2009 ANNUAL REPORT
PETER WALL INSTITUTE FOR ADVANCED STUDIES

COMMUNITY EXCELLENCE IMPORTANCE
INNOVATION INTERDISCIPLINARITY KNOWLEDGE
POTENTIAL PROGRESS SIGNIFICANCE
UNIQUE

Where Converging Minds Freely Explore.

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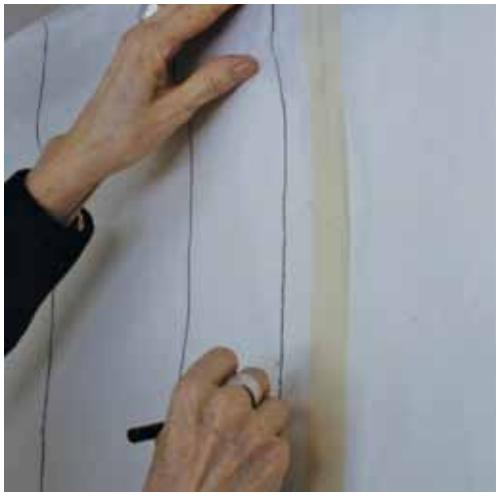


Charlotte Wall,
Boardroom Art
Installation,
e-loo'me-nem
Al + Na3 (AlF6)

Dianne Newell
Director
Peter Wall Institute

It is, as always, a joy to be part of these developments, collaborations, and connections, and especially to be so intimately connected to a place so "rare in the world."

Institutes modeled on the Institute for Advanced Study at Princeton and devoted to facilitating open and innovative thinking and research at the highest levels, free of the necessity of immediate results, are rare in the world. Most of them focus their programs and funding around visiting scholars and concentrate on specific research fields. What is unusual about the Peter Wall Institute is its multifaceted capacity to concurrently develop and nurture a strong core of UBC scholars; to encourage and facilitate international collaborations and visits from distinguished visiting scholars; and to promote basic, interdisciplinary research for scholars in all fields. The Institute's established programs and current strategic directions reflect this unique combination of talents.

The year 2009 was one in which many of the Institute's plans and projects came to fruition. In particular, our new initiative to partner with international institutes has begun to broaden our impact internationally and benefit our UBC Faculty Associates. We welcomed Patrick Dewilde, Director, and two senior administrators of our latest partner, the Technical University of Munich – Institute for Advanced Study, to the Wall Institute in September. Five distinguished faculty exchanges between senior Faculty Associates of the Institute and distinguished scholars at partner institutes were arranged this year, and a Wall Colloquium Abroad took place in South Africa in November, co-hosted by our partner the Stellenbosch Institute for Advanced Study.

At UBC, our new agreement with the Cecil H. and Ida Green Visiting Professorships Program at Green College generated several outstanding interdisciplinary speakers for the Institute's Colloquia

program. Our arrangement with the Institute for Computing, Information, and Cognitive Systems not only raised the profile of our programs in the University, it led to the co-funding of specific scholars and workshops at the Institute. Positive changes occurred with two core residential programs in 2009. The Distinguished Scholar in Residence cohort increased from four appointments to six, and these researchers now have a dedicated area in which to work and meet. On another front, at the suggestion of past cohorts of Early Career Scholars, we have moved to the model of a single, integrated cohort of associate and assistant professors with its augmented research contact benefits.

Vibrant exchanges of ideas and researchers are acutely evident this year in the Peter Wall Distinguished Visiting Professor and Major Thematic Grant programs. The month-long visit of Professor Alain Berthoz of the Collège de France, one of our partner institutes, established many cross-disciplinary discussions and future collaborations. Thus we will be able to hold the 2010 Wall MTG Sensorimotor Computation workshop, "The Control of Gaze," at the Collège in Paris. This MTG project, and a new one, on Ultracold Coherent Chemistry, attracted Canada Foundation for Innovation grants, accomplished significant research and technical breakthroughs, and expanded research collaborations at UBC and abroad. Several promising new MTG applications are in various stages of preparation, and two Distinguished Visiting Professors have been appointed for 2010.

Much of what I highlight here and in the following pages was enabled by the exciting changes to the Institute's facilities and technical capabilities at the start of the year. The completion of our major renovation project created a separate, imposing glass entrance and new administrative, research, and distinguished visitor areas in the East Wing and produced significant upgrades to our Scholars and Conference areas. We worked with consultants in 2009 to develop publicity materials—creating our first true PWIAS logo, a new website, brochure, and mobile banner, and exterior signage for the Institute. The audio podcasts of our major talks, which are featured on our new website, have become a dominant presence on UBC on iTunes U, the University's central repository of audio and visual media. These initiatives of ours increase the Institute's visibility internationally and acknowledge our leadership at UBC in research innovation.

It is impossible to imagine how any of this would have been accomplished had it not been for the commitment of our Faculty Associates and distinguished visitors, award committees, Board of Trustees, and talented and dedicated staff, and support from members of the Wall family. Peter Wall's original gift of Wall Financial Corporation shares provides considerable ongoing income to the Institute; our new Institute direction sign on Marine Drive signals our appreciation for his gift and his vision. We also give special thanks to Charlotte Wall, for creating and donating in 2009 a site-specific and inspiring art installation for the Institute's boardroom to illustrate the process of research.

It is, as always, a joy to be part of these developments, collaborations, and connections, and especially to be so intimately connected to a place so "rare in the world."

Dinesh Pai with Patrick Dewilde, Technical University of Munich–IAS

RESIDENTIAL PROGRAMS

Residential programs are people-based programs whereby excellent researchers are invited to be in residence (of varying intensities) with others chosen on the same basis. These programs are deliberately non-thematic. There is no attempt to choose people based on disciplinary background, and while there are very specific activities intended to bring people together, there is no specific joint end-product that is expected.

PETER WALL DISTINGUISHED PROFESSOR

The Peter Wall Distinguished Professor is a unique appointment directed at attracting or retaining a world-class scholar. This scholar can be expected to have a major impact on broad areas of research work at UBC. The endowed chair provides salary support for a five-year term, renewable without limit.

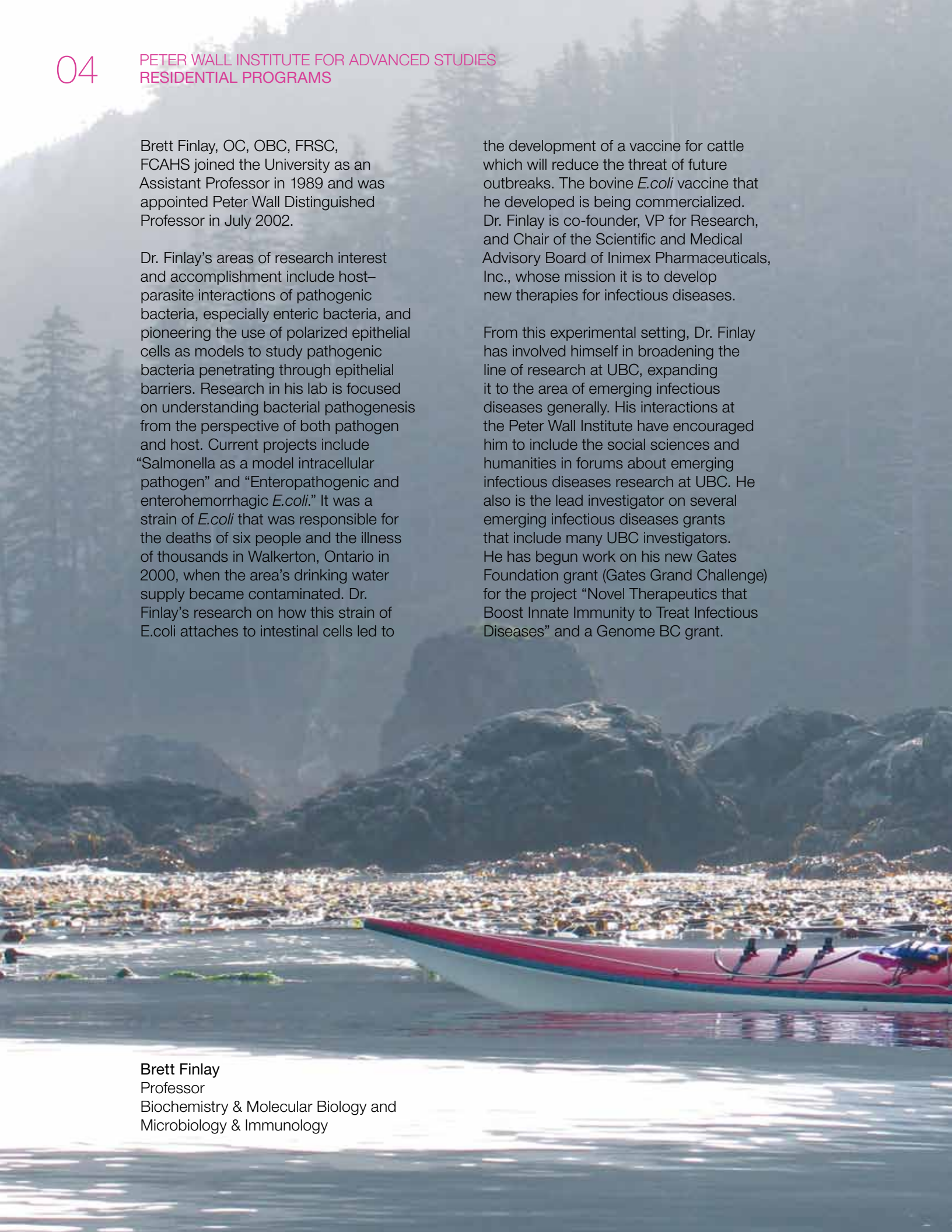
The Peter Wall Distinguished Professorship launched the programs of the Institute. It was established in 1994, originally as two endowed chairs, held by Dr. Raphael Amit, Sauder School of Business, and the late Dr. Michael Smith, Biochemistry and Molecular Biology, and Nobel Laureate in Chemistry.

In July 2002, UBC President Martha Piper appointed Dr. Brett Finlay as the new Peter Wall Distinguished Professor; his appointment was renewed in 2007.

Brett Finlay, OC, OBC, FRSC, FCAHS joined the University as an Assistant Professor in 1989 and was appointed Peter Wall Distinguished Professor in July 2002.

Dr. Finlay's areas of research interest and accomplishment include host–parasite interactions of pathogenic bacteria, especially enteric bacteria, and pioneering the use of polarized epithelial cells as models to study pathogenic bacteria penetrating through epithelial barriers. Research in his lab is focused on understanding bacterial pathogenesis from the perspective of both pathogen and host. Current projects include "Salmonella as a model intracellular pathogen" and "Enteropathogenic and enterohemorrhagic *E.coli*." It was a strain of *E.coli* that was responsible for the deaths of six people and the illness of thousands in Walkerton, Ontario in 2000, when the area's drinking water supply became contaminated. Dr. Finlay's research on how this strain of E.coli attaches to intestinal cells led to the development of a vaccine for cattle which will reduce the threat of future outbreaks. The bovine *E.coli* vaccine that he developed is being commercialized. Dr. Finlay is co-founder, VP for Research, and Chair of the Scientific and Medical Advisory Board of Inimex Pharmaceuticals, Inc., whose mission it is to develop new therapies for infectious diseases.

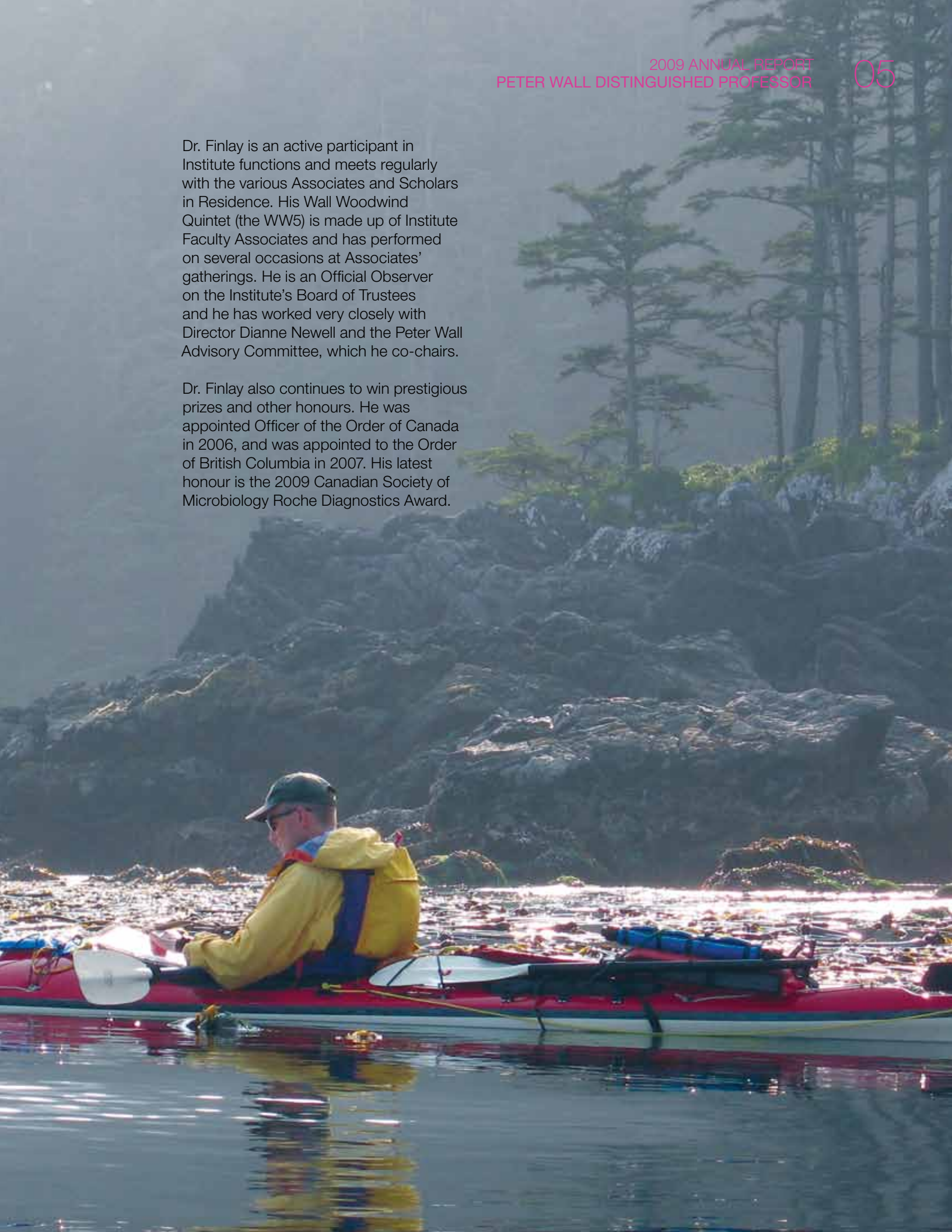
From this experimental setting, Dr. Finlay has involved himself in broadening the line of research at UBC, expanding it to the area of emerging infectious diseases generally. His interactions at the Peter Wall Institute have encouraged him to include the social sciences and humanities in forums about emerging infectious diseases research at UBC. He also is the lead investigator on several emerging infectious diseases grants that include many UBC investigators. He has begun work on his new Gates Foundation grant (Gates Grand Challenge) for the project "Novel Therapeutics that Boost Innate Immunity to Treat Infectious Diseases" and a Genome BC grant.



Brett Finlay
Professor
Biochemistry & Molecular Biology and
Microbiology & Immunology

Dr. Finlay is an active participant in Institute functions and meets regularly with the various Associates and Scholars in Residence. His Wall Woodwind Quintet (the WW5) is made up of Institute Faculty Associates and has performed on several occasions at Associates' gatherings. He is an Official Observer on the Institute's Board of Trustees and he has worked very closely with Director Dianne Newell and the Peter Wall Advisory Committee, which he co-chairs.

Dr. Finlay also continues to win prestigious prizes and other honours. He was appointed Officer of the Order of Canada in 2006, and was appointed to the Order of British Columbia in 2007. His latest honour is the 2009 Canadian Society of Microbiology Roche Diagnostics Award.



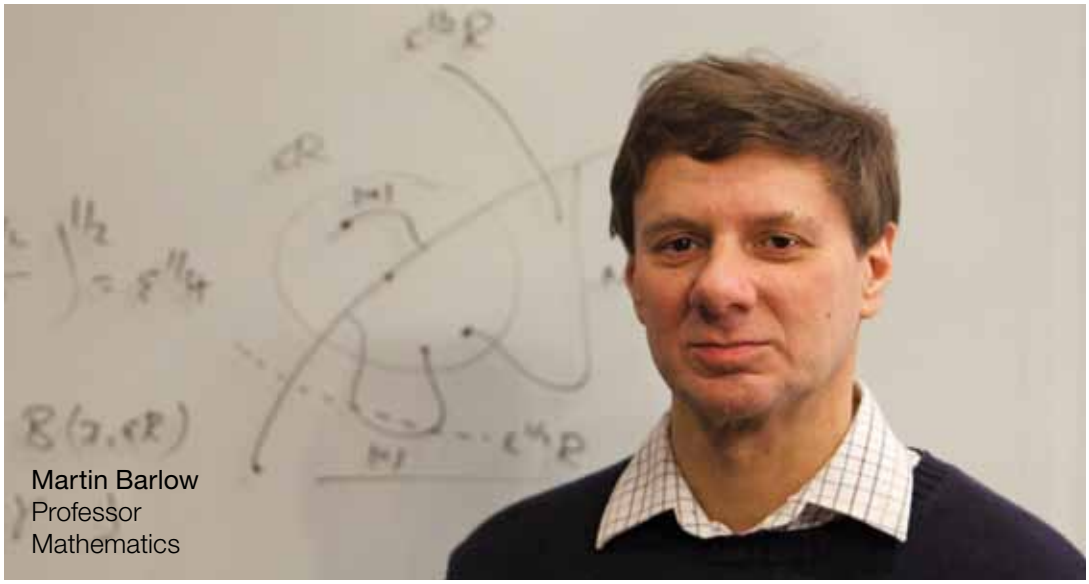
DISTINGUISHED SCHOLARS IN RESIDENCE

Up to six one-year appointments of outstanding senior UBC scholars are made each year. Scholars take up research offices at the Institute; among other activities at the Institute they present a talk on their research, participate in a two-day research retreat, and meet together on a weekly basis.

Six scholars took up up their awards in April 2009: Martin Barlow, Trevor Barnes, Michael Doebeli, Leah Edelstein-Keshet, Harvey Richer, and Stephen Sheppard. The Distinguished Scholars in Residence selected for 2010 are Holger Hoos, Computer Science; Janis Sarra, Law; Margaret Schabas, Philosophy; Ilan Vertinsky, Institute for Asian Research and Sauder School of Business; and Mark Warren, Political Science.

Top row: Distinguished Scholars on a fieldtrip to UBC's Beaty Biodiversity Centre

Bottom row: Distinguished Scholars on a fieldtrip to the Canada-France-Hawaii telescope on Mauna Kea



Martin Barlow
Professor
Mathematics

Martin Barlow is a leading figure in probability theory and one whose work has shaped research in the field of stochastic analysis, a field in which it is not easy to make an impact. He began his career by developing profound ideas in the area of stochastic calculus, making a number of important contributions to the theory of stochastic processes, especially in the realm of Brownian motion on fractals. He also has close connections with the theory of "disordered media" in physics and has explored a number of related topics in stochastic analysis in Euclidean space, manifolds, and graphs. Dr Barlow is the leading international expert in the behaviour of diffusions on fractals and other disordered media.

Dr. Barlow holds a BA in Mathematics and a diploma in Mathematical Statistics from the University of Cambridge; he received his PhD from the University of Wales in 1978. Since his appointment as Associate Professor of Mathematics at UBC in 1992 and Professor in 1994 he has lectured worldwide, including most recently the Institute of Mathematical Statistics Medallion Lecture at the World Congress of the Bernoulli Society, and has received many international fellowships. He is a Fellow of the Royal Society of Canada and of the Royal Society (London).

At the Institute, Dr. Barlow is preparing a book manuscript on the topic, "Random Walks on Graphs," and initiating research on topics of long-standing interest that are broadly connected with the history of science.

Dr. Barlow's Scholar in Residence talk, "Random Walks and Random Structure," is available as an audio podcast on the Institute's website.

Trevor Barnes
Professor
Geography

Trevor Barnes is a prominent human geographer who specializes in the economic geography of contested zones. From his early work focusing on an analysis of the capitalist space economy, which was the title of his first book, he has expanded his approach to incorporate issues affecting rainforest ecosystems and industrial geography. In his *Logics of Dislocation* (Guilford Press), he emphasized the role of social and institutional relations in the development of economic geography, an approach that the Canadian Association of Geographers has referred to as "visionary." He then explored post-structuralism, co-editing two influential studies, *Writing Worlds* (Routledge) and *Reading Human Geography* (Edward Arnold). For the past several years, he has been investigating his own field of economic geography from a historical perspective.

Dr. Barnes received a BSc in Economics from University College London with MA and PhD degrees in Geography from the University of Minnesota. Since joining UBC as Assistant Professor in 1983, he has distinguished himself as a leading and highly innovative interdisciplinary scholar. Among his many honours are the Canadian Association of Geographers Award for Scholarly Distinction and the Presidential Award for Distinguished Achievement from the Association of American Geographers, and from UBC a Killam Memorial Fellowship, Killam Research Prize, and a UBC Distinguished University Scholar appointment.

At the Institute, Dr. Barnes is exploring the connections between the Second World War and the Cold War within the discipline of geography and the knowledge it produced. The book that the Institute will be supporting, to be published by Cornell University Press, will highlight the knowledge produced by geographers and draw on the discipline of science studies to emphasize the relationship between social context and prevailing forms of social knowledge.

Dr. Barnes' Scholar in Residence talk, "Two Men of War and Their Big Idea: Walter Christaller, Edward Ullman, and Central Place Theory," is available as an audio podcast on the Institute's website.


Michael Doebeli
Professor
Zoology and
Mathematics

Michael Doebeli is a specialist in the origin of biological diversity and has pioneered the study of speciation through the approach of mathematical biology. He was the co-author on one of the most widely cited speciation papers ever, "On the Origin of Species by Sympathetic Speciation," in *Nature* 1999, and is engaged in integrating his work on species diversification to develop an evolutionary understanding of cooperation.

Dr. Doebeli received his MA and PhD in Mathematics from the University of Basel, Switzerland with a special emphasis on dynamical systems in zoology. Since joining UBC as an Assistant Professor in 1999, becoming Professor in 2007, Dr. Doebeli has taught advanced courses in Ecology and Mathematical Biology. He is past director of the Integrated Sciences Program in the Faculty of Science.

In addition to his notable publication history, Dr. Doebeli's work has been honoured with such national awards as the NSERC Steacie Fellowship, and a UBC Charles S. McDowell Award for Excellence in Research and a UBC Killam Memorial Fellowship.

Given his prior history as a Peter Wall Early Career Scholar in 2000 and current Scholar in Residence appointment, the Institute is pleased to support the completion of Dr. Doebeli's book monograph addressing the evolution of diversity in biology, language, and culture for Princeton University Press. The mathematical and experimental models he addresses will be expanded further as he follows his interest in the origin of diversity in language and religion, approached from an evolutional perspective.

Dr. Doebeli's Scholar in Residence talk, "Evolution of Diversity," is available as an audio podcast on the Institute's website.

Leah Edelstein-Keshet
Professor
Mathematics

Leah Edelstein-Keshet's career is dedicated to using mathematics as a tool for research in the life sciences. She has become recognized as one of the world leaders in the area of mathematical biology, in which she has been at the forefront for 25 years. Her work spans many topics, from the sub-cellular to the ecological. For the past decade, she has focused on biomedical research, including autoimmune diseases such as type 1 diabetes. She also researches Alzheimer's disease.

Dr. Edelstein-Keshet earned her BSc and MSc degrees in Mathematics from Dalhousie University and received her PhD in Applied Mathematics from the Weizmann Institute of Science in Rehovot, Israel in 1982. She held teaching positions at Brown University and Duke University before joining UBC as Associate Professor in 1989, becoming Professor in 1995. Her book *Mathematical Models in Biology* (Random House) is regarded as the definitive textbook in the rapidly growing field of mathematical biology. She has been awarded the Canadian Mathematical Society's Krieger-Nelson Prize, which recognizes outstanding research by a female mathematician, and, at UBC, the Faculty of Science Award for Leadership. She has also served as President of the Society for Mathematical Biology.

As a Scholar in Residence this year, Dr. Edelstein-Keshet is applying her interdisciplinary approach to an understanding of cellular mechanics, biochemistry, and the molecular biology of cell processes. Her work on cell motility and the cytoskeleton addresses such fundamental questions as changes in cell shape following stimulation by chemoattractants, crawling motion and turning of the cell in response to external cues. Such processes are important regulators of cellular dynamics in cancer, pathogen invasion, and normal cellular functions. In 2009, she held a "Cellfest" and sponsored several visiting international speakers.

Dr. Edelstein-Keshet's Scholar in Residence talk, "A Mathematician's Adventures in Cell Biology," is available as an audio podcast on the Institute's website.

Harvey Richer
Professor
Physics & Astronomy

Harvey Richer is an observational astronomer who uses his privileged access to the Hubble Space Telescope and a range of other telescopes to explore the age of the Universe, the evolution of stellar systems, and the formation of galaxies. Over the past eight years, he has been one of the largest Canadian users of the Hubble, large blocks of time on which are internationally competitive and extremely limited.

Dr. Richer received his BSc degree in Physics and Mathematics from McGill University and his PhD in Astronomy and Physics from the University of Rochester. Prior to coming to UBC, he taught at Rochester and worked as a Visiting Astronomer at the Kitt Peak National Observatory and the Cerro Tololo Inter-American Observatory. Since becoming Professor at UBC in 1983, Dr. Richer has been a Canada Council of the Arts Killam Fellow and a Fulbright Fellow.

Dr. Richer's distinguished record of research brought him to the Institute this year, where he and his team will be analyzing their latest Hubble telescope data with an aim to image one of the earliest star clusters in the Universe. By analyzing the cooled white dwarf stars in this cluster, the team will be able to date the origin of this formation. Further, by locating and characterizing the cluster's least massive normal stars, they will determine the minimum stellar mass that is capable of sustained nuclear reactions in its core.

The Scholars in Residence fieldtrip to the Canada-France-Hawaii telescope on the summit of the 4200m dormant volcano Mauna Kea on the Big Island of Hawaii in December was arranged and led by Dr. Richer.

Dr. Richer's Scholar in Residence talk, "Watcher of the Sky: An Observational Astronomer's View of the Universe," is available as an audio podcast on the Institute's website.

Stephen Sheppard
Professor
Forestry and
Landscape Architecture

Stephen Sheppard specializes in landscape planning and aesthetics. He is one of a handful of researchers in the world who uses visualization technology to explore key questions of our times. Dr. Sheppard's work in Forest Resources Management and Landscape Architecture analyzes the relationship between human perceptions, environmental conditions, and the participatory processes of future planning. From his 1989 work *Visual Simulation* (Van Nostrand Reinhold), looking at the disconnect between popular concern about the environment and the lack of political will to address the issue, Dr. Sheppard expanded into laboratory-based perception experiments to explore participatory techniques for forestry practitioners.

Dr. Sheppard received his BA and MA in Agricultural and Forest Services from the University of Oxford and his PhD in Environmental Planning from the University of California, Berkeley in 1982. After arriving at UBC in 1997, he divided his time between the environmental services sector and academia. Along the way, he has established himself as a leading figure in the aesthetics of climate change, and his CALP (Collaborative for Advanced Landscape Planning) research group at UBC has played host to scholars from around the world.

At the Institute, Dr. Sheppard is analyzing his latest data on the public perceptions of climate change for a book manuscript with the working title, *Seeing Carbon: Perceptions of Climate Change*, which he is completing under an agreement with Earthscan. Based on his novel research approach into the role of visualization-based planning methods, this research promises to contribute substantively to an understanding of how cognition, cultural factors, and the media influence perceptions on this vital political issue. He will hold a workshop in March 2010 that will demonstrate the background of his CALP research group and its impact on the emerging theory of aesthetics and perception of climate change.

Dr. Sheppard's Scholar in Residence talk, "Changing Our High-Carbon Aesthetic: Shifting Attitudes on Climate Change," is available as an audio podcast on the Institute's website.

DISTINGUISHED SCHOLARS RESEARCH EVENTS

If research events at the Institute, such as a workshop or a lecture series, would complement the scholarly plans of Distinguished Scholars in Residence, an additional sum is provided for such purposes.

CellFest: An Interdisciplinary Workshop on Cell Biology

Workshop organized by Leah Edelstein-Keshet, Department of Mathematics and 2009 Distinguished Scholar in Residence
May 1, 2009

A day of short lectures emphasizing areas of possible contact and identifying research questions where an interdisciplinary approach could be mutually beneficial provided a platform for interaction, discussion, and collaboration between UBC experimentalists and modelers working in cell biology.

Biophysics of Motility: The Cofilin Activity Cycle and Chemotaxis and Predicting Metastasis with the Invasion Signature

Lectures organized by Leah Edelstein-Keshet, Department of Mathematics and 2009 Distinguished Scholar in Residence
August 11, 2009

Two talks were presented by John S. Condeelis, Co-Chair of Anatomy and Structural Biology, Albert Einstein College of Medicine, New York.

The Spread and Evolution of Highly Pathogenic Avian Influenza H5N1 Virus in Poultry, Wild Birds, and Humans in Africa

Colloquium organized by Leah Edelstein-Keshet, Department of Mathematics and 2009 Distinguished Scholar in Residence
October 2, 2009

This talk was presented by Claude P. Muller, Institute of Immunology, Graduate School for Psychobiology, University of Trier, Luxembourg; WHO Collaborating Centre for Reference and Research on Measles Infections; and WHO National Reference Laboratory for Measles and Rubella.

In Africa, the HPAI H5N1 (“birdflu”) virus was first detected in Northern Nigeria in early 2006, and since then in ten other African countries. The first incursion of H5N1 led to government containment measures. However, preliminary tests from southern Nigeria were also positive, necessitating the culling of poultry farms vital to the economy.

Connecting Academic Research to Aboriginal Wellness

Workshop organized by Margery Fee, Department of English and
2008 Peter Wall Distinguished Scholar in Residence
October 25, 2009

This two-and-a-half-day workshop addressed Aboriginal responses to the intensive medical research and wellness initiatives following from the high rates of type 2 diabetes and other health problems in their communities. It addressed preventative measures for researchers and health professionals seeking to avoid racializing Aboriginal people; it also focused on the need for interdisciplinary, collaborative work on the topic. Sander Gilman gave a public talk in the form of a Wall Colloquium, which is available on the Institute's website as an audio podcast. (See page 40 for details of Dr. Gilman's Colloquium talk).

Dr. Gilman's participation was sponsored by the Cecil H. and Ida Green Visiting Professorships Program, Green College.

Near Infrared Spectroscopy: Innovations and Applications

Workshop organized by Andrew Macnab, Departments of Pediatrics and Urology and
2006 Peter Wall Distinguished Scholar in Residence, and Darlene Reid, Physical Therapy
November 9, 2009

Near infrared spectroscopy (NIRS) is an established technology that provides exciting opportunities for scientists and clinicians to monitor changes in tissue oxygenation and hemodynamics non-invasively in real time. Recent advances include new technology, additional measurement parameters, and novel applications beyond skeletal muscle and the brain. This day-long interdisciplinary workshop included public talks by external leaders in NIRS – William Colier, Yagesh Bhambhani, and Rob Boushel – covering unique applications of this technology plus an intense round-table panel discussion.

Leah Keshet's CellFest, group photo

EARLY CAREER SCHOLARS

This program brings together for one year outstanding tenure-track faculty from diverse disciplines at the early stages of their careers at UBC. At present, there is a single cohort made up of beginning untenured Assistant Professors and newly tenured and promoted Associate Professors. Those who are full members of UBC's Institute for Computing, Information, and Cognitive Systems (ICICS) are co-funded by ICICS.

The 2009–2010 cohort took up their appointments September 1, 2009.

Early Career Scholars meetings and receptions

Top row: 2008-2009 cohort

Bottom row: 2009-2010 cohort, with Scholars in Residence

Jehannine Austin
Assistant Professor
Psychiatry

Jehannine's research investigates the clinical applications of psychiatric genetics research. She received a BSc in Biochemistry from the University of Bath and a PhD in 2001 in Neuropsychiatric Genetics from the University of Wales College of Medicine. With more than 25 publications in leading scientific journals, her clinical research helps mental health professionals and the families of patients understand the role of genetics in mental illness.

Jehannine completed an MSc in Genetic Counselling at UBC in 2003 and remained at the University as a genetic counsellor and clinical instructor before receiving a tenure-track appointment in Psychiatry in 2007. Her current interests focus on the genetic and environmental factors in the development of postpartum psychiatric illness among women who have previously experienced psychiatric problems.

Chris Carlsten
Assistant Professor
Medicine and School of
Environmental Health

Chris is Chair of the UBC Occupational and Environmental Lung Disease Clinic. He received his BA in Human Biology and MD from Stanford University, and a Masters of Public Health degree from the University of Washington. He joined UBC in 2007.

Chris is already an outstanding expert in pollution sources and human airway health. His recent work focuses on occupational airways disease, including the effects of diesel exhaust and other particulate matter on asthma induction and exacerbation. He has published in the *Journal of the American Medical Association* as well as *Environmental Health Perspectives*, and has written chapters in *Fundamentals of Ecogenetics, Textbook of Clinical Occupational and Environmental Medicine*, and *Clinical Respiratory Medicine*.

Sathish Gopalakrishnan
Assistant Professor
Electrical & Computer Engineering

Sathish received his MS in Applied Mathematics and PhD in Computer Science from the University of Illinois at Urbana-Champaign, and his BE in Computer Science and Engineering from the University of Madras. He joined UBC in 2007. Earlier, at the Hewlett-Packard Labs, Sathish interacted with musicians and audiologists on the design of a high-fidelity wireless stereo system; this work resulted in an invention disclosure at HP Labs.

At UBC, Satish is working on developing programming models that simplify the use of wireless sensor networks and allow users to have greater flexibility over the kinds of data they collect. He is also collaborating with the UBC Sustainability Office to develop a sensor network that would allow students to have a precise real-time estimate of their carbon footprint.

Christoph Hauert
Assistant Professor
Mathematics

Christoph, a native of Switzerland, employs mathematical models to understand evolutionary processes in biological as well as cultural settings and explores the rich dynamics generated by Darwin's simple concept of natural (cultural) selection. To do so, Christoph uses game theory, a mathematical framework suitable for analyzing interactions between individuals.

Christoph earned his degrees in Theoretical Physics (MSc from the University of Bern; PhD in 1998 from Christian-Albrecht's-University of Kiel, Germany), and he served as a Postdoctoral Research Fellow in the Department of Mathematics at the University of Vienna and as a Research Associate at Harvard's Program for Evolutionary Dynamics. He joined UBC in 2007. His work has appeared in top-tier journals such as *Nature* and *Science*.

Victoria Lemieux

Assistant Professor
Library, Archival & Information Studies

Victoria is an expert in archival management and information science in the digital age. She received undergraduate degrees in History and English from the University of Toronto and an MAS in Archival Studies at UBC before earning her PhD in Archives Administration in 2002 from University College London. Her research focuses on risk management and security for digital information in the financial sector.

Prior to coming to UBC in 2008, Victoria held positions as a records analyst, government archivist, researcher for the World Bank, and in London as Vice-President of Technology Risk and Technology Infrastructure Services at Credit Suisse.

Siobhan McElduff

Assistant Professor
Classical, Near Eastern & Religious Studies

Siobhan received her degrees in Classical Studies: BA from Trinity College Dublin; MA from the University of Victoria; PhD in 2004 from the University of Southern California. She took up her UBC appointment as Assistant Professor of Latin Language and Literature in 2007.

Siobhan's research interests include the history, theory, and practice of translation in the ancient Mediterranean region and in the modern era and the history of classical reception amongst the non-elite in eighteenth- and nineteenth-century Ireland. Her current projects include a book manuscript on translation in the Mediterranean region, a book-length translation of the Latin orator Cicero's political speeches, and a book on Roman theories of translation. She has articles forthcoming on Cicero and his interpreters and Cicero's translations of Plato.

Gregg B Morin
Assistant Professor
Medical Genetics

Gregg has been with the BC Cancer Agency since 2004, as Head of Proteomics, Genome Sciences Centre, and Senior Scientist, BC Cancer Research Centre. He received his UBC appointment in Medical Genetics in 2007. Greg holds a MSc in Chemistry from the University of California, San Diego, and a PhD in Biochemistry in 1988 from the University of Colorado at Boulder, before postdoctoral studies at Yale and a faculty position at the University of California, Davis.

Gregg's research has focused on how the biochemical processes of the cell are regulated by the cell and its environment. At present, he seeks to understand the processes involved with RNA-biology and how mitochondrial RNA interacts with cellular control systems.

Christopher Rea
Assistant Professor
Asian Studies

Christopher earned his AB in Chinese Language & Literature from Dartmouth College and his MA, MPhil, and PhD in Chinese Literature from Columbia University. He joined UBC as Assistant Professor of Modern Chinese Literature in 2008. His study of Chinese literature, cinema, and drama from the late nineteenth century to the present earned him the Willy Gorrissen Prize in Asian Studies and the Pray Modern Languages Prize.

A specialist in the literary and cultural history of late Quin and Republican China, Christopher is writing a book titled "A History of Laughter: Comic Culture in Modern China, 1895–1957." A second book project concerns the rise of "cultural entrepreneurship" as a mode of cultural agency in early twentieth-century China.

Neil Safier
Assistant Professor
History

Neil studies the intellectual and cultural histories of early modern Europe and colonial Latin America. He received his AB in Comparative Literature from Brown University and his MA and PhD in History from Johns Hopkins. Neil held a Dibner Library for the History of Science Resident Scholar Fellowship, Smithsonian Institution, an Andrew W. Mellon Postdoctoral Fellowship in the Humanities, and a Fulbright Fellowship. He joined UBC in 2007.

Neil's 2008 book, *Measuring the New World: Enlightenment Science and South America*, won the 2009 Gilbert Chinard Prize from the Society of French Historical Studies and the Institut Français de Washington. His new work focuses on the transatlantic careers of two important Brazilian intellectuals: Hipólito José da Costa and José Mariano da Conceição Velloso.

PETER WALL DISTINGUISHED VISITING PROFESSOR

In the Distinguished Visiting Professor program, from time to time a senior, renowned scholar with a reputation for interdisciplinary engagement spends time in residence at the Institute. It is expected that the Visiting Professor will pursue a specific research agenda, participate in Institute programs and events, give talks, and organize specific activities intended to contribute to the intellectual life of the Institute and its affiliated scholars.

Past holders of this appointment are Arif Dirlik, Historian, Professor Emeritus, Duke University; and Roald Hoffmann, Chemist and Writer, 1981 Nobel Prize in Chemistry, Frank H. T. Rhodes Professor of Humane Letters, Cornell University.

Scholars appointed for 2010 are Philippe Sansonetti, Microbiologist, Collège de France, and Barbara Grosz, Computer Scientist, Dean, Radcliffe Institute for Advanced Study, Harvard University.

2009 Distinguished Visiting Professor

Alain Berthoz, Professor and Chair, Physiology of Perception and Action, Collège de France, Paris

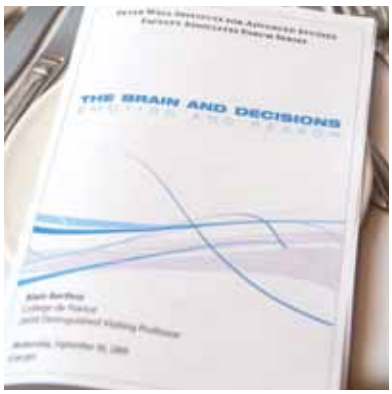
Professor Berthoz attended the University of Paris, obtaining degrees in Mathematics and Philosophy and a doctorate in Natural Sciences, focusing on Neurophysiology and Psychology; he also attended the École des Mines de Paris, for degrees in Engineering. He began researching at the physiology of work laboratory, Centre National de la Recherche Scientifique (CNRS) in 1969, and has since 1993 been Professor of Neurophysiology at the Collège de France. A member of numerous academies and learned societies, Professor Berthoz has won many prestigious awards and prizes, including Chevalier de l'Ordre de la Légion d'Honneur, France's highest honour; and the Grand Prix of the Académie des Sciences de l'Institute de France.

Through brain imaging, recording movements, and the use of virtual reality, Professor Berthoz and his research team study the neural basis of four major types of cognitive-motor functions: eye movements, generation of locomotion trajectories, strategies for cognitive spatial memory, and perception and expression

of emotions and actions of others. In addition to his scientific research, he engages in multidisciplinary investigations into the philosophy of mind and the history of psychology. Through these various pursuits, Professor Berthoz seeks to understand the basic function of the brain as a system for predicting future responses in both thought and action.

Professor Berthoz visited the Institute in 2008 as a distinguished invited speaker for the Wall Major Thematic Grant project on Sensorimotor Computation; following this visit he was instrumental in arranging a formal partnership between the Collège de France and the Peter Wall Institute, and he serves as Scientific Advisor for that arrangement.

As 2009 Wall Distinguished Visiting Professor, Alain Berthoz spent the month of September giving talks and collaborating with UBC researchers at the Institute and at centres and units across campus and beyond. This included a Wall Faculty Associates Forum, "The Brain and Decisions: Emotion and Reason," (see page 45 for details) and a Wall Fireside Chat, also two public addresses and a CBC/Radio-Canada (French language) interview. A reception in Alain Berthoz's honour was hosted at the residence of the Consulate General of France in Vancouver. He collaborated with Sensorimotor Computation project investigators and he is co-organizing, with the principal investigator of that grant, Dinesh Pai, a Sensorimotor Computation Workshop on the control of the gaze at the Collège de France in May 2010. From the perspective of the Institute, it was an extraordinarily productive, stimulating, and greatly appreciated visit.



WALL SUMMER INSTITUTE FOR RESEARCH

Held from time to time, the Wall Summer Institute for Research is an intensive five-day workshop involving outstanding interdisciplinary fellows in residence, invited from around the world, to debate, discuss, and push forward thinking on a cutting-edge research question, with select scholars from the University of British Columbia. This is followed several months later by a follow-up retreat in another part of the world.

2008 Wall Summer Institute Follow-Up Retreat
The End of the Peasant? Global Capitalism and the Future of Agrarian Society

Organizer: Arif Dirlik, Professor Emeritus, Duke University; Chair Professor of Chinese Studies, Chinese University of Hong Kong (CUHK); and 2005 Wall Distinguished Visiting Professor. Co-organizers: Shaoguang Wang, CUHK; Wang Sangui and Wen Tiejun, School of Agricultural Economics & Rural Development, Renmin (People's) University of China; He Huili, School of Humanities and Development, Agricultural University of China.
June 12–19, 2009

Shaoguang Wang (front row centre), Alejandro Rojas and Dong Zhengua (second row), and Arif Dirlik (third row centre) in Lankao County, PRC

For this WSIR follow-up research retreat, Arif Dirlik wanted to elaborate on the theme of global capitalism and the future of agrarian society using as one of the major examples the People's Republic of China. The PRC is exemplary of current transformations and offers an important venue for exploring their implications. In the PRC there has been much talk over the last few years of the "three agricultural problems" (nongmin/peasant, nongcun/village, and nongye/agriculture). The discussions are presently in the process of being converted into policy.

The Institute funded this eight-day meeting that began in Hong Kong, included a three-day field visit to the agricultural county of Lankao in the Kaifeng District of Henan Province, China, and concluded in Beijing. Joining the research retreat were nine participants of the 2008 Wall Summer Institute held in Vancouver.

Participants met at CUHK for a day to investigate issues from the Vancouver meeting and hear presentations by Shaoguang Wang and Dong Zhenghua on the contemporary effects of agricultural policy change in the PRC. As moderator for the general discussion, Arif Dirlik asked, "What does it mean for the rural to be gone?" And he reminded us that Mike Davis's *Planet of Slums*, one of the studies central to WSIR 2008, concluded that slums have become the fastest part of growth—the step from the rural to urban. Participants also reflected on the contents and logistics of the forthcoming 2008 WSIR proceedings volume under the editorship of Arif Dirlik and Alex Woodside.

In mainland China, field visits were made to the Lankao County villages of Chenzhai, for local rural culture, Nanmazhuang, for a farmers' cooperative, Zhuangzhua, for environmentally friendly building construction, and Huzhai, for its cooperatives (land, vegetables, and credit), and to Yifeng Township for its cooperative union and a large-scale Taiji performance.

After visiting the Yellow River and the ancient city of Kaifeng, the group travelled by express train from Zhengzhou to Beijing. At Renmin University, they attended a day of presentations by local scholars on agricultural policy and the global economic crisis, and some took an optional tour the next day to an eco-farm and North-American style community gardens in a Beijing suburb.

The field-trip and the seminars reinforced the pessimistic conclusions of the WSIR in 2008: that agrarian society in China is indeed in deep trouble. It was inspiring to witness the enthusiasm of participants in the reform efforts in the villages we visited. And yet, it was equally evident that agrarian issues were by no means foremost in the minds of local officials or the government, and that the efforts of reformers such as Wen Tiejun were likely to be powerless to reverse the decline of agrarian society, especially the out-migration of adult males which left the villages as the domain of the elderly, women, and children. No less disheartening was pervasive evidence of environmental degradation, symbolized by the Yellow River which has turned into a virtual cesspool.

The Institute is most grateful to Arif Dirlik for his vision in selecting the PRC for this follow-up research retreat and for skillfully guiding the entire process, to the co-organizers in Hong Kong and Beijing, and to our generous hosts in Lankao County and at Renmin University.

FACILITIES RENOVATIONS

2009 AT A GLANCE

JANUARY THEME DEVELOPMENT WORKSHOP *Culture and the Mind Project* ■ DISTINGUISHED SCHOLARS WELCOME LUNCH ■ DISTINGUISHED SCHOLARS RESEARCH RETREAT ■ FACULTY ASSOCIATES FORUM Edward Slingerland and Joseph Henrich, *Integrating Science and the Humanities* ■ FACULTY ASSOCIATES FORUM Stephen Sheppard, *Changing Our High-Carbon Aesthetic* ■ COLLOQUIUM Simon Conway Morris, *Does Evolution Have A Deeper Structure?* **FEBRUARY** THEME DEVELOPMENT WORKSHOP *Ethics, Design, and Use of Assistive Technologies* ■ DISTINGUISHED SCHOLARS ALUMNI DINNER ■ THEME DEVELOPMENT WORKSHOP *Health and Information Technology* ■ THEME DEVELOPMENT WORKSHOP *Integrating Foothills Watershed Research* ■ FACULTY ASSOCIATES FORUM Robert Brain, *Varieties of Empathy in Science, Art and Culture* ■ THEME DEVELOPMENT WORKSHOP *Social Responsibility in the Health Professions* ■ FACULTY ASSOCIATES FORUM Leah Edelstein-Keshet, *A Mathematician's Adventures in Cell Biology* ■ THEME DEVELOPMENT WORKSHOP *Arts-Based Methods in Health Research* ■ MAJOR THEMATIC GRANT, SENSORIMOTOR COMPUTATION LECTURE SERIES Michael Arbib, *From Manual Action to Language* **MARCH** FACULTY ASSOCIATES FORUM Susanna Braund, *Translation and Authority* FACULTY ASSOCIATES FORUM Harvey Richer, *Watcher of the Sky* ■ MAJOR THEMATIC GRANT, SENSORIMOTOR COMPUTATION LECTURE SERIES Reza Shadmehr, *The Computational Problem of Motor Control* **APRIL** OPEN HOUSE AND DEDICATION, RENOVATED FACILITIES ■ FACULTY ASSOCIATES FORUM Thomas Hutton, *The New Economy of the Inner City* ■ FACULTY ASSOCIATES FORUM *Martin Barlow, Random Walks and Random Structure* ■ JUNIOR EARLY CAREER SCHOLARS LAB CRAWL ■ SENIOR EARLY CAREER SCHOLARS LAB CRAWL **MAY** DISTINGUISHED SCHOLAR RESEARCH EVENT *CellFest* ■ FACULTY ASSOCIATES FORUM David Fraser, *Conservation and Animal Welfare Science* ■ FACULTY ASSOCIATES FORUM Michael Doebeli, *Evolution of Diversity* ■ EXPLORATORY WORKSHOP *The Sea Before Us* **JUNE** COLLOQUIUM Allison Okamura, *Robot-Assisted Needle Steering* and Lynette Jones, *Thermal Feedback in Haptic Displays* ■ INSTITUTE BOARD OF TRUSTEES MEETING AND TRUSTEES APPRECIATION LUNCHEON ■ WALL SUMMER INSTITUTE FOR RESEARCH – FOLLOW-UP

RESEARCH RETREAT IN CHINA *The End of the Peasant?* **JULY** EXPLORATORY WORKSHOP *Ethics, Design, and Use of Assistive Technologies* **AUGUST** DISTINGUISHED SCHOLAR RESEARCH EVENT John S. Condeelis, *Biophysics of Motility* and *Predicting Metastasis with the Invasion Signature* **SEPTEMBER** PETER WALL DISTINGUISHED VISITING PROFESSOR LECTURE Alain Berthoz, *Physiology of Eye Movements for Computer Scientists and Engineers* ■ MAJOR THEMATIC GRANT, SENSORIMOTOR COMPUTATION LECTURE SERIES Jennifer Groh, *Looking at Sounds* ■ DISTINGUISHED VISITING PROFESSOR FIRESIDE CHAT Alain Berthoz, *Simplexité* ■ FRENCH CONSULATE RECEPTION FOR DISTINGUISHED VISITING PROFESSOR ■ FACULTY ASSOCIATES FORUM Dinesh Pai, *Eyes and Hands and Brains! Oh, My!* ■ MAJOR THEMATIC GRANT, SENSORIMOTOR COMPUTATION LECTURE SERIES Kathleen Cullen, *How Actions Alter Sensory Processing* ■ COLLOQUIUM Tanisha Ramachandaran, *Appropriation of the Hindu Goddess by Western Feminism* ■ FACULTY ASSOCIATES FORUM Alain Berthoz, *The Brain and Decisions* ■ THEME DEVELOPMENT WORKSHOP *Positron Emission Tomography/MRI Imaging* **OCTOBER** EARLY CAREER SCHOLARS RESEARCH RETREAT ■ DISTINGUISHED SCHOLAR RESEARCH EVENT Claude P. Muller, *The Spread and Evolution of Highly Pathogenic Avian Influenza H5N1 Virus in Poultry, Wild Birds and Human in Africa* FACULTY ASSOCIATES FORUM Danielle van Jaarsveld and Daniyal Zuberi, *Globalization and the Service Workplace* ■ FACULTY ASSOCIATES FORUM Trevor Barnes, *Two Men of War and Their Big Idea* ■ DISTINGUISHED SCHOLAR RESEARCH EVENT *Connecting Academic Research to Aboriginal Wellness* ■ COLLOQUIUM Sander Gilman, *Ethnicity and Diabetes* **NOVEMBER** COLLOQUIUM ABROAD *The HIV-Exposed but Uninfected Infant* ■ BOOK LAUNCH Jennifer Jihye Chun, Dawn H. Currie, Renisa Mawani, and Becki L. Ross DISTINGUISHED SCHOLAR RESEARCH EVENT *Near Infrared Spectroscopy* ■ FACULTY ASSOCIATES FORUM Meeko Oishi, *Ethics, Design, and Use of Assistive Technologies* INSTITUTE BOARD OF TRUSTEES MEETING ■ EXPLORATORY WORKSHOP *Arts-Based Methods in Health Research* ■ COLLOQUIUM Grant Gillet, *Neuroethics and Hysteria* **DECEMBER** HOLIDAY RECEPTION ■ DISTINGUISHED SCHOLAR IN RESIDENCE FIELDTRIP

THEMATIC PROGRAMS

Thematic Programs establish an overall research theme in which scholars with related expertise are gathered together for interdisciplinary collaboration.

MAJOR THEMATIC GRANT

The Major Thematic Grant provides funding of up to $500,000 over a three- to five-year period to interdisciplinary teams of UBC and external scholars to research a new area. It is expected that UBC will become a centre for research on the topic.

2009–2011	Coherent Dynamics of Ultra-Cold Molecular Systems Moshe Shapiro, Chemistry and Physics & Astronomy
2008–2010	Sensorimotor Computation Dinesh Pai, Computer Science
2000–2003	Acoustic Ecology Kathleen Pichora-Fuller, Institute for Hearing Accessibility Research
1999–2002	An Interdisciplinary Inquiry into Narratives of Disease, Disability, and Trauma Valerie Raoul, Centre for Research in Women's Studies & Gender Relations
1999–2002	Pathogenomics Ann Rose, Medical Genetics
1997–2000	Understanding Electron Motion in Matter Christopher Brion, Chemistry
1996–2000	Crisis Points Priscilla Greenwood, Mathematics

Coherent Dynamics of Ultracold Molecular Systems

A Peter Wall Major Thematic Grant, 2009–2011

Principal Investigator: Moshe Shapiro, Chemistry. Co-investigators: John Hepburn, Chemistry, VP Research and International; Roman Krems, Chemistry; Kirk Madison, Physics & Astronomy; Valery Milner, Physics & Astronomy.

External Collaborators: Jun Ye, Joint Research Institute of the National Institute of Standards and University of Colorado; Paul Brumer, University of Toronto: Matthais Weidemüller, Heidelberg University; David J. Jones, UBC; Bretislav Friedrich, Fritz-Haber-Institut, Berlin.

Roman Krems, Moshe Shapiro, Dianne Newell (Director), Valery Milner, and Kirk Madison

Recent conceptual and technological breakthroughs in the molecular and laser sciences, some of which have been initiated by members of the Shapiro-led team, have opened up a number of new ways of using coherent lasers to create and manipulate molecules at ultracold temperatures. ("Ultracold" refers to temperatures less than 0.001 degrees above the absolute zero of –273.15 degrees Centigrade.) Quantum mechanics tells us that, due to their sluggish motion, ultracold molecules behave more like waves than particles. This wave-like behaviour offers unique possibilities for using the field of "coherent control," in which one employs coherent laser waves to induce interferences between matter waves, thereby altering the natural outcome of many chemical, physical, and biological processes. By tuning the phases of coherent lasers while they interact with material systems, one can change the nature of the interferences between the matter waves from being "constructive" to being "destructive," causing the selective enhancement of desired outcomes and the elimination of undesired ones. The project builds on the momentum generated by a highly successful Wall Exploratory Workshop held in the summer of 2007.

The project is engaged in a multi-faceted interdisciplinary research program that will capitalize on recently acquired, unique capabilities at UBC. The work bridges the gap between chemistry and

physics, and between experimentalists and theorists, and combines the "ultra-fast" with the "ultracold."

In 2009, the project's four research groups, headed by Moshe Shapiro, Roman Krems, Kirk Madison, and Valery Milner, respectively, made rapid progress in the project's first year toward achieving its main goals.

A seminar series on the topic "Cold-Atomic and Molecular Interactions" was launched to develop awareness of the breadth of scientific challenges. Nine seminars were held in 2009, with seven external speakers from Canada, Germany, and the United States. Details of these seminars are available on the project website [www.ultracold-workshop.pwias.ubc.ca/]. Members of the group published or submitted for publication 27 project-related articles and book chapters and delivered 28 talks and seminars at research centres around the world.

New research collaborations were initiated within UBC and with external collaborators. Within UBC, a major coup was achieved by the project when it joined with three other research groups in Chemistry at UBC (led by Takmasa Momose with the participation of Ed Grant and Ruth Signorell) to successfully apply for a Canada Foundation for Innovation (CFI)-funded "Centre for Research on Ultracold Systems" (CRUCS). The injection of much-needed equipment via the CFI funding will boost the research of all four research groups within the MTG project, and it will enable important joint collaborative projects under the entire CRUCS umbrella.

Strong collaborative ties internationally were formed this year with the group of Kenji Ohmori at the Institute for Molecular Sciences (IMS), Okazaki, Japan on photoassociation of Rb ultracold atoms to form ultracold Rb2 molecules. Kenji Ohmori and others from IMS will visit the MTG project at UBC in 2010. The MTG project also initiated a student exchange program between the UBC Chemistry department and IMS, funded jointly by the Japan Society for the Promotion of Science and UBC. A collaborative study on the coherent control of ultracold ionic lattices with the group of Michael Drewsen, Physics, Aarhus University, Denmark has also been initiated by the MTG project, as have collaborations with the group of Thomas Baumert, Physics, Kassel University, Germany, as part of a Senior Humboldt grant awarded to Moshe Shapiro by the German government.

Several other international collaborations are planned: a collaborative effort between Roman Krems and the theoretical physics group of Tommaso Calarco at the University of Ulm, Germany to study a range of problems on quantum control of atomic and molecular systems; and the further cultivation and fostering collaborations with the various research networks in Europe (Euroquam and FastQuast) and the United States (Muris).

Research advances achieved thus far have been in the areas of the non-destructive reconstruction of quantum states of molecular wave packets and the resolution of the spectroscopic phase problem; optical spatial separation of mixtures of ultracold chiral molecules; quantum simulations of reactive collisions of ultracold molecules; and the development by Valery Milner's group of a prototype magnetic coil that will serve as a building block of a magnetic decelerator of supersonic molecular beams.

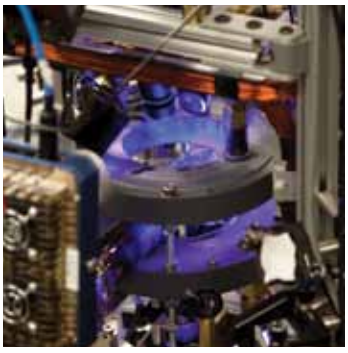
Project findings are already attracting international interest. The scenario suggested by Xuan Li and Moshe Shapiro for the spatial separation of ultracold chiral molecules of opposite handedness is a topic of great fascination to chemists and physicists alike. This optical separation is analogous to Pasteur's manually separating, with the aid of a microscope and a pair of tweezers, crystals of such

"enantiomers." Besides the intellectual challenge of making light move such nearly identical molecules in different directions, the optical process will perform the separation molecule by molecule, at a rate that is millions of times faster than that achievable manually.

Xuan Li and Cian Menzel-Jones of Moshe Shapiro's group have solved the general problem of the non-destructive reconstruction of unknown quantum state. The algorithm developed in this context generates as a side product the potentials that govern the motion of the unknown quantum state in a "point-by-point" manner. The method uses as input the power spectrum of the light emitted from a small minority of replicas of the unknown state (hence the term "non-destructive") and the potential (often that of the ground state) to which the light emission occurs. There is currently a great interest in this problem, both in the quantum information community, where this development appears to by-pass some of the difficulties associated with the "non-cloning" theorem, and in the community of molecular spectroscopists, because of the tantalizing possibility of mining the high resolution data they have been generating for years to obtain highly accurate potentials.

Lastly, the formulation of Roman Krems for quantum simulations of reactive collisions in ultracold molecular gases confined by optical lattices has attracted much interest among theoretical and experimental physicists. The theoreticians are now working to extend this formalism to systems composed of polar molecules (with long-range interactions—a topic of great interest to the quantum information community), while the experimentalists are planning to test the theoretical prediction of Krems' group that reactive scattering of molecules in a quasi-2D geometry must be suppressed.

Looking ahead, the first MTG workshop, on "Coherence in Ultracold Molecular Physics" will take place at the Peter Wall Institute, May 20-23, 2010. It is attracting most of the world leaders in the field of ultracold molecular gases representing the major European and U.S.-based laboratories and networks of research in this field.



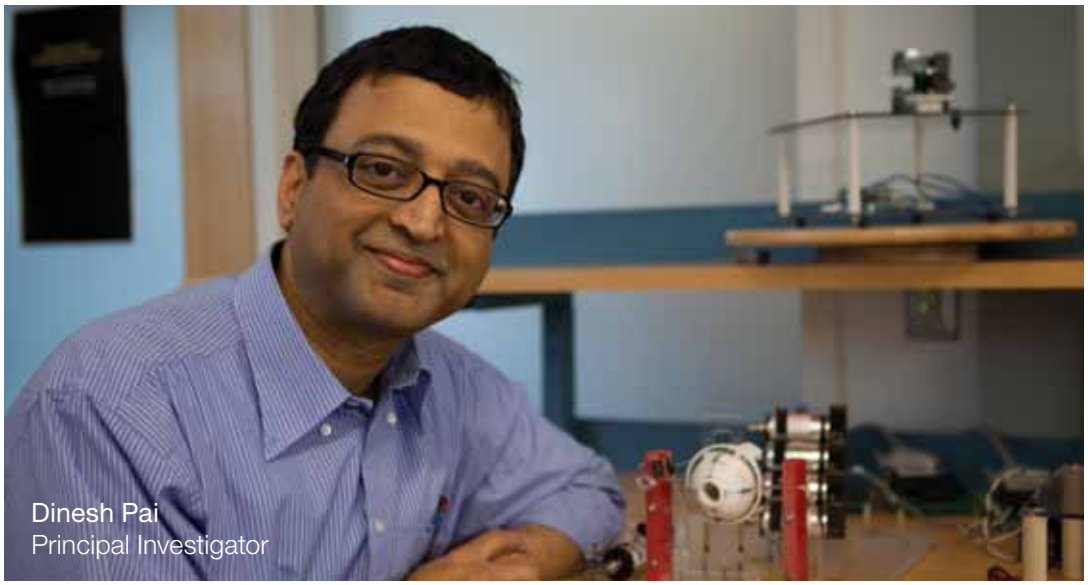
Moshe Shapiro, Principal Investigator, project's laser lab, apparatus for generating laser cooled Li + Rb ensembles

Sensorimotor Computation

A Peter Wall Major Thematic Grant, 2008–2010

Principal Investigator: Dinesh K. Pai, Computer Science. Co-investigators: Antony Hodgson, Mechanical Engineering; J. Timothy Inglis, Human Kinetics; Alan K. Mackworth, Computer Science; Martin J. McKeown, Neurology; John D. Steeves, International Collaboration on Repair Discoveries (ICORD).

External Collaborators: Andrea d'Avella, Santa Lucia Foundation, Rome; Kathleen Cullen, Physiology, McGill University; Joseph Demer, Jules Stein Eye Institute, University of California, Los Angeles; Yoky Matsuka, Computer Science and Engineering, University of Washington; Joel Miller, Smith-Kettlewell Eye Research Institute, San Francisco; Mitsunori Tada, Digital Human Research Center (DHRC), Tokyo.



Dinesh Pai
Principal Investigator

In its second year, the Sensorimotor Computation Project has continued to make rapid progress towards achieving both of its main goals: to develop new computational models of the human eye and hand, and to develop a new interdisciplinary community of researchers in this theme at UBC. The PI was on sabbatical leave for the year but remained actively involved in the project, returning to Vancouver to participate in most of the project-related events detailed here; a co-investigator, Tim Inglis, managed the project locally for part of the year.

Major highlights include the month-long visit in September by Alain Berthoz of the Collège de France, Paris as the 2009 Peter Wall Distinguished Visiting Professor (see page 21 for details). During the visit, several satellite events were organized, including a tutorial on "The Physiology of Eye Movements for Computer Scientists and Engineers" by Berthoz, a Research Day on the Vestibular System (with MTG external participant Kathleen Cullen), a Research Day on the superior colliculus (with special guest Jennifer Groh from Duke University), and a talk at the

PWIAS Associates Lunch by Dinesh Pai (see page 45 for details). To further strengthen the Institute's partnership and research interactions with the Collège de France, Pai spent all of May as a Chaire d'Etat at the Collège, where he gave four public lectures on "Computational Models of Human Movement," the theme of the MTG, and initiated a new collaboration on eye movements with researchers from the Collège and Université Pierre et Marie Curie (Paris VI).

A second major achievement for both the research and community-building activities of the project was the award of a CFI Leading Edge Fund grant to ICICS, with Pai leading the theme on Human Sensorimotor Systems, which includes all the MTG investigators. This brings $1.6 million in state-of-the-art equipment to the MTG theme, including a new motion capture system, advanced eye and head trackers, a high-density EEG/EMG system, several haptic interfaces, a robotic arm exoskeleton, and a multifingered robot hand.

The Sensorimotor Computation Seminar Series sponsored a total of six invited speakers from Canada (1), USA (3), France (1), and the Netherlands (1), including the aforementioned visitors. Sponsored also was a year-long undergraduate project for a group of six Mechanical Engineering students with the goal of building a human-like robotic finger.

Significant research progress was made in the main research themes. Experiments with the biomechanical modeling framework, for example, suggested several improvements for both efficient simulation and robust handling of very tight constraints due to tendon sheaths. This capability does not exist in any other current biomechanical model. A second important aspect was to incorporate more realistic constitutive properties of muscle. The team is now working with collaborators at Northwestern, Drexel, and Northern Arizona universities to validate the simulator experimentally. More generally, Pai showed mathematically that a common assumption used in almost all previous biomechanical models can lead to significant errors in dynamic simulation. A paper describing this finding is currently under review and has inspired new physiological experiments at Northwestern University to test these theoretical predictions.

With Mitsunori Tada, MTG external participant at DHRC Tokyo, the UBC team continuing to acquire unique measurements of the functional biomechanics of cadaveric hands using a robotic tendon actuation system and CT imaging. UBC PhD student Shinjiro Sueda worked at the DHRC in Tokyo on designing the measurement and acquisition system.

On another front, the MTG project is one of only two international collaborators on a proposal with an external participant, Yoky Matsuoka, to create a major US National Science Foundation-funded Engineering Research Center on Neural Engineering at the University of Washington. This project could combine the computational models of hands developed in the MTG group with biomedical applications in neuro-robotics and rehabilitation.

Substantial strides were also made in imaging. Computed Myography (CMG) is a technique developed by the MTG project for measuring the activity of hand muscles during movement. The team obtained significantly better estimates using a physiologically motivated tripole basis, gleaning new insights into the numerical algorithms used for robust reconstruction. CMG will prove important in a planned European project led by another MTG external participant, Andrea d'Avella, to develop a novel human interface. The MTG project also developed a new algorithm for estimating muscle fiber architecture from DTI.

To study sensorimotor control at a finer scale, Inglis and Pai, with Jean-Sébastien Blouin and postdoc Martin Héroux in the UBC School of Human Kinetics, began a project to characterize the behaviour of human spindles using microneurography. Research Associate Kees van den Doel in Computer Science is also collaborating with Inglis and Blouin to analyze EMG recordings; this collaboration has already led to a paper forthcoming in the *Journal of Neurophysiology*.

Lastly, MTG researchers investigated sensorimotor control of human gaze by building computational models and a robotic model. The biomechanical model is now able to simulate the effects of extraocular muscle pulleys (discovered by MTG external participants Joseph Demer and Joel Miller) and to predict the effects of clinical conditions such as superior oblique palsy and degeneration of orbital tissues in the elderly. Cullen provided neural recordings of motor neurons during saccades that the MTG project used for validating the predictions of the biomechanical model. A new mechanical design of the robotic eye was developed by graduate student Mahkameh Lakzadeh with Tony Hodgson and Dinesh Pai. Joining the project to develop algorithms for visuomotor control is a Master's student, Martin Lesmana.

Looking ahead, the major research focus for 2010 is the completion of many of the new projects. MTG researchers plan, for example, to complete software development and experimental validation of the biomechanical simulator that provides the foundation for their models, and to distribute the simulator outside UBC. They also plan to complete the development of the robotic model of the eye and to use it to investigate biologically inspired control algorithms. They will develop a new model of the connective tissue mechanisms of the hand from the data acquired in 2009 and will develop a new model of neural coding in an important human sense organ, the muscle spindle.

In addition to hosting research visits from MTG external participants and sponsoring visits from international students, the MTG project will co-host a workshop on the Control of Gaze at the Collège de France in May 2010, which will assemble many European experts on this topic, and will hold a workshop on Modeling the Hand at UBC in Fall 2010.

John Steeves, Timothy Inglis, Antony Hodgson, Dinesh Pai, Martin McKeown, and Alan Mackworth

EXPLORATORY WORKSHOP GRANT

The Exploratory Workshop program offers competitive funding for meetings of researchers from various disciplines at UBC with distinguished external experts. Outcomes may include a special issue of a journal, an edited volume, or an application for a large grant such as a Wall Institute Major Thematic Grant.

A total of 73 Exploratory Workshop Grants have been awarded since 1999.

Translation and Authority

Principal Investigator: Susanna Braund, Classical, Near Eastern, & Religious Studies
March 6–8, 2009

UBC's mission is "education for global citizenship." There can be no activity more central to global citizenship than translation. We all engage in multiple acts of "translation" every day. Translation extends beyond words and texts; it involves values and ideologies. To understand other cultures we need to know what gets lost, found, suppressed, enhanced, and changed in translation. Any translation transaction involves two languages or cultures, usually in a hierarchical relationship, whether this is implicit or explicit. Yet we often invest translations with enormous authority, with little reflection on modes of production or the impact of the hierarchies of languages, cultures, values, or ideas.

The Faculty of Law, Faculty of Arts (HSS Symposium Grant), and many units in Arts provided additional funding.

The Sea Before Us: Reconstructing the Strait of Georgia

Principal Investigators: Anthony Pitcher, Fisheries Centre, and Coll Thrush, History
May 29–31, 2009

This three-day workshop aimed to explore ways of creating an integrated environmental and social history of the marine ecosystem of the Strait of Georgia, and to determine how to draw up credible, detailed, scientifically-supported future scenarios for the Strait using insights from this history. An overall objective was to draft a proposal for a Wall Institute Major Thematic Grant on the same theme. Participants debated potentially achievable outputs such as an integrated history of the Strait published as a book. Also explored were various means, such as a web-based system, for obtaining community-led feedback and evaluation of these futures. Because ways of using insights from the past to influence policy are controversial, participants discussed more robust approaches to creating future scenarios.

Removing Barriers and Enabling Individuals: Ethics, Design, and Use of Assistive Technologies

Principal Investigators: Meeko Oishi, Electrical & Computer Engineering, and Ian Mitchell, Computer Science
July 22–24, 2009

Workshop participants addressed the interdisciplinary gap that exists in assistive technology (assistive, adaptive, and rehabilitative devices for people with disabilities) research by bringing together researchers from computer science, engineering, social science, humanities, medicine, rehabilitative, and clinical fields. Topics spanned evaluation, sensing, networking, and mobility, while the research themes included customization, privacy, ethics, and integrated end-user involvement. Results included the identification of concrete directions for future interdisciplinary collaborations, best practices guidelines for successful assistive technology design and use, and potential publication of the presentations.

The Institute for Computing, Information, and Cognitive Systems co-funded the workshop, and the Disabilities Health Research Network provided additional support. Videos of the public keynote talks by Anita Silvers, Gary Birch, and Albert Cook are posted on the workshop's website.

Arts-Based Methods in Health Research

Principal Investigators: Susan Cox, Centre for Applied Ethics, and George Belliveau, Language & Literacy Education
November 20–22, 2009

Arts-based initiatives have emerged over the last few decades as promising avenues for innovation in qualitative research. As a result, researchers in various disciplines are experimenting with novel forms of inquiry and data representation, such as dance, drama, fiction, poetry, songs, and visual arts. If much has been written about the form, the content, and the legitimacy of these novel research methods, it seems that other important questions have been neglected. The organizers opened up to a larger audience at UBC and internationally the discussion about under-studied issues such as: What is unique about using arts-based methods in health research as opposed to other fields of research such as education or law? What level of professionalism and core competence is required from artists/performers versus what is required from lay artists? Does the art form have to be executed to a high professional standard to be effective or can lay artists also contribute to effective forms of inquiry and methods for conveying research results?

THEME DEVELOPMENT WORKSHOPS

Theme Development Workshops facilitate brief, informal meetings of UBC researchers to explore the research possibilities of a topic of interdisciplinary interest. Workshops by Early Career Scholars are often funded by the Early Career Scholar Program. The workshops led by full members of the UBC Institute for Computing, Information, and Cognitive Systems (ICICS) are co-funded by ICICS.

Culture and the Mind Project

Two-part workshop organized by Joe Henrich, Psychology and Economics, and 2007–2008 Early Career Scholar
January 6–11, 2009

The planning workshop was held as part of an ongoing series of annual workshops for this UK Arts and Humanities Research Council project, a large, five-year, interdisciplinary, cross-cultural endeavour led by cognitive philosophers. The Early Career Scholars Program co-sponsored the workshop.

Removing Boundaries: Challenges and Opportunities in Interdisciplinary Research of Assistive Technologies

Workshop organized by Meeko Oishi, Electrical & Computer Engineering and 2008–2009 Early Career Scholar
February 3, 2009

An organizational workshop for UBC participants of the Exploratory Workshop held on that theme and co-sponsored by the Early Career Scholars Program and ICICS. (See page 36 for Exploratory Workshop details.)

Health and Information Technology

Workshop organized by Noreen Kamal, eHealth Strategy Office, Medicine
February 6, 2009

This luncheon meeting launched ongoing discussions about how the latest technology can contribute to health outcomes. It brought together researchers from technology, eHealth, education, medicine, health informatics, information science, communications, health policy, and health administration. Key emerging themes were: interaction and social networks, knowledge and information, and credibility.

Integrating Foothills Watershed Research

Workshop organized by Marwan Hassan, Geography and 2007–2008 Early Career Scholar
February 9–10, 2009

The Foothills Research Institute has supported a small number of UBC scientists conducting applied, interdisciplinary, watershed research in the Foothills of Alberta for more than five years. While the researchers from various

disciplines had worked in the same locales, their projects had not been truly integrated. This workshop discussed the potential to develop a new framework that would encourage integration. The Early Career Scholars Program co-sponsored the meeting.

Social Responsibility in the Health Professions: Critical Explorations

Workshop organized by Shafik Dharamsi, Family Practice and 2008–2009 Early Career Scholar
February 23–24

Exploring the implications of the topic for the education of health professions, this workshop formulated specific research questions, explored perspectives and experiences, and developed foundational themes and questions that will inform future research activities and build a research network in this research area. The meeting was funded by a grant from the Social Sciences and Humanities Research Council of Canada and received additional funding from the Early Career Scholars Program.

Arts-Based Methods in Health Research

Workshop organized by Susan Cox, Centre for Applied Ethics
February 24, 2009

An organizational workshop for UBC participants of the Exploratory Workshop held on that theme. (See page 36 for Exploratory Workshop details.)

Position Emission Tomography/ MRI Imaging

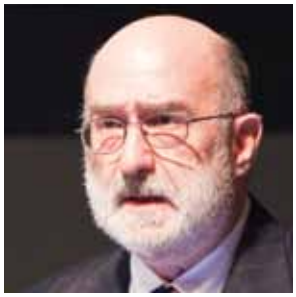
Workshop organized by Vesna Sossi, Physics & Astronomy and 2006–2007 Early Career Scholar
September 28, 2009

An informal day-long meeting between members of Bernd Pichler's group at Tübingen University that is pioneering emission tomography/MRI imaging and interested UBC researchers, with the ultimate goal of bringing such a modality to UBC and increasing ties between UBC and the Tübingen group. The Early Career Scholars Program co-funded the workshop.

Marwan Hassan and Vesna Sossi

COLLOQUIA

Colloquia are public talks by distinguished visiting researchers that will appeal to an interdisciplinary audience. Visitors under the Cecil H. and Ida Green Visiting Professorships Program of Green College often give a Wall Colloquium as part of their series of interdisciplinary talks on campus. Most of these talks are available as audio podcasts on the Institute's website.



Simon Conway Morris, Sander Gilman, and Grant Gillett

January 23, 2009
Simon Conway Morris, Professor of Evolutionary Paleobiology, University of Cambridge, and Cecil H. and Ida Green Visiting Professor, explored the evidence demonstrating life's almost eerie ability to navigate to a single solution, repeatedly. Eyes, brains, tools, even culture: all are very much on the cards. So if these are all evolutionary inevitabilities, where are our counterparts across the galaxy? In his talk, "Does Evolution Have a Deeper Structure?" Dr. Morris argued that the tape of life can only run on a suitable planet, and it seems that such Earth-like planets may be much rarer than hoped. Olaf Slaymaker of Geography organized the talk.

June 30, 2009
Allison Okamura, Professor of Mechanical Engineering, Johns Hopkins University, in a talk entitled "Robot-Assisted Needle Steering," spoke about the novel partnership between human surgeons and robotic devices for overcoming the limitations of traditional surgery. In a second presentation, Lynette Jones, Professor of Mechanical Engineering, Massachusetts Institute of Technology, gave a talk entitled "Thermal Feedback in Haptic Displays: What Does It Contribute?" This talk explored the use of thermal displays as part of haptic interfaces so that virtual or remote objects can be identified with the hand. Karon MacLean of Computer Science organized this Colloquium.

September 25, 2009
Tanisha Ramachandaran, Assistant Professor, South Asian Religions, Wake Forest University, in her talk entitled "Dildos, Knives and Flapping Tongues: The Appropriation of the Hindu Goddess by Western Feminism," examined the depiction of the Hindu goddess by Western feminists through issues of imperialism, orientalism, and cultural appropriation. Responsible for this mid-day Colloquium was Sunera Thobani, Women's Studies and 2008-2009 Early Career Scholar. The event was funded through the Institute's Early Career Scholar Program.

October 23, 2009
Sander Gilman, Distinguished Professor of the Liberal Arts and Sciences and Professor of Psychiatry at Emory University, and Cecil H. and Ida Green Visiting Professor, gave a talk on the topic "Ethnicity and Diabetes: The Jews as a Diabetic People." Peter Chow-White, Assistant Professor in the School of Communication at Simon Fraser University, responded to Dr. Gilman's talk. The Colloquium took place in the Royal Bank Cinema, Chan Centre, and was followed by a Wall-sponsored reception at Green College. It was organized by Margery Fee, English, and 2009–2010 Distinguished Scholar in Residence.

November 27, 2009
Grant Gillett, Professor of Philosophy, University of Otago, New Zealand, and Cecil H. and Ida Green Visiting Professor, explored how the neurological disorder known as hysteria produces a condition where the person concerned does not seem to know what is going on in his or her own mind. His talk was entitled "Neuroethics and Hysteria: The Mind and Neurological Disorder." Peter Reiner, Psychiatry, organized the talk.

FACULTY ASSOCIATES FORUM

A biweekly gathering of Institute Associates and guests over lunches and dinners with talks by Associates. It is the key forum at UBC for interdisciplinary research contact. Most of the talks since January 2008 are available as audio podcasts on the Institute's website.

Jehannine Austin, Sonia Ziesche, Jane James, and Brian James

Chris Carleston, Jennifer Sandoval, and Sid Katz

January 14, 2009
Edward Slingerland, Asian Studies and 2008–2009 Early Career Scholar, and Joseph Henrich, Psychology and Economics and 2007–2008 Early Career Scholar
"Integrating Science and the Humanities"

The mind–body dualism that informs the sharp divide between the "two cultures" of the natural sciences and the humanities may not be plausible in light of recent discoveries about human cognition. Drs. Slingerland and Henrich argued that it was time to focus more attention on bridging the increasingly untenable gap between these cultures. We should recognize that the more complex human structures typically studied in the humanities, such as religion, culture, meaning, ethics, literature, consciousness, emotions, and aesthetics, could now in theory be incorporated into a vertically integrated understanding of humanity. Drs. Slingerland and Henrich led an Exploratory Workshop on the topic in 2008.

January 28, 2009
Stephen Sheppard, Forest Resources Management and Landscape Architecture and 2009 Distinguished Scholar in Residence
"Changing Our High-Carbon Aesthetic: Shifting Attitudes on Climate Change"

The aesthetic aspects of climate change have important relationships between human perception and causes of climate change in Western cultures. Dr. Sheppard discussed the often overlooked socio-cultural phenomenon that he calls the "High-Carbon Aesthetic," related to concepts such as "conspicuous consumption" and prevailing aspirations for "monster homes," " status vehicles," and imported luxury materials. His talk reviewed new evidence on the role of visual media in cognition and attitudes on climate change, with particular reference to the effects of growing climate change awareness on our perceptions of environmental limits and desirable lifestyles.

February 11, 2009
Robert Brain, History
"Varieties of Empathy in Science, Art, and Culture"

How do we know the emotions and expressions, thoughts and intentions of others? Dr. Brain argued that two streams of research—one rooted in the neurosciences, another in the humanities—have emerged in the last 20 years and cast dramatic new light on our capacity to mentally identify ourselves with persons or objects of contemplation. The discovery of mirror neurons, which simulate bodily movements and emotions in the brain, have opened a new investigation of empathic response in humans and animals, and have "rediscovered" a nineteenth- and early twentieth-century research tradition in the physiology, psychology, and philosophy of art, architecture, and social communication, which similarly described human modes of comprehending corporeal gestures and emotions. Dr. Brain led an Exploratory Workshop on the topic in 2008.

February 25, 2009
Leah Edelstein-Keshet, Mathematics and 2009 Distinguished Scholar in Residence
"A Mathematician's Adventures in Cell Biology"

Many types of animal cells have the capacity to move by crawling. These include amoebae, white blood cells, and other cells responsible for healing wounds. Typically, after a directional stimulus such as a chemical gradient, a resting cell becomes polarized, changes its shape, and starts to crawl in the given direction. Dr. Keshet argued that cell motility stems from constant remodeling of, and propulsive forces exerted by, biopolymers that



Edward Slingerland, Joseph Henrich, and Robert Brain



Susanna Braund, Tom Hutton, and David Fraser

form the internal "skeleton" of the cell (called the cytoskeleton and largely composed of actin), regulated by a complex biochemical "signaling" network whose details are gradually being elucidated experimentally. Her talk highlighted how mathematical modeling can help to address these issues. The model acts as a tool to help bridge the gap between one scale, such as interacting molecules, and another, such as cell behaviour.

March 11, 2009
Susanna Braund, Classical, Near Eastern, & Religious Studies
"Translation and Authority"

A report on the March 6–8, 2009 Exploratory Workshop "Translation and Authority."
(See page 35 for workshop details.)

March 25, 2009
Harvey Richer, Physics & Astronomy and 2009 Distinguished Scholar in Residence
"Watcher of the Sky: An Observational Astronomer's View of the Universe"

Observational astronomy is the science of observing the Universe using various astronomical instruments. Dr. Richer discussed some of the objects, events, and instruments that have influenced him in his career as an observational astronomer. He presented incidents from early in his career and discussed a number of celestial objects that shaped his research over the years. In particular, he presented recent work with the Hubble Space Telescope, which allowed him and his team to discover the oldest known planet in the Universe, derive ages for the most ancient star clusters known, and play "MythBuster" with a very fashionable current paradigm in star cluster physics.

April 15, 2009
Thomas Hutton, Community & Regional Planning and Centre for Human Settlements
"The New Economy of the Inner City:
Restructuring, Regeneration, and Dislocation in the Metropolis"

Twenty-five years after the restructuring process that swept away the traditional manufacturing economy of the metropolis, new industries and enterprises are transforming post-industrial landscapes of the inner city. These creative, technology-intensive industries are integral to the emergence of the "new inner city" of the twenty-first century. Dr. Hutton, who led a workshop on the topic in 2008, addressed the critical intersections between process and place that

underpin the formation of creative enterprises in the inner city's new industrial districts, demonstrating the global reach of development and innovation across urban systems. Instructive case studies included London, San Francisco, Singapore, and Vancouver.

April 29, 2009
Martin Barlow, Mathematics and 2009 Distinguished Scholar in Residence
"Random Walks and Random Structure"

Random walks can be used as a description for the motion of a particle that moves in space "at random." Significant work was done in the early twentieth century: in particular, random walks and their continuum limits were used by Einstein to study Brownian motion, and Bachelier used them to study stock prices. The second model is "percolation," introduced by Broadbent and Hammersley in 1957. This describes a network with random connections: one motivation is to describe obstructions to the flow of gas through the carbon filter in a gas mask. Percolation arises in many other contexts, such as the "contact networks" used to describe the spread of disease in a community. Dr. Barlow argued that, though both models can be described easily, many questions remain unsolved. He also described what happens when one combines the two models.

May 13, 2009
David Fraser, Land & Food Systems and Centre for Applied Ethics
"Conservation and Animal Welfare Science (CAWS): We've Got the Anagram — Now Let's Create the Field"

The concerns that people express about animals tend to focus on two issues: animal conservation (preservation of populations, species, and ecosystems) and animal welfare (suffering, health, and quality of life). Scientists responding to these concerns have created two distinct fields. Conservation biology uses the tools of ecology and population biology; it deals with wild animals at the population and ecosystem level. Animal welfare science uses the tools of animal behaviour, physiology, and veterinary medicine and deals mainly with domestic and captive animals, especially at the individual level. Dr. Fraser led an Exploratory Workshop on the topic in 2007.

May 27, 2009
Michael Doebeli, Mathematics and Zoology and 2009 Distinguished Scholar in Residence
"Evolution of Diversity"

All life has evolved from a much more uniform ancestral state—which begs the question about the mechanisms for the evolution of diversity. Traditional evolutionary theory predicts uniformity: natural selection, acting on organisms under given environmental conditions, produces a unique, optimally adapted phenotype. This view, according to which diversity only emerges through a change in conditions over space or time, misses out on the important perspective that diversification can itself be an adaptive process that is driven by biological interactions, such as competition for resources. Dr. Doebeli reviewed the basic theoretical concepts underlying such adaptive diversification and offered examples for this process, including results from experimental evolution in the bacterium *E. coli*. He suggested that these evolutionary concepts could help us understand the emergence of diversity in human culture, such as with language and religion.

September 16, 2009
Dinesh Pai, Computer Science and Principal Investigator, Peter Wall Major Thematic Grant
"Eyes and Hands and Brains! Oh, My!"

The three-year Sensorimotor Computation project, funded by a Major Thematic Grant in 2008, is developing a constructive understanding of how humans move. Dr. Pai described the computational models of the exquisite biomechanical machinery of eyes and hands that are being constructed in this project using new imaging techniques and efficient simulation algorithms. As the nod to the Wizard of Oz in the title suggests, He speculated that the emerging picture could change the way we think about information processing and machines that perform work.

September 30, 2009
Alain Berthoz, Physiology of Perception and Action, Collège de France, Paris and 2009 Wall Distinguished Visiting Professor
"The Brain and Decisions: Emotion and Reason"

Theories proposing that humans are rational deciders have been questioned since the pioneering work of the psychologist Daniel Kahneman, who received the Nobel Prize in Economics in 2002. It is, today, necessary to establish new foundations for a biologically based theory of decision-making, including the important role of emotion. Numerous studies in cognitive neuroscience have recently been devoted to this question. Dr. Berthoz presented work from his laboratory and other groups that shows that decision-making is a distributed property of brain functions at many levels of perception, action, and reasoning. Modern fMRI and intracranial recordings techniques in epileptic patients, for example, provide insights into the hierarchical organization of these multiple levels of decision and their interaction with the limbic system, which is responsible for emotion.

October 14, 2009
Danielle van Jaarsveld, Sauder School of Business, and Daniyal Zuberi, Sociology, both 2006–2007 Early Career Scholars
"Globalization and the Service Workplace"

Global economic competition poses significant challenges for our understanding of the world of work. An exemplar case for examining how global competition is reorganizing work is found in the service sector. The service sector encompasses work that involves the provision of services to customers (such as business services, banking, healthcare,



Dinesh Pai, Danielle van Jaarsveld, and Meeko Oishi

or tourism). Drs. Jaarsveld and Zuberi argued that, as a consequence of globalization, service work is being outsourced both locally and in some cases globally, transcending national borders through offshoring arrangements. Despite the pervasiveness of these trends, relatively little is known about whether national institutions (such as unions or labour and employment laws) are still meaningful as technology facilitates the seamless transfer of work from one geographic location to another. Beyond institutions, not much is known about how the reorganization of service work is affecting job quality (as in wages, job security, and mobility) and labour market outcomes for the service workforce. Drs. Jaasveld and Zuberi held an Exploratory Workshop on this topic in 2008.

October 28, 2009
Trevor Barnes, Geography and 2009 Distinguished Scholar in Residence
"Two Men of War and Their Big Idea: Walter Christaller,
Edward Ullman, and Central Place Theory"

Dr. Barnes examined the role of war on the production of academic geographical knowledge by examining the case of central place theory. Central place theory, a geographical theory of the optimal spatial distribution of cities, was independently discovered at various times during the 1930s by three men: Germans August Lösch and Walter Christaller and the American, Edward Ullman. Lösch spent the Second World War at a research institute, whereas Christaller became a member of Himmler's SS in July 1940, and Ullman joined the US Office of Strategic Services, the forerunner of the CIA. Dr. Barnes focused on Christaller and Ullman and detailed the wartime activities of both men. He followed their later activities once the war was over until they met at what became a key conference in post-war geography, the 1960 International Geographical Union Symposium on Urban Geography at Lund, Sweden. The conference was key because it set out a scientific agenda for the discipline, one critically informed by central place theory.

November 18, 2009
Meeko Oishi, Electrical & Computer Engineering and 2008–2009 Early Career Scholar
"Removing Barriers and Enabling Individuals: Ethics,
Design, and Use of Assistive Technologies"

A report on the Exploratory Workshop "Removing Barriers and Enabling Individuals," held July 22-24, 2009. (See page 36 for workshop details.)

INTERNATIONAL PARTNERSHIPS

A current strategic direction of the Institute is to create scholarly partnerships among the international network of institutes of advanced study to support research of lasting value and impact. The Institute has since the fall of 2008 concluded memoranda of understanding for faculty exchanges and colloquia with the forerunner of all institutes for advanced study, the Collège de France in Paris, established in 1530, and with one of the newest, the Technical University of Munich–Institute for Advanced Study, founded in 2005. We have also partnered with Africa's young, premier institute, the Stellenbosch Institute for Advanced Study, South Africa.

Distinguished Faculty Exchanges

Under the memoranda of understanding with our International Partners, the Institute can welcome each year up to three outstanding professors from the Collège de France within the context of its invited Distinguished Visiting Professor program, and in turn, the Collège can invite up to three senior Faculty Associates of the Institute for one month under the rubric of its "State Chair" program. Stellenbosch will welcome up to five nominations per year of senior Faculty Associates of the Institute for fellowships of three months or longer. The Institute and TUM–Institute for Advanced Study will arrange annual brief exchanges of small, interdisciplinary research clusters with interests in a common topic.

Andrew Macnab is the first Faculty Associate of the Institute to be appointed a Stellenbosch Fellow (for three months, late 2009 and early 2010) under the new partnership. Dr. Macnab is a Professor of Pediatrics and was a 2006 Wall Distinguished Scholar in Residence.

Dr. Macnab is bringing elements that enriched his year as a 2006 Peter Wall Distinguished Scholar in Residence to the STIAS community by completing the data analysis of the four-year evaluation of the UBC Makerere University, Kampala, Uganda partnership.

Upcoming faculty exchanges between senior Associates of the Institute and the Collège de France for 2010 and 2011 will include the Institute's Lawrence Ward and Brett Finlay and the Collège's Philippe Sansonetti and Stanislas Dehaene.

Wall Colloquium Abroad

In recognition of its commitment to research exchanges and collaborations with its international partners, the Institute launched a special program to co-sponsor and fund colloquia from time to time at its partner institutes.

Like Exploratory Workshops held at the Institute, Wall Colloquia Abroad are small meetings to which scholars from a range of disciplines, from UBC and abroad, are brought together for a few days to develop and further research agendas on cutting edge topics. These are headed by Faculty Associates of the Institute who are in residence at partner institutes. Holding the meetings in other parts of the world raises the research profile of the Wall Institute and attracts key researchers from those regions who might otherwise not be able to participate; holding them at partner institutes enhances the intellectual value of the partnerships. A Colloquium Abroad is being planned for the Collège de France in 2011.

The HIV-Exposed but Uninfected Infant: How Can the Excess Morbidity and Mortality Be Explained?

Colloquium Abroad organized by David Speert, Pediatrics, UBC, and STIAS Fellow 2009; Monica Esser, Tygerberg Hospital, and Ben Marais and Mark Cotton, Pediatrics, Stellenbosch University
November 3–5, 2009

The first of Colloquium Abroad was held at the Wallenberg Research Centre of the Stellenbosch Institute for Advanced Study, Stellenbosch, South Africa, co-host of the event. The purpose of this special interdisciplinary gathering was to review the international experience with regard to a newly emerging health issue: morbidity and mortality in HIV-exposed but uninfected (HEU) infants. A second goal was to begin planning a collaborative study to identify the potential underlying causes of the HEU phenomenon. The ultimate goal of the proposed study is to design interventions that will enhance the health of affected infants. Two days of papers and discussions were attended by researchers and clinicians from South Africa, Zimbabwe, Canada, Belgium, and the USA. Twenty attendees presented papers, and many more offered their opinions and insights. The meeting provided an excellent opportunity to showcase the work of South African scientists both in the country and from abroad, and to launch the new partnership between the Peter Wall Institute and STIAS.

Colloqium participants at the Stellenbosch Institute for Advanced Study and children at Butterfly House, Paarl, South Africa

SPECIAL EVENTS

Official Opening of the Renovated Facilities
April 14, 2009

A gathering of several hundred attended this joyful event, which marked both the official opening of the Institute's renovated facilities and a celebration of the 10th anniversary of the Leon & Thea Koerner University Centre (originally the UBC Faculty Club). The Institute had been instrumental in reopening the old Faculty Club facilities in 1999. UBC President Stephen Toope and Sonya Wall, Trustee and Donor Family member, unveiled a plaque formally renaming the East Wing as the Peter Wall Institute for Advanced Studies. The event, under the guidance of the UBC Ceremonies office, was co-hosted by the Institute and Sage Bistro.

Top row:
Sonya Wall and Stephen Toope

Bottom row:
Trustees Luncheon, Brett Finlay and Stephen Toope, Robert Lee, and Akbar Lalani

Annual Trustees Appreciation Luncheon
June 1, 2009

The Trustees and Official Observers of the Wall Institute Board of Trustees joined Institute Director Dianne Newell and UBC President Stephen Toope, Chair of the Board of Trustees, for the third annual luncheon to recognize the contribution of the Board to the success of the Institute. The 2009 Distinguished Scholars in Residence participated as special guests, as did Roman Krems, Chemistry, and Kirk Madison, Physics & Astronomy, who briefed the group on the subject of the new Wall Major Thematic Grant in which they participate as co-investigators, "Coherent Dynamics of Ultra-Cold Molecular Systems."

Book Launch

November 4, 2009

Jennifer Jihye Chun, Sociology and 2008–2009 Early Career Scholar, *Organizing at the Margins: The Symbolic Politics of Labor in South Korea and the United States* (Cornell University Press); Dawn H. Currie, Sociology, co-author, *'Girl Power': Girls Reinventing Girlhood* (Peter Lang Publishing); Renisa Mawani, Sociology and Wall 2001 Visiting Junior Scholar, *Colonial Proximities: Crossracial Encounters and Juridical Truths in British Columbia, 1871-1921* (University of Washington Press); and Becki L. Ross, Sociology and Women's Studies, *Burlesque West: Showgirls, Sex, and Sin in Postwar Vancouver* (University of Toronto Press). The Early Career Scholars Program co-funded the event.

Peter Wall Institute Holiday Reception and Launch of the Charlotte Wall Art Installation

December 4, 2009

This year's annual holiday reception, attended by over 100 Faculty Associates and guests, provided a unique occasion for friends of the Institute from across campus and beyond to gather for lively conversation and networking. Even the children who came seemed happy to join in the festivities.

This gathering also saw the launch of the 2009 installation art by artist Charlotte Wall, which she generously donated to the Institute. The piece, titled "e-loo'me-nem Al + Na3 (AlF6)," was site-specifically created for the Peter Wall Boardroom. Celebrating the Institute's role as a site for advanced, interdisciplinary, cutting-edge research, it is the artist's intent to illustrate in a work featuring aluminum and paint the process of research. Charlotte Wall was at the launch to discuss her work.

Holiday Reception

Top row: Sherrill Grace and David Speert

Bottom row: Brett Finlay and Judith Hall

FUNDING

The Institute is fully endowment-funded. The Peter Wall Endowment comprises Peter Wall's original gift of 6.5 million Wall Financial Corporation shares. Peter Wall is a visionary Vancouver property developer responsible for the iconic Wall Centre in the downtown area. The dividends from the shares support programs, the lease, and a major portion of the Institute's administration. Interest from the Hampton Endowment, a UBC fund dedicated to the Institute in 1994, supports programs and the balance of the administration costs.

GOVERNANCE

The governing body of the Peter Wall Institute for Advanced Studies is the Board of Trustees, as specified under the "Deed of Trust for the Establishment of the Peter Wall Endowment, 1991." Since January 1, 2005, the Institute has for routine matters reported to the Office of the Vice President Research & International. An Academic Advisory Committee of the Institute meets prior to Trustees' meetings to discuss with the Director program policy and special initiatives.

Board of Trustees

The Board of Trustees has overall responsibilities for the policies and finances of the Institute. The Board meets with the Institute Director twice yearly. The five Trustees are the UBC President, who chairs the Board, two UBC-appointed Trustees, and two donor-appointed Trustees. As of December 31, 2009, there are four Trustees:

Akbar Lalani, MD, Royal Columbian Hospital ■ **Robert H. Lee**, Prospero International Realty Inc. and former Chair of the UBC Board of Governors ■ **Stephen J. Toope**, UBC President **Sonya Wall**, Donor Family

Official Observers of the Board (as of December 31, 2009):

David Farrar, Provost and VP Academic ■ **Brett Finlay**, Peter Wall Distinguished Professor **John Hepburn**, VP Research & International ■ **Dianne Newell**, Institute Director ■ **Wesley Pue**, Vice Provost and Associate VP Academic Resources ■ **Bruno Wall**, President, Treasurer, and Director, Wall Financial Corporation

Academic Advisory Committee (as of December 31, 2009):

Anne Condon, Computer Science ■ **Brett Finlay**, Peter Wall Distinguished Professor and Vice-Chair ■ **David Jones**, Zoology ■ **Sid Katz**, Pharmaceutical Sciences ■ **Alan Mackworth**, Computer Science ■ **Dianne Newell**, Director and Chair ■ **Sarah Otto**, Zoology ■ **Anthony Phillips**, Psychiatry ■ **Margaret Schabas**, Philosophy ■ **Lawrence Ward**, Psychology






Top row:
Anne Condon,
David Jones,
and Alan
Mackworth

Bottom row:
Sarah Otto
Anthony Phillips,
and Margaret
Schabas

FACILITIES

The Institute occupies the two-storey East Wing and the top floor of the Leon and Thea Koerner University Centre, University of British Columbia. In 2008, the University renamed the East Wing as the Peter Wall Institute for Advanced Studies.

With completion of the major renovations to the top floor of the East Wing in April 2009, the space now includes the offices of the Assistant Director and the IT Manager, a Bookings and Financial Clerk reception desk, a Program Secretary's desk, a Project Office for Major Thematic Grants, a Distinguished Visitor's Office for Wall Distinguished Visiting Professors and other guests of the Director, a staff room, storage and server rooms, and an open plan meeting room.

Scholars' Area

The east half of the top floor of the University Centre houses the Office of the Director, the research offices of the Wall Distinguished Professor and Distinguished Scholars in Residence, and a lounge and kitchenette for the use of the residential scholars and small gatherings called by the Director. The Peter Wall Boardroom is used for Institute Board of Trustees' meetings and the Director's meetings. Refurbishment to this area was completed in 2009.

Conference Rooms

The Institute operates two conference rooms in the west side of the top floor of the University Centre. The large and small rooms can be used separately or combined for meetings, talks, and meals. Both rooms open onto a large terrace with a sweeping view of the sea and mountains. The larger of the rooms features a fully integrated and automated audio-visual system. Telephone and network connectivity are provided in throughout the conference area. When not in use by the Institute for program events, the conference rooms can be rented by individuals and groups affiliated with the University or for University-sponsored events. Priority in booking the Institute facilities is given to Institute programs, followed by academic-related activities open to the University community. Refurbishment to this area was completed in 2009. Income from the rental of the conference rooms is used to offset the operating costs of the facilities.

Guest Rooms

The Institute's six non-smoking guest rooms reopened in 2009, once the renovations to the East Wing were completed. The guest rooms are available only for participants in Institute-sponsored programs.

DIRECTOR AND STAFF

Dianne Newell, Director. Dr. Newell is an historian of technology who has spent her career examining the diffusion of knowledge in disciplines across the social sciences and humanities. She was named Acting Director in 2003 and appointed Director January 1, 2007. In this role, she has led the Institute's strategic direction, which has focused on both reaching out to the local community and creating scholarly partnerships among the international network of advanced studies institutes. Under her leadership, the Institute has expanded its facilities, programs, and information technology to heighten its reputation as an inspiring location for high-risk research and discussions at the highest level, involving outstanding scholars at UBC and abroad.

Barbara Harrmann, Assistant Director. Barbara joined the Institute in November 2008. She has a Master's degree in History and Journalism from Leipzig University. Barbara is responsible for the office management and administration, including facilities, finance, human resources, and event management. She had major responsibility for the completion of the Institute's renovation to its facilities, landscaping, and signage, and the move of staff into the renovated East Wing.

Markus Pickartz, IT Manager. Markus manages all systems, including computer networks and audio-visual installations, and communications covering web and print publishing and, most recently, the production of podcasts of Institute events. He had major responsibility for the new technology infrastructure designed as part of the facilities renovations. Markus has a BA in Theatre from Arizona State University and a diverse and extensive background in IT. He joined the Institute in 2004.

Alfredo Santa Ana, Facilities Reservations & Office Clerk. Alfredo joined the Institute in February 2008. In addition to booking and administering the Institute's conference and guest facilities, Alfredo also undertakes the day-to-day financial transactions of the Institute. He is completing his doctoral degree in Music (Composition) at UBC. The short melody that introduces each Institute podcast since August 2009 is a piece by Alfredo that the Institute commissioned.

Program Secretary. As of December 2009, the staffing of a senior secretary position was stilll in progress.

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