Be immortalized. Be *inspired!*

ALBERTA SCIENCE AND TECHNOLOGY LEADERSHIP FOUNDATION

The Universe is full of magical things, patiently waiting for our wits to grow sharper.

EDEN PHILLPOTTS

ASTECH
FOUNDATION

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FEATURING 2010 ASTECH HONOUREES, PATRONS AND SPONSORS

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Be Immortalized! Be *Inspired!*

Message from the Foundation

Outstanding achievements warrant recognition, and the possibility of future recognition encourages achievement and stimulates progression, motivation, and dedication. How many times during the Vancouver Olympic Games did you hear an athlete enthusing about a childhood spent dreaming about their moment in the spotlight? The same is true of the Nobel Prize, the Oscars or the Grammys, where recipients demonstrate their passion, commitment and gratitude for being honoured for their achievements while also acknowledging the strong motivational force that the potential for recognition provides.

The prospect of recognition and the potential for glory is at least partially responsible for driving achievement in every field from athletics to politics; the fields of science, technology and business in Alberta are no exception to this rule.

Showcasing the outstanding innovation coming from this province stimulates others to excel and achieve even greater outcomes. The successes and triumphs of Alberta's leaders in science, technology and business drive Alberta's economy and help us to attract, develop and retain the talented individuals who will help to shape this great province and improve the quality of life for all Albertans today, tomorrow and in the years to come.

This year the Alberta Science and Technology Leadership Foundation proudly recognizes and celebrates the achievements of 36 honourees who embody our region's brightest minds and most innovative enterprises and initiatives. They demonstrate the outstanding activity that is occurring in Alberta's science, technology and related business communities; and they illustrate the breadth and depth of Alberta's science and technology achievements and capabilities. At the same time they spark excitement as they hint at the possibilities that lie just down the road.

Each year for the past 21 years the celebration of innovation that is the ASTECH Awards has represented a common understanding in our community of the importance of science and technology for all of us, for our province and for our future. Over these 21 years ASTECH has presented 240 awards to leaders who have been instrumental in shaping Alberta into the great place it is today.

As we honour the next generation this evening, the spirit of the awards is perpetuated with the support of our many patron organizations, which will be profiled throughout the gala. These private companies, individuals, research and educational institutions and federal and provincial governments contribute significant time, talent and money in recognition of the tremendous contributions Alberta is making to the global science and technology landscapes.

As I thank our ASTECH patrons and sponsors for their insight and support, I encourage you to do the same and to catch some of their enthusiasm for celebrating our success beyond this evening's festivities. I also thank each of you for joining us tonight to recognize the tremendous achievements of this year's ASTECH Honourees. Share the excitement as we highlight recent achievements and eagerly anticipate what could be just around the corner, from tonight's recipients and from the future honourees who are surely present in this room.

We know that our honourees do not pour their talents, their hearts and their souls into their work solely with an ASTECH award in mind, but we do thank you for joining us in expressing what it is that these awards do mean: Your work matters – to Alberta and to Albertans.

And we're proud of you.

Martin Kratz
ASTECH FOUNDATION CHAIR

There is one thing even more vital to science than intelligent methods; and that is, the sincere desire to find out the truth, whatever it may be.

CHARLES PIERCE

The more you praise and celebrate your life,
the more there is in life to celebrate

OPRAH WINFREY

Mining Alberta's Science Riches for Stories

Science belongs to no one country.

LOUIS PASTEUR

Alberta abounds with stories of exploring, discovering, creating and achieving in all fields.

Each year we at ASTech mine the riches of our province's science and technology sector to find its most innovative individuals, organizations and businesses. We want to recognize and honour them – and tell their stories.

Our task is difficult. The quality of innovation in science in Alberta is quite simply, outstanding.

This year we've narrowed it down to 36 honourees. They represent the brightest minds and most innovative enterprises practising and operating in the province today. Their contributions – to health, energy and environment, biosciences and technology throughout Alberta – are improving the lives of people and reducing the environmental footprint of industry around the world.

These science and technology fields may seem disparate and unrelated. But they use multiple synergies to create one holistic entity that makes this province so extravagantly rich with action and opportunity.

We hope these nuggets – our stories – capture the dynamism and energy of Alberta's scientists and all of their collaborators.

2010 ASTech Awards Categories

Excellence in Science and Technology Public Awareness

Innovation in Agricultural Science sponsored by Dow AgroSciences Canada Inc.

Innovation in Information and Communications Technology sponsored by TELUS

SAIT Polytechnic Outstanding Achievement in Applied Technology and Innovation

Innovation in Oil Sands Research sponsored by Syncrude Canada Ltd.

Outstanding Achievement in Environmental Technology and Innovation sponsored by Agrium Inc.

Societal Impact Award

Leaders of Tomorrow

Outstanding Leadership in Alberta Technology

Outstanding Leadership in Alberta Science

Outstanding Contribution to the Alberta Science and Technology Community

Bio Sciences

Life sciences, which includes human health, agriculture, forestry and the environment, is predicted to be one of the world's fastest growing industries in the coming years. Alberta is on the forefront globally in life sciences research and technology because of support from academia, government and industry – and the province's unparalleled access to tremendous renewable bio-resources.

In the mid 1990s when the "bioeconomy" was still a new concept, Alberta was already developing new opportunities and attracting world talent in the field.

Alberta aims to continue establishing itself as a global centre and resource for bio-based research, talent, investment and solutions.

ASRA *Growing our Future An Integrated Life Sciences Strategy for Alberta* (2003) states that by 2020, the life sciences industry in the province will generate $55 billion in revenue and will create 70,000 new high tech and value-added jobs.

Seven of the 2010 ASTECH honourees are working in the biosciences in Alberta and attest to the province's ability to attract the finest minds. Through the work they do in the province, they themselves continue to make Alberta a compelling place to practise life sciences.

The collective contributions of these honourees have had and will continue to have far-ranging reverberations, improving the environment and human, animal and crop health in Alberta and around the world.

Dr. Ross H. McKenzie

The harvest of innovation

Developing environmentally and economically sustainable solutions for agriculture has always been a driving force behind **Dr. Ross McKenzie's** research. In the 1970s he began developing new techniques of direct seeding, which was a radical concept at the time and not widely practised. Since then – and due in part to Dr. McKenzie's advocacy – this environmentally superior method of no-till seeding has become common practice in Alberta.

His other work in the area of integrated cropping systems includes optimization of nutrient and water use, crop management and new laboratory standards for soil phosphorus analysis, manure management and the development of Environmentally Smart Nitrogen (ESN).

Dr. McKenzie's research leadership, contribution to the scientific literature and remarkable technology transfer of results has influenced scientists policy makers, industry and individual farmers.

Intersecting agriculture, health and nutrition

Work at the intersection of agriculture, health and nutrition produces a significant functional foods and nutraceuticals industry, based on foods and food ingredients or extracts that have been developed to provide a health benefit. The growth of this industry could enhance individual health, reduce the stress on the health system and strengthen Alberta's agricultural economy.

Under the leadership of Dr. Susan Lutz, a team of 50 scientific professionals from Alberta – in fields such as agronomy, product development, regulatory and marketing issues and communications and promotion – responded to international consumer demand for high-quality *Rhodiola rosea* natural health products to relieve stress.

The **Rhodiola Rosea Commercialization Project** developed a brand new Alberta-grown crop: *Rhodiola rosea*, Aurora. It found markets and created a cooperative that links more than 160 growers with international buyers.

Launched in 2004, the Rhodiola Project initiated the first natural health product value chain in Alberta. It started with a few project growers and knowledge of an emerging market and grew into a new generation cooperative. It has become the most advanced natural health product standardization model – from seed to shelf – in the world.

Rhodiola Rosea Commercialization Project Team
Back row: Dr. Raimar Loebenberg (U of A, Pharmacy), Dr. Kwesi Ampong-Nyarko (ARD), Nav Vashistha (U of A, Pharmacy), Dr. Brian (Duff) Sloley (Phytovox Inc.) *Third row:* Margurite Thiessen (ARD), Atanu Das (Paelon Inc.), Dave Maruszeczka (ARRGO) *Second row:* Zhixiong Zhang (ARD), Shirzad Chunara (ARD), Judy Zastre (ARRGO), Dr. Hugh Semple (AITS) *Front row:* Nabi Chaudhary (ARD), Dr. Susan Lutz (ARD), Monica Blaeser (ARRGO), Dr. Sheau-Fang Hwang (ARD)

Wayne Wasylciw

Extraordinary innovation finds application in China

It is rare to witness a technical innovation that addresses a basic human need, improves the living conditions of millions of people, creates a new industry, reduces greenhouse gas emissions and protects the environment on a large scale. **Oriented Structural Straw Board (OSSB)** is such an extraordinary innovation.

Under the leadership of Wayne Wasylciw of Alberta Innovates Technology Futures (formerly Alberta Research Council), Alberta scientists developed a product using what is traditionally considered waste. The innovation is providing shelter for people on the other side of the globe. OSSB is a structural building panel created from wheat straw. It is suitable for the construction of homes, schools, clinics, offices and small industrial buildings. OSSB technology is being used commercially to produce straw panels at a factory in China, with two more factories coming on stream.

The straw board is well-suited for earthquake-prone areas where brick and concrete structures often collapse as occurred in China in 2008. An estimated 4.7 million people were left homeless.

Mountain Pine Beetle Research Project Team
Top: Wade Chute (left), Ted Garver
Bottom: Gary Smith

Making a silk purse from a sow's ear

Alberta's bioscience sector is delivering on the potential of agriculture and forestry in areas such as sustainable production, biorefining, composite materials, value-added food and health products, and nano-enabled materials.

The dedication of scientists in the sector has grown industries where none existed before, sometimes making the proverbial silk purse out of a sow's ear.

The devastation of the mountain pine beetle infestation on western Canadian forests and the forest industry is well documented. It has caused mills to close and workers to be laid off.

The Alberta Newsprint Company (ANC) used a hi-tech weapon to gain an economic edge over the mountain pine beetle. The paper company and its partners have developed and implemented technologies to overcome the impact of mountain pine beetle on the newsprint manufacturing through the **Mountain Pine Beetle Research Project**.

ANC developed a system of sensors that identify the beetle-transmitted fungus and measure changes in fibre quality and chemistry; and it researched and developed processes to manufacture premium paper from the diseased and inferior wood. The process has proven so successful ANC has improved its production by 10 per cent.

The technology helps support a healthy forest- and forest-products industry by enabling the harvest and using trees that might otherwise present a fire hazard or be stock piled into large amount of biomass waste.

Dr. David Wishart

Collaboration key to changing the way medicine is practised

A collaborative cross-disciplinary approach to innovation strengthens the scientific impact and broadens applications for the work being done in the province. It creates new knowledge and produces groundbreaking discoveries that improve the quality of life for people everywhere. Potential synergies like these make the life sciences key to producing real and lasting benefits to Albertans.

University of Alberta researcher **Dr. David Wishart** works with scientists from various disciplines in institutions in Alberta and around the world. His research has pioneered innovative hardware, software, databases, chemical libraries and methodologies that redefine what is being done with metabolomics.

Over the past decade Dr. Wishart's team has been working on techniques that allow for hundreds of metabolites to be identified and quantified by nuclear magnetic resonance (NMR) and mass spectrometry. Most impressively, the Human Metabolome Project created the world's largest collection of human metabolites, the most complete collection of metabolite spectral libraries and the most complete set of metabolite databases in the world.

The research and technology the team has developed promises to make the delivery of diagnostic tests much cheaper and the quality much better. It has the potential to completely change the way medicine is practised by providing metabolic-profiles for individual patients to monitor and treat their unique health issues.

In the fields – researching and communicating

Work in the labs, fields and classrooms builds on the robust research environment in Alberta and continues to attract top researchers, trained workers and other innovators to the province.

Dr. Lloyd Dosdall's 25-year career studying the insects that infest Alberta farmers' fields has resulted in exceptional contributions to Alberta's agricultural industry. Among his achievements is developing a weevil-resistant canola that promises to provide enormous economic benefits to canola growers and helps reduce pesticide use.

The focus of Dr. Dosdall's current research examines beneficial insects, predators and parasites and exploits their abilities to control crop pests naturally. He acknowledges that the research is crucial, but only if the results are communicated.

Dr. Dosdall is committed to working with Alberta farmers, talking to them in their fields and helping them adopt beneficial crop production practices to improve their livelihoods.

Dr. Lloyd Dosdall

Dr. Tim McAllister

Contributing to science on all fronts

Sometimes Alberta's scientists work in the field. Other times they put in countless hours serving on industry boards and mentoring the next generation of scientists.

On all of these fronts, **Dr. Tim McAllister's** contributions to agriculture are impressive and demonstrate his drive, energy and commitment to research. His innovations in areas that include feeding strategies, GMO feed, livestock health, environmental health and food quality, lead the development of economically and environmentally sustainable agricultural practices for Alberta and the world.

Dr. McAllister's leadership is not confined to the lab and the lecture hall. He has played a significant role on industry and university boards and he has mentored 16 post-doctoral fellows, seven international senior scientists and 16 graduate students. He has made remarkable contributions in science excellence, leadership, innovation, technology transfer, team building and mentoring. Dr. McAllister has received prestigious international awards and widespread recognition for his work.

Honourees from Bio Sciences

Dr. David Wishart
Professor, Computing/Biological Science and Adjunct Professor Faculty of Pharmacy and Pharmaceutical Sciences, University of Alberta

Dr. Lloyd Dosdall
Professor, University of Alberta, Department of Agricultural, Food and Nutritional Science

Mountain Pine Beetle Research Project
Alberta Newsprint Co. and Alberta Innovates – Technology Futures
Gary Smith, John McDougall, Ted Garver, Wei Li, Wade Chute, Holton Quinn

Oriented Structural Straw Board
Alberta Innovates – Technology Futures
Wayne Wasylciw, Rob Wellwood, Bruce Mallas, Grant Reekie, Karl Smith, David Bilyk, Steve Kirincic, Krijn Leendertse, Steve Lee

Dr. Tim McAllister
Research Scientist, Agriculture and Agri-Food Canada, Sustainable Production Systems

Dr. Ross H. McKenzie
Senior Research Scientist, Agronomy, Alberta Agriculture and Rural Development

Rhodiola Rosea Commercialization Project
Dr. Susan Lutz, Project Lead, Alberta Agriculture and Rural Development

Energy & Environment

Collaboration is the common thread that connects the ASTECH honourees in the Energy and Environment field. These interdisciplinary collaborations between academia, government and industry have significantly advanced scientific knowledge related to all areas of energy and the environment.

Alberta is a global leader in technology and research on oil sands and heavy oil. It has unique expertise in gasification, upgrading, carbon capture and storage, advanced recovery, water use, tailings management and alternative energy.

Oil sands

As of August 2009 there were 91 producing oil sands projects in Alberta that contain at least 85 per cent of the world's reserves of natural bitumen. Between them they cover over 140,000 square kilometres - an area about the size of England – and hold proven reserves of 1.75 trillion barrels of bitumen in place.

During the extraction process, the leftover mixture of water, sand, clay and residual bitumen – known as tailings – is stored in tailings ponds, where the solution can settle and separate. Some of the material is toxic to the environment. More than 170 square kilometres of tailings ponds are in use in the oil sands region and present a huge challenge for industry – a challenge that is actively being researched to find effective solutions.

New oil sands plants are expected to generate fewer tailings; and new tailings technologies will speed up reclamation.

The bio-connection

Through their work, **Dr. Phillip Fedorak** and **Dr. Julia Foght** have demonstrated that any plan for remediation of the tailings must take biology into account.

The University of Alberta researchers show that a combination of water composition and solvents will determine whether the microbes will release methane or convert the sulphates in the water to hydrogen sulphide gas.

Their research has contributed substantially to the current knowledge in the oil sector in areas like tailings dewatering and the bioremediation and treatment of oil sands process water. Their work is highly relevant to the industry given the major terrestrial and aquatic reclamation projects that will be undertaken in the coming years. The vision of remediated tailings as active bioreactors that release clean water back into the Athabasca River has been brought closer to reality by the work of Dr. Fedorak and Dr. Foght.

Dr. Phillip Fedorak and Dr. Julia Foght

Raising the bar on tailings management

Already an established pioneer in fine tailings management, Suncor Energy is again on the forefront of finding solutions to this key environmental concern. In the 1990s Suncor developed Consolidated Tailings (CT) technology to help speed up tailing pond reclamation times.

The company's latest improvement, **Tailings Reduction Operations** (TRO), uses innovative technology and processes to dry the tailings and dramatically reduce the time it takes to reclaim tailings ponds – from over 30 years to under 10 years.

TRO reduces the need to build more tailings ponds and curtails the existing mature fine tailings inventory, reducing the environmental footprint of the oil sands.

Suncor's Shelley Powell says this is a good news story. "Suncor is proud to improve our environmental performance by being part of the solution to this industry-wide challenge."

Suncor's cross-functional team, together with partners from academia and industry, has been conducting field-scale trials to test the technology since 2003. The company has recently received ERCB approval to implement TRO.

Tailings Reduction Operations Team
Top, l to r:
Vince Debruyn, Jamie Eastwood, Dwayne Edwards, Keith Palmer, Trevor Bugg, Grant Wearing
Bottom, l to r:
Erika Hernandez, Khalid Elladen, Graham Hanson, Paul Reaper

Dr. P.V. Jampana

Dr. Sirish Shah

Wonder of science

Suncor isn't interested only in what to do with the tailings once they are in the ponds. The company worked with a team of talented University of Alberta researchers and Edmonton-based software firm Matrikon Inc. to reduce the volumes of tailings that make it to the ponds.

Using digital cameras and a sophisticated algorithm, **Dr. Sirish Shah** and **Dr. Phanindra Jampana** found a way to improve the efficiency of an oil sands process that increases bitumen recovery and reduces tailings volumes.

The new technology resulted in recovery of an additional 1,600 barrels of bitumen per day from one tank at Suncor. That's 50-per cent less bitumen going into tailings ponds. Similar sensors are being implemented in two other separation tanks at Suncor.

And what began as finding a solution to an oil sands challenge has found application for the diagnosis of Malaria parasites. Dr. Shah says this is truly a wonder in science.

"Imagine research used to develop oil sands technology leading to medical imaging. Who would have thought of it?"

Dr. John Chen

Prolific scientist makes Alberta home

The potential of innovation in Alberta made possible by widespread industry, academic and government support and collaboration has established an atmosphere of creative possibilities that attracts professionals from all over the world.

Dr. Zhangxing John Chen came to Alberta via China and the United States so he could tackle the big issues in the heavy oil recovery industry. He's spent his two-decade-long career shaking up the global reservoir simulation world with his innovative modelling and simulation techniques. His work in developing algorithms has significantly advanced the sector's understanding the physics of oil reservoirs.

The busy University of Calgary researcher found time in his schedule of authoring books and articles and making presentations to discover the solution to a problem that had confounded oil reservoir simulation experts in academia and industry for more than 30 years. The state-of-the-art reservoir simulation toolkits he created allow for multiple parallel runs, faster computation and rigorous optimization – enhancing oil recovery, economically and environmentally.

In February 2009 the prestigious *Oilsands Review* selected Dr. Chen as one of the three most prominent researchers in reservoir simulation.

What Dr. Chen is proud of above all is the legacy he leaves through his students. He has supervised 10 post-doctoral fellows, 15 PhD students and 26 M.Sc. graduate students. He currently co-supervises 36 graduate students.

Warren Heisler

A home-grown solution to industry challenge

Not all research in Alberta's environment and energy field is about the oil sands and takes place in multi-million-dollar research labs. Alberta's can-do spirit attracts independent inventors to the arena of innovation.

Warren Heisler is that breed of scientist. You won't see this entrepreneurial oil contractor in a lecture hall. He's in the field or in his home-based lab near Lloydminster, Alberta. That's where he invented the Exhaust Gas Recovery System.

"Having worked for 22 years in the oil and gas industry," says Mr. Heisler, "I recognized the problems waste gas was creating." In 2007 he began his path of innovation to reduce his clients' carbon footprints and help keep the environment clean.

Mr. Heisler's Exhaust Gas Recovery System prevents significant amounts of waste gas originating from methanol pumps on oil and gas sites from venting into the atmosphere, thus preventing environmental damage, reducing operating costs and creating a new potential revenue stream from the recovered gas.

Mr. Heisler independently designed the prototype, tested it in a controlled environment in his own shop, received a Canadian "Patent Pending" and field-tested it with a local natural gas company. He is now marketing his Exhaust Gas Recovery System in Western Canada.

Gord Jaremko Editor, Alberta Oil

Magazine an ambassador for scientific advances in the energy sector

The Alberta energy industry accounts for approximately one-third of the province's revenues and employs almost one out of every six workers in Alberta. In spite of its prominence, the sector receives little public attention for its technological and scientific advances.

***Alberta Oil* Magazine** offers a comprehensive portrait of the energy sector that includes factual information on the scientific advances made by oil and gas companies. It facilitates important conversations among industry leaders and workers about pressing issues, and it raises awareness among the general public about the science that underpins the energy sector.

Publisher Ruth Kelly and Editor Gord Jaremko see value in talking about the investment Alberta's energy sector makes in innovation to efficiently and environmentally exploit and extract the resource. Readers – in and out of the sector – see the effort, science, money and human capital being invested into the industry in Canada.

More than 88,000 senior decision-makers in industry, science and government around the world read *Alberta Oil* magazine. The website receives an additional 168,000 hits per year.

Researchers set sights on profound global environmental problem

Alberta's researchers, entrepreneurs and businesses are setting global standards in reducing the environmental impacts of industry, providing better information to understand the earth's ecosystems and supporting the development of greener technologies.

Two University of Calgary researchers have developed a technology to help solve an issue that transects all industries all over the world. Polychlorinated biphenyls (PCBs) are persistent organic pollutants and have entered the environment through both use and disposal. The environmental transport of PCBs is complex and nearly global in scale. Estimates put the total global production of PCBs in the order of 1.5 million tons.

Dr. Gopal Achari and **Dr. Cooper Langford** combined their unique scientific perspectives – chemistry and environmental engineering – to develop a novel technology to remediate PCB-contaminated soils. They conducted the research in collaboration with TransCanada Pipelines Limited. The elegance of the technology lies in its simplicity: it can be mounted on a flatbed truck and taken easily from site to site; and it uses no harsh chemicals.

Their system takes a cradle-to-grave approach using chemical additives and ultra-violet light to degrade components of the contaminated soil or sediment into harmless materials that require no further treatment. The technology is in a pre-commercial stage and is expected to have a profound impact on a persistent, global environmental problem.

Dr. Gopal Achari (left)
Dr. Cooper H. Langford

Dr. Daniel Smith

Wide-ranging research has extensive practical applications

From contaminated soil to water quality, Alberta researchers are tackling the tough questions and coming up with solutions that are improving health in Canada and around the world.

Dr. Daniel Smith has conducted wide-ranging research on water quality and treatment. This is particularly relevant as instances of disease transmission and questionable public water sources have increased public awareness about water safety. Dr. Smith's discoveries and their applications have extensive implications for the natural environment, urban infrastructure and sustainability of key Alberta resource industries.

The University of Alberta professor emeritus is also a global leader in research related to northern environments. And he has mentored many undergraduate and graduate students in the fields of environmental engineering and environmental science. Dr. Smith has also contributed generously to the University of Alberta and several technical societies, professional associations and organizations in Canada and internationally.

His outstanding accomplishments over a 25-year career have raised the level of environmental engineering and led to widespread applications in improving public health and environmental well-being within Alberta and globally.

New technology eyes and ears in gathering remote environmental data

The climate is fundamental to life. Yet environmental scientists remain perplexed about its changes and influences on ecosystems near and far. One Alberta scientist is helping them to better understand.

As a result of **Dr. Arturo Sánchez-Azofeifa's** research and development, researchers around the world have access to a vast amount of previously inaccessible environmental information that relates to the impacts of climate change in subarctic, boreal and tropical environments.

The U of A researcher developed Enviro-Net, a web-based platform for using ground-based wireless sensor networks for continuous observations of ecosystem function from virtually anywhere. Enviro-Net has proven its potential to be a reliable accurate and comprehensive set of "eyes and ears" in remote areas of the globe that play a critical role in ensuring the future health of our planet. The technology includes software, hardware and applications.

Enviro-Net has the potential to be important for agriculture and other industries in Alberta in documenting and measuring drought and other climate-related environmental changes.

Dr. Arturo Sánchez-Azofeifa

Dr. Viola Birss

Leading the way to energy, technological and economic diversification

Because of Alberta's energy and environment focus, researchers have become engaged in emerging technologies. In **Dr. Viola Birss'** case, it is fuel cell technology,

Fuel cell technology involves highly efficient and clean conversion of chemical energy of fuels to electrical energy. The technology can help meet the challenges of ongoing industrial growth and the need for an enhanced sustainable development of Canada's economy – all the while reducing our environmental footprint.

Dr. Birss is a celebrated Canadian researcher and scientist, recognized internationally for her contributions to solid oxide fuel cell (SOFC) technology and innovation. Without her research, fuel cell systems will not be economically viable.

Beyond her groundbreaking discoveries, Dr. Birss has shown exceptional leadership in bringing together academia, government and the private sector to create SOFC Canada. The network creates research and commercialization opportunities for fuel cell technologies. Because of her dedication, Alberta stands poised to create a new technology sector, providing tremendous economic diversification.

In addition to all of her accomplishments, Dr. Birss is a role model and mentor for women in science. She has supervised many M.Sc. and PhD graduates who work internationally in academia and research.

Honourees from Energy & Environment

Alberta Oil Magazine
Publisher, Ruth Kelly
Editor, Gord Jaremko

Dr. Gopal Achari and Dr. Cooper Langford
Dr. Achari, Professor, Centre for Environmental Engineering Research and Education, Schulich School of Engineering, University of Calgary
Dr. Langford, Professor Emeritus Department of Chemistry, University of Calgary

Dr. Zhangxing John Chen
Professor, Schulich School of Engineering, University of Calgary
NSERC/AERI/Foundation CMG Chair In Reservoir Simulation
iCORE Industrial Chair in Reservoir Modelling
Director, iCentre Simulation & Visualization

Dr. Daniel W. Smith
Professor Emeritus, University of Alberta

Dr. Arturo Sánchez-Azofeifa – Enviro-Net
Professor, Department of Earth and Atmospheric Sciences, University of Alberta

Warren Heisler – Exhaust Gas Recovery System

Dr. Phillip Fedorak and Dr. Julia Foght
Microbiology and Biotechnology Group, Department of Biological Sciences, University of Alberta

Dr. P.V. Jampana and Dr. S.L. Shah
Researchers, Department of Chemical and Materials Engineering, University of Alberta

Tailings Reduction Operations Team
Shelley Powell, Vice President Extraction, Suncor Energy
Bradley Wamboldt

Dr. Viola Birss
Professor, Chemistry, University of Calgary
Canada Research Chair in Electrochemistry of Fuel Cells and Related Applications

Health Solutions

Alberta's strong health research environment is leading discoveries that are enhancing care and practice in diverse areas, such as cardiovascular health, brain development and health, diabetes, biomedical technologies, infectious diseases and bone and joint health.

The majority of health research – 84 per cent – is performed within the public sector, mostly in academic health centres in collaboration with the education and research structures of post-secondary institutions.

Health research in Alberta's private sector is estimated at approximately 16 per cent of the province's total investments in health research. More than 130 bioindustry companies operate in Alberta with the majority of them in the health biotechnology and medical devices and equipment sectors.

Collaborative research communities and infrastructure in these areas help attract outstanding people, industry trials, manufacturing and venture capital to Alberta. Other technological advances on the horizon could revolutionize the health system and diversify Alberta's economic base.

Technology provides patient care wherever and whenever

Advances in information communications technology have led to electronic health records and new ways of delivering health care – such as telehealth – to rural and remote communities.

'Time is brain' is a familiar slogan that emphasizes that a stroke victim can be helped by emergency treatments only through a very narrow time window. Correct diagnosis can be given only with accurate clinical examination and review of advanced brain imaging.

Technology developed in **Dr. Ross Mitchell's** lab in Calgary allows advanced interactive visualization of remote datasets, helping healthcare providers to save lives by making diagnoses quickly and accurately.

Dr. Mitchell's family of advanced medical diagnostic imaging software, ResolutionMD™, is a powerful image-rendering device that makes high quality visualization of medical images possible on inexpensive workstations. PureWeb® adapts the ResolutionMD software for mobile devices, drastically improving diagnosis times, especially in rural and remote healthcare.

continued…

Dr. Ross Mitchell

Technology provides patient care wherever and whenever…continued

The technology is capable of bringing expertise to the patient wherever they may be. It has the potential to lead to inexpensive home-monitoring solutions through bi-directional, real-time sharing of information between patient and doctor.

The commercialization story

Commercialization ensures that knowledge generated by health research can lead to economic development opportunities, new diagnostics, therapies and technologies.

Calgary Scientific Inc. (CSI), the company Dr. Mitchell co-founded, is commercializing ResolutionMD and PureWeb, making it available around the world.

Under the leadership of CEO Byron Osing, CSI has taken its place at the forefront of a dynamic new world of healthcare innovation that promises to have considerable impact on our economy and our ability to deliver the best in healthcare.

In addition to ResolutionMD and PureWeb, CSI developed a computer-assisted diagnosis technology designed to undertake tissue differentiation and virtual biopsy from digital medical images to maximize the value of medical imaging data.

Founded in 2003, CSI employs more than 50 skilled professionals from diverse scientific disciplines. The company holds eight patents, with 13 pending, four of which are for PureWeb.

CSI's innovation success is largely due to the company's agility in incorporating feedback from industry experts and end users, and engineering products that work for them.

Byron Osing

Dr. Robert Burrell

Visionary transforms nanotechnology into nanomedicine

Advances in nanotechnology are leading to changes in diagnosing disease through developments such as the "lab-on-a-chip", tiny glass or polymer chips that integrate one or several laboratory functions on a single chip.

Dr. Robert Burrell is considered by many among his peers to be a visionary. He saw the potential to apply nanotechnology to medicine and had the exceptional scientific skills to create a successful therapeutic product that saves lives and improves the quality of life for people worldwide.

His product, Acticoat™, is the first therapeutic application of nanotechnology in the world. The nanostructured silver-coated Acticoat bandages are used worldwide as an antimicrobial barrier over wounds. Acticoat has also shown promise in treating severe lung inflammation.

It has potential to be as important to prevention and treatment of infectious diseases as the discovery and development of penicillin was in the 1940s.

"Many people get to change the bottom line of companies; few get to change the outcomes of people's lives," says the University of Alberta researcher. "I'm lucky to be one of the latter group."

Respected scientist contributes to neuroscience

In the field of molecular neuroscience, **Dr. Gerald Zamponi's** discoveries have had profound impact on cardiovascular, neurobiological and drug development fields. The University of Calgary professor is regarded as one of the world's leading researchers in the molecular neurophysiology of calcium channels.

Calcium ions help keep our memory intact and our hearts beating, among other important jobs. These ions move into a cell through a calcium channel – a tightly regulated entryway that stops too much calcium from getting into a cell.

Dr. Zamponi investigates how calcium channels do this. His research in this area could lead to better drugs for various diseases and conditions.

Dr. Zamponi's seminal research programs have resulted in numerous contributions to biomedicine, including important implications for health and disease such as mental health, epilepsy, chronic pain, heart disease and some cancers. Excess calcium may contribute to heart disease, stroke and epilepsy.

Dr. Zamponi is an energetic leader and valued contributor in neuroscience across Canada and internationally.

Dr. Gerald W. Zamponi

Dr. John Vederas

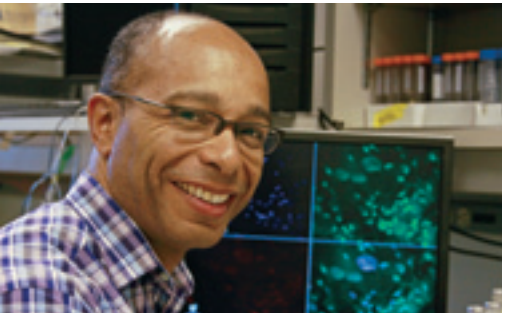
Creativity, curiosity ingredients for research innovation

Alberta is particularly strong in basic biomedical sciences and has substantial expertise in understanding the pathogenesis of certain diseases. Among its leaders is **Dr. John Vederas**, an outstanding chemist whose research is characterized by its creativity.

"I'm driven by curiosity of how nature works and prefer conducting pure research, which I believe is responsible for advancing technology," says the University of Alberta professor.

Through his creativity and dedication, Dr. Vederas has advanced the field of bio-organic and medicinal chemistry. He and his colleagues focus on studying the chemistry used by nature to assemble biological molecules. They purified and characterized non-toxic proteins that can prevent growth of harmful bacteria on food, which helps better preserve food and makes it safer to eat. The potential exists for medicinal use in the treatment of bacterial infections that are currently resistant to antibiotics.

Scientific discovery is only one facet of Dr. Vederas's 33-year-long career. He has mentored 43 PhD students, 8 masters students, over 50 postdoctoral fellows and 50 summer undergraduates completed research in his group at the University of Alberta.



Dr. Bernard Thébaud

Rising star in perinatal research

In spite of his relative youth, during his eight years at the University of Alberta **Dr. Bernard Thébaud** has become an accomplished investigator and key figure in newborn lung biology. He has made important contributions and advancements to the area of neonatal health research.

Dr. Thébaud's stem cell-based research into prenatal lung development allows caregivers to improve outcomes of treatment for babies with pulmonary hypertension. His discovery that stem cells can prevent lung injury and even rescue established lung damage represents a major breakthrough for incurable lung diseases. It offers hope of curing or improving the quality of life for patients suffering from chronic lung diseases.

Dr. Thébaud has demonstrated dedication to mentoring and training future scientists and has built an international reputation as a superb physician and scientist.

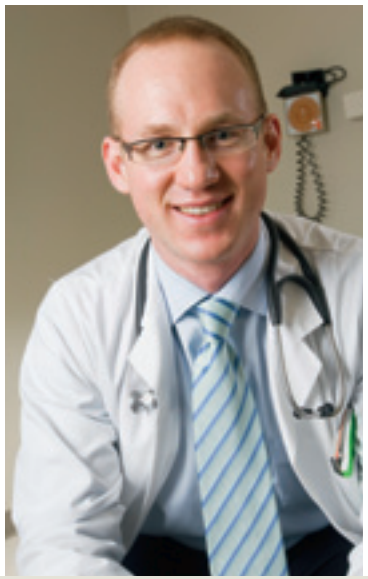
Young scientist eager to make a difference

Just out of the gate at the beginning his scientific career **Peter Gill** is a natural leader who has the ability to engage others in his causes.

The Rhodes Scholar is an advocate for improving children's health. Mr. Gill recognized a shortfall in the medical care of children and based his PhD thesis on finding a solution. His thesis focuses on developing and piloting "markers" of quality in paediatric care in routine general practice. It promises to lead to fundamental changes in improving how health care is delivered to children worldwide.

Mr. Gill sees advocacy as a critical role that he and his colleagues will play as physicians. He's off to a good start. While he was a student at the University of Alberta, he spearheaded a successful campaign to secure increases to student loans available to medical students. He is also a committed philanthropist.

In what bodes well for Alberta's future, Mr. Gill aspires to be an Alberta-based paediatrician, clinical scientist and medical doctor.



Peter Gill

Honourees from Health Solutions

Dr. Ross Mitchell
iCORE/Calgary Scientific Inc. Chair in Medical Imaging Informatics, University of Calgary
Medical Computer Scientist, University of Calgary Hotchkiss Brain Institute, Southern Alberta Cancer Research Institute
Co-Founder and Chief Scientist, Calgary Scientific Inc.

Dr. Robert Burrell
Professor and Chair, Biomedical Engineering, University of Alberta
Chair in Nanostructured Biomaterials, Canadian Research Council

Peter Gill
2009 Rhodes Scholar, Oxford Paediatrics and Primary Health

Dr. Gerald Zamponi
Chair, Department of Physiology and Biophysics, University of Calgary
Canada Research Chair

Dr. John Vederas
Professor of Chemistry Faculty of Science, University of Alberta
Canada Research Chair for Bio-organic and Medicinal Chemistry

Calgary Scientific Inc.
Byron Osing, CEO

Dr. Bernard Thébaud
Associate Professor, Paediatrics, University of Alberta

Technology

Technological innovation sets the stage for a vibrant next-generation economy built on the foundation of scientific research work being conducted in Alberta for the benefit of the entire world. Timely commercialization of these innovations accelerates the development of prosperous businesses in Alberta.

Productive working partnerships and support is fundamental to quickly translate research into meaningful products, processes and services – all in an environment of open innovation. Alberta provides fertile ground to grow all of these vital elements.

All of our ASTECH honourees have contributed enormously to Alberta's technology future. They have collaborated to innovate and build a new economy.

We were delighted to see the strong contingent of honourees whose focus is raising awareness about science and by doing so, nurturing and educating a new generation of scientists and science appreciators.

Others are leaders in their communities and have played essential roles in shaping the future of our province's educational institutions and the technology sector itself.

Stephen Lougheed

Tireless technology advocate helps create jobs and investment in Alberta

There can be little doubt about the positive impact **Stephen Lougheed** has brought to Alberta as an open and prolific campaigner for science and technology in the private and public sectors. The vice-chair of Alberta Innovates Technology Futures has improved the quality of life in the province by his tireless advocacy of science and technology as a volunteer and business leader.

Mr. Lougheed is credited with spearheading the creation of the Alberta Information and Communications Technology Institute (AICTI) in 2006 during his seven-year tenure on the Alberta Science and Research Authority (ASRA) Board. He also played an instrumental role, with his board colleagues, in establishing Tecterra, Canada's Centre of Excellence for Integrated Resource Management.

Through his successful international and national business ventures and his public policy contributions to help small- and mid-sized technology companies, Mr. Lougheed has yielded hundreds of millions of dollars in new value and hundreds of jobs in Canada and Alberta.

Dr. Dennis Fitzpatrick

'Shoot high' philosophy builds innovative campus, research opportunities

One of Alberta's treasures is the enthusiastic crusader for academic and technological innovation, **Dr. Dennis Fitzpatrick**, Biochemistry professor and former University of Lethbridge vice-president of Research.

Under Dr. Fitzpatrick's leadership, the University of Lethbridge has evolved into a comprehensive research and instructional university with strong ties to the provincial technology community. Since he arrived 10 years ago, the university's research budget has grown from $2 million – to almost $24 million in 2010.

"The money increases the kinds of opportunities that impact the lives of people in Alberta and especially southern Alberta," Dr. Fitzpatrick says. His 'think big and shoot high' philosophy is fundamental to the university's success, as is his vision to deliberately focus on developing specific areas with programs of instruction and research in tandem.

Dr. Fitzpatrick has established several programs at the university that encourage creative partnerships across disciplines to produce groundbreaking research; and they produce highly educated students who have abundant opportunities.

Strive not to be a success, but rather to be of value

ALBERT EINSTEIN

Dr. David Naylor

U of L researcher helps explore space through high-tech lens

Also contributing hugely to the transformation of the University of Lethbridge from small campus to international research hub is **Dr. David Naylor**.

For more than 30 years, the Physics and Astronomy professor has been developing a world-class research program at the university. During that time he supervised over 150 undergraduate and 20 graduate students, which he says is "without question, what I'm most proud of in my career".

Dr. Naylor's research in the design, construction and use of Fourier transform spectrometers in astronomical research has added tremendous advances to space imaging technology. Dr. Naylor is also investigating the technology's potentially significant applications in medicine.

"With the detectors we have, you could throw an ice cube from the space shuttle and we could see it," he says. "So why shouldn't we be able to see a tumour in someone's brain?"

These instruments are among the most sensitive in existence and are used by international space agencies like NASA, ESA and CSA in their space missions. Right now a spectrometer designed by Dr. Naylor's team is on the dark side of the moon, collecting colour images never before seen.

Dr. Naylor is sought after internationally to become involved in a variety of space imaging projects.

Collaboration creates 3D imaging hub in Alberta

Also making international waves, in Edmonton the work of **Dr. Pierre Boulanger** has been on the forefront of 3D image sensing, processing, mechanical reverse engineering, industrial dimensional inspection and visualization. The impact of Dr. Boulanger's research is recognized worldwide and has established Alberta as a global hub in the field.

Over the past 25 years, the University of Alberta professor has developed technology being used in fields ranging from surgical instruction to virtual reality environments for museums. His Advanced Man-Machine Interface Laboratory has brought together the strengths of imaging and processing, rapid product development, medical and industrial visualization and tele-immersion.

Dr. Boulanger, iCORE Chair on Collaborative Virtual Environments, is largely responsible for significantly advancing his field of research and enabling others to pursue avenues of research. He collaborates with academic and industry partners and has supervised and mentored many successful graduate students.

Dr. Pierre Boulanger

Ryan L. Johnson

Helping to map out industry impact for conservation

Building strong academic and public institutions is fundamental to fostering innovation that will lead to a successful and sustainable technology sector. As well, strong business communities and research hubs are required to create a viable technology economy to provide jobs for grads and skilled professionals.

Once again, Lethbridge is mapping the route with **Iunctus Geomatics Corp.** leading the way.

Since the company was founded in 2000, the Iunctus team has developed leading remote sensing products. Among them is the TerraEngine, which facilitates the storage and transmission of large files of digital imagery over the internet. The imagery is used to create geographical maps and other data for industries including agriculture, disaster management, forestry, telecommunications planning and oil exploration.

Iunctus is also paving the way for a geomatics industry in Lethbridge by investing $1 million into a partnership with the City of Lethbridge to sponsor an incubator for technology companies.

"We're helping young entrepreneurs by building a hub for technology companies to grow and stay in Lethbridge," says President Ryan Johnson.

The company has almost 50 employees in three divisions: ATIC, a joint venture with the University of Lethbridge; a new data centre; and PrioraNet Canada, a joint venture between Iunctus and the Swedish Space Corporation.

Andrew Osis

Poynting the way for mobile local search applications

Public policy, strong institutions and technology hubs are all playing an important role in developing Alberta's technology sector. So too is entrepreneurial capability and innovation – to bring all that has been achieved to world markets. That's what **Poynt Corporation** (formerly Multiplied Media) does very well.

Founded in 2002 and led by Chairman Stephen Lougheed and President and CEO Andrew Osis, Poynt is a global leader in developing and delivering mobile local search applications.

The Calgary-based company has 38 employees and operates in seven countries in five languages. Its lead product is Poynt, which takes its core technology from the integration of mapping, GPS and geomatics, large-scale data sourcing and integration, intuitive graphic interfaces and mobile data optimization. All of these find strong historical roots in Alberta's resource and technology sector.

Launched in 2008, Poynt technology now has 3.5 million users globally and demand is growing.

"Local mobile search applications are one of fastest growing consumer products in terms of interest," explains Mr. Lougheed. "We are among the clear leaders in what we are doing and we are accomplishing that by growing globally. And it's happening here, not in New York City or Silicon Valley. This is an exciting Alberta story."

High-speed solution slows flow of malware

Calgary-based **Wedge Networks**, led by Dr. Hongwen Zhang, also maintains a strong mandate of hiring, training and retaining skilled employees and contributing to research and development in Alberta. The company works collaboratively with the University of Calgary's Computing Sciences faculty and local technology company TRLabs to slow the flow of malicious internet spam with a high-speed solution.

Virtually all businesses in Alberta have integrated the web into their operations. "If internet security cannot be trusted, the effectiveness of our economy is compromised," says Dr. Zhang.

Wedge Network's award-winning BeSecure Web Security appliance provides enterprises and service providers with the means to detect, block and defend against malicious web-based attacks that steal data, disrupt networks and damage credibility. BeSecure is considered in the industry to be a paradigm changing innovation in how malware is fought.

By ensuring security of the Internet, BeSecure helps web-based businesses to safely reach new markets.

Wedge Networks

Top to bottom, l to r: Mark Koob, Alexes Hushlak, John Preston, Chris Ooraikul, Henning Moe, Kevin Stadlmayer, Kevin Chmilar, Julie McLaughlin, Husam Kinawi, Cameron Schaus, Hongwen Zhang, Feng Yan, Pat Bergamin, Hong Zhao, Leo Wai Yeung

Nathan Armstrong

Biocomposites key to new generation of vehicle manufacture

Alberta's economic future relies on diversification of the economy by moving away from being hewers of wood to becoming technological innovators. Ideally, new diversified industries use the province's abundant natural resources to supply raw materials for a manufacturing process – and lead to a greener world.

Motive Industries is helping to diversify the economy by developing innovative advanced composites and engineering design using locally available materials and working with a consortium of small- and medium-size companies to conduct large-scale projects.

Through his energy and vision, President Nathan Armstrong is on the forefront of developing high-end software tools and innovative materials to manufacture cheaper, safer and more environmentally sustainable vehicles.

Mr. Armstrong's transformational leadership has been instrumental in helping Alberta companies to be competitive in automotive electric and hybrid vehicle production and aerospace and international radio telescope developments.

Under the leadership of Mr. Armstrong, Motive Industries is helping to address important societal challenges and build Alberta's economy by leading the creation of sustainable innovation capacity, collaborative work processes, engagement of high-quality partners and motivation to deploy various novel technologies.

Inspiring the next generation of scientists and engaged citizens

Where would the future of science and technology be without the individuals who act as ambassadors? They are the teachers, the entrepreneurs and the web developers that reach out to inspire future generations to embrace natural science and technology.

In the course of his rich and multi-faceted 30-year career as educator, journalist, author, television host, photographer, naturalist and scientist, **Mr. John Acorn** has inspired hundreds of thousands of curious minds to explore science.

He created and hosted *Acorn The Nature Nut*, a popular television series and he is a prolific author of books about nature and palaeontology and bird- and insect-specific field guides. His trilogy of children's books called *The Tiny Perfect Dinosaur* won the Parents' Choice Gold Award. And he stars in a number of interpretive videos in the Royal Tyrell Museum where thousands of viewers see him every year.

Mr. Acorn has received numerous awards for his work. He teaches in the Department of Renewable Resources at the University of Alberta.

Mr. Acorn says his talent is looking at the big picture. He takes joy in synthesizing information and presenting it in just the right way to engage different audiences on meaningful levels. In this, he has most certainly achieved success.

John Acorn

Making noise for science

Dr. Lucio Gelmini makes a big bang when he talks to kids about science. He uses natural chemical reactions to make explosions and loud noises that leave school children impressed.

Dr. Gelmini has made it his mission to introduce school children from 10- to 17 years old to the scientific wonders in everyday life through the hands-on science demonstrations he brings to schools and youth organizations. But he also has an ulterior motive.

"I want to get more people involved in science," says the busy Grant MacEwan University instructor and generous volunteer. "We live in a knowledge-based economy in Alberta and we have to go outside of the province and country to get skilled people. We shouldn't have to do that. That is one of my driving forces."

Over the past 10 years Dr. Gelmini has made presentations to about 18,000 people a year in his talks and demonstrations around Alberta. He was instrumental in developing Grant MacEwan University's science outreach program and is the chair of the Edmonton Science Outreach Network.

Dr. Lucio Gelmini

Touch a scientist and you touch a child.

RAY BRADBURY

l to r: **Brit Trogen, Torah Kachur, Rheanna Sand**

Lighting the spark of curiosity

Albertans are spreading the word about science in every kind of medium available – from books and television, CDs and classroom presentations to the internet. And they are appealing to a variety of audiences by making cultural connections.

Science in Seconds is a multi-faceted online video and blog series that fuses scientific news with humour and personality. It combines dazzling visuals with passion, flare and accuracy in a multi-media approach to science journalism that appeals to a wide spectrum of people. Using short easy-to-digest packets of information, the site provides attention challenged web surfers with a "gateway drug to science".

The creators, three University of Alberta science graduates, engage audiences by using all available interactive digital media to build discussion. They keep information on the site current, crisp and relevant.

The goal of Science in Seconds according to co-founder Rheanna Sand, is to "light the spark of curiosity" in its audience. Every week the website has thousands of visitors from more than 80 countries.

Iron Science Teacher team

Building professional pride by challenging science teachers

Educating the new generation about science is a noble mission. And what better way to do that than by teaching the teachers to inspire their students.

Iron Science Teacher is a Canada-wide challenge to encourage innovation in science education. Its goal is to create a level of awareness and appreciation for creative science teaching that, through the scale of collaboration, has a greater impact than any individual effort might have.

Iron Science Teacher was created by Dr. Mary Anne Moser, director of Communications, Schulich School of Engineering in 2006. She worked with media partner, the Discovery Channel, to launch the program nationally in 2007. Nine science centres and museums also participate in the project. The nation-wide challenge has been enthusiastically embraced by science teachers.

Built on the Iron Chef idea, the creative project integrates the web, broadcast and print media and live events to reach a wide audience. It elevates the pride and professionalism of science teachers and is an inspiration to teachers and students; and it promotes science and innovation across Canada.

Honourees from Technology

Dr. David Naylor
Professor, Physics and Astronomy, University of Lethbridge
Director, Space Astronomy Division, Institute for Space Imaging Science

Dr. Dennis Fitzpatrick
Professor, Biochemistry and former VP Research, University of Lethbridge

Dr. Lucio Gelmini
Instructor Department of Physical Science Grant MacEwan University

Iron Science Teacher
Dr. Mary Anne Moser
Director Communications, Schulich School of Engineering, University of Calgary
Director, Banff Science Communications Program

Iunctus Geomatics Corp.
Ryan Johnson, President and CEO

John Acorn
Faculty Service Officer, Department of Renewable Resources, University of Alberta

Motive Industries
Nathan Armstrong, President

Dr. Pierre Boulanger
Professor, Computer Science, Faculty of Science, University of Alberta
iCORE/TRLabs Chair in Collaborative Virtual Environments
Director, Advanced Man Machine Interface Laboratory Research Director, Alberta Radiological Visualization Centre

Science in Seconds
Rheanna Sand, Co-owner

Stephen Lougheed
Vice Chair, Alberta Innovates Technology Futures
Chairman, Poynt Corporation

Wedge Networks
Dr. Hongwen Zhang, CEO

Poynt Corporation
(formerly Multiplied Media Corporation)
Stephen Lougheed, Chairman
Andrew Osis, President and CEO

ASTECH Awards Distinguished Patrons

Agrium is a leading agricultural retailer in the Americas and, a global producer and marketer of agricultural nutrients and industrial products. Agrium produces and markets three primary groups of nutrients: nitrogen, phosphate and potash, as well as controlled release and micronutrient fertilizers. Agrium is proud to note that ESN, their premiere controlled release product, was created here in Alberta. Agrium's strategy is to grow internationally through incremental expansions, acquisitions and, through the development and commercialization new products and services.

Alberta Innovates is Alberta's aligned research and innovation system consisting of the Alberta Research and Innovation Authority and four publicly funded corporations: Alberta Innovates - Bio Solutions; Alberta Innovates - Energy and Environment Solutions; Alberta Innovates - Health Solutions and Alberta Innovates - Technology Futures. These five new dynamic agencies focus on taking outstanding research and ideas to the next level by creating products, services and processes that will address challenges faced by Albertans and people around the world.

With Alberta's largest technology and intellectual property practice, Bennett Jones LLP is an internationally recognized Canadian business law firm focused and founded on principles of professional excellence, integrity, respect and independent thought. Our firm's leadership position is reflected in the law we practise, the groundbreaking work we do, the client relationships we have and the quality of our people.

Bio Alberta is the central voice and the organizing hub for life sciences in Alberta. We are a private, not-for-profit industry association with activities focused on the following areas: advocacy; industry promotion and marketing; increasing access to human resources; business development; and networking opportunities. Alberta's life science industry is a broad field of endeavours encompassing biotechnology, environmental science, medical technology, industrial bioproducts, agriculture biotechnology, bioinformatics and natural health products.

CMG Reservoir Simulation Foundation (Foundation CMG) supports professors and students in leading edge research in computer simulation and modelling flow of liquids and gases and bio-chemical reactions in the earth. Improving technology and reducing negative impacts: C02 sequestration, oil and gas production, in-situ recovery and other processes with advanced 4D dynamic visualization. Exciting opportunities for engineers and scientists exploring C02, oil and gas recovery, coal bed methane, in-situ oil sands, environment remediation and other technologies. Foundation CMG is an industry-endowed not-for-profit organization and sponsors researchers and students in universities in Alberta and around the world.

At Conroy Ross Partners, we offer results-driven Business Advisory and Executive and Professional Search solutions. We act as growth partners for the long term of our clients, colleagues, candidates and the communities where we work. Through our offices in Calgary, Edmonton and Regina, we assist our clients in building better organizations and we deliver Leadership + Growth solutions to an expanding client base who rely on us as a continuing source of practical innovation that works in the real world.

No matter where our clients grow their businesses, Conroy Ross Partners is positioned to help them succeed. As an owner/member of IIC Partners, we have connections with a broad network. IIC Partners is ranked among the top 10 executive search groups in the world, providing global reach and local focus through more than 50 offices in 38 countries.

Dow AgroSciences Canada is a research-based, agricultural sciences company with a diverse product portfolio including weed, insect and disease management for crops, range and pasture, forestry and industrial vegetation management. The company also has significant investments in plant genetics and biotechnology platforms in canola and corn, which focus on a range of input production traits and value-added quality traits. Established field research capabilities across Western and Eastern Canada include a canola breeding station and global trait research facility in Saskatoon, Saskatchewan, and a corn breeding station at St. Mary's Ontario. Significant research and commercial development alliances in Canada include the National Research Council's Plan Biotechnology Institute in Saskatoon and Agriculture and Agri-Food Canada.

Fugro Data Solutions is part of the global Fugro group of companies and specializes in management of upstream oil and gas data. Fugro Data Solutions provides commercial software and consulting services for master data management systems, stores, copies, archives and outsources the management of petrotechnical data. Globally, Fugro provides the people, equipment, expertise and technology that support the exploration, development, production and transportation of the world's natural resources. Fugro's organizational structure is decentralized and client oriented, delivering a wide range of services in a variety of operating environments and conditions to clients in the oil and gas industry; construction industry; mining sector; and governments. Fugro delivers these services from a global network of offices and facilities with over 255 companies in 55 countries employing over 13,500 staff. Fugro strives to achieve strong market positions based on (in-house) developed technologies, high-value services and a strong international or regional presence and provides its clients with the technical data and information required to design, construct and maintain structures and infrastructure in a safe, reliable and efficient manner.

Government of Alberta The Government of Alberta works collaboratively to achieve its vision of an innovative and prosperous province where Albertans enjoy a high quality of life built on a healthy environment, a competitive economy and vibrant communities. To this end, the government is committed to making Alberta the most competitive jurisdiction in North America. Our ongoing support for science and technology will help Alberta maintain a leadership role in the global economy, and attract and develop world-class researchers, learners, leaders and innovators. Through support for our world-class post-secondary education system, Campus Alberta, and the world-class research and innovation efforts of Alberta Innovates, we will transform our economy. Our people are naturally entrepreneurial, and our great Alberta spirit will do the rest.

Hitachi Data Systems leverages global R&D resources to develop storage solutions built on industry-leading technology with the performance, availability and scalability to maximize customers' ROI and minimize their risk. By focusing on the customer's perspective as we apply the best hardware, software and services from Hitachi and our partners, we uniquely satisfy our customers' business needs. With approximately 4,100 employees, Hitachi Data Systems conducts business through direct and indirect channels in the public, government and private sectors in over 170 countries and regions. Its customers include more than 50 per cent of Fortune 100 companies.

KPMG is well qualified to serve the needs of technology companies. We have the necessary resources and in-depth experience to help producers of technology products and services succeed in today's dynamic business environment. As an industry thought leader, we provide long-range vision, astute insights, and innovative professional service strategies to help leading companies stay at the top of their markets. Our role is to help businesses sustain their success by minimizing risk and transforming opportunities into clear and powerful results. KPMG LLP is the Canadian member firm of KPMG International, the coordinating entity for a global network of professional services firms, providing audit, tax, and advisory services, with an industry focus. The aim of KPMG International members' firms is to turn knowledge into value for the benefit of their clients, people, and the capital markets. With nearly 94,000 people worldwide, members firms provide audit, tax, and advisory services for 717 cities in 148 countries.

As your insurance advisor, we ensure our risk management and insurance knowledge is current and remains on top of technological trends that affect your business. Whether you are an emerging company or a multinational firm, Lloyd Sadd Insurance makes it a priority to understand your business. Lloyd Sadd Insurance's Science & Technology Practice is a group of insurance professionals focused on working with science and technology clients to deliver unique and dynamic solutions for their insurance needs so clients can stay focused on growing their business.

NAIT is one of the preeminent institutes of technology in Canada, providing real-world education in business, advanced technologies and skilled trades. Known for student success, NAIT also engages with business and industry in applied research and innovation and provides corporate training around the world. Last year, NAIT had almost 86,000 registrations in more than 250 apprenticeship, certificate, diploma, applied degree and baccalaureate degree programs, as well as more than 1,400 continuing education courses. The institute is home to two unique baccalaureate degrees: The Bachelor of Technology in Technology Management (BTech) – the only program of its kind in Alberta - and the Bachelor of Business Administration (BBA). The largest apprenticeship trainer in Canada, NAIT offers 35 apprenticeship programs and trains approximately half of Alberta's apprentices. NAIT has more than 156,000 alumni.

When it comes to innovative technology training, SAIT Polytechnic is in a class of its own. With programming spanning eight broad disciplines, SAIT offers applied degrees, diplomas, certificates, apprenticeships, continuing education and corporate training to more than 77,000 registrants each year.

SAIT works closely with business and industry to ensure its programs are relevant with more than 1,000 industry professionals serving on program advisory committees. As a result of industry's involvement, the class of 2009 has a 91 per cent employment rate. SAIT is also a leader in applied research and innovation, providing expertise, with student involvement, in prototype design to commercialization. It is active in emerging areas of research such as Green Building Technologies, Water Remediation, Alternative Energy and SMART Grid Systems and Sports & Wellness Engineering.

Established in 1916, SAIT has embarked on the largest expansion in its history: construction of a $445 million Trades and Technology Complex that will add 3,600 fulltime training spaces. A member of Polytechnics Canada, SAIT was named one of Alberta's Top 50 Employers as well as one of Alberta's Best Workplaces for 2010.

Syncrude Securing Canada's Energy Future For more than 30 years, Syncrude has been responsibly producing crude oil from the oil sands of Alberta. And for 45 years, research and development have played a large role in shaping the company's success; it now produces enough crude oil to meet 15 per cent of Canada's needs, is a major contributor to Alberta's economy and is poised for further growth that is executed in a sustainable way. Syncrude operates the oil sands industry's only dedicated research and development centre, and, in the last five years alone, has spent more than $200 million to find new or improved ways to operate and reduce its impact on the environment. As well, Syncrude collaborates with many universities and research institutes, and is a founding member of the Canadian Oil Sands Network for Research and Development.

TELUS At TELUS, we give where we live. Since 2000, TELUS has donated more than $158 million and over 3 million volunteer hours across Canada. We want to be as well known for our community and environmental programs as we are for the quality of our networks. We want to be known as a company that both builds community and keeps people connected.

TRLabs TRLabs is Canada's largest and most industry-invested information and communications technology (ICT) R&D consortium. TRLabs fast tracks innovation to market by working with its industry partners to discover, develop and commercialize technology. TRLabs is also working closely with universities and colleges to transform its traditional R&D agenda toward a market driven commercialization process starting with a market need and including business and technology assessments, applied research, proof of concept, prototyping and technology transfer. TRLabs allows students and graduates from all ICT related disciplines to work with local and global industry players who are interested in innovation. Applied Research, Development and Commercialization activity focuses on three themes: Digital Media; eHealth; and Strategic Sectors. TRLabs also pursues more creative innovation vehicles, which has resulted in Javelin – a Tech Comm and Entrepreneurship program that combines market driven technology ideas, talented recent graduates, and industry mentors to create technology companies.

UNIVERSITY OF ALBERTA The University of Alberta is the largest research institution in the province serving nearly 38,000 students in more than 170 undergraduate and 120 graduate programs. As one of Canada's top universities, it received $512.6 million in sponsored research in 2009-10. The university's international reputation continues to grow with its leading-edge achievements such as "Edmonton Protocol" treatment for Type 1 diabetes; the pioneering work of the National Institute for Nanotechnology; the creation of the Li Ka Shing Institute of Virology; and the emergence of the Helmholtz-Alberta Initiative. Since 1994, University researchers have reported more than 1,386 inventions,

received 424 patents and generated more than $36 million in licensing and royalties revenue. The university (through TEC Edmonton) currently has 78 active start-up companies, ranking it seventh among all North American universities for start-ups still in operation. Our students learn from many of the brightest scholars in the country and the best teachers: the University of Alberta leads the country in the number of 3M Teaching Fellowships – Canada's top award for undergraduate university teaching excellence; in 2010, four Canada Excellence Research Chairs (CERCs) were awarded to the University of Alberta, twice as many as any other institution in the country.

As one of Canada's top research-intensive universities, the University of Calgary reflects the community that created and supports it – dynamic, innovative, and energetic. The University of Calgary has significantly increased its research funding to $272 million, and actively participated in 12 Networks of Centres of Excellence. In 2009-2010 government and industry jointly supported more than 135 endowed chairs in total at the University of Calgary, with an allocation of $5.29 million. This keeps us firmly in the Top 10 in Canada.

Since its founding in 1967, the University of Lethbridge has evolved from a small and very successful primarily undergraduate university to a research-intensive, comprehensive university with a focus on both undergraduate and graduate studies.

Today the University of Lethbridge provides a personal, supportive learning environment for approximately 8,500 students. The university offers relevant, progressive programs and more than 150 degree/program options through six Faculties and Schools Arts & Science, Education, Fine Arts, Health Sciences, Management and Graduate Studies. Undergraduate and graduate students alike learn with inspired scholars who combine teaching, creativity and research.

The strong tradition of research excellence at the University of Lethbridge has secured the institution[1]s place as one of Alberta[1]s three research universities. The University of Lethbridge is the home of the Canadian Centre for Neuroscience (CCBN) and the inaugural Alberta Heritage Foundation for Medical Research (AHFMR) Polaris Award; the Prentice Institute for Global Population and Economy; the Alberta Water and Environmental Science Building (AWESB); and many of Canada[1]s brightest minds and most accomplished researchers.

Western Economic Diversification Canada. Diversification de l'économie de l'Ouest Canada. Canada

Western Economic Diversification Canada (WD) invested more than $43 million towards 33 innovation projects across the West in 2009-10. This leveraged an additional $53 million from a variety of partners, including provincial and municipal governments, universities, research institutes, industry and not-for-profit organizations.

CANADIAN BREAST CANCER FOUNDATION. FONDATION CANADIENNE DU CANCER DU SEIN. Prairies • NWT/TNO

As the largest national volunteer-based organization in Canada, the Canadian Breast Cancer Foundation is dedicated exclusively to working collaboratively to fund, support and advocate for relevant and innovative research, early diagnosis and effective treatment, meaningful education and awareness programs and a positive quality of life for those living with breast cancer.

The science of today is the technology of tomorrow.

EDWARD TELLER

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VisionGain Consulting Inc.

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University of Calgary

Dr. Olga Kovalchuk
University of Lethbridge

Dr. Cornelia Kreplin
Agriculture and Rural Development

Mr. Derek Logan
Extreme Engineering

Ms. Myka Osinchuk
Institute for Reconstructive Sciences in Medicine (iRSM)

Mr. Rick Tofani
Alberta Innovates Technology Futures

Journalism Panel

Mr. Steve Sweitzer
Woodruff Sweitzer

Ms. Connie Bryson
Freelance Journalist

Mr. Cam Zimmer
University of Saskatchewan

Reality is merely an illusion, albeit a very persistent one.

ALBERT EINSTEIN

ASTECH Awards Nominators

ASTECH greatly appreciates the time and effort of the nominators, without whom we would not be able to bring these outstanding stories of innovation and leadership forward.

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Dr. Elizabeth Cannon
Dr. George Clayton
Dr. John Spence
Dr. Rose Goldstein
Dr. Thomas Feasby
Dr. Walter Bischof
Dr. Christine Murray
Dr. Daniel Weeks
Dr. Gregory Taylor
Dr. Kathryn Todd
Dr. Miodrag Belosevic
Dr. Patrick Sullivan
Dr. Terrance P. Snutch
Dr. William Bridger
Dr. Yun Kau Tam
Mr. Bert Roach
Mr. Brent Allison
Mr. Christopher Micetich
Mr. Craig Strand
Mr. David Magdalinski
Mr. David Mackillop
Mr. Jamie McNaul
Mr. Joe Lukacs
Mr. John Masters
Mr. Kevin Dahl
Mr. Martin Kratz
Mr. Michiel Verheul
Mr. Paavo Montandon
Mr. Robert Tasker
Mr. Robert Marshall
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Mr. Zachary Bodmer
Mrs. Shelly Brimble
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Ms. Tracy Sletto
Ms. Victoria P.A. Brilz
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Dr. Michael Cohen
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Dr. William Chessleigh McCaffrey
Mr. Gary Smith
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Peter Kinash, Chair
Replicon Inc.

Bonni Clark
Alberta Innovates

Brian Gilbertson
Agrium Inc.

Rob Tasker
TRLabs

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Calgary Technologies Inc.

Ed Knash
ATB Financial

Peter Kinash
Replicon

Peter Hackett
University of Alberta, National Institute for Nanotechnology

Lynn Sutherland
VRStorm

Roger Pederson

ASTECH Awards Winners 1990-2009

Innovation in Alberta Science and Technology

1990 Ronald G. Micetich

Outstanding Leadership in Alberta Science

1991 Leroy Cogger
1992 Leonard T. Bruton
1993 Benno Nigg
1993 D.L.J. Tyrrell
1994 Jerry H. Wang
1995 Robert Hodges
1996 Robert V. Moody
1997 Timothy R. Mosmann
1998 Richard E. Peter
1999 David W. Schindler
2000 The Islet Transplantation Group
2001 John Wallace
2002 Samuel Weiss
2003 Brian D. Sykes
2004 Bryan Kolb
2005 Paul Kubes
2006 Philip Currie
2007 David Bundle
2008 Tristram Chivers
2009 Ian Whishaw

Outstanding Leadership in Alberta Technology

1991 John Tulip
1992 Lawrence C.H. Wang
1993 Brian Unger
1994 Donald B. Robinson
1995 Karl Chuang
1996 Norman J. Dovichi
1997 Maurice M. Moloney
1997 Anthony A. Noujaim
1998 Leo A. Behie
1999 Wayne Grover
2000 Larry Comeau
2001 Terry Allen
2002 D. Jed Harrison
2003 Michael Brett
2004 Gérard Lachapelle
2005 Norman Beaulieu
2006 Alberta Ingenuity Centre for Machine Learning (AICML)
2007 Garnette Sutherland
2008 Jacob H. Masliyah
2009 Linda Pilarski

Outstanding Achievement in Applied Technology and Innovation

2002 Saskatchewan Research Council, Pipe Flow Technology Centre
2003 Miodrag Belosevic
2004 Light Up the World Foundation
2005 IMUS Research Team
2007 Conematic Heating Systems Inc.
2008 DIRTT Environmental Solutions
2009 Airdar Inc.

Outstanding Commercial Achievement in Alberta Science and Technology

1990 B & W Technologies Ltd.
1991 Intera Technologies Inc.

Outstanding Commercial Achievement in Alberta Science and Technology

Corporations with sales > $25M

1992 Sherritt Gordon Ltd., Metals and Coinage Products Marketing
1993 CS Resources Limited
1994 IDACOM Telecom Division, of Hewlett-Packard Canada Ltd.
1995 NOWSCO Well Services
1996 Tesco Corporation
1997 PanCanadian Petroleum Ltd.
1998 Syncrude Canada Ltd.
1999 QC Data International Ltd.
2001 CSI Wireless Inc.
2002 SMART Technologies Inc.
2003 NOVA Chemicals Corporation
2004 NOVA Chemicals Corporation
2005 NovAtel Inc.
2007 Intuit Canada Ltd.
2008 Hemisphere GPS Inc.
2009 Computer Modelling Group Ltd.

Corporations with sales < $25M

1992 Biomira Inc.
1992 Westronics Inc.
1993 Valmet Automation (Canada) Ltd.
1994 Alta Genetics Inc.
1995 Merak Projects Ltd.
1996 Revolve Technologies Inc.
1997 SMART Technologies Inc.
1998 Wi-LAN Inc.
1999 EyeWire, Inc.
2000 Matrikon
2001 BioWare Corp.
2002 Micralyne Inc.
2003 Upside Software Inc.
2004 Ceapro Inc.
2005 CV Technologies Inc.
2006 Replicon Inc.
2007 Extreme Engineering
2009 Gushor Inc.

Outstanding Contribution to the Alberta Science and Technology Community

1990 Eric A. Geddes
1991 Clement W. Bowman
1992 Robert B. Church
1993 Harry E. Gunning
1994 D. Robert Weir
1995 John S. Colter
1996 Thomas P. Keenan
1996 Martha Piper
1997 William D. Croft
1998 James W. Murray
1999 Eric P. Newell
2000 David Mitchell, Q.C.
2001 William Cochrane
2002 Andrew W. Gilliland
2003 Matt Spence
2004 David T. Lynch
2005 William Bridger
2006 Cyril M. Kay
2007 Eldon Smith
2008 Howard E. Tennant
2009 M. Elizabeth Cannon

Leaders of Tomorrow

2000 Rita Aggarwala
2001 Jocelyn Grozic
2002 Michael S. Kallos
2002 Talib Rajwani
2003 Tim Poon
2004 Konrad Walus
2005 Ryan Schneider
2006 Sean Hum
2007 Jeeshan Chowdhury
2008 Travis Murdoch
2009 Shaheed Merani

ASTech Foundation Special Award

1992 Richard E. Taylor
1993 Raymond U. Lemieux
1994 Lionel E. McLeod
1995 TRLabs
1996 Alberta Research Council
1998 Honorable Peter Lougheed, Q.C.
1999 Fred A. Stewart
2001 Robert J. Crawford
2003 Alastair Ross, in memoriam
2005 Roger Butler, in memoriam
2005 Karl A. Clark, in memoriam
2006 Alvin Gerald Libin
2007 Margaret-Ann Armour
2008 Institute for Reconstructive Sciences in Medicine (iRSM)

Innovation in Industrial Research

2005 Xsensor Technology Corporation
2006 Quadrise Canada Fuel Systems

North

1991 Axion Spatial Imaging
1992 ZI Probes Inc.
1993 Russell Technologies Inc.
1994 Harding Instrument Co. Ltd.
1995 Epsilon Chemicals
1996 Madenta Communications Inc.
1997 AltaRex Corp.
1998 Cytovax Biotechnologies Inc.
1999 BioTools Incorporated
2000 SRW Technologies
2001 Russell N.D.E. Systems Inc.
2002 BigBangwidth Inc.
2003 Acrodex Inc.
2004 Virexx Medical Corp.

South

1991 Itres Research
1992 Smart Technologies Inc.
1993 Malibu Engineering Ltd.
1994 New Era Systems Service Ltd.
1995 Yellowbird Products Limited
1996 Travis Chemicals Inc.
1997 Intelligent Databases International Ltd.
1998 Canzyme Corporation
1999 Oncolytics Biotech Inc.
2000 Mentor Engineering
2001 Alterna Technologies Group Inc.
2002 SemBioSys Genetics Inc.
2003 Spartek Systems Inc.
2004 Canadian Bio-Systems Inc.

Innovation in Oil Sands Research

1992 Roger Butler
1993 Jacob Masliyah
1994 Clifton Shook
1995 Norbert Morgenstern
1996 Otto P. Strausz
1997 Murray R. Gray
1998 Don Scott
1999 Waldemar Maciejewski
2000 Jan Czarnecki
2001 Donald E. Sheeran
2002 Keng H. Chung
2003 Paraffinic Froth Treatment Technology Commercialization Team
2004 Hassan Hamza
2005 Rodney Ridley and Patrick Dougan
2006 The In Situ Combustion Research Team
2007 AACI Research Team, ARC
2008 Hong Zhang
2009 COANDA Research & Development Corporation

Innovation in Agricultural Sciences

1999 Gary R. Stringam
2000 Prem Kharbanda
2001 James H. Helm
2002 Allen Good
2003 John O'Donovan
2004 Cold Regions Geoenvironmental Research Facility
2005 Thava Vasanthan and Feral Temelli
2006 George Clayton
2007 Maurice Moloney
2008 Ronald Howard
2009 Michael E. Stiles and Lynn M. McMullen

Al-Pac/ASTech Innovation in Integrated Landscape Management

2001 Stan Boutin
2002 Brad Stelfox
2003 EMEND Project Partners

Excellence in Science and Technology Journalism:

General Public

1992 Mark Lowey
1993 Michelle Jones
1994 Arthur Heller
1996 Scott McKeen
1998 John Acorn
2002 Alberta Venture Magazine, Editorial Team
2004 Ed Struzik
2006 Gregory Harris

Specialized Publications

1993 Rae Haaland
1994 Lois Hammond
1995 Dennis Urquhart
1999 Connie Bryson
2001 Tony Kryzanowksi
2005 Nickle's New Technology Magazine, Editorial Team

Excellence in Science and Technology Public Awareness

1994 Science Alberta Foundation
1995 Praxis Society
1996 Calgary Science Network
1996 WISEST
1997 Discover 'E' Science Camps
1998 Alberta Women's Science Network
1999 Dinosaur Country Science Camp
2000 Edmonton Space & Science Centre
2001 Operation Minerva
2002 'Pi in the Sky'
2003 University of Alberta's Faculty of Graduate Studies and Research (FGSR) Outreach Program
2004 Biotechnology Training Centre Outreach
2005 Shad Valley
2006 Kananaskis Field Stations and G-8 Legacy Chair in Wildlife Ecology
2007 The Alta Project, James Pinfold, U of A
2008 The Rothney Astrophysical Observatory
2009 Discover E Engineering & Science Camps

ASTech Societal Impact

2008 Madentec Limited
2009 The Mustard Seed Society

Outstanding Achievement in Environmental Technology and Innovation

2008 Patrick Hettiaratchi
2009 Embedia Technologies

Innovation in Information and Communications Technology

2008 H. James Hoover and Antony G. Olekshy, University of Alberta and Avra Software Lab
2009 SMART Technologies ULC

I have not failed. I've just found
10,000 ways that won't work

THOMAS EDISON

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