. Olafsen (University of Kansas) will focus on understanding the fundamental physical properties of layered, antimonide-based semiconductors.

John A. Shaw (University of Michigan) will investigate the production and properties of metallic foams made of NiTi-based shape-memory alloys.

The **Optical Society of America** (OSA) has announced 2001 Awards.

Nick Holonyak Jr., University of Illinois, received the **Frederic Ives Medal/Quinn Endowment** for pioneering work in the field of semiconductor lasers and light-emitting diodes.

George Smith, Bell Labs, retired, and **Willard Boyle**, Bell Labs, retired, received the **Edwin H. Land** Medal for the invention and development of the charge-coupled device.

Duncan T. Moore, University of Rochester, received the **OSA Leadership Award/New Focus Prize** for technical, educational, and service contributions to the optics community and for contributions in public policy.

Barbara A. Paldus, Informed Diagnostics, received the **Adolph Lomb Award** for developments of the ultrasensitive absolute method for trace analysis of gas-phase species.

Federico Capasso, Lucent/Bell Labs, received the **R.W. Wood Prize** for seminal contributions to the invention, demonstration, and development of the quantum cascade laser.

Shuji Nakamura, Nichia Chemical Industries, Ltd., received the **Nick Holonyak Jr. Award** for original demonstration and commercialization of GaN-based semiconductor lasers and light-emitting diodes.

Frank C. de Lucia, Ohio State University, received the **William F. Meggers Award** for pioneering work in the development of the submillimeter-wave region of the electromagnetic spectrum and its application to scientific problems in physics, chemistry, and astronomy.

Tatsuo Izawa, NTT Electronics Corp., received the **John Tyndall Award** for contributions to vapor-phase axial deposition for optical-fiber fabrication and pioneer work on silica-based planar light-wave circuit. □

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