Advancing Research
and Teaching in the
University of British Columbia
Faculty of Science

UBC Science Synergy

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UBC Researchers Reap CFI Bonanza

ICICS Director Rabab Ward (centre), Computer Science Professor Jim Varah (left), and Vice-President Emeritus K.D. Srivastava spearheaded the concept for UBC's Institute for Computer, Information and Cognitive Systems.

2000 is a banner year for UBC researchers. Twenty groups received funding from the Canadian Foundation for Innovation. This issue of Synergy features four exciting projects involving the Faculty of Science. The largest, and one of the most innovative interdisciplinary collaborations, is the Institute for Computing, Information and Cognitive Systems.

Imagine an intelligent system that recognizes your gait, your voice, your hand or eye imprint and unlocks the front door, turns off the alarm, and greets you as you enter. Imagine flying off to a business meeting, wondering if you remembered to shut off the stove, and being able to check—and turn it off—from your window seat.

Personal wireless communicators and "smart homes" are just two examples of technological innovations to be developed at UBC's Institute for Computing, Information and Cognitive Systems (ICICS). This Institute recently received $22.2 million in funding: $8.85 million from CFI, $8.85 million from BC's Knowledge Innovation fund, and $4.5 million from UBC Foundation's Blusson Research Fund. One of the largest interdisciplinary research initiatives in Canada, ICICS will bring together researchers from the faculties of Science, Applied Science, Commerce, Dentistry, Education, Forestry, Pharmacy, Medicine, and the Arts.

ICICS is the brainchild of several members of the Centre for Integrated Computer Systems Research (CICSR). Traditionally, humans have had to adapt to machines, and this has not always proved beneficial, as illnesses such as repetitive stress syndrome have shown. For years, our only interface with computers has been a keyboard and a mouse. "We want to change the focus of our research so that human needs are at the forefront," says CICSR Director Rabab Ward. "As CICSR evolves into ICICS, we want to develop machines that adapt to humans in order to give us a better quality of life."

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Science 101 Broadens Horizons

This past summer was a journey of discovery for adult students from the Downtown Eastside and over 50 UBC science professors and graduate students. UBC's Science 101 Program provided an opportunity for nineteen individuals who have not had prior access to post-secondary education to learn fundamental science at the first-year level in a university setting. It was modelled after the highly successful Humanities 101 program started by UBC Arts students, which was inspired by an initiative in New York several years ago. The student-administered program was spearheaded by Science grad student Tara Ivanochko, coordinated by graduate Jesse Guscott, and funded by the Alma Mater Society's Innovative Projects Fund, the President's Office, and the Society for Canadian Women in Science and Technology.

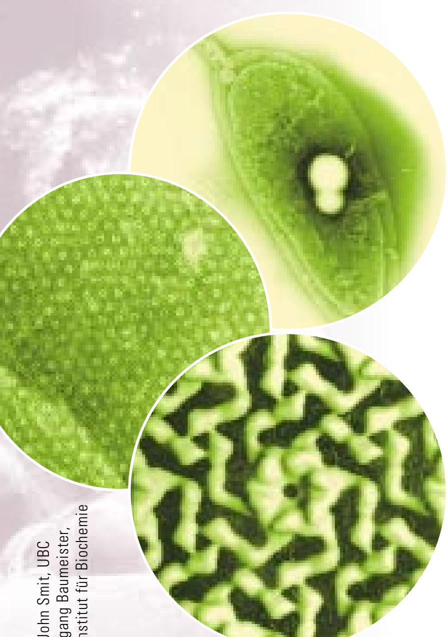
When Ivanochko put out a request for volunteers to teach, over 50 people responded. The course outline included everything from classical mechanics and atomic structure, to thermodynamics, probability, climate studies, plate tectonics, and fisheries ecology. Each class was team taught by at least one professor and several grad students. Although it was a non-credit course, Ivanochko notes that students got the same lab and instructors as students taking introductory microbiology.

Professor Douw Steyn says the instructors wanted to teach science, not merely talk about it. This meant including math and labs. How did the students fare? "They were remarkable," says Steyn. "Especially their willingness to do the hard stuff, which required very abstract thinking." He says his greatest reward was the class's enthusiasm for learning, and the experience of teaching with some very talented and dedicated graduate students.

For Ivanochko, the challenge was presenting the material in a way that was interesting to others outside of the field. "It was incredible to see people get excited about basic concepts we take for granted. It rejuvenated my love for what I do."

"I always knew I loved learning," says Science 101 student Debbie Blair, who is now studying journalism at Langara College. "This program gave me some focus and direction, and something to look forward to. It was like a drink of water in the desert."

Invitrogen Licences Gene Expression System



Top, middle: John Smit, UBC
Bottom: Wolfgang Baumeister, Max-Planck-Institut für Biochemie

As a model system for cell development, scientists have been studying the bacterium caulobacter for years. What interests John Smit, however, are its biotech applications. Genetic engineering research requires substantial quantities of small to medium-sized recombinant proteins. Caulobacter bacteria (left, top) secrete a large amount of a protein that assembles into a "cardigan jacket"—so called for the hounds-tooth-like geometric pattern (left, middle and bottom)—on the cell surface. How this protein is formed, and why in such abundance, are questions that led Smit and his lab to develop a new type of gene expression system.

By modifying the genetic structure of caulobacter they developed "jacketless" bacteria that use the secretion signals of the jacket protein to make designer proteins. But some characteristics of the jacket protein remain; in trying to self-assemble, the designer proteins instead form globs of protein outside the cell. You can actually observe them form in a beaker. "Simply strain it out, wash it with water, and you have your favourite protein—already 90 to 95 percent pure," says Smit's colleague John Nomellini. Smit adds, "The system is suitable for early stages of research, where you might want to make multiple variants of a protein, to search for a better vaccine, for example. But this bug grows cheerfully at very high densities, so there is no major impediment to working on a large scale."

It also has the potential to secret proteins that might be problematic for other systems on the market. In October, UBC licensed the PurePro™ Caulobacter Expression System to Invitrogen. It is available to universities and non-profit agencies for research purposes and as an evaluation kit for industrial customers. Companies have a year to try the system before they must purchase a licence.

As the only researcher in the caulobacter field who tackles biotech applications, Smit is excited about other possibilities. He and his colleagues have been able to grow caulobacters very densely on surfaces as a one cell-layer thick biofilm. By keeping its hounds-tooth jacket intact and adding new peptides to the "fabric", caulobacter is no mere working-class protein producer. It also has uptown aspirations in the areas of proteomics and nanotechnology.

Zoologist David Jones wins Flavelle Medal

What enables diving animals to hold their breath—and even control heart rate—under water? Zoology Professor David Jones has been studying the circulatory and metabolic secrets of elephant seals and leatherback turtles to try and determine why they are able to exceed their aerobic dive limit and remain under water even after their oxygen supplies have been exhausted. He has also been studying how many diving animals are able to regulate heart rate (a largely autonomic response in humans) to less than 2 beats/min when presented with an unusual or threatening stimulus.

Jones has joined the prestigious ranks of Flavelle medal winners, recognized as one of the world's premier comparative physiologists for his work on regulatory and integrative physiology. The Flavelle medal was established in 1924 to honour those who have made an outstanding contribution to biological science. Previous recipients include UBC zoologist Peter Hochachka, the late UBC Professor Emeritus Michael Smith, Wilder G. Penfield, and Sir Frederick Banting.

His work has led him to study a host of familiar and exotic creatures, from the giant Gippsland earthworm of Australia to sea cucumbers, alligators, fish, and birds. Most recently he has employed Magnetic Resonance Spectroscopy and electrocardiogram monitoring to study the diving response of large seals, making him one of the few zoologists in the world who is applying advanced technology to field studies in this area of research.

CFI Bonanza; *cont'd from p. 1*

And as information technology evolves, it will permeate every aspect of our lives—how we work, play, learn, interact, understand, and create. ICICS's human-centred focus involves understanding and quantifying human experience—including our knowledge, emotional states and environmental contexts—in order to develop technology that uses and communicates experience rather than just exchanges information.

Developing the concept for ICICS and writing the CFI application took over a year and a half, notes Computer Science professor and former CICSR director Jim Varah. He and K.D. Srivastava, former head of Electrical Engineering and UBC Vice-President Emeritus authored the proposal, with input from several of the 120 co-applicants. "We emphasized that CFI was for innovation, not renovation," says Srivastava. "So our proposal had to reflect that. The other challenge was to focus such a broad initiative."

Interactive information environments was the theme that emerged, with global information systems at the core of all research. Human communications technologies and multi-agent systems are research areas that will involve new space and equipment. Interactive information environments will also be a major focus of research.

The study of human experience will involve modelling the intricacies of facial expressions, body language, tone of voice, and even human tissue. It will have applications in everything from medicine, engineering, education, psychology, and linguistics to e-commerce and entertainment. "Part of the research is to understand how technology is affecting us and how we can learn from it," says Ward. This is really a humanist endeavour, so we must learn from others in those disciplines to ensure that technology evolves in the most beneficial way for humankind."

Visions of the Future

While some of the machines and systems developed at ICICS will save time and reduce stress, others are being designed to enhance learning, support interactive video and a wireless Internet, and improve medical procedures. One group of researchers will be using ICICS facilities to study how infants and adults learn and recognize speech. Others will be studying human memory development in infants and memory breakdown in Alzheimer patients. Another will be studying the biomechanical properties of human tissue in combination with robotics and haptic interfaces in order to design better diagnostic procedures and surgical simulators.

Under the guidance of Guy Dumont from Electrical and Computer Engineering, a team of researchers including anaesthesiologists, pharmacologists, electrical engineers, and applied mathematicians are working on automated drug delivery systems. Multi-agent systems (where an agent can be a human, computer, or software) are used to monitor and control the delivery of anaesthesia and manage alarms in order to provide improved patient care and safety. Eventually, this technology could be applied to implantable systems to help manage chronic conditions such as diabetes, arrhythmia or schizophrenia.

"This research is unique in Canada," says Srivastava. It is a wonderful example of the innovation and collaboration that ICICS will foster.

Discovering and Harnessing Microbial Activity

UBC's new Environmental Biotechnology Facility will provide the infrastructure needed to study microbial diversity, find novel and useful species of microorganisms, and explore enzyme structure and function in order to help clean up our environment.

ACCORDING TO BILL MOHN, associate professor of Microbiology and Immunology, when it comes to organisms, the smallest are the most useful, the most abundant—and the least understood. "Microbes are the most profuse organisms on earth and they really do everything of importance, from catalyzing chemical reactions to regulating nutrient cycles," says Mohn. "By comparison, the most significant result of human activity is environmental damage."

With the recent announcement of $2.2 million in funding from CFI, BC's Knowledge Development Fund and UBC's Blusson Research Fund, microbial bioremediation is just one area of research that UBC's new Environmental Biotechnology Facility (EBF) will help to advance. Green chemistry, the term for alternative and more sustainable methods of chemical transformation, is another important focus. Mohn particularly credits microbiology colleague Lindsay Eltis for helping to prepare the EBF proposal. The facility will involve twelve researchers from Microbiology and Immunology, Chemistry, Biochemistry, and the Biotechnology Laboratory. It will have advanced equipment to support five research units: microbe culturing, analytical chemistry, molecular ecology and proteomics, protein purification and characterization, and biocatalyst design.

The new world-class infrastructure and UBC's research expertise gives the EBF group a leading edge in the field of environmental biotechnology. For example, Eltis is an international leader in the investigation of oxygenases, enzymes that add oxygen to compounds. These enzymes are crucial for aerobic biodegradation of pollutants, yet ironically they are very unstable and sensitive to oxygen. "With the new infrastructure, we will be able to purify and characterize oxygenases anaerobically," Mohn says. "Not many other groups in the world are doing this research."

Microbiologist Bill Mohn's research on the degradation of pollutants by microorganisms will help to alleviate some of the damage humans have caused.

After useful enzymes are identified and isolated, the next step is to improve their activity or tailor it to various applications. EFB researchers, such as Steve Withers (see *Synergy 6.1*), are in the forefront of biocatalyst design. Using *in vitro* evolution, researchers exert selective pressures on recombinant enzymes to enable them to "evolve" desirable characteristics. Designing enzymes that have faster reaction rates, improved substrate specificity, or that work better under extreme temperature or pH conditions requires high-throughput screening. State-of-the-art analytical chemistry instrumentation will permit improved characterization and measurement of microbial activities. The EFB will have a robotic liquid handling system and a bacterial colony image analyser for a wide array of assays. The new facility will also make it easier and more efficient to grow and harvest cells and to purify proteins.

Whether searching for new microbial life forms in mud or deep-sea thermal vents, or manipulating their metabolic properties to clean up toxic waste, EBF researchers will have the best available tools to explore basic science that has broad applications for improving our environment.

Using Microbes to Clean Up Pollution

Cleaning up and recycling natural waste is an important function of microorganisms. Compost is a common example. However, man-made pollutants such as chlorinated compounds in PCBs, pesticides and dioxins persist in the environment and are very difficult to get rid of. And when these pollutants are incompletely degraded, they can be transformed into "dead-end metabolites," substances that aren't further degradable and that can be more toxic than the original substance.

"In the case of PCBs, there really isn't a demonstrated biological treatment process that is commercially viable or practical," says EFB project leader Bill Mohn. Bioremediation in Arctic environments (left) is one focus of Mohn's research. Arctic sites pose two main problems for PCB and other hydrocarbon pollutant clean up. First, the extreme cold drastically limits biological, chemical and physical processes, as the soil is frozen most of the year. Second, the remote location makes the conventional clean-up methods of removal and incineration extremely expensive. Microbial degradation is a promising alternative—for any climate. While his group has developed a process that works in the lab, it has yet to be tested in more hostile surroundings.

Chris Radziminski

Although the bioremediation industry is still in its infancy, Mohn is cautiously optimistic. "We need to understand the ecology and physiology of microorganisms in extreme conditions if we are going to be able to use them effectively."

Fish Teeth to Volcanoes—the Geological Dating Game

Today, it takes a lot more than picks and shovels to navigate the rocky terrain of geological research. The Pacific Centre for Isotopic and Geochemical Research (PCIGR) will have the latest tools for studying the age and formation of rocks and minerals, their dispersal in the environment, and their impact on the biosphere.

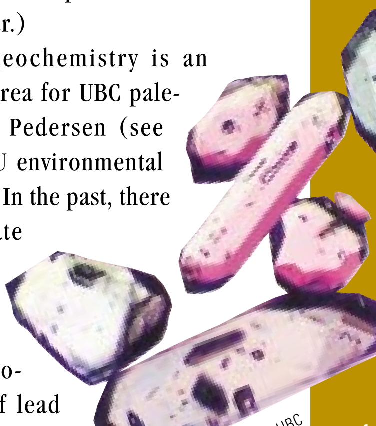
When geochronologist Jim Mortensen gazes out over the North Shore mountains, he doesn't merely see a breath-taking view; he sees the remnants of volcanoes that erupted in the distant past. The questions when, why, and how rapidly were they formed fuel much of his research.

"To understand earth processes and why they happen, we must be able to date geological events very precisely," says Mortensen. UBC has one of the oldest dedicated geochronology labs in Canada. With a recent award of $1.03 million from CFI, matched by $1.03 from the province, and another $.5 million from the gift of noted geologist and UBC alumnus Stewart Blusson, the new Pacific Centre for Isotopic and Geochemical Research (PCIGR) will be one of the most sophisticated of its kind in the world, and involve researchers from UBC, SFU, UVic and the University of Alberta.

Many recent advances in earth sciences are due to the application of isotopic techniques. Radiogenic isotopes are a small group of naturally occurring, unstable elements that decay to more stable atoms of different elements. For example, potassium decays to argon and uranium decays to lead. Since the rate of radioactive decay is known, and because it is unaffected by most physical and chemical processes and takes place over geological spans of time, it is an important dating method for geochronologists. New laser-based systems will facilitate the analysis of single grains of minerals. For example, zircon crystals (shown right) are commonly less than 150 microns in length, and a twenty-kilogram rock sample may yield less than 100 milligrams of zircon. (Mortensen's lab processes about 150 such samples per year.)

Jim Mortensen, associate professor of Earth and Ocean Sciences at UBC, is director of the new Pacific Centre for Isotopic and Geochemical Research.

Environmental geochemistry is an important research area for UBC paleoceanographer Tom Pedersen (see Synergy 2.2) and SFU environmental geologist Diana Allen. In the past, there has been no accurate way to identify who or what was polluting specific areas. Allen is using the isotopic composition of lead as a fingerprint to detect and measure lead contamination of groundwater in southeastern British Columbia.



J. Mortensen, UBC

As a forensic tool to help nab polluters, or as a method to help scientists evaluate the extent of global change, isotopic signatures have broad applications. For example, analysis of a fossil fish tooth found in marine sediment can provide information on the composition and perhaps even the temperature of the water when the fish was alive, thereby providing a record of changes in ocean water through time.

"The PCIGR will involve at least one-third of the faculty members in Earth and Ocean Sciences, in ways we haven't even imagined yet," says Mortensen. He recalls marine virologist Curtis Suttle (see Synergy 4.2) asking if they would be able to measure the carbon isotopic composition of a single virus. "Right now I don't have a clue," he laughs. "But if it's possible, we will probably have the equipment to do it."

Pinpointing Pay Dirt

As a field geologist, Jim Mortensen studies mineral deposits in exotic places like Mexico, Cuba, Albania, Turkey, China, and Australia. One of the most geologically interesting areas is closer to home, in the Yukon and Alaska, where he has spent many summers studying how granites and related mineral deposits are formed. "This area has a lot of very large intrusion-related gold deposits, and we don't yet fully understand why," says Mortensen.

The answer, he believes, is in the age of the granites and the process by which they were formed. "We need to be able to determine if the origin of the mineralization is linked to the formation of the granite, and if they are both products of the same process—which our research suggests is the case." The age and composition of granites—and gold deposits—vary widely in this region. The new PCIGR facility will provide geologists with sensitive new tools to help determine if there really is 'gold in that thar hill.'

"I think it is highly appropriate that some of the Blusson fund is being used for this," says Mortensen, "because Northern Canada is where he did most of his work." PCIGR is one of the many UBC research facilities where Stewart Blusson's legacy lives on.

PCAMM—Advancing Materials Research

In the revolutionary field of advanced materials, breakthroughs can depend on the thickness of a molecule, or the spin of electrons. To stay competitive, top materials researchers from UBC and SFU pooled expertise and resources to form the Pacific Centre for Advanced Materials and Microstructures (PCAMM).

ADVANCED MATERIALS ARE THE BACKbone of the high-tech industry. While the discovery of new materials can lead to innovative products and processes, transforming them into practical applications involves increasingly sophisticated and costly systems. To meet this challenge, prominent materials researchers from UBC and SFU formed the Pacific Centre for Advanced Materials and Microstructures (PCAMM) in 1995, with initial funding from NSERC through their Major Facilities Access program. The collaboration has paid off. The combined infrastructure has stimulated new research and influenced a growing number of students to do graduate work in this important field. It will also facilitate an already strong collaboration between industry and researchers from both universities. During the past year alone, UBC has created six spin-off companies and SFU has created four.

A major CFI award of $3.2 million, to be matched by the BC Knowledge Development Fund, and capped by funds from the UBC Blusson Fund, Simon Fraser University, and equipment suppliers will provide a sophisticated $8.2-million infrastructure to ensure PCAMM researchers stay at the forefront of their field. A Molecular Beam Epitaxy (MBE) chamber will be installed at UBC, where Tom Tiedje's research group are working on nitride-based semiconductors. MBE is a physical technique for growing high-quality semiconductor crystals. Nitride III-V semiconductors are being developed as an alternative to silicon for high-performance niche applications, including fibre optic communications and the Internet; high-speed, high-powered electronics for wireless base stations; and visible lasers in display technology.

PCAMM researchers Simon Watkins, SFU Physics; Jeff Young, UBC Physics; Tom Tiedje, head, UBC Physics; Karen Kavanagh, SFU Physics; Ross Hill, SFU Chemistry

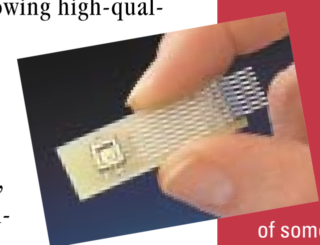
A parallel chemical method for growing crystals, called Metal Organic Chemical Vapour Depositions (MOCVD), is being studied by Simon Watkins' group at SFU. "The crystal quality varies, depending on the technique used," says UBC materials physicist Jeff Young, who heads the PCAMM management committee. "One technique might be better for optics and the other for electronic applications, so we will have the ability to use either method, depending on which is best for specific applications."

In addition to developing new processes, PCAMM will improve existing ones. For example, the manufacture of computer chips involves laminating extremely thin layers of semiconductor material with metals and insulators. State-of-the-art micro-fabrication apparatus will allow physicists, chemists and engineers to characterize, measure and fabricate materials on nano and atomic scales.

The vanguard of advanced materials research requires the best people with the latest equipment. "You might have the greatest material in the world, but if you can't get it to work with other materials, it could be useless," says Young.

"Spintronics"

The secret to the next generation of computer technology could lie in the electron's spin. PCAMM researchers are investigating revolutionary technology, based on hybrid semiconductor/magnetic thin films, which may eventually replace many silicon-based microelectronics. Today's electronic devices use electric current, or electronic charge that flows through wires, and ignores the fact that electrons come in two "flavours"—either "up" or "down." Instead of using the electron's charge, "spintronics" uses the electron's spin to carry information through circuits.



In most devices there is a completely random orientation of up or down spins. By developing materials and processes that allow engineers to control the spin, it may be possible to dramatically increase the speed of some computer functions. As an example, consider the time it takes to boot up Windows 2000. In spintronics, the RAM and the hard drive memory would be integrated; greatly reducing the time spent transferring information between the two sub-units.

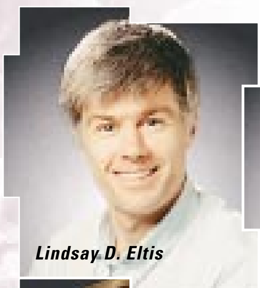
"Spintronics could provide a radical new way of doing electronics," says Jeff Young. He and Tom Tiedje at UBC, and SFU researchers Bret Heinrich, Karen Kavanagh, Mike Thewalt, and Simon Watkins, are pooling their expertise in semiconductors, high-quality metal films, and techniques for studying new physical phenomena in order to develop this new technology. The field is still in its infancy. To work, these structures must be extremely small and smooth. Any imperfections, however minute, could cause the electrons to switch spin polarization. PCAMM's new equipment, including electron microscopes, *in situ* scanning microscopes and laser probes will allow the team to "leapfrog the competition" and go directly to nanostructure devices.

UBC's Science Brain Gain

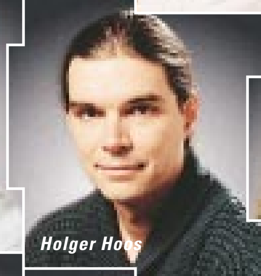
The Faculty of Science welcomes twelve new faculty members with a glimpse into their research and their passions outside of the lab.


Fran Bates


Cristina Conati


Lindsay D. Eltis


Ian Frigaard


Holger Hoos


Maya Kopylova

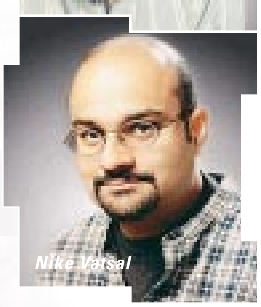

Karon MacLean


Lacey Samuels


Santokh Singh


Nelly Panté


Dave Perrin


Nike Vatsal

Greg Morton, UBC Media Group

FRAN BATES, Instructor, Physics and Astronomy. "I believe the lecture and lab experience should be exciting and relevant. Laboratories should provide students with a 'hands-on' opportunity to explore concepts and develop an appreciation for the experimental method."

CRISTINA CONATI, Computer Science. Research: Artificial Intelligence, User Modeling, Adaptive Systems. "I am interested in computational models of the cognitive, perceptual and affective processes underlying users' performance with complex interactive systems, to make these systems more effective and responsive to users' needs."

LINDSAY D. ELTIS, Microbiology and Immunology. Research: Understanding how bacterial enzymes degrade aromatic compounds and engineering them to degrade environmental pollutants. "When not in the lab, I like to relax by climbing rock faces—the steeper the better."

IAN FRIGAARD, Mathematics and Mechanical Engineering. Research: Applying mathematics to interesting problems, including non-Newtonian fluid mechanics and various industrial processes.

HOLGER HOOS, Computer Science. "I am interested in methods for practically solving computationally hard problems from domains such as bioinformatics, artificial intelligence, and e-commerce. I also work on projects in computer music; otherwise, much of my life is filled with music or spent under water."

MAYA KOPYLOVA, Geological Sciences. Research: Deep rock specimens from the earth's interior. "The Earth's mantle at 100 to 200 km depths can only be studied directly as xenoliths and diamonds sampled by kimberlite magmas. When I'm not at work, I am with my three kids."

KARON MACLEAN, Computer Science. Research: Physical user interfaces. "Computers have opened up new worlds, but tied us to clumsy manual tools that our hands aren't evolved for. I'm trying to put dexterity back into the equation."

LACEY SAMUELS, Botany. Research: Rapid freezing of plant cells preserves sub-cellular structures that have never been observed before. "In cells producing economically important products like wood (lignin), I am using this new information to synthesize models that integrate structure and function."

SANTOKH SINGH, Botany. Research: Physiology and biochemistry of plant hormones and nitrogen recycling. "My work focuses on hormonal regulation of plant growth and development. Watching students become fascinated by plant structure and function is both gratifying and inspiring."

NELLY PANTÉ, Zoology. Research: Nuclear transport. "Almost every cellular process involves transport into or out of the cell nucleus, yet we don't know how this happens. Viruses infiltrate the cell nucleus to propagate infectious diseases, so I use them as probes to unveil the cellular highways for nuclear transport."

DAVE PERRIN, Chemistry. Research: Bioorganic chemistry. "Scientific research requires imagination driven by creativity. When we can't create what we want, we must figure out how to find it. When not in the lab, I'm often in the forest looking for deadly amanita phalloides or the prized boletus edulis, depending on if they're for the lab or the kitchen."

NIKE VATSAL, Mathematics. Research: Number theory. "I've been interested in several things over the years, but always come back to math. In number theory I work with elliptic curves and L-functions, but I also manage to find time to read, write and publish fiction."

UBC Chemists honoured by the Canadian Society for Chemistry

The Canadian Society for Chemistry (CSC) recently honoured six prominent UBC researchers at a celebration of “Milestones of Canadian Chemistry in the 20th Century.” Raymond Andersen, Melvin Comisarow, William Cullen, David Dolphin, Brian James, and Charles McDowell were recognized for their ground-breaking research and inspirational leadership.

Finlay two-time Howard Hughes International Research Scholar

Brett Finlay, professor in the areas of Microbiology and Immunology, the Biotechnology Laboratory, and Molecular Biology was awarded his second Howard Hughes Medical Institute International Research Scholar award for his work in bacterial diseases. Finlay is one of 45 scientists outside of the US to receive the $450,000 award.

New Royal Society of Canada Fellows

Raymond Andersen of Chemistry and Earth and Ocean Sciences, Gordon Slade of Mathematics, and Gordon Semenoff of Physics were recently elected fellows of Royal Society of Canada.

Semenoff wins CRM-CAP Prize

Gordon Semenoff also won the Centre de recherches mathématique” (CRM) and the “Canadian Association of Physicists (CAP) joint prize created to celebrate the 50th anniversary of the CAP and recognize exceptional achievement in theoretical and mathematical physics.

Phillips awarded Fry Medal

John Phillips, professor emeritus of Zoology, has been awarded the Fry Medal by the Canadian Society of Zoologists. The society’s top award recognizes lifetime achievement and contribution to zoology.

Statistician wins gold medal

Statistics head James Zidek received the Statistical Society of Canada’s prestigious 2000 Gold Medal for his work in estimation theory, decision analysis and environmental health statistics, and for his leadership in promoting statistical science.

Hsieh receives top award for global climate research

William Hsieh, joint professor of Earth and Ocean Sciences and Physics and Astronomy received the Canadian Meteorological and Oceanographic Society’s top award, the President’s Prize, for his contributions to global climate research.

Klawe elected ACM vice-president

Dean of Science Maria Klawe has been elected vice-president of the Association for Computing Machinery (ACM). Founded in 1947, the ACM now has more than 80,000 members from 100 countries.

Physicists acknowledged for research and teaching

Physicists Doug Bonn and Philip Stamp win the UBC Izaak Walton Killam Faculty Research Prize for 1999. Doug Bonn is also recipient of the Science Council of BC’s New Frontiers in Research Award for his work in high-temperature superconductors. Physics PhD graduate Colin Borys won the 1999/2000 UBC’s Graduate Teaching Assistant Award.

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