



UBC REPORTS



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the next **BIG** thing

UBC Reports has conducted its third annual informal poll of researchers to identify a few advances that will change your world. Their predictions capture the power and importance of the ongoing pursuit of new knowledge.

Tapping into the Heat Beneath our Feet

Virtually all of Canada's high-temperature geothermal resources are under B.C. In the next 15 years they can supply 30 per cent of our power needs with the cleanest form of energy known.

BY JOHN A. MEECH, Professor and Director of The Centre for Environmental Research in Minerals, Metals, and Materials (UBC-CERM3), and **MORY GHOMSHEI,** Adjunct Professor and Head of the CERM3-Earth Energy Laboratory in The Norman B. Keevil Institute of Mining Engineering.

With climate change so high today on the environmental and political agenda, substitutes for fossil fuels are under examination. Three significant alternative energy types exist: wind, solar, and geothermal. Each can create electricity, with passive solar and geothermal also able to produce heat for direct

use. Wind and solar sources are intermittent, while geothermal is available all the time making it a key way to reduce greenhouse gas emissions.

Although high-temperature geothermal energy is a small fraction of total world energy production, it has been growing annually at approximately 3.5 per cent over the past 20 years. About 10 gigawatts (GW) of power capacity exists worldwide with the U.S. producing about 25 per cent of this total and the Philippines about 20 per cent. Iceland is an important supplier at 10 per cent, with additional increases expected to support a European "hydrogen economy" in transportation.

Virtually all of Canada's

high-temperature resources are located in B.C. along the Coast Mountain range. From Harrison Hot Springs to Pemberton to the Stikine and into the Wrangell Mountains, many young volcanic formations contain water and steam at temperatures above 200 °C. Within the next 10 to 15 years, about 3 GW of high-temperature geothermal power will be established to provide the cleanest and greenest form of energy known. This capacity is about 30 per cent of B.C.'s current hydroelectric system and can be used to supply customers outside B.C. who require purchasing carbon credits. Each generating station will typically

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PHOTO: MARTIN DEE

John Meech and Mory Ghomshei: a geothermal heating system for a large building could reduce long-term costs by 75 per cent.



PHOTO: JOHN CHONG

Jens Haeusser likens a virtual ID card to your physical driver's licence with features to protect privacy

NBT: Going Beyond Passwords, to Virtual Identities

BY JENS HAEUSSER
Director, Strategy,
UBC Information Technology

Using the Internet today can be a frustrating experience. It seems like every other website you visit requires you to create another account, picking yet another username and password, and disclosing a wide range of personal information. What if there was a better way? What if you could use a wide range of online services more securely, with much greater control over your privacy? A team of technologists from around the world, including IT staff here at UBC, is hard at work to make this vision a reality.

UBC IT is part of a wide range of organizations and individuals exploring new user-centric technologies, including OpenID (<http://openid.net>) and Information Cards (http://en.wikipedia.org/wiki/Information_Card). As a member of the BC Identity Management Forum, chaired by the Office of the Chief Information Officer (CIO) of BC (<http://www.cio.gov.bc.ca/idm/>), UBC has helped create a new identity management architecture for the province that puts the needs of the citizens of B.C. first, and does its utmost to help protect their privacy and personal information. This new architecture will enable the

creation of virtual ID cards that can be used to access a wide range of online services. Like the signature on your driver's license, virtual IDs can contain a digital signature used to verify who is using that ID in a more secure way than a simple username and password.

Like your physical driver's license, you will be in full control of your virtual ID cards. Just like you choose when to show your driver's license to prove your physical identity today, you will be able to choose when and when to show your virtual ID. And just as the government doesn't know when you show

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More on the web – Visit our January edition on the web to read two more expert essays on new trends:

- Reducing Global Child Mortality, by Dr. Robert Armstrong, Assoc. Prof. and Head, Department of Pediatrics
- The New Field of Neuroethics, by Judy Illes, Professor and Canada Research Chair in Neuroethics




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IN THE NEWS

Highlights of UBC media coverage in December 2007. COMPILED BY JULIE-ANN BACKHOUSE

UBC psychology researchers shine in the New York Times

Two separate studies by UBC psychology researchers were included with 70 of the world's most intriguing discoveries over the past 12 months for the *New York Times Magazine's* "7th Annual Year in Ideas".

In *The God Effect*, the *New York Times Magazine* highlighted findings by UBC Asst. Prof. Ara Norenzayan and PhD graduate Azim Shariff that people will act with greater altruism and generosity when they're reminded of God or their civic responsibility. Their study was published in the September issue of *Psychological Science* journal and is available online at: www.psychologicalscience.org/media.

Also included in the *New York Times Magazine*, under *Quitting Can Be Good for You*, was research by UBC Psychology Assoc. Prof. Greg Miller and Concordia University's Carsten Wrosch. Their study, published in the in the September issue of the journal *Psychological Science*, found that too much perseverance can be bad for your health. The research explored how teenage girls exhibit increased levels of the inflammatory molecule C-reactive protein (C.R.P.) if they continue striving for a hard-to-reach goal. In adults, C.R.P. is linked with diabetes, heart disease and early aging.

Preschool curriculum helps performance

United Press International reported on a UBC study that says a preschool curriculum may help school performance and close the achievement gap between children of poor families and wealthier ones.

UBC Psychiatry Professor Adele Diamond was motivated by previous research which

showed that children from lower-income families enter school with disproportionately poor executive functions skills and fall progressively farther behind in school each year.

Diamond led the first evaluation of the curriculum Tools of the Mind that focuses on improving executive functions including: inhibition, planning, time perception, working memory, self-monitoring, verbal self-regulation, regulation of emotion and motivation.

UBC researchers create first biomechanical model of a feeding fin whale

UBC researchers have been tracking whales to determine exactly how they're able to consume enough food to build

their giant bodies. Jeremy Goldbogen, a PhD candidate at UBC's Department of Zoology, and Robert Shadwick, zoology professor and Canada Research Chair, have created the first detailed biomechanical model of a feeding fin whale.

Working with Nick Pyenson, a biologist at the University of California, Berkeley, they applied basic laws of physics to detailed data and combined it with information about the size and shape of fin whale bodies. The scientists ended up with a surprisingly complete picture of what the whales do when they feed.

Their study was recently published in the journal *Marine Ecology Progress Series* and reported in *The New York Times*.



PHOTO: DONALD DRUIN

Prof. Adele Diamond earned wide international coverage for a study connecting preschool curriculum to school performance.

UBC REPORTS

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NBT: Saying Goodbye to HIV in Canada

BY DR. MICHAEL REKART

Clinical Professor, Director, STI/HIV Prevention and Control, British Columbia Centre for Disease Control

At the risk of sounding like a cockeyed optimist, I can see a time in the not too distant future when the human immunodeficiency virus, HIV, has been all but eliminated from Canada. And the weapons that we need to win this long-running war against this elusive adversary are not still “under development” in the research laboratory – they’re actually already at hand.

HIV is a lifelong infection during which the virus levels in the blood stream and other bodily fluids ebb and flow, in much the same way that a patient’s symptoms can vary from time to time. However, it’s clear that the largest viral loads occur during the early and late stages of infection. Since the risk of transmission to someone else correlates with the amount of virus, an infected person poses the greatest risk of spreading HIV during the early and late stages. It would be logical, therefore, to target these highly infectious individuals with an enhanced focus on preventing such transmission. But that’s not



PHOTO: MARTIN DEE

Dr. Micheal Rekart wants to take advantage of new blood tests that detect HIV DNA and that become positive within days.

resistance. Furthermore, many people who require treatment have significant problems in accessing the health care system in the first place. Many of them struggle with more immediate difficulties like drug

of infection, the acute phase, can be 28 times higher than during the latent phase which lasts eight to 10 years. Since the standard HIV blood test measures antibodies against HIV and thus takes four weeks to turn positive,

tissue donations. The Sexually Transmitted Infection (STI) and HIV Prevention and Control Division at the British Columbia Centre for Disease Control (BCCDC) has just been awarded a \$2.5 million grant from the Canadian Institutes for Health Research (CIHR) to pilot the use of NAAT to identify and intervene for acute infections in Vancouver.

Imagine how the current HIV infection/transmission scenario could be turned around if we were able to identify infections within days rather than weeks. People who do get infected would be aware of their status much, much sooner, allowing them to take precautions against infecting others at a much earlier point in time as well – and ultimately empowering them to begin taking better care of their health overall, to live healthier and longer lives. This push to ensure early detection also ties

in with overall HIV prevention advocacy, especially when it comes to getting people to get tested.

On a related note, it appears that the role of herpes simplex virus type 2 (HSV-2) as a cofactor in up to 40 per cent of HIV transmissions can be mitigated by scaling up HSV-2 education, diagnosis, treatment and prophylaxis programs with new lab tests and generic drugs already available. HIV doesn’t exist in a vacuum -- and by better recognizing and addressing this, we can make significant progress in reducing HIV infection and transmission.

By aggressively targeting the early and late phases of HIV infection and by dealing more proactively with HSV-2 infection, I believe we can – and will – make HIV a thing of the past.

Imagine how the current HIV infection/transmission scenario could be turned around if we were able to identify infections within days rather than weeks.

such an easy thing to do.

During the late stages of infection, most patients qualify for free anti-retroviral (ARV) treatment which lowers their viral load and risk to others. But half of these individuals, currently, are not actually taking ARVs. Drug cocktails (commonly called HAART – highly active retroviral treatment) can be difficult to take, cause serious side effects and generate drug

addiction, poverty, poor housing, discrimination and abuse.

Dr Julio Montaner, Director of the BC Centre for Excellence in HIV/AIDS, believes that it’s possible to improve this situation through directly-observed therapy and once-a-day HAART regimens which are less toxic but currently more expensive.

On the other end of the continuum, HIV levels in a person during the first few weeks

you might think that this critical period is unassailable. But you would be wrong, because blood tests that detect HIV DNA and that become positive within just a few days of infection have been approved in Canada for several years now.

These diagnostics are called the nucleic acid amplification tests (NAATs) and these are what Canadian Blood Services uses to screen blood and

HEAT *continued from page 1*

be able to generate 25 to 100 megawatts (MW) of electrical power as base load energy.

An equivalent amount of energy is also delivered by low-temperature geothermal systems installed worldwide to provide heat and cooling for buildings. These systems are smaller units (3kW to 10 MW) that are much more distributed than are high-temperature sources, since they can be applied to heat individual homes. In all parts of Canada, our homes can be heated using energy extracted from beneath our property.

Two types of low-temperature geothermal systems exist: closed-loop and open-loop. With a closed loop system, several 10-15cm diameter holes are drilled about 15-30m into the Earth. A 12mm diameter loop of hosepipe is placed in each hole to pump-in anti-freeze at

about 3-5°C and return it to surface at about 10-12°C. The temperature difference between inlet and outlet represents the energy to be extracted by a heat pump as it boosts the delivery loop temperature to 45-55°C to distribute heat throughout the building. A heat pump is simply a refrigerator operated in reverse using a refrigerant (iso-butane) compression/decompression cycle to transfer heat from the anti-freeze solution into the delivery water loop.

An open-loop system consists of two deep (30-60m) water wells – one pumping the energy source ground water to a heat pump similar to that of a closed-loop system. This water is injected back into the aquifer to ensure the groundwater table is not drawn down. With proper positioning of these wells, the resource temperature can be maintained at about 10 to 20°C depending on depth and

latitude. The energy used by the heat pump in either case is between 20 to 40 per cent of that extracted from the ground.

The installation cost of a low-temperature system is about 50 to 100 per cent higher than that of a conventional fossil-fuel-fired furnace for a single-family dwelling, so this is difficult to justify without GHG emission

incentives (carbon credits). Economies of scale are gained with large buildings or by creating a district heating system. The incremental costs can be paid back in three to four years, which is advantageous since long-term (20-25 years) energy operating and maintenance costs are reduced by 75 per cent.

These systems are useable

coast to coast and into the far north. The city of Yellowknife, for example, is designing a district heating system using luke-warm waters extracted from the nearby Con Mine. In Springhill, Nova Scotia, a system has been in place for over 10 years to heat an industrial park using 20°C water from an abandoned coal mine.

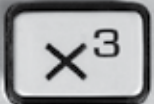
per cent.

The future for Geothermal Energy Systems is indeed bright and UBC is actively researching the best ways to exploit these technologies in Canada. We have partnered with a flower-growing greenhouse operation in Chilliwack to build a demonstration plant to heat the greenhouse with geothermal

The associated green house gas reductions represent 50 per cent of Canada’s Kyoto Accord obligations.

When combined with high-temperature systems in B.C., Yukon, and Nova Scotia, a total of 42 GW will offset fossil fuel use over the next 15 years. The associated GHG reductions represent 50 per cent of Canada’s Kyoto Accord obligations. This is certainly not insignificant particularly when it will also reduce energy costs by over 50

energy and remove the current natural-gas boilers. Both high- and low-temperature resources are accessible at this site and so we are also establishing a satellite research station to allow studies into all aspects of geothermal energy systems. For more info: www.cerm3.mining.ubc.ca



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PHOTO: MARTIN DEE

Prof. Kai Chan says that researchers have not been effective at showing impacts of extracting natural resources.

NBT: A New Way to Assess Local Ecosystems Sustainability

BY KAI M. A. CHAN

Assistant Professor and Canada Research Chair, Institute for Resources, Environment, and Sustainability, College for Interdisciplinary Studies

Ecosystems are in flux around the world. Important species are disappearing due to mismanagement and climate change, while invasive new species are appearing. These changes are striking fear into many communities that depend on ecosystems for their livelihood.

Imagine you are a local shellfish harvester on the west coast of Vancouver Island. Sea otters, which have been known to wreak havoc on some shellfish industries, are beginning to recolonize local waters. It doesn't matter much to the community that this marks the return of a once-loved native species: they are still up in arms. The local First Nation is considering hunting the otters. But is a cull the best thing for the community or the ecosystem?

To answer this complex but important question, researchers at UBC and elsewhere are employing a new concept, ecosystem services, to help community leaders make the best decisions for the long-term health of local ecosystems. The concept of ecosystem services can be traced to Plato, but the term was introduced by Paul and Anne Ehrlich in 1981 and has enjoyed exploding popularity since.

Ecosystem services are the direct and indirect benefits that people obtain from their interactions with ecosystems. There are provisioning services like the production of natural resources including food, fibre, and fuel; regulating services like the mitigation of floods and climate change; cultural services like the provision of recreational opportunities and scientific, artistic, and religious

inspiration; and supporting services like the pollination of crops and the biological control of pests. A sustainable ecosystem would continue to produce these benefits for future generations.

You might think that researchers understand how ecosystems produce all these services, and that the current unsustainability of ecosystems is a result of poor policy and management. It's true that in extracting natural resources, industry often turns a blind eye on ecosystem impacts. But researchers have not been able to show the consequences of these impacts for ecosystem services, so the impacts continue apace.

The B.C. Coastal Ecosystem Services team – a group of UBC faculty and students plus leaders from conservation organizations – is employing the ecosystem services concept in Clayoquot Sound. Despite the fear, otters may help various industries by regenerating productive kelp forests, so boosting populations of rockfish, herrings, and possibly also grey whales, sea birds, and more: these species are associated with commercial and recreational industries that benefit coastal communities. The kelp forest expansion may even help some shellfish, but the jury is still out. So should First Nations hunt otters? We don't know, but by working with local decision makers we're hoping to help them make sustainable choices.

Our project is affiliated with the Natural Capital Project (www.naturalcapitalproject.org), which is working in China, Tanzania, California, and elsewhere. The study of ecosystem services brings together experts from ecology, economics, conservation, hydrology, anthropology, earth and ocean sciences, ethics, and more to provide as complete a picture of the potential pros and cons of management decisions facing ecosystems.

Even enlightened decisions have downsides, but ecosystem-service analyses provide ways of reducing conflict by revealing the winners and losers and suggesting possibilities for compensation. This can reduce conflict between stakeholders and promote justice.

Sustainable ecosystems and ecosystem services are not easily achieved. Just like with the many shellfish and finfish industries and various recreational industries of Vancouver Island, numerous ecosystem services are produced simultaneously by interacting components of complex systems. Salmon, for example, provide food and fundamental cultural services to people of BC and elsewhere, and they also provide nutrients and energy for forests, bears, wolves, and eagles. Salmon cannot be managed alone, because over the course of their lives they navigate thousands of kilometers of freshwater, estuaries, and ocean, dodging impacts of logging, dams, pollution, and nets, including those for other fish.

Ecosystem services are the flip side of the ecological footprint. In fact, ecosystem services are the 'print' part of the footprint; the so-called 'ecological footprint' is the shoe size. The insightful ecological footprint concept (of Wackernagel and Rees at UBC) is the amount of biologically productive land and sea needed to produce the resources used by a person or population. It tells us that we're already outstripping the planet's capacity to sustainably provide for us. But that ecological footprint doesn't fall in any one place: the negative impacts of a person's consumption fall in many places across the globe. Even if the global population had a sustainable foot, it might have many unsustainable ecosystems. Interdisciplinary "ecosystem services" research paves a path to sustainable ecosystems and human well-being.

LEGAL NOTICE OF CLASS ACTION CERTIFICATION

If you paid a parking or towing fine to the University of British Columbia, you have legal rights in a class action lawsuit

WHAT'S THIS ABOUT?

The British Columbia Supreme Court has certified a class action lawsuit about the parking and towing fines that have been collected by the University of British Columbia. The Court authorized this Legal Notice to guide you on the steps that you may need to take, if any.

The lawsuit claims that UBC has unlawfully collected parking and towing fines and must repay all of the parking and towing fines that it collected during the period of **September 1, 1990 to September 30, 2007**. UBC denies any wrongdoing and will defend the lawsuit. The Court has not yet made any decision on the merits of the claim or the defences.

WHO'S INCLUDED?

You are a Class Member if you paid parking and towing fines to UBC between September 1, 1990 and September 30, 2007.

WHAT TO DO IF YOU LIVE IN BC?

If you are a Class Member who lives in British Columbia, you do not need to do anything to continue to be included as a Class Member at this stage of the lawsuit.

If you do not want to be a Class Member who is legally bound by this lawsuit, you must exclude yourself by August 31, 2008. To learn how to exclude yourself, contact the lawyers who represent the Class Members, Camp Fiorante Matthews, whose address is below.

If you exclude yourself by the deadline it means that you can bring your own lawsuit. It also means that you cannot collect any money that may ultimately be paid to Class Members as a result of this lawsuit.

WHAT IF YOU DON'T LIVE IN BC?

If you do not live in British Columbia and want to participate in the lawsuit, you must take action to include yourself by August 31, 2008. To learn how to include yourself, contact the lawyers who represent the Class Members, Camp Fiorante Matthews, whose address is below.

If you do not include yourself by the deadline it means that you can bring your own lawsuit and will not be bound by the result in this lawsuit. It also means that you cannot collect any money that might ultimately be paid to Class Members as a result of this lawsuit.

WHO PAYS THE LAWYERS?

If the lawsuit is not successful, you will not be responsible for any lawyer fees and costs.

If the lawsuit is successful, the lawyers who represent all the Class Members have an agreement with the representative plaintiff that allows them to be paid a percentage of the total amount that they obtain for the Class Members. The agreement can only be enforced if it is approved by the Court and the Court will approve the amount that is paid to the lawyers for the Class Members.

It is strongly recommended that you review the long form of this Legal Notice which can be obtained from the lawyers representing all of the Class Members, Camp Fiorante Matthews, and is on their website:

www.cfmlawyers.ca/class_actions/UBCParkingFineClassAction.html.

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The False Hope of the Next Big Thing

The values inherent in the field of physical therapy remind us that there is no substitute to the basic work of maintaining a good lifestyle.

BY ELIZABETH DEAN

Professor, Department of Physical Therapy

Physical therapy is the quintessential non-invasive health care profession. Its values are consistent with the profound tenets of Hippocrates that include 'First do no harm' and 'The function of protecting and developing health must rank even above that of restoring it when it is impaired.' A holistic health approach is consistent

with contemporary definitions of physical therapy and its 100-year tradition of health education and prescription of physical activity and exercise.

Lifestyle conditions are leading causes of chronic illness and disability in high-income countries and increasingly in middle- and low-income countries. These conditions include ischemic heart disease, smoking-related conditions, high pressure and stroke, and diabetes and obesity. The next 'big thing'

in the profession of physical therapy is aligning contemporary practice more closely with its underlying values to impact the social and economic burdens of these conditions, in addition to their impact on individuals and their families.

In addition to being members of the fifth largest health care profession, physical therapists are uniquely suited to impact these lethal conditions because, compared with other health care professionals, they spend prolonged periods of time with their clients/patients – this pattern of care enables effective

teaching and follow-up to be implemented. The translation of existing evidence-based knowledge into practice is paramount in the 21st century.

Effective lifestyle behavior change is a multi-dimensional challenge that may explain its relative failure compared with adherence to invasive care recommendations related to drugs and surgery. Effective teaching and effecting lifestyle behavior change must be the priority in physical

therapy. Consistent with the recommendations of the Romanow Report and the Kirby Report on health care in Canada, physical therapy needs to be as important a response to 21st century health care priorities as it was to the needs of survivors of the world wars and the polio epidemic. Putting into practice the 2,500 year-old ethical and cost-effective tenets of Hippocrates will be a giant step forward in addressing the health priorities of our time.

NBT: Floating Speed Trains

BY TAE OUM

Professor and UPS Foundation Chair in Transport and Logistics, Sauder School of Business, University of British Columbia.

In our interconnected global world, people have now have not had a clean alternative to pollution-creating jet travel. There is a much cleaner alternative now on the horizon: floating speed trains that can travel 500 km per hour and will help spur a great shift from air to rail travel.



PHOTO: JR-MAGLEV

The floating train has recorded a speed of 581 km per hour.

Rail enthusiasts take note. Japan is preparing for the build-out of the fastest train in the world – connecting the mega-cities of Tokyo and Osaka and a dense regional population of more than 50 million people.

But speed isn't the only factor that makes this train unique. While project planning is still at the early stages (construction wouldn't begin until at least 2009), the tab for the project is expected to reach \$100 billion, making it the most expensive project in world history.

Japanese taxpayers aren't panicking, however. Central Japan Railway Company (JR Central) believes it can finance

The maglev system doesn't have wheels. When it reaches a certain speed, it floats. That's why it can travel so fast – it doesn't touch the ground.

The technology has been in development since the 1970s. Back then, it was a concept. Then we started to see the building of test tracks in various places, such as Europe and Japan.

China is currently home to the 30km Shanghai Magnetic Levitation Demonstration Operation Line, connecting Shanghai to Pudong International Airport.

But in terms of long distance, for which this technology is designed, the Tokyo-Osaka

into place for this mega-project. The money is there. The technology is there. The public support is there.

There's also the environment element. Relative to other modes of transport, maglev technology is very green. Calculations show that the technology is 10 times cleaner than airlines in terms of CO2 emissions. This significantly impacts greenhouse gas emissions in the region, and ultimately global warming – for the better.

You reduce the air travel, you reduce the travel by roads, you reduce congestion, and you save commuters time. In the process, you reduce emissions – carbon

The maglev system doesn't have wheels. When it reaches a certain speed, it floats.

this project entirely with private funds.

The technology is known as superconducting magnetic levitation transport, or maglev for short. Using electromagnetic force, it's a form of transportation that suspends and guides vehicles. The 18 km-long Japanese test track in Yamanashi Prefecture has recorded a speed of 581km per hour, the current world record.

train is going to the first and the fastest.

Japanese commuters should like it. With speeds topping 500km per hour, it will shorten travel time from Tokyo to Osaka to just over an hour. The current high-speed trains traveling in that corridor – which can reach speeds of up to 300 km per hour can still only make the trip in two and a half hours.

So the key factors are falling

dioxide and other pollutants.

The airlines are naturally concerned about the future competition. There will be a massive shift from air passengers to rail passengers.

But aircraft technology is not environmentally friendly – even compared to other modes of transport, and especially compared to rail. Maglev, on the other hand, is greener, faster, but not surprisingly, much more expensive.



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This individual will be responsible for improving the training environment of research postdoctoral fellows in the Faculty of Medicine. Responsibilities will include chairing a postdoctoral advisory committee, assisting with the provision of professional development programs, developing a career resource centre, monitoring postdoctoral training, responding to postdoctoral fellow questions, and organizing orientation and other postdoctoral activities. The position is expected to require an approximate one day per week time commitment, and the individual will report to the Assistant Dean, Graduate Education.

The successful candidate should be a faculty member in Medicine with research experience, an understanding and commitment to postdoctoral research training, and demonstrated administrative abilities.

Dean's Office | Research

www.med.ubc.ca/research

Applications, accompanied by a detailed curriculum vitae and names of three references, should be directed to:

Dr. Susan Porter
Assistant Dean,
Graduate & Postdoctoral
Education
Faculty of Medicine
#317-2194 Health Sciences Mall
Vancouver, BC V6T 1Z3
sporter@pathology.ubc.ca

Closing date: February 4, 2008
or until a suitable candidate has
been identified.

The Faculty of Medicine is home to approximately 200 postdoctoral fellows and is working to enhance the training and to provide support and professional development opportunities for these researchers.

The Faculty of Medicine at UBC, together with its partners including B.C.'s Health Authorities, provides innovative programs in the areas of health and life sciences through a province-wide delivery model. The Faculty teaches students at the undergraduate, graduate and postgraduate levels and generates more than \$200 million in research funding each year. It is home to Canada's first distributed MD undergraduate program.



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www.planning.ubc.ca www.universitytown.ubc.ca

PASSWORD *continued from page 1*

your driver's license during a physical transaction, they won't know where or why you choose to show your virtual ID card either. This end-user control, combined with the secure digital signature on the virtual ID, will greatly enhance the security and privacy of online transactions. Indeed, the Ontario privacy commissioner has recently come out in favour of using information cards, since they have several key security and privacy advantages over today's password based systems.

One of the important aspects of these virtual ID cards is what they are not. This is not an attempt by the provincial government to collect a whole bunch of information into one giant central database. Today, your wallet holds a wide range of cards, from your driver's license to your credit card to your video store membership. Tomorrow, your digital wallet will be able to hold a wide range of virtual IDs, from a card from the province of B.C. that you can use to prove your name or

your age, to one from UBC that proves that you are a registered student.

In the end, what does all of this complicated identity management technology mean for the average online user? Coming soon to a computer near you, user-centric technologies such as virtual ID Cards will move us beyond passwords, to a more secure online world where end-users are in direct control of where, when, and why they choose to release their personal information.



PHOTO: KARIN WILSON

The UBC Okanagan Micro-Optical Engineering Research Program is developing integrated optical processors.

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NBT: Computing at Light-speed

Look out transistors and wire. New light-based devices will make computers much faster, while optical communications move data faster than ever before.

BY JONATHAN HOLZMAN,
Assistant Professor, School of
Engineering, UBC Okanagan

It is an incredible time to be an electrical engineer at the University of British Columbia. Communication technologies have grown by leaps and bounds over the past decade, and innovative devices and communication systems are continually evolving to meet growing network demands.

of Engineering at the University of British Columbia Okanagan, is working to meet the growing demands of communication technologies through a variety of optical technology-based communication processing systems.

The optical benefits that revolutionized information transmission over the past decade through fibre-optic cable distribution are now being shown to have great potential

currently being investigated for use as highly complex logical architectures for information processing and as bi-directional communication nodes within wireless optical (near-infrared) communication networks. The transmission and processing rates that characterize light-based devices are thousands of times faster than their electronic counterparts and show great potential.

The current research being carried out by the Micro-Optical Engineering Research Program is part of a larger network of researchers and facilities

The transmission and processing rates that characterize light-based devices are thousands of times faster than their electronic counterparts . . .

Internet traffic usage alone has jumped from Gigabit levels (109 bits/sec) in the late 1990's to Petabit levels (1015 bits/sec) at the present, and technologies are struggling to keep up. At the forefront of this communication explosion have been numerous fibre-optic and device-related technologies within modern communication systems (of which many had their start in Canadian research programs from universities, national institutes and the private sector).

The Micro-Optical Engineering Research Program, which I head with Julian Cheng in the School

in ultrahigh-speed optical information processing.

With this in mind, the Micro-Optical Engineering Research Program is developing three-dimensional integrated optical "processors" to carry out complex logical computations and processing that have been realized historically by electronic systems.

Our work will overcome the inherently slow bottlenecks of electronic transistor-based devices by implementing purely photonic logic structures and all-optical processing structures.

The integrated devices are

both within and outside of the University of British Columbia. The program has brought together nanotechnological material researchers from the National Research Council Canada (NRC) National Institute for Nanotechnology (NINT) and device fabrication experts from UBC Vancouver's Advanced Materials and Process Engineering Laboratory (AMPEL). The ultimate photonic device realizations are carried out at the UBC Okanagan Laser Laboratory, where the future of optical technology looks especially bright.

NBT: Doing Business 2.0



Business is being revolutionized by a new form of mass collaboration facilitated by social networking tools.

BY PAUL CUBBON,
Instructor, Marketing Division,
Sauder School of Business,

Facebook, Secondlife, LinkedIn, Flickr – these websites are more than just digital entertainment, but rather the experimental frontline of a new way of communicating and doing business.

But because of the rapid pace of change along with new and sometimes confusing jargon

secretive industry, famously made all of its geological information public online, and ran a competition to help it identify where to look for gold. Thousands of submissions came from unconventional sources; many of these were productive, leading to 8 million ounces of new gold production.

Meanwhile, Procter and Gamble now has thousands of non-employee scientists signed up to its open collaboration

So, “wikinomics” and “web 2.0” are not just jargon terms, or for “Internet geeks.” Mass collaboration, enabled by the Internet provides the opportunity for all types of organizations to transform the way they operate.

Some, for example, are facilitating “expert, evangelical” customers to help other customers in online expert forums and knowledge bases, improving satisfaction, increasing the sense of brand community

Procter and Gamble now has thousands of non-employee scientists signed up The aim is to generate at least half of future new business ideas and technology from outside of the company.

and names, there is a danger that people are missing the bigger business story at play. Collaborative, web-based tools represent a fundamental change in the way that business is, and increasingly will be, conducted.

Although many exciting new web-based ventures are being created and championed in the media, as with the first generation of web activity, the lower profile but more profound changes are happening in the traditional business world. In his 2006 book, Wikinomics: How Mass Collaboration changes everything, Don Tapscott notes two prime examples of “old economy” companies benefiting from web-enabled mass collaboration.

Goldcorp, a Canadian mining company in a traditionally

network, focused on innovation and problem-solving. The aim is to generate at least half of future new business ideas and technology from outside of the company.

This trend represents a serious threat to the survival of those companies that ignore it, and a massive opportunity for creativity, productivity and competitiveness in those companies that embrace this change.

The premise is that the second stage (Web2.0) of the web revolution is just beginning. The future is predicated on collaboration and what we currently see as primarily entertainment sites for the young are the experimental ground for future business collaboration and operation.

and loyalty, and reducing customer service and call centre costs. Many companies (think computer hardware and software companies like Apple, Dell, Microsoft) are pro-actively engaging a select group of customers to help other customers problem-solve.

There is no set play-book (although Tapscott’s blog on www.wikinomics.com is currently facilitating a collaborative effort to write a “playbook” on this topic.)

It is a time of exciting experimentation where the bold innovators are already crafting a competitive advantage by learning from their successes and from their mistakes. The takeaway: find a way to increase your collaborative network – then empower experimentation.



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