The League of EXTRAORDINARY RESEARCHERS

RESEARCH STRATEGY FRAMEWORK

ILLUSTRATING MEMORIAL | VOLUME I
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VISION
Memorial University is a leading knowledge community where research excellence is valued and promoted for its contributions to the advancement of knowledge, to the professional and personal development of students and researchers, and to the well-being of Newfoundland and Labrador, Canada and the world.

MISSION
We will build upon Memorial University’s vibrant culture of creativity, innovation, and research excellence to create, transform, interpret, share, and apply knowledge with integrity, excitement, vigour and purpose.

GUIDING PRINCIPLES
• Valuing and supporting the freedom of researchers to pursue research excellence that is based on their individual and collective intelligence, curiosity, ingenuity and creativity.

• Valuing and supporting all aspects of research including scholarship and creative activities, as well as the translation of knowledge into products, practices and policies, and other forms of community engagement.

• Valuing and supporting Memorial’s special obligation to the people of Newfoundland and Labrador by supporting and building capacity for research excellence that:
  o Addresses needs and opportunities for our province,
  o Engages our researchers on matters of international significance,
  o Contributes to Memorial’s teaching and learning environment through academic programs of international calibre.

• Valuing and supporting overarching research themes that cut across academic units and address significant opportunities and challenges for which Memorial is particularly well-positioned to build nationally and internationally recognized research capacity.
message
I AM PLEASED TO PRESENT the first volume of our Illustrating Memorial trilogy. Each will detail one of three new University frameworks: Research, Teaching and Learning, and Engagement.

The first, aptly titled The League of Extraordinary Researchers, highlights the specific goals and strategic themes which form the background of our research strategy. Memorial University is already home to internationally-renowned experts and respected authorities, some of whose work is featured in the pages that follow. Our researchers and scholars are also widely recognized for their active engagement with communities, both here and around the world. Indeed, it is these innovative research programs, careful stewardship and strong community that make Memorial University unique.

Externally sponsored research has grown substantially in the last decade. These investments have enabled the growth of research excellence at this University, especially in areas of strategic importance. Our new research framework, developed using an inclusive and highly consultative process, defines the principles and goals with which we will build even greater capacity, impact and reputation in research. It identifies areas where we have clear cross-disciplinary strengths on which to build, as well as emerging themes with significant potential for growth and importance. All can and will strengthen Memorial’s historic and continued contributions to the economic, social, cultural and scientific well-being of this province and the country.

The new research strategy framework, along with others to appear in the Illustrating Memorial trilogy, are guiding our overall planning process, and informing the institution’s decision-making and strategic direction. This will culminate in a new comprehensive, strategic plan for the future.

DR. GARY KACHANOSKI
President and Vice-Chancellor
Memorial University of Newfoundland

mun.ca/president
THE RESEARCH STRATEGY FRAMEWORK represents a major advance in Memorial University’s growth and evolution.

It puts into words our vision of the future of research, and our aspirations for a university-wide culture of research excellence. It also articulates ways in which Memorial can build on its rich record of engagement with community partners and research collaborators, both here and around the world.

Our vision was developed and refined through active consultations across the University and throughout the province. Ten research themes emerged from these sessions reflecting our current strengths and emerging strategic opportunities. These themes are neither exclusive nor prescriptive in scope. On the contrary, they are titles that capture clusters of activities, many with natural connections across the diverse disciplines, academic units, and forms of scholarship at this University. And their inclusiveness and versatility are evident throughout the stories featured in this, the first volume of Illustrating Memorial.

The development of the Research Strategy Framework was ably led by Dr. Ray Gosine. It was also aided by an external advisory committee whose thoughtful advice ensured that Research Strategy Framework remained connected to the many communities of interest with whom we partner and work. Their work has led to a framework that reflects our highest aspirations and is rooted in our unique culture.

It is now our collective responsibility to deliver on those aspirations.

DR. CHRIS LOOMIS
Vice-President of Research
Memorial University of Newfoundland
mun.ca/research
message
SINCE THE DAWN OF TIME, LONG BEFORE THE ADVENT OF THE WHEEL OR DISCOVERY OF FLAME, THERE HAVE BEEN HEROES.

MEN AND WOMEN EAGER TO ADVANCE THE UNDERSTANDING OF OUR WORLD, READY TO CHALLENGE CONVENTIONAL WISDOM, AND WANTING TO BETTER THE LIVES OF THEIR COMMUNITIES, NEAR AND FAR. PEOPLE WITH A PASSION AND FIRE UNRIVALLED BY THE MAJORITY OF HUMANITY.
THEY ARE A SPECIAL BREED. A CLAN LIKE NO OTHER. THEY ARE...
The League of Extraordinary Researchers!
chapter 1

goal: attract, retain, support and celebrate people engaged in and supporting research.
Annie Mercier, a researcher with the Faculty of Science, is engaged in a mission to extend the frontiers of science in deep-sea biology, an area that has seen little exploration. She has taken it upon herself to lift that veil of secrecy. The technology now exists that can make this adventurous exploration possible—exciting news, considering there are likely millions of species that have yet to be discovered. Much to the delight of our crafty heroine, Memorial was awarded more than $16 million in federal-provincial funding to expand and enhance the Ocean Sciences Centre, including a new research facility with equipment, laboratories and a cold-water holding tank for the specialized study of invasive species, deepwater organisms and unknown marine diseases. This immense expansion will go a long way in attracting and retaining others who, like our heroine, share this passion.

We celebrate Annie’s bravery, as she boldly goes where no researcher has gone before.
SCHOOLS OF COLOURFUL CREATURES THAT FLITTER THROUGH THE IMMENSE WEIGHT OF THE SALTED WATER.

FILLEd TO THE BRIM WITH MYSTERY. ORGANISMS SO SMALL THAT NO SINGLE LENS IS POWERFUL ENOUGH TO REVEAL THEIR SHAPE.

WE KNOW CREATURES EXIST, BUT WE DON’T TRULY KNOW WHAT THEY ARE.

THE OCEAN IS SHROUDED IN A VEIL OF SECRETS.
deep roots
Have you heard the tale of the tamarack?

The tamarack tree stands as a beacon of shelter and a friend to all on the land. However, that hasn’t always been the case.

The tree, captivated by its own vanity, turned the birds away, forcing them to continue their long flight in the frigid air. Suporguksuak, the spirit who watches over the land, witnessed the transgression and punished the tree by removing its needles. Embarrassed by the display of its ignorance, the tree suffered through the cold days and nights that followed. Learning from its past, the tamarack made a pledge to always be a brother to the southern Inuit.

Legend has it that one day during a great squall, a flock of whippoorwills flying towards the south were refused shelter by the tamarack.
Like the Tamarack, our awareness of the past is what helps us grow. Time is not always an enemy.

The dynamic Lisa Rankin leads a team, along with Hans Rollman, John Kennedy and Mario Blaser, who are travelling back in time. Work has begun on a five-year project entitled “Understanding the Past to Build the Future.” With a focus on the Inuit occupation of Southern Labrador, our intrepid team is collecting and analyzing evidence of Inuit-European interactions, documenting cultural changes, and bringing the history of the Southern Inuit into the present day. This collaborative venture links two universities with a multitude of community partners and a veritable cornucopia of graduate students. One of the many outcomes of this study will be the incorporation of new information into the school curricula in Southern Labrador, and to materials used to improve adult literacy. The relationships and knowledge-sharing between the universities and the community partners will increasingly enrich Southern Inuit culture—future students will continue to celebrate their rich cultural history. This project has brought Memorial students to the farthest reaches of Southern Labrador. To explore. To learn. And by doing so, it is ensuring the next generation of extraordinary researchers.

Like the Tamarack towering above all the other treetops, history not only helps the people of Southern Labrador understand the past, it is preparing them for the days yet to come.
AND THAT, CHILDREN, IS THE LEGEND OF THE TAMARACK...
ADVENTUROUS ENGINEERING STUDENT
GRACIE WATTS STANDS AT THE EDGE OF THE
NORTH ATLANTIC, HER RAGLAN BLOWING IN
THE CRISP NORTHERN GALE.

AT NIGHT SHE HAS DREAMS OF THE WATER. THE
SAME WATER HER FATHER SAILED WHEN SHE WAS A
CHILD. THE SAME WATER THAT SAW THE WIDESPREAD
UPHEAVAL OF BOATS OVER TWENTY YEARS AGO.

NOW, SHE STANDS ON ITS PRECIPICE
AND YEARNS TO MAKE A DIFFERENCE.
A lot has changed in the past twenty years. It’s time to prepare for the twenty to come.

Memorial understands this, and is making great strides in attracting people like Gracie, who long to make an impact. That is why they have joined forces with multiple organizations to create a program dedicated to technological research. The NSERC CREATE Training Program for Offshore Technology Research is allowing students like Gracie to make themselves into highly qualified personnel who can thrive in the continually expanding offshore industry. The program is nurturing the transition from new trainee to employee, while also offering graduates an opportunity to take specialized courses and focus their research in four thematic areas: floating structures, mooring lines and risers, corrosion material engineering and subsea systems. Importantly, students are able to apply their academic prowess and advance their intellectual skills in a four-month internship with an industrial or research partner.

This program is giving people like Gracie the opportunity to explore far beyond the surface of the sea.
chapter 2

goal: support an environment of research excellence.
IT'S A FUNNY THING ABOUT CONTROL. MANY WOULD WALK TO THE VERY EDGE OF THE EARTH JUST TO TOUCH IT.

CONTROL IS A MYSTICAL CONCEIT—A SEEMINGLY INAUDIBLE WHISPER THAT HANGS UPON THE BREATH OF THE WIND.
Andrew Staniland and his partner in musical crime Scott Stevenson understand and respect the dichotomy of control.

Andrew comes from a world of music, Scott is an engineering student from a land filled with binary code and sophisticated sensors. They have collaborated together to create the perfect blend of art and science. Andrew and Scott hatched a plan to develop a haptic device that can be used to control digital media in a contemporary classical music performance. Haptic technology refers to instruments that use touch as the main source of control. Not only have our duo created such a device, it’s compact enough for touring. Memorial is proud to support this interdisciplinary research duet and their dashingly dexterous prototype.

Andrew and Scott’s master plan provides an exciting window into the strangely tactile future of musical control.

LEGACIES HAVE BEEN SQUANDERED IN ITS CAPTURE AND COUNTRIES HAVE FALLEN IN THE WAKE OF ITS ELUSIVENESS. ONLY THOSE WHO ARE PURE OF HEART AND TRUE IN SPIRIT CAN WIELD ITS POWER RESPONSIBLY.
They say the North is not a land for the meek. It is a place where, for half of every year, time is frozen like ice and wrapped in deepest of dark nights.

Yet it is also where light dances rhythmically across the night sky, where the sun flames the brightest and the air swirls the sweetest.

The Great White North isn’t what it used to be.
minding mines

IT HAS BECOME A LAND OF INFINITE POSSIBILITY AND ENDLESS OPPORTUNITY.
...SOMEWHERE NORTH OF THE 52ND PARALLEL
John Sandlos and Arn Keeling are working hard to introduce people to Canada’s new North.

This interdisciplinary adventure from the departments of history and geography focuses on John and Arn’s work entitled “Abandoned Mines in Northern Canada: Historical Consequences and Mitigation of Current Impacts.” The study is exploring the development of eight northern mines through the lens of environmental justice and political ecology, and how factors such as isolation and environmental hardships have impacted the decline of these mining communities. Their research will inform how northern communities and governments facing large-scale mineral development can make decisions that will ensure extractive development does not affect their economic and environmental foundations. Since its inception, this stupendously satisfying study has grown to include many other researchers as well as residents in the communities of interest. Memorial proudly supports the project’s goal of assisting industry and government in better managing large-scale growth and minimizing the inevitable impact of recession.

This work will help keep the lights of the North dancing above mining communities for years to come.
SATELLITES SPIN IN PERPETUAL SILENCE AROUND OUR PLANET. THEY FLOAT HIGH ABOVE THE EARTH LIKE METAL SKINNED BALLOONS, SENDING AND RECEIVING SIGNALS IN A SYNCHRONIZED DANCE BELOW A CANOPY OF STARS.

ALL THE WHILE, THE NORTH LIES BENEATH THE ATMOSPHERE GLIMMERING BRIGHT LIKE SOME INVERTED MOON. THE PEOPLE WHO LIVE THERE ARE OF A UNIQUE STOCK. THEY ARE SEEKERS. INNOVATORS.
C-CORE has shown lightning-fast reflexes in responding to the challenge of acquiring timely, cost-effective information on the changing northern environment.

LOOKNorth (Leading Operational Observations and Knowledge for the North), a national Centre of Excellence for Commercialization and Research under the federal Networks of Centres of Excellence Program, seeks technologies that can answer the tough business and environmental questions about the North. Whether monitoring northern caribou, determining the strength of ice roads or identifying viable marine transportation routes, LOOKNorth is collaborating with a boisterously broad network of research partners and institutions, along with northern businesses and industries, to identify, test and commercialize remote sensing technologies. Ultimately, the safe, environmentally responsible, cost-effective and sustainable development of Canada’s northern natural resources is in everyone’s best interests. And LOOKNorth takes the approach that technology is only relevant and viable if it meets the needs of its users.

Memorial is happy to undertake research that addresses the information needs of these hearty seekers of the North.
goal: engage with community partners and collaborators locally, nationally and internationally to create, share and apply research.
I’ve been around. And one thing I’ve learned is that the underworld of human genetics can be a troublesome place.

It’s a place filled with hidden signals and sequences. Undiscovered obstacles seem to be waiting around every corner.
THIS IS NO PLACE FOR THE WEARY. DOWN HERE
THERE IS A CODE. A GENETIC CODE THAT, ONCE
CRACKED, WILL REVEAL A WORLD OF LIGHT
AND UNDERSTANDING FEW HAVE EVER SEEN.

FORTUNATELY FOR THOUSANDS OF
PEOPLE, TERRY-LYNN YOUNG HAS
MANAGED TO CRACK THAT CODE.
Terry-Lynn joined forces with Sean Connors and Kathy Hodgkinson to create an interdisciplinary Memorial research team striving to identify the genetic causes of Sudden Cardiac Death such as arrhythmogenic right ventricular cardiomyopathy (ARVC). ARVC is a cruel condition that has taken the lives of many young men and women in this province.

The Sudden Cardiac Death gene discovered in Terry-Lynn’s lab was initially believed to be unique to the Newfoundland population. However, collaborations with international heart research institutes are uncovering new evidence of this gene and related lethal mutations in other populations—a much larger “super family” with a genetic connection to sudden cardiac death. The team is now working with research groups internationally to explore sudden cardiac death elsewhere in the world.

Thanks to the dauntless deeds of Terry-Lynn and her courageous team, carriers of this gene, both at home and abroad, can now be easily identified and implanted with an internal defibrillator that is ready to jump-start the heart faster than a speeding neurotransmitter.
THE WORLD IS SO CROWDED WITH PEOPLE.

EVERY DAY WE GO ABOUT OUR BUSINESS.

EACH OF US WITH A STORY THAT WE CARRY WITH US.

WE SLING THE STORY OF OUR LIVES UPON OUR BACKS LIKE SOME WORN LEATHER BAG AND GO ABOUT THE BUSINESS OF LIVING.

SOME BAGS ARE FILLED WITH THE MUNDANE—WHILST OTHERS, IF YOU LOOK CLOSE ENOUGH, ARE FILLED WITH THE MOST EXQUISITE OF SURPRISES.
Jeffrey Pittman is a man with a bag brimming with ingenuity.

At first blush, he’s a regular man walking the city streets with his fellow city-dwellers, clad in a simple black overcoat with a worn leather rucksack strapped tightly to his back. Although, dig a little deeper and you’ll find a man who has the world buzzing with his evidence on the role that corporate tax incentives play in motivating firms to invest in research and development tax credits. Even the President of the United States, Barack Obama, referenced Jeffrey’s research on tax credits and private sector investment in innovation to help support the policy rationale for a business tax reform proposal. Jeffrey and his colleagues, Ken Klassen and Margaret Reed, make the case for a permanent adoption of the Research and Experimentation Tax Credit—a temporary credit system in place since 1981. Jeffrey estimates that if this bionic booster for stimulating economic growth is permanently adopted, then firms will spend nearly $3 more on research and development projects for every tax dollar foregone. This is yet another example of Memorial’s impact in research having international significance. In this case, the effects have reached all the way to 1600 Pennsylvania Avenue. Jeffrey’s electrifying contribution could spark valuable and much needed investments in an otherwise ailing economy.

When it comes to great research, Jeffrey Pittman has got it in the bag.
THE GLASS. IT’S PECULIAR.

ONE MINUTE IT CAN BE HALF FULL AND THE NEXT IT CAN BE HALFWAY TO BONE DRY.
Lesley James is chief among them.

On a great and gelid Thursday in December of 2011, Chevron Canada and RDC partnered together to appoint the Chevron Chair in Petroleum Engineering at Memorial. Lesley James was given the nod to assume this prodigiously pertinent position. A wonder woman with a blend of academic and industry experience, Lesley holds a PhD in chemical engineering. Her research, which is largely focused on enhanced oil recovery, aims to increase the proportion of oil recovered from petroleum reservoirs. As the Chevron Chair in Petroleum Engineering, with strong financial support from the Hibernia Management and Development Company Ltd. and with technical support from ExxonMobil, she boldly goes where few have gone before, researching ways to maximize the recovery of oil from offshore Newfoundland and Labrador. Memorial is committed to stimulating research and connecting with businesses and communities at home and abroad. To this end, the university has established other chairs with support from Statoil, Husky Energy and Wood Group. They allow people like Lesley to bring locally relevant real-world data together with industry challenges in the classroom and teaching laboratory, so that many may benefit from the scope of her research.

To Lesley, each and every glass should be far more than half full.
chapter 4

goal: support fundamental and applied research excellence in areas of strategic opportunity.
WAY BACK THEN, WESTWARD TO WAGONS, THERE WAS A TIME WHEN FOLKS WEREN’T TOO WORRIED ABOUT THE ENVIRONMENT.

THERE WERE NO SKYSCRAPERS OR CARS OR THEM FLYING MACHINES IN THE SKIES. THERE WAS JUST NATURE.
Folks at Grenfell Campus are finding ways to make a difference.

High atop the jagged Corner Brook hillside at Memorial’s Grenfell Campus, something momentous has happened. There has been a coming together of professors, researchers and community folks alike. I’m talking about the Environmental Policy Institute (EPI). This beneficent band of experts dedicated to research and analysis are moseying about their business of researching and analyzing. Led by Wade Bowers, these folks are dedicated to focusing on important issues like climate change, energy, food security and forest policy. Why, they’re even collaborating to develop the very first Environmental Atlas of Newfoundland and Labrador.

Folks in the EPI aren’t interested in having their glory in the sun, they’re interested in making sure they see us all to another sunset somewhere down the dusty trail. And for all that work, I give them a tip of my hat, and if I could, I’d buy them all an ice-cold sarsaparilla, or maybe just fetch them some fresh water from a mountain spring.
THE SEA ISN'T ALWAYS PREDICTABLE.

IT TAKES A NIMBLE MIND TO CHART A COURSE OVER THE BRINE. KNOWING THE INFORMATION IS ONLY A SMALL PART OF LIFE ON THE WATER.
The Marine Institute’s Centre for Fisheries Ecosystems Research (CFEr) aims to give young scientists a taste of the sea.

The goal of CFEr is to achieve a better understanding of the sustainability of fish stocks and the productivity of the province’s marine ecosystem through fisheries research. With a five-finned faculty focus on fisheries and the sustainability of stocks, research and training opportunities to graduate students, both locally and internationally, collaboration with the Department of Fisheries and Aquaculture, Fisheries and Oceans Canada, and other researchers and institutions in Canada and abroad, CFEr is poised to make a definitive difference in the deep. It is only fitting that a magnificent marine mandate such as this be carried out in one of the world’s most technologically advanced vessels. Chartered by CFEr, the RV Celtic Explorer will not only enable and echo the work of established researchers, but will attract and inspire young scientists within the world of fisheries science.

Young scientists rarely have the opportunity to experience research and life at sea. CFEr provides these research minnows with a whale of an opportunity aboard the RV Celtic Explorer.
all swimmers great and small
A RESEARCHER STANDS HUNCHEd AND wAITING.
PLAYING PEEk-a-BOO wITH THE SEA.

PEERING BENEATH THE RIPPLES AT THE
SHAPES THAT WHIZ PAST IN A FRENetic
DANCE OF FRANTIC FRENZY.

COLOURS THAT SHINE BRIGHTER THAN FLAME ARE COUNTERBALANCED
BY WHAT APPEAR TO BE SOME OF THE MOST HASTILY PUT TOGETHER
CREATURES IMAGINABLE. A SWEET SMORGASBORD OF VARIABILITY
WHEELING AND TWISTING IN THE FREEDOM OF THE SEA.

ONE VOICE STANDS READY TO SPEAK.
On October 4, 2010, marine explorers from more than 80 countries delivered an historic first — the global Census of Marine Life.

One of our own stepped forward to courageously lead the assembly and reporting of the census results. That man was Paul Snelgrove. In one of the largest scientific collaborations ever conducted, more than 2,700 exceptional scientists spent over 9,000 days at sea on more than 540 expeditions, plus countless days in labs and archives. This past year, the team celebrated their triumphs by releasing maps, three landmark books and a highlights summary that crown a decade of discovery. In July, Paul strapped on his cape and flew to Edinburgh, Scotland to deliver the team’s findings at the world-renowned TEDGlobal 2011.

Paul and his charismatic crew of the deep are thrilled by the results. Now everyone can appreciate the beautiful oddities that dwell beneath the waves.
THERE IS A CONFESSION TO BE MADE NOW THAT WE’VE NEARED THE END OF OUR JOURNEY.

I’M NOT MUCH FOR VIDEO GAMES. WHEN I WAS A CHILD… WE HAD SAND. THAT IS ALL WE HAD. WE’D JUST SIT IN BOXES FULL OF SAND AND BUILD CASTLES WITH BUCKETS.

NOW YOU CAN MAKE WHATEVER YOU WANT INSIDE OF A VIRTUAL ENVIRONMENT THAT YOU CAN CONTROL WITH YOUR OWN BODY. THE IDEA HAS TRANSCENDED SIMPLE GAMEPLAY AND MOVED INTO THE PRAXIS OF REAL LIFE. AND NOT A SINGLE BUCKET HAS BEEN NECESSARY.
Virtual safety is saving lives.

This innovative inter-faculty collaboration is developing virtual environments for the offshore petroleum and shipping industries. The Faculty of Engineering and Applied Science and the School of Human Kinetics and Recreation may seem, at first blush, to make odd bedfellows. However, experts from these two units have joined forces in a project that is refining the technologies and virtual environments that train workers to improve both safety and survivability on the treacherous waters of the world’s oceans. To this end, Scott MacKinnon and Brian Veitch are leading an experienced multi-disciplinary research and development team based at Memorial. The research team is partnering with Virtual Marine Technology Inc. to move prototypes of emergency response training simulators to commercially ready production systems. Our geographic and historic connections to the harsh ocean environment around us make this super-simulated initiative a natural direction for Memorial University.

We’re proud to be a real part of this virtual journey.
SO THERE YOU HAVE IT. THAT’S THE LEAGUE. THIS IS WHO WE ARE. A GROUP OF SEEKERS. A SOCIETY OF WOMEN AND MEN SEARCHING FOR ANSWERS. ALL WITH ONE COMMON THEME—GREAT RESEARCH WITH REAL IMPACT.
WE GO ABOUT OUR DAYS WORKING FOR THE GREATER GOOD. SOMETIMES ALONE. SOMETIMES IN COLLABORATION WITH THE COMMUNITY. OTHER TIMES WITH INTERNATIONAL PARTNERS. WE ARE DEDICATED TO OUR INDIVIDUAL CAUSES AND THE UNIVERSITY WE SO PROUDLY REPRESENT.

WE ARE STRONG. WE ARE COMMITTED.

WE ARE THE LEAGUE OF EXTRAORDINARY RESEARCHERS.
Sketchpad
RESEARCH STRATEGY FRAMEWORK

MEMORIAL UNIVERSITY IS A LEADING KNOWLEDGE COMMUNITY WHERE RESEARCH EXCELLENCE IS VALUED AND PROMOTED FOR ITS CONTRIBUTIONS TO THE ADVANCEMENT OF KNOWLEDGE, TO THE PROFESSIONAL AND PERSONAL DEVELOPMENT OF STUDENTS AND RESEARCHERS, AND TO THE WELL-BEING OF NEWFOUNDLAND AND LABRADOR, CANADA AND THE WORLD.

MISSION
We will build upon Memorial University’s vibrant culture of creativity, innovation, and research excellence to create, transform, interpret, share, and apply knowledge with integrity, excitement, vigour and purpose.

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• Valuing and supporting the freedom of researchers to pursue research excellence that is based on their individual and collective intelligence, curiosity, ingenuity and creativity.

• Valuing and supporting all aspects of research including scholarship and creative activities, as well as the translation of knowledge into products, practices and policies, and other forms of community engagement.

• Valuing and supporting Memorial’s special obligation to the people of Newfoundland and Labrador by supporting and building capacity for research excellence that:
  o Addresses needs and opportunities for our province,
  o Engages our researchers on matters of international significance,
  o Contributes to Memorial’s teaching and learning environment through academic programs of international calibre.

• Valuing and supporting overarching research themes that cut across academic units and address significant opportunities and challenges for which Memorial is particularly well-positioned to build nationally and internationally recognized research capacity.

GOALS AND OBJECTIVES
Goal 1: Attract, retain, support and celebrate people engaged in and supporting research

OBJECTIVES ASSOCIATED WITH GOAL 1:
1.1 Place high value on research success and excellence.
1.2 Promote Memorial’s research opportunities.
1.3 Consider the prospect for research success and excellence in Memorial’s research environment when recruiting.
1.4 Support faculty, students and research fellows and trainees to achieve excellence in research.
1.5 Support non-faculty researchers and research support staff.
1.6 Encourage mentoring for researchers.
1.7 Celebrate the achievements of researchers and research teams.

**Goal 2: Support an environment of research excellence**

**OBJECTIVES ASSOCIATED WITH GOAL 2:**
2.1 Increase coordination, communication and responsiveness of administrative supports for research.
2.2 Foster interdisciplinary collaborations and research.
2.3 Maximize the impact of research chairs.
2.4 Enhance supports for researchers to obtain and manage funding.
2.5 Develop and maintain top-quality research infrastructure, space, equipment, and support technologies.
2.6 Implement integrated systems for tracking and reporting research activities and outputs.
2.7 Increase supports for sharing research findings and outputs, including across campuses.

**Goal 3: Engage with community partners and collaborators locally, nationally and internationally to create, share and apply research**

**OBJECTIVES ASSOCIATED WITH GOAL 3:**
3.1 Place high value on research collaborations and sharing of research findings with external partners and collaborators.
3.2 Facilitate external engagement activities.
3.3 Encourage local, national and international research collaborations.

**Goal 4: Support fundamental and applied research excellence in areas of strategic opportunity**

**OBJECTIVES ASSOCIATED WITH GOAL 4:**
4.1 Track and assess the outcomes and impacts related to the Strategic Research Themes.
4.2 Support research excellence within the Strategic Research Themes through hiring and funding practices.
4.3 Increase opportunities for Memorial researchers to communicate and collaborate with one another and with external partners and collaborators on research related to the Strategic Research Themes.
4.4 Secure funding in support of initiatives that advance the Strategic Research Themes.
4.5 Establish mechanisms to facilitate communication and collaboration across the Strategic Research Themes.
STRATEGIC RESEARCH THEMES

The Strategic Research Themes identify both new areas of significant research opportunity for which Memorial is strategically positioned to achieve research excellence and existing areas of research strength which hold considerable potential for expansion of expertise, resources and contributions from our researchers in areas that offer potential to grow.

The Themes identify Memorial’s research priorities to other funders and partners, in areas where we have strengths to build on, where we see opportunity for growth. They also include research areas where there is a need for fundamental and applied research in our province. The titles of the Themes reflect issues and opportunities for research growth across multiple units at Memorial. The descriptions of each Theme capture our current strengths, how these cut across the university, and where we see potential for growth. While the Planning Process identified 10 Strategic Research Themes, it is recognized that there will be opportunities for researchers to address issues and opportunities outside of these thematic areas.

THE STRATEGIC RESEARCH THEMES, IN ALPHABETICAL ORDER, INCLUDE:

(1) Aboriginal Peoples
(2) Arctic and Northern Regions
(3) Community, Regional and Enterprise Development
(4) Creative Arts, Culture and Heritage
(5) Environment, Energy and Natural Resources
(6) Governance and Public Policy
(7) Information and Communication Technology
(8) Oceans, Fisheries and Aquaculture
(9) Social Justice
(10) Well-being, Health and Biomedical Discovery

STRENGTHS AND OPPORTUNITIES ACROSS STRATEGIC RESEARCH THEMES

Memorial University has research strengths in all of the Strategic Research Themes that span the research spectrum—from fundamental to applied research, including creative activity and scholarship. The Strategic Research Themes also span geographies and in each Theme, Memorial has research strengths in addressing provincial, national and international contexts. In further developing the Strategic Research Themes, Memorial will continue to support the broad array of research activities and localities.

Much of the research associated with the Strategic Research Themes is not limited to any one Theme; the inter-connectedness among the Strategic Research Themes is as important as the classification of work under each. Implementation of the Research Strategy will foster cross-Theme collaborations as a key part of building strength in these areas.
PARTNERSHIPS ACROSS STRATEGIC RESEARCH THEMES

External engagement (i.e. sharing research findings and partnering on research activity with communities, governments, organizations, and the private sector) and inter-disciplinary collaboration are vitally important to realizing the significant opportunities presented through the Themes.

Memorial researchers working in the themes are internationally recognized for their achievements in engagement and sharing with Newfoundland and Labrador communities, nationally and internationally. However, participants of Research Plan consultations on the Themes repeatedly stressed that there is need for more dedication to building and maintaining connectivity with communities and other partners outside the university. The importance of developing Memorial’s institutional recognition of external engagement activities and achievements (including the investments required to build relationships and share findings in innovative and effective ways) was emphasized.

Consultations on the Themes also revealed that increased collaboration across disciplines offers significant potential for researchers to benefit from one another’s work. Implementation of the Research Strategy will include support for communication and coordination of research activities and the sharing of research across the Research Themes and academic disciplines at Memorial. Additionally, greater interaction across Memorial’s campuses will be encouraged and supported.

DESCRIPTIONS OF STRATEGIC RESEARCH THEMES

(1) Aboriginal Peoples:
Research under this theme relates to the pre-history and history of Aboriginal peoples, as well as to contemporary issues and opportunities in Newfoundland and Labrador, nationally and internationally.

Key research areas include education, languages, society, culture, human rights, gender, literature, religion, ethics, politics, and social and economic development; contemporary issues around resource development, land claims, climate change, health, physical activity, and community development; indigenous expressive culture; youth engagement relating to social policy, social participation and youth programs; Northern Labrador climate change, resource development, transportation, new national parks, and collaboration with the Nunatsiavut Government; and traditional knowledge of Aboriginal peoples and its relation to contemporary issues.

(2) Arctic and Northern Regions:
Research under this theme relates to people and communities, environment and resources, approaches and technologies for sustainable resource development, and land, ocean and coastal zones in arctic and northern regions.

Key research areas include northern peoples and their languages, society, culture and communities; regional, national and international governance mechanisms such as environmental regulations
and the Law of the Sea; distance education, telecommunications and learning technologies and their implications for northern peoples; technologies for and management of natural resource development, transportation, safety and survival, and health care and emergency response in harsh, remote locations; the geography and ecology of northern marine, terrestrial and ice environments; climate change and its impacts, significant resource developments, and assertion of Canadian sovereignty in the north; land claims, environmental assessment, transportation, and northern and remote infrastructure; economic and regulatory models and best practices to maximize benefits from resource developments.

(3) Community, Regional and Enterprise Development:
Research under this theme relates to building capacity of people, organizations, communities, industries, and enterprises to foster social and economic prosperity and development in rural and urban communities, neighbourhoods and regions.

Key research areas include influences affecting economic development and social well-being; the role of education, community health, and social policy and their impact on empowerment of individuals and groups in communities; land use, drinking water, waste management, transportation planning, affordable housing, and labour market development; economic diversification, new business development and improved business practices; impact of climate change, aging populations, migration and immigration on communities and regions; and rural-urban and local-global interaction, regional cooperation and governance, and innovation in policy and service delivery.

(4) Creative Arts, Culture and Heritage:
Research related to creative production and expression; curation and interpretation; and archaeological, historical, ethnographic and archival research in Newfoundland and Labrador, Canada and internationally.

Key research areas include the arts; all forms of creative production and expression (drama, music and sound, visual, performance, literature); education to preserve and strengthen culture and build identity; performance pedagogy; tangible cultural heritage; intangible cultural heritage, including language and music; cultural industries; history (Newfoundland, maritime, Canadian, and European); expressive determinants of society and individual identity; contemporary and historical creative activity; the use of new media and technologies in the ongoing production of art, culture and heritage; interdisciplinary research in music, health and well-being, in music and engineering; the use of creative expression to critique understandings of culture and society.

(5) Environment, Energy and Natural Resources:
Research related to the environment, development of natural resources (oil and gas, mining, forestry), and the interaction of people, industry, and communities with the natural world, locally, nationally and globally.
Key research areas include human interactions with climate change and environmental impacts; energy efficiency; resource economics; cultural perceptions of the environment; environmental science; wildlife, marine, land, habitat resource and waste management; plant and forestry science; environmental engineering and sustainability; cellular and molecular biology and marine sciences; energy industry economics and policy; health, safety and survival in the oil and gas industry; harsh environment engineering, ocean observation systems; petroleum reservoir characterization and exploration geophysics; sustainable and alternative energy solutions; reclamation of non-renewable resource developments; social and economic benefits of the nonextractive values of natural resources; watersheds and water quality business opportunities, public policy, legal issues and regulatory regimes.

(6) Governance and Public Policy:
Research related to organizational and corporate governance, public policy and the relationships amongst governments and non-government organizations. Corporate governance consists of the collection of rules, processes, and practices that determine the relationship between managers of an organization and those who have a stake in the organization’s performance, including shareholders, creditors, employees, customers, and society at large. Governance, more broadly, includes how government bodies develop and implement public policy, and how governments relate to non-governmental organizations in the shared allocation of decision-making and resources for achieving public policy purposes.

Key research areas include auditing, taxation, finance, leadership and corporate social responsibility; public and collective decision making in economic policy (including policy and governance arrangements relating to specific economic sectors, as well as to cross-cutting areas such as fiscal and monetary policy and trade policy), social policy (including health, education, and social services), cultural policy, environmental policy, defence policy and other policy fields; legal studies across all policy fields; local, regional and federal systems, as well as multilateral and international governance relationships and organizations; immigration and population change; land-use and urban planning; and food security.

(7) Information and Communication Technology:
Research related to the theoretical foundations of information and communication technology (ICT), the design and deployment of ICT in a variety of settings, and the evaluation of the use of ICT and its impact on individuals, organizations, and society. It involves research into the study and design of systems that capture, store, transmit, process, and use information in a manner that is efficient, accurate, reliable, secure, profitable, and responsible.

Key research areas include foundational and design areas, including algorithms and complexity, data management, software engineering, computational modeling, computer networks, and intelligent computing; ICT impact, including telemedicine, distance education and e-learning technology, electronic commerce, and privacy; geographic information systems, autonomous ocean systems; managing (storing, retrieving, filtering, and processing) the vast amounts of
Data collected by businesses and other organizations using web-based and sensor-based data collection (data collection includes scientific, health, pharmaceutical, commercial, geographic, and social network data, remote sensing, communication networks, information technologies, and computational modeling; it spans traditional structured databases and unstructured text); electronic health service delivery in remote areas of the province (including tele-oncology, tele-psychiatry, tele-video resuscitation) and innovative interactive teaching programs for remote areas (i.e., electronic continuing medical education – MD.cme); and cultural and social impacts of ICT.

(8) Oceans, Fisheries and Aquaculture:
Research related to the maritime environment, the interaction of coastal people and communities with the ocean and maritime environment, and the scientific, technological and organizational requirements of industrial development in this environment, particularly relating to conditions in the North Atlantic. Fishery and aquaculture, more specifically, include fresh water and marine fish biology and environments and scientific, technological and organizational aspects of fishery and aquaculture industry development, and their related social, community, environmental and public policy characteristics.

Key research areas include cultures and societies around the North Atlantic Rim, and how they interact with the ocean and ocean industries, including economic and political agreements and relationships; technologies for natural resource development, transportation, and safety and survival in harsh, remote locations, and the geography and ecology of North Atlantic marine, terrestrial and ice environments; fundamental research in biology, ecology, environmental science, and ocean science; climate change; fisheries conservation and resource management; aquaculture and seafood development; food processing technology and processes to support industry development; research related to the people, organizations, history, economics and policies pertaining to fisheries and aquaculture; deep water and harsh environment marine and petroleum activity; and business development and marketing associated with fisheries and oceans industries.

(9) Social Justice:
Research related to systems and structures that contribute to more humane, equitable and just societies. Its focus is on building the capacity and enabling the civic engagement of vulnerable populations, locally, nationally and internationally, whose voices are seldom heard in addressing the barriers to their well-being and full participation in society.

Key research areas include immigration, citizenship and labour market inclusion, and poverty reduction; empowerment of individuals through education, community health approaches, access to medical care and services, and child and family welfare; interdisciplinary aspects of diversity, difference, equity and ethics; labour relations, social and working class history, gender equality and sexuality; the impact of poverty on individual and community development in urban and rural neighbourhoods and communities; homelessness, affordable housing, and poverty; citizen engagement in communities, and how education is valued (to help explain the low rate of high school graduation); mental health, aging, social development, and disabilities issues; national and international social justice issues; and corporate social responsibility.
(10) Well-being, Health and Biomedical Discovery:
Research related to improvement of health and well-being through building research and knowledge provincially, nationally and internationally especially for the people of Newfoundland and Labrador in areas of unique provincial need and opportunity.

Key research areas include genetics research that addresses both the need and opportunity presented by the founder population characteristics of the province (genealogy, community and population health, ethics and health policy development, as well as specific bio-molecular research and clinical care innovation); health services and health policy research as well as research related to special medical, nursing and other health professional education that respond to the province’s aging, rural, northern and aboriginal populations and distinctive workforces; research related to efficient and accessible health care systems, and effective public health programs and policies and healthy and safe work places; biomedical sciences ranging from cellular and molecular processes to animal and cell modeling that respond to the province’s high incidence of diseases such as obesity, diabetes, and cardiovascular disease; multinational clinical trials of drug and device interventions; health promotion, public health, health policy, disease prevention and chronic disease management; and healthy aging.
ILLUSTRATION: PAUL TUCKER

Paul Tucker was born under a waning bone white moon on the fourth day of the eleventh month. A meek man of meagre means, Tucker graduated from Grenfell Campus, Memorial University a champion of all things visually artistic in 2003. Paul first became enamored of the world of comic books and graphic novels at the age of nine. His first triumph in the field came in 2007 when he published The Underworld Railroad through Viper Comics. In 2010, this now grizzled veteran of the comic book industry, co-founded the Breakdown Comic Jam, a fantastic free monthly get-together in St. John’s for local cartoonists of all ages and skill levels.

THE TEAM

Deep within the recesses of the Arts and Administration building at Memorial University there lies a secret. A team of professionals whose job it is to inform the earth of the whimsy and wonderment that exists within the walls of this university. The Division of Marketing and Communications takes great pride in its ability to communicate the story of Memorial through its own brand of creative ingenuity.

The League of Extraordinary Researchers is the first book in our graphic novel series. Stay tuned for more of what we have to offer in the upcoming volumes of Illustrating Memorial.
MEMORIAL UNIVERSITY OF NEWFOUNDLAND is an inclusive community dedicated to creativity, innovation and excellence in teaching and learning, research and scholarship, and to public engagement and service. We recognize our special obligation to the people of Newfoundland and Labrador. With campuses in St. John’s and Corner Brook, NL, and Harlow, United Kingdom, Memorial welcomes students and scholars from all over the world and contributes knowledge and shares expertise locally, nationally and internationally. We are committed to people in all parts of our province, a land that is ripe with history, culture and opportunity. We are a community of seekers and 21st Century explorers dedicated to fostering and promoting creativity and ingenuity amongst our 19,000 students and 2,500 permanent faculty and staff from more than 80 countries Memorial is shaped and changed by the professional and personal stories of its people. You’ll see it in our research and our publications, the way we recruit students and the compelling manner in which we choose to share the story of Memorial.

To take a closer look at Memorial, visit www.mun.ca.

ABOUT THE LEAGUE OF EXTRAORDINARY RESEARCHERS

This publication contains the research strategy framework of Memorial University of Newfoundland. We welcome your feedback. To send your comments or to receive a copy of this document, please contact research@mun.ca or call 709 737 2530.

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