

Leading sustainability, environmental and "green" energy research at Queen's

Alternative energy

Praveen Jain (Electrical and Computer Engineering), head of Energy and Power Electronics Applied Research Laboratory (ePOWER) – energy efficiency improvements within electrical energy.

Brant Peppley (Mechanical and Materials Engineering), Canada Research Chair in Fuel Cells – fuel cell technology.

Steve Harrison (Mechanical and Materials Engineering), leads Queen's Solar Calorimetry Laboratory – designing, analyzing, modelling and improving solar heating systems and components.

Joshua Pearce (Mechanical and Materials Engineering) – renewable energy engineering.

Bryne Purchase (Policy Studies) – energy policy.

Sustainability research

BIOCAP Canada Foundation – helped lay the groundwork for Canada's transformation towards a sustainable bioeconomy.

Sustainable Bio-Economy Centre – moving from the current fossil-fuel-based economy to a biological resources-based economy.

Andrew Pollard (Mechanical and Materials Engineering), director of Queen's Sustainable Bio-Economy Centre – computational and experimental fluid dynamics.

Kerry Rowe (Civil Engineering) – tunneling, soil reinforcement, geosynthetics and waste management, contaminant containment and safe landfill design.

Green chemistry research

GreenCentre Canada, a National Centre of Excellence for Commercialization and Research, bringing together Canada's leading green chemistry researchers, industry partners and commercialization professionals to develop cleaner, less energy-intensive solutions for traditional chemical and manufacturing processes.

Philip Jessop (Chemistry) – "green" chemical methods for separating oil and water, or solvents, using carbon dioxide and air.

Neal Scott (Geography), Canada Research Chair in Greenhouse Gas Dynamics and Ecosystem Management – impacts of reforestation on greenhouse gas emissions.

Environmental research

John Smol (Biology), Canada Research Chair in Environmental Change, founder and co-director of Paleoecological Environmental Assessment and Research Laboratory (PEARL) – natural and human impacts on lakes and ecosystems.

Bruce Pardy (Law) – environmental law and issues related to international climate change agreements, environmental governance, ecosystem management, environmental liability and water law.

Andrew Daugulis (Chemical Engineering) – producing ethanol from renewable resources as a viable alternative for automotive fuel, and developing bioreactors for the destruction of toxic compounds.

Paul Grogan (Biology), Canada Research Chair in Climate Change Effects on Northern Ecosystems – Arctic ecosystems response to changes in summer air temperature, winter snow accumulation, vegetation distribution and caribou migration.

Kurt Kyser (Geological Sciences and Geological Engineering) – new ways to protect the environment, the safety of our food and environmentally responsible extraction of mineral resources.

Water quality research

Stephen Brown (Chemistry and Environmental Studies) – new methods of environmental analysis, with emphasis on detecting small organic compounds in water samples.

Linda Campbell (Environmental Science) – aquatic systems health, heavy metal contamination, management and remediation, mostly in the Great Lakes.

Gary vanLoon (Chemistry, Environmental Studies) – environmental chemistry, drinking water chemistry, waste water treatment and groundwater remediation procedures.

Kent Novalkowski (Civil Engineering) – creating tools that protect municipal drinking water from its source in the watershed to the taps in people's homes.

Research projects receive \$25 million from Ontario Government

By NANCY DORRANCE

Queen's researchers involved in 26 projects, ranging from nuclear materials and microelectronics to bone and joint repair, have received more than \$25 million in new provincial infrastructure grants.

"We are delighted to receive this very substantial investment in Queen's many innovative and diverse research projects," says Principal Daniel Woolf. "The funding will help ensure that our outstanding researchers continue to have competitive, state-of-the-art infrastructure to engage in their leading-edge research and technology development. This in turn will bring significant benefits to our local community, to the province and to the country."

Mechanical and Materials Engineering professor Richard Holt and his 30-member team receive \$7 million to support their study of the behaviour of nuclear reactor core materials in a simulated radiation environment. The program is developing advanced materials for the next generation of nuclear reactors.

Ian McWalter (Canadian Microelectronics Corporation) and Richard Oleschuk (Chemistry) lead a team of 300 researchers at Embedded Systems Canada, who are designing microsystems for the information, clean tech and medical device technologies sectors. CMC Microsystems was launched in 1984 at Queen's as a collaboration among universities, NSERC (Natural Sciences and Engineering Research Council of Canada) and industrial partners. The research group has been awarded \$9.2 million.

Professor of Orthopaedic Surgery and Mechanical and Materials Engineering David Pichora's 15-member team at the Human Mobility Research Centre receives \$700,000 to support their research into improving bone and joint tissue reconstruction and

regeneration with a combination of biomechanical, biological, computing and imaging approaches. Their work will enhance mobility in people with musculoskeletal disorders.

Other Queen's researchers receiving ORF infrastructure grants are: **Gunnar Blohm**, Physiology, Computing (\$200,000); **Christopher Booth**, Oncology (\$80,000); **Christopher Bowie**, Psychology, Psychiatry (\$75,000); **John Cartledge**, Electrical and Computer Engineering (\$180,000); **John Cartledge** and **David Plant**, Electrical and Computer Engineering (\$1.2 million); **Anne Ellis**, Allergy (\$180,000); **Gabor Fichtinger**, School of Computing (\$400,000); **Yves Filion**, Civil Engineering (\$150,000); **Lauren Flynn**, Chemical Engineering (\$100,000); **Gregory Jerkiewicz**, Chemistry (\$200,000); **Philip Jessop**, Chemistry (\$270,000); **Zongchao Jia**,

Biochemistry (\$46,000); **Kurt Kyser**, Geological Sciences and Geological Engineering (\$2 million); **Amy Latimer**, Kinesiology and Health Studies (\$95,000); **Paul Martin**, Biology (\$120,000); **William Nelson**, Biology, \$130,000; **John Peacey**, Robert M. Buchan Department of Mining (\$100,000); **Joshua Pearce**, Mechanical and Materials Engineering (\$200,000); **Elaine Petrof**, Infectious Diseases, Microbiology and Immunology (\$180,000); **Kyra Pyke**, Kinesiology and Health Studies (\$80,000); **Kevin Robbie**, Physics (\$1.4 million); **Jeremy Squire**, Pathology and Molecular Medicine (\$500,000); and **Kim Woodhouse**, Chemical Engineering (\$125,000).

As part of Ontario's Innovation Agenda, the Ontario Research Fund grants will support 46 projects involving nearly 342 scientists and researchers at 13 institutions across the province.



JEFF DRAKE

Among recipients of recent ORF infrastructure funding are Mechanical and Materials Engineering professor Richard Holt and Chemistry professor Richard Oleschuk.

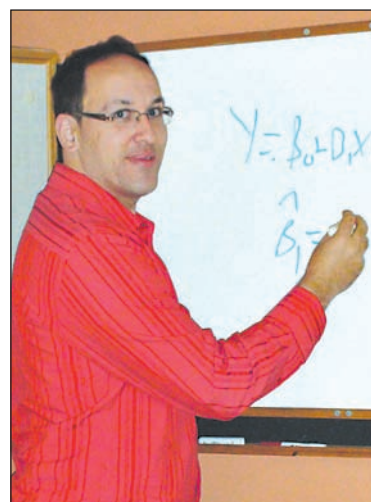
Study linking health and education wins international award

TEENS' MENTAL HEALTH AFFECTS HOW LONG THEY STAY IN SCHOOL, NEW STUDY SHOWS

By NANCY DORRANCE

Researcher Steven Lehrer has won a prestigious international award in recognition of his contributions to health economics.

A professor in the School of



COURTESY OF STEVEN LEHRER

School of Policy Studies professor Steven Lehrer has won the Victor R. Fuchs Research Award.

Policy Studies and Department of Economics, Dr. Lehrer shares the RAND Corporation's Victor R. Fuchs Research Award with Jason Fletcher of Yale University. Their prize-winning paper, recently published in the journal *Forum for Health Economics & Policy*, examines the effects of adolescent health on educational outcomes.

"Our study shows that poor mental health in children and teenagers has a large impact on the length of time they will stay in school," says Dr. Lehrer. He notes a large number of school-based programs have recently been introduced to prevent childhood obesity through lifestyle changes, but suggests the net should be cast more widely. "It's important for policymakers to target health conditions that are not the easiest to identify – like inattention – but may have larger impacts on one's future."

The findings provide strong evidence that inattentive symptoms of Attention Deficit Hyperactivity Disorder (ADHD) in childhood and depression in adolescents are linked to the number of years of completed schooling. Dr. Lehrer says this points to potentially large benefits from childhood and adolescent health interventions that have not yet been identified. "We focus on the link between health and education because unraveling the

mechanisms linking the two will have important implications for policy design."

In their study, the team introduces a new research design they call a "genetic lottery" identification strategy, based on the fact that, at conception there are differences in genetic inheritance among siblings. "While our paper uses this research design to estimate the relationship between health and education outcomes, we believe this identification has much wider applicability in a number of critical areas in both social science and health services research," says Dr. Lehrer.

"Unraveling [these links] will have important implications for policy design."

Steven Lehrer

Presented annually by the RAND Corporation – a U.S.-based, non-profit global policy think tank – the \$10,000 Fuchs Award is given to the best research paper with the potential to spawn new research in an underdeveloped area of health economics or health policy.