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Faculty of Science

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Illuminating a Cure

Immunologist, mother, professor, and founder, president and CEO of QLT PhotoTherapeutics—one of the top 13 biotech companies in North America—Julia Levy is incredibly modest about her achievements, claiming serendipity and luck to be as much a part of her success as insight and vision.

Scientist and CEO Julia Levy is a Fellow of the Royal Society of Canada, Chair of the Premier's Advisory Council on Science and Technology, and was recently named Canadian Woman Entrepreneur of the Year.

It takes a pretty remarkable skill-set to accomplish what Julia Levy has accomplished. As a leading researcher in photodynamic therapy (PDT), her work has triggered a new generation of light-activated therapies for the treatment of cancer, autoimmune disorders and, most recently, age-related macular degeneration (AMD), a major cause of blindness in the elderly (see p.3). Levy attributes a large part of her success to her 40-year career as a UBC researcher and professor—and her love of working in the lab. "I always made sure I stayed in touch with the technology," says Levy. "This has given me an understanding of the science that is invaluable."

Serendipity and a mother's watchful eye helped to shift the focus of her research from tumour immunology, which had occupied her lab at UBC for over 15 years, to photoimmunology. Levy recounts, with obvious relish, the story of her children coming in from play at their summer home on Sonora Island with burns on their skin. "I knew it must have been from a plant, but I didn't correlate it with sunshine."

With the help of colleague Neil Towers, a plant biochemist at UBC, she confirmed the culprit as cow parsley, which causes burns to the skin if its secretions are exposed to sunlight. Until then, Levy had been working on immunotoxins, in which a poisonous substance is attached to antibodies in order to target and treat cancer. After the cow parsley discovery, Levy decided to try hooking photosensitizers onto the antibodies, which eventually lead to her research in PDT.

"I realized that these antibodies needed to be commercialized if they were going to be useful in treating disease," says Levy. In the early '80s, however, there was virtually no biotech industry in Canada, and universities had no industry liaison to assist researchers in developing and commercializing biotech discoveries. In 1981, when some of her associates asked if she wanted to help found a new biotech company—initially called Quadra Logic—Levy agreed.

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Botany
Microbiology & Immunology
Zoology

Mathematics & Information Sciences
Computer Science
Mathematics
Statistics

Physical Sciences
Chemistry
Earth & Ocean Sciences
Physics & Astronomy

Biotechnology Lab

Integrated Science—New Models for Learning

"ISCI encourages exploration and group interaction. It has also really boosted my ability to speak up in class."

"In other courses you get tonnes of information and then don't remember what you did. In this one, I will remember how Mammoth works."

—ISCI students

HIDDEN AWAY ON CAMpus, in a small room with three windows and four computers, something exciting was happening. Twenty-four students, most with no background in programming or artificial intelligence, were building walking robots.

They lumbered, they slipped, scuttled, two-stepped, six-stepped—and sometimes didn't budge. But the robots created by the students in Integrated Science (ISCI) course 333 were not merely acting on remote control, they were reacting to their environment. (See sidebar.)

The philosophy behind UBC's newly created Integrated Science program is inquiry-based, motivational, and goal-seeking. "We wanted a different kind of program," says Alan Mackworth, ISCI 333 instructor and director of the Laboratory for Computational Intelligence. "Something that actually provided a variety of skills in science, collaboration, teamwork, and communication." Since most science undergrads don't go on to adopt science as a career, ISCI was in part designed to provide them with conceptual skill-sets needed to be successful in any career path.

Zoologist John Gosline, director of the Integrated Science program, notes that it is an offshoot of the popular Science One and Co-ordinated Science programs established by Jülyet Benbasat, associate dean of Curriculum Development, and championed by George Spiegelman, professor in Microbiology, who chaired the committee to initiate the program. The mandate is to provide an interdisciplinary, integrated degree option for third- and fourth-year students.

"The program is incredibly challenging, primarily because students are in an environment where there are no safety nets," says John Steeves, neuroscience professor and director of CORD (Collaboration on Repair Discoveries). Steeves is co-instructor of ISCI 333—Biological and Artificial Control Systems—along with Gordon Hiebert of the CORD research group, and Alan Mackworth. Since there are no set textbooks, no hard and cold facts to disseminate, no rote exams, and an interactive learning environment, it is also very challenging for the professors.

"We are really integrating on the fly," says Gosline. "For us it is not just a change in topic, but a whole change in the way we teach. We must create a scenario where the students are going to do something and get something out of it, without telling them what that is."

The application process to ISCI is also formidable. Students must provide a history of course-work completed, write an essay on their education goals, outline the courses that they will complete in order to meet their goals (which actually becomes a signed contract with their advisors), set out their course plans and schedule their own timetables. Since they are taking courses from many departments, this is not an easy task.

However daunting, this process didn't dampen enthusiasm for the program. Most of the undergrads in ISCI heard about it by word of mouth. There were 50 students in Integrated Science's inaugural year and five will be graduating this summer—before the course was ever printed in the calendar.

Photo: ISCI / Peter Gorniak

Students from ISCI 133, Biological and Artificial Control Systems, assemble a walking robot as instructors look on. Other ISCI courses include :* The Size of Things, Measurement and Instrumentation*, and an upcoming field course,* Exploration of Land, Sea and Sky*.

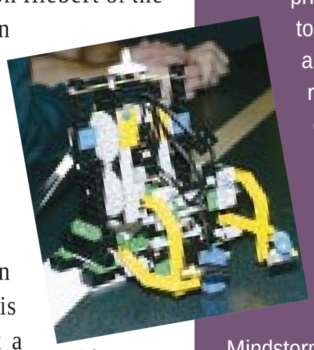


Photo: ISCI / Peter Gorniak

Building a Walking Robot

One of the first things the students in ISCI 333 were asked to ponder was: how does an outstretched arm hold up a weight? "Instead of talking about dynamic and equilibrium control systems, they first talked about the bones and muscle," notes Peter Gorniak, a masters student in artificial intelligence and a teaching assistant for the course. Nevertheless, these control principles were what students had to grasp before they could identify and solve the problem of building a robot that walks on legs (as opposed to moving on wheels), traverses a path (white line), navigates around obstacles, and finds its way back onto the path again.

Each group of six students had the same tools, a Lego Mindstorms® kit—an interactive remote computer that controls user-defined Lego parts, motor, and sensors that run according to programs developed by the user on a PC. The variety of solutions—and robots—was a testament to the course's success. While one robot used a rudder-like device to manoeuvre, another used the natural tendency of the mechanism to turn in one direction. A two-legged robot had interlocking feet for stability. One robot relied on surface friction for movement, another was impeded by it. While two groups of six students managed to meet the most difficult challenge—building a two-legged robot—all groups showed a level of ingenuity, creativity and collaboration that would have made any research scientist proud.

Top Administrators Will Be Missed

Photos: UBC BioMedCom / Greg Morton

WHILE UBC'S FACULTY OF SCIENCE RESEARCHERS MAKE the headlines, it is the administrators behind the scenes who make sure the books are balanced, schedules kept, and graduation requirements met. Two key people will be leaving the Faculty this year. The word "retirement," however, is foreign to both David Holm and Maureen Douglas.

As associate dean of Student Services, David Holm will be leaving a thirty-year legacy of teaching, research and administration within the Faculty of Science. He introduced and ran the Cell Biology 200 course, which became a prerequisite for all the life-science programs. He also chaired the Faculty's Biology Program and the Campus Advisory Board on Student Development. While Holm's career has been focused on students, Maureen Douglas has spent the past sixteen years assisting the Deans of Science—all seven of them. She began her career with the Faculty as a research associate in Zoology in 1959 and moved into administration, as a Clerk 1, in 1977. Both Holm and Douglas plan to keep busy. Holm might volunteer as a student advisor and Douglas would like to travel, investigate her genealogy, and perhaps write a book—on the history of UBC.

Julia Levy*; cont'd. from p. 1*

It was in the mid-80s, when Levy met UBC porphyrin chemist David Dolphin, that her work in PDT got underway in earnest. Porphyrins are a component of haemoglobin, which carries oxygen to the blood. Isolated porphyrins can absorb energy from photons and transfer it to surrounding oxygen molecules, forming toxic "singlet oxygen" that destroys targeted cells. Dolphin's specialty was custom-designing porphyrin molecules, and by the late '80s, he and Levy had identified verteporfin as an ideal photosensitizer.

Levy and Dolphin also discovered that this "green stuff" didn't need antibodies to target the cells. The molecule attaches to lipoproteins, which are found in high concentrations in cells undergoing rapid growth, such as cancer cells and cells that form abnormal blood vessels. Photosensitizers target these diseased cells and are then activated by a light source. This makes PDT highly specific and non-invasive.

The problem with marketing PDT as a cancer therapy, says Levy, is that it is not really an oncology product. "It is a procedure carried out by specialists, so every body part requires a separate sales force." Also, PDT is so effective at eradicating primary tumours that it makes follow-up difficult—an essential part of treatment to ensure the cancer doesn't spread. Nevertheless, Levy is very excited about PDT, especially as a therapy for AMD and the pre-cancerous condition of Barrett's esophagus (now in phase III clinical trials), as well as non-melanoma skin cancer. In conjunction with QLT, her lab at UBC is also undertaking phase I trials for PDT as a treatment for autoimmune conditions such as psoriasis and rheumatoid arthritis.

As a trailblazer who brought basic science out of the lab and into the boardroom, Levy shares her experience by sitting on boards of other start-up companies. Her skills as a researcher and CEO have earned her the respect of colleagues, staff, and industry. Photodynamic is an apt adjective to apply to Levy, her work and her company. Collectively, they are the beacon that guided BC's biotechnology community into the global arena.

Visudyne™ — Let There Be Sight

"Visudyne was developed at UBC," says Julia Levy, president and CEO of QLT PhotoTherapeutics. "It resulted from work that David Dolphin and I did ten years ago on an NSERC strategic grant."

Again, serendipity played a part in the research and development of this second-generation drug, which has fewer side effects than Photofrin®, QLT's first drug approved for photodynamic therapy. Levy had never heard of age-related macular degeneration (AMD) until her mother was diagnosed with the disease. "From my mother's experience, we realized that there was no treatment," says Levy. Now PDT is poised to become the treatment of choice for the 500,000 people per year who suffer from AMD, the leading cause of blindness in people over 50. With the successful completion of Phase III trials using verteporfin (trademarked Visudyne™), QLT and partner CIBA Vision have a potential blockbuster drug.

Levy attributes the company's success to tenacity, low turnover and a great employee option plan. "And a belief that we could do it," adds Levy. "We're going to get there." Confidence begets confidence. The company just completed another $200-million public offering and TSE stock prices have soared to $70 from $17.

The Mystery of Anti-Matter

Subatomic physicists such as Janis McKenna form an inquisitive group of scientists who ask the most fundamental questions about the nature of the universe and the forces that govern and shape it.

Background composite: SLAC

SCIENTISTS STILL HAVE NO GRAND UNIFIED THEORY THAT DESCRIBES THE interactions of all the known forces in the universe. The most comprehensive, called the Standard Model of Electroweak Interactions, is the closest they've come, according to Janis McKenna, UBC Physics and Astronomy associate professor . The Standard Model unites the weak and electromagnetic forces, but does not account for gravity. So far, with hundreds of thousands of observed interactions, physicists have found nothing to contradict the Standard Model, which has incredible predictive power. However, there is still much work to be done to test the theory, and possibly expand upon it to include gravity.

McKenna and a select international group of researchers are testing the Standard Model at various particle accelerators around the world. As a result, McKenna spends a lot of time on the road; between her teaching and research at UBC, and her research conducted at particle accelerators in Stanford, California and Geneva, Switzerland, her slate is very full.

Often, new technologies must be developed before new experiments are possible. For example, at the LEP collider in Geneva, a 27-kilometre loop of electromagnets that accelerates particles at the highest energy ever achieved in an electron-positron collider, scientists are performing stringent high precision tests of the Standard Model, and are searching for new physics, with the possibility of discovering particles that have never been seen before.

Physicist Janis McKenna was recently given the Charles McDowell Medal for Excellence and Promise in Research. She is one of nine Canadian faculty members involved in a major international inquiry into how the forces of the universe work at their most minute level.

One of the fundamental questions nagging physicists today is: where has all the anti-matter gone? Most Big-Bang theories suggest the universe began with equal parts of matter and anti-matter. Yet, everywhere scientists look, there is matter, but no evidence of places in the universe that are mainly anti-matter.

A rare phenomenon called CP (charge parity) violation—that permits decays in which there is matter-anti-matter asymmetry—could explain the situation and fit within the Standard Model. The CP violation process has been observed and measured in rare decays of neutral kaons, and despite all the painstaking high-precision experiments performed on the neutral kaon system, physicists still have no single indisputable origin for this phenomenon. However, a major new experiment at the Stanford Linear Accelerator Centre (SLAC) is being conducted to shed new light on the CP violating process. (See sidebar.)

As part of an international research team, McKenna is hoping to find evidence of CP violation, but there are no guarantees. "There are a lot of good reasons to expect to see CP violations," said McKenna. "But if we don't, that would also be extremely interesting. It could be evidence for new physics—perhaps even a new force of nature."

Cutting no SLAC

This spring, at the Stanford Linear Accelerator Centre (SLAC), a new experiment began that could help to solve the riddle of the huge matter-anti-matter asymmetry of the universe.

McKenna and the current UBC team (two graduate students, a postdoctoral research associate, and a scientist from the Institute of Particle Physics Canada) are among some 500 scientists from around the world involved in the ten-year experiment that should lead to a new understanding of the CP violating process.

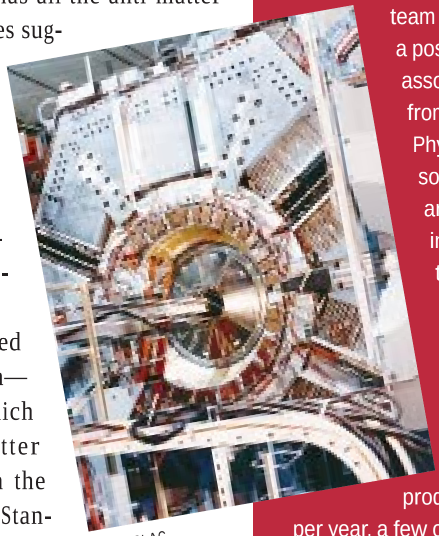


Photo:SLAC

The SLAC facility has just undergone a major engineering effort to enable it to produce 30 billion B mesons per year, a few of which are expected to exhibit the rare phenomenon of CP violation as they decay.

Canada's major role in the experiment is the design, construction and operation of a drift chamber, one of several specialized detectors designed to capture information about events occurring at subatomic levels. In this huge project, tasks may be broken down into thousands of smaller jobs involving not just physics, but also electronics, engineering and software. The devices needed at the leading edge of particle physics don't exist off the shelf, says McKenna. "We have to invent our own tools and technologies to investigate new and unexplored territory."

Ubiquitous Enigma of Marine Viruses

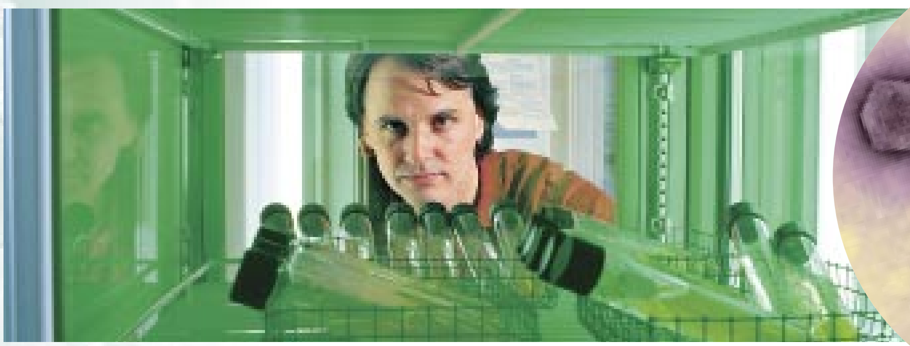
Until ten years ago, scientists were unaware of the profusion of viruses in the world's oceans. Marine virologist Curtis Suttle and his UBC research team have recently received major funding from the Canadian Foundation for Innovation (CFI) to study the effect these perplexing viruses have on organisms and ecosystems.

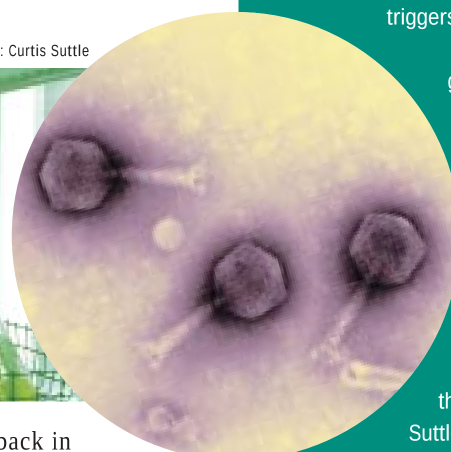
WHEN WE STEP INTO THE OCEAN, OR GAZE OUT over a seaside vista, most of us are unaware that every teaspoonful of sea water contains 10 to 100 million viruses. Scientists know that bacteria, by weight, represent 70 percent of the marine biomass—or all living material in the oceans. Yet by numbers marine viruses are about ten times more abundant than bacteria. Microbiologist and oceanographer Curtis Suttle is trying to discover why these viruses exist in such profusion and what role they play in the marine and global ecosystems. "If you consider that approximately half of all organisms that make up most of the marine biomass are killed every few days by viruses, then how does this fit into the global picture, in relation to global warming for example?"

So far, Suttle's research indicates that viruses play a considerable role—both as destructive pathogens and natural control mechanisms. Marine viruses survive by infecting and killing other organisms, including heterotrophic bacteria, (which live on carbon that has already been photosynthetically fixed), and phytoplankton. Since photosynthetic organisms such as phytoplankton are the base of the food chain in the world's oceans, they are considered the "grass of the sea." The relative amount of carbon they produce to feed marine ecosystems is as substantia—and crucial—as the oxygen produced by all the plants on land.

While viruses can prevent the formation of organic carbon, they can also prevent carbon that has already formed from sinking and becoming lost in the ocean's sediment. Their effect on global geochemical cycles is part of the big picture that Suttle and research scientist Amy Chan (also his spouse) have been trying to piece together for over ten years—eight of which were at the University of Texas at Austin.

Virus photo: Curtis Suttle





An alumnus of UBC, Suttle is happy to be back in Canada, where he says the work of excellent graduate students is key to his research team's success. Among the other phenomena they are studying is the effect viruses have on populations of individual organisms. His lab has recently isolated a virus from BC's coastal waters that infects *Heterosigma*, an algae toxic to fish and a real problem for aquaculture. *Heterosigma* blooms prefer warm water, low salinity and calm weather. Viruses also need certain conditions before they can attach to the surface of an organism. The question is: does the physical environment change in order to allow the algae to bloom, or does it change so that the virus can't infect them? Suttle argues the latter and believes that understanding marine viruses can provide scientists with a different way to look at these problems.

Whether you consider them villains or agents of biodiversity, some marine viruses appear to have few close relatives, so the potential for new discoveries is substantial. Just the challenge for a research scientist who likes to surf in uncharted waters.

"I have always gone after questions I thought were important instead of being tied to one discipline," says Curtis Suttle, head of UBC's Molecular Marine Microbiology and Virology Lab, and associate professor of Earth & Ocean Sciences, Botany, and Microbiology and Immunology.

How Viruses Make a Living

At the level of microbiology, viruses are genetic tricksters, albeit sloppy ones. Some are able to hide in their hosts, integrate their DNA with the host's DNA and remain dormant until a reaction triggers their replication. However, they are not great at removing their DNA without taking some of the host's genetic information with them. So a virus can infect another organism with its own DNA as well as residual genetic material from the former host. For Suttle, this trait has exciting possibilities.

"That's where the field of molecular biology began, shunting genes around with a virus called *lambda*. One of the things we want to study with the CFI funding is the possibility of finding an equivalent of *lambda* for eukaryotes, which may provide a means to move genes around in more complicated life forms than bacteria."

Marine viruses are also extremely sensitive to UV radiation. Since they have no way to repair their own damaged DNA, they inject it into the host, which uses a light-activated enzyme called photolyase to repair the DNA, thinking it is its own. Then the virus becomes infectious and kills the host. "It turns out that most viruses in the ocean make a living that way," says Suttle.

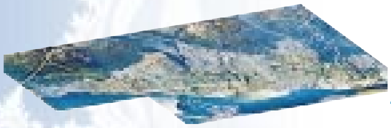
New Technologies for Old Problems

Despite his soft-spoken, casual manner, Jack Snoeyink conveys considerable passion for his chosen areas of study, computational geometry and basic computer science theory.

"I'M PROBABLY A DIFFICULT PERSON TO WRITE about," says Computer Science Associate Professor Jack Snoeyink. "My motivations are fairly abstract." In spite of this, concrete solutions—and even sculpture—have emerged from his work.

He likes using the latest technology to look at old problems—especially three-dimensional mathematical problems—in new ways. One of Snoeyink's favourite examples is the design and construction of a large metal tube structure, the result of a mathematical theorem about the difficulty of three-dimensional geometric assembly problems. This abstract puzzle led to at least two concrete results: a dramatic sculpture for the Computer Science building atrium, and a way to speed up algorithms.

As a mathematician and computer scientist, Snoeyink has always been interested in problems he can represent visually. He rarely talks about his work without the aid of pictures or graphics. He draws on several images and demos to describe the work he and PhD student Mike McAllister are doing for Facet Decision Systems, a local developer of geographic information systems. One of the goals of this work is to define the province's watershed boundaries, a critical task for the management of natural resources. The data currently available is detailed for the terrain along BC's rivers, but sketchy along the boundaries of the water-sheds.



Aerial photo: Selkirk Remote Sensing Ltd.

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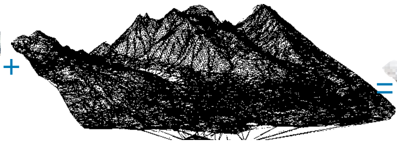

Data: Facet Decision Systems

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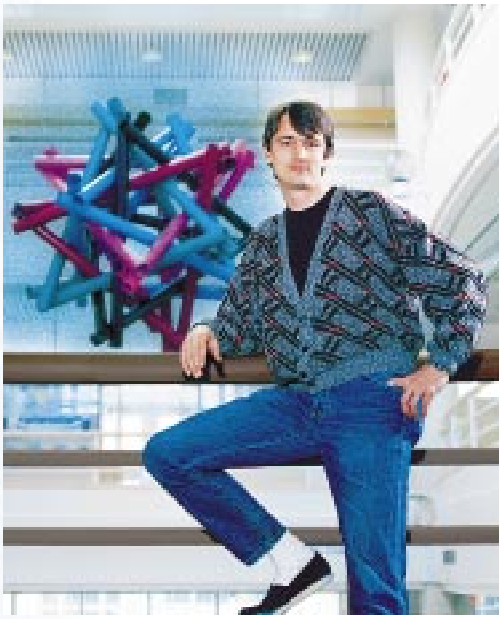
Composite image: James Slack and Shinjiro Sueda

While the applications of his work—including solid modelling, CAD/CAM, computer graphics, geographic information systems (GIS) and robotics—are all quite concrete, Snoeyink is just as happy in the world of basic mathematics and abstract theory.

Snoeyink's goal is to use the data available to define watershed boundaries as closely as possible, without overlap and without leaving out any areas. "If you want consistency, you have to look at the geometric structure." He is developing a mathematical model to incorporate all sources of data, encode it, and extract boundaries that are an improvement over the current system.

"I'm always trying to get the most amount of information for the least amount of resources," says Snoeyink. He has found that by stating spatial problems as abstract geometry problems, lessons learned in one domain apply to others, a discovery that appeals to his love of efficiency. One example of this is how a solid-model algorithm for converting polygon boundaries led Snoeyink to a new implementation of line simplification for cartography. His system depicts elevation data as realistic-looking pictures of jagged mountains, rather than presenting elevation gains as an orderly series of steps.



UBC Computer Science Associate Professor Jack Snoeyink was recently awarded a Killam Research prize for his contributions to new understanding in computational geometry and basic computer science theory.

Because his work is so visually oriented, Snoeyink has become involved in using and optimizing the latest technology to present and disseminate the results of his work. He is exploring new ways to send visual data over the Internet, as well as working on video and experimenting with virtual reality to better communicate his results. As the world becomes increasingly visual, and computing resources increase to the point where communicating in three and four dimension becomes commonplace, Snoeyink will feel more and more at home.

Snoeyink and the NCEs

UBC has a presence in all 14 of the national Networks of Centres of Excellence (NCE), thanks in part to the work of Jack Snoeyink, who is participating in three NCEs.

Snoeyink has been involved in the Institute for Robotics and Intelligent Systems (IRIS) for the past five years, and also plans to take part in two new networks that are just starting, Mathematics of Information Technology and Complex Systems (MITACS) and Geomatics for Informed Decisions (GEOID).

For GEOID, Snoeyink is co-leading a portion of the project to look at dynamic spatial data as applied to GIS systems, with Chris Gold from Laval University. The team will be working with the Canadian Hydrographic Service on ways to optimally represent changing data.

While the mapping of dynamic marine environments has a practical side, there is enough mathematical challenge to interest Snoeyink. "There are a lot of questions of scale, rate of change, how to get data in and out. Usually new data simply replaces old data, but it would be better if one informed the other. That's a long way off."

UBC's Strong Force

UBC physics grad students sit on most of the University's governing bodies, compete in marathons and triathlons, and get involved in student demonstrations and educational outreach. As with the particles that many of them study, one could pose the question: what makes them so active—or interactive?

REMEMBER THE STEREOTYPE OF THE PHYSICS STUDENT—LIVING IN THE LAB, ISOLATED AND alone, eyes strained over equations and shoulders hunched over equipment? UBC's physics grad students are quickly dispelling that myth. Vighen Pacradouni, a PhD student in opto-electronics, is also a member of the UBC Senate, the Campus Advisory Board on Student Development, a director (and past-president) of the Graduate Student Society (GSS), and an avid hockey and soccer player. He thinks it is partly the need to break out of that very mold that gets physics students involved in other activities.

Lab-mate Murray McCutcheon, a Rhodes scholar and triathlon competitor, says it goes beyond the need for connection and community. "Physics isn't easy, and in order to do it you have to be prepared to work hard. I think that people in physics are just motivated in a lot of different ways."

Physics students (clockwise from top) Murray McCutcheon, Elana Brief, Vighen Pacradouni, Michael Hughes, and Jamie Pond.

McCutcheon will be taking a break from the grind of optical absorption measurements to study politics, philosophy and economics at Oxford. "One of the frustrating things about doing physics is that there is really no time for anything else, especially in the humanities and other areas I am interested in," he admits. "This is the perfect opportunity to broaden myself. There is lots of time for a PhD later if that's what I choose." For McCutcheon, the possibility of competing in Europe's high-profile triathlon events is also "part of the equation." As a member of the Canadian National Triathlon team, and third place winner out of 400 in a recent Victoria event, his chances are pretty good.

Jamie Pond, a PhD student in condensed matter physics, and Michael Hughes, a PhD student in laser and plasma physics, met in the President's office—protesting an increase in international student fees. The profile they achieved in bringing student fee issues to the attention of the student body, the media and the community helped to get each of them elected to the University's Board of Governors. In addition, Pond is vice-president and Hughes is director (and past-president) of UBC's Student Legal Fund. They are also members of student groups involved in the APEC inquiry.

Hughes received the Ubyssey Community Contribution Award, which is administered by a committee comprised of UBC faculty, administration and students, for his responsible activism and leadership. Both Pond and Hughes also run marathons and are gearing up for the Vancouver International Marathon to be held in May. Pond placed first in the men's 20-24 category of last year's event.

Commitment to research and educational outreach keeps Elana Brief running. A PhD student in biophysics, Brief uses magnetic resonance spectroscopy (MRS), a non-invasive form of measurement, to study concentrations of chemicals in the brain. She will be joining an elite community of scientists using MRS to study multiple sclerosis, a disease which affects the part of the neuron called the myelin sheath.

Brief's enthusiasm is also evident in teaching and community work. She is a recipient of the UBC President's Graduate Teaching Award, and for the past two years has been UBC's co-ordinator for Let's Talk Science, a national outreach initiative geared to elementary school students and teachers. By collaborating with a local grassroots organization called Parents for Science, Brief was able to pair up over 60 grad students with grade-school teachers in the Vancouver School Board. This year, she helped to secure funding from the Faculties of Science, Medicine, Forestry, and the President's Office for the Let's Talk Science program.

Brief also has a theory about why she and her fellow physics students are so active in the community. "I feel incredibly privileged to study physics and be able to ask big questions and design ways to try and get the answers. Getting involved with education and the community is a way to share these skills and add balance to my life."

Photo: Al Schmalz

Off the Wall

The Physics team (from top, Michael Mitton, Paul Paddon, Michael Hughes, Jamie Pond and Murray McCutcheon) took this year's UBC intramurals literally by storm, winning the Storm the Wall event for the second time in three years.

Bonn Awarded NSERC Steacie Fellowship

UBC physicist Doug Bonn received the 1999 NSERC Steacie Fellowship. The $180,000 award acknowledges Bonn as a leading international researcher in high temperature superconductivity, with his work on how electrons of these exotic metals respond to microwave and infrared radiation.

Three UBC Physics Students Win CAP Prize

Yaroslav Tserkorvnyak, Michael Forbes and Trevor Lanting placed first, third and fifth, respectively, in the top ten students to win this year's Canadian Association of Physicists University Prize Exam.

Math Scholar Wins Prestigious Sloan Prize

Jingyi Chen, assistant professor of Mathematics, is one of only two Canadian university scientists to receive the Alfred P. Sloan Research Fellowship in 1999. The award of US $35,000 honours young scientists who "show the most outstanding promise of making fundamental contributions to new knowledge." Chen is recognized for his research in differential geometry and geometric analysis, particularly the structure of curved spaces.

Smith and Levy Receive BC Biotechnology Awards

Michael Smith, Nobel Laureate and director of the Genome Sequence Centre at UBC, and Julia Levy, former UBC professor and now president and CEO of QLT PhotoTherapeutics, were honoured at the BC Biotechnology Alliance's first annual awards, which recognize scientific achievement, leadership and community development in the BC biotech community.

Finlay Receives Steacie Prize

For the second year in a row, a UBC researcher in the Biotechnology Lab has won the Steacie Prize. Brett Finlay, who holds a joint professorship in the Biotechnology Lab, Biochemistry and Molecular Biology, and Microbiology and Immunology, received the $10,000 award for his research into new methods of treating bacterial diseases such as salmonella and E.coli.

Zoology Post-doctoral Fellow wins NSERC Doctoral Prize

Troy Day, a post-doctoral fellow in zoology at UBC has recently won the $5,000 NSERC Doctoral Prize and silver medal for his interdisciplinary approach to the study of issues in evolutionary biology.

MITACS Receives Major Federal Funding

The Mathematics of Information Technology and Complex Systems (MITACS), a new Network Centres of Excellence (NCE) will receive $14.5 million over four years, to enable 175 researchers at 22 Canadian universities to develop new mathematical tools for Canadian Industry. Researchers at UBC are pivotal to this collaboration. Sixteen members of UBC's Mathematics Department are involved in industrial projects, including pharmaceuticals, fuel cell development and financial risk management.

Ng Elected Fellow of American Physical Society

Physics and Astronomy Prof. Andrew Ng has been elected a fellow of the American Physical Society, an organization of 40,000 physicists worldwide dedicated to advancing the knowledge of physics.

Did you know…

For the past 15 years, at least two students from UBC have finished in the top 200 out of 2,500 students in North America in the gruelling six-hour Putnam undergraduate mathematics competition.

This year, Lawrence Tang, Jesse Goodman and O-Yeat Chan captured this honour.

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