**Atlantic Canada Opportunities Agency (ACOA)**

**Memorial University of Newfoundland**

**Potential R&D Activities**

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| **R&D Activities** | **R&D Description** | **Faculty Member** | **Faculty/Department** | **Email** |

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| **Missile Systems** | Self-propelled precision-guided munition system including missile guidance, missile launching and/or related technologies. | Mike Katz – Gas Storage [mkatz@mun.ca](mailto:mkatz@mun.ca) | Chemistry | [mkielley@mun.ca](mailto:mkielley@mun.ca) |
| Luc Rolland ([luc.rolland@gmail.com](mailto:luc.rolland@gmail.com)) |  | [mkielley@mun.ca](mailto:mkielley@mun.ca) |

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| **Autonomy and Robotics** | Human/autonomous-system interaction and collaboration, swarm and multi-unit autonomy, machine perception, reasoning, and intelligence, and test, evaluation, validation and verification. | George Mann  [gmann@mun.ca](mailto:gmann@mun.ca) | Engineering | [mkielley@mun.ca](mailto:mkielley@mun.ca) |
| Stephen Czarnuch [sczarnuch@mun.ca](mailto:sczarnuch@mun.ca) |  | [mkielley@mun.ca](mailto:mkielley@mun.ca) |
| Mohamed Shehata [mshehata@mun.ca](mailto:mshehata@mun.ca) |  | [mkielley@mun.ca](mailto:mkielley@mun.ca) |
| Theodore Norvell [theo@mun.ca](mailto:theo@mun.ca) |  | [mkielley@mun.ca](mailto:mkielley@mun.ca) |
| Luc Rolland [luc.rolland@gmail.com](mailto:luc.rolland@gmail.com) |  | [mkielley@mun.ca](mailto:mkielley@mun.ca) |
| Andrew Vardy  [av@mun.ca](mailto:av@mun.ca) |  | [mkielley@mun.ca](mailto:mkielley@mun.ca) |
| Ralf Bachmayer [ralf.bachmayer@gmail.com](mailto:ralf.bachmayer@gmail.com) |  | [mkielley@mun.ca](mailto:mkielley@mun.ca) |

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| **Cyber Security** | Development of science and technology for efficient, effective cyber capabilities across the spectrum of joint operation to include the protection of secure networks and surveillance of hostile networks. | David Pike  [dapike@mun.ca](mailto:dapike@mun.ca) | Math and Statistics | [mkielley@mun.ca](mailto:mkielley@mun.ca) |
| Octavia Dobre  [odobre@mun.ca](mailto:odobre@mun.ca) | Engineering | [mkielley@mun.ca](mailto:mkielley@mun.ca) |
| Dr. Robert Gallant  [rpgallant@grenfell.mun.ca](mailto:rpgallant@grenfell.mun.ca) | Grenfell | [mkielley@mun.ca](mailto:mkielley@mun.ca) |
| Jonathan Anderson ([jonathan.anderson@mun.ca](mailto:jonathan.anderson@mun.ca)) |  |
| Theodore Norvell ([theo@mun.ca](mailto:theo@mun.ca)) |  |

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| **Data Analytics** | Science and applications to reduce cycle time and manpower requirements for analysis and use of large data sets, leading to actionable data | | Ronald Haynes  [rhaynes@mun.ca](mailto:rhaynes@mun.ca) | | Math and Statistics | | [mkielley@mun.ca](mailto:mkielley@mun.ca) | |
| Scott MacLachlan  [smaclachlan@mun.ca](mailto:smaclachlan@mun.ca) | | Math and Statistics | | [mkielley@mun.ca](mailto:mkielley@mun.ca) | |
| Alex Bihlo  [abihlo@mun.ca](mailto:abihlo@mun.ca) | | Math and Statistics | | [mkielley@mun.ca](mailto:mkielley@mun.ca) | |
| Edward Kendall  [edward.kendall@mun.ca](mailto:edward.kendall@mun.ca) | | Medicine | | [mkielley@mun.ca](mailto:mkielley@mun.ca) | |
| Xiaodong Liang  ([xliang@mun.ca](mailto:xliang@mun.ca)) | |  | | [mkielley@mun.ca](mailto:mkielley@mun.ca) | |
| Ralf Bachmayer ([ralf.bachmayer@gmail.com](mailto:ralf.bachmayer@gmail.com)) | |  | | [mkielley@mun.ca](mailto:mkielley@mun.ca) | |

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| **Directed Energy** | Systems to transfer energy to a target for a desired effect. Energy sources can be electromagnetic, particle-based or acoustic/sonic. | Mike Katz – electromagnetic release of Chemicals  [mkatz@mun.ca](mailto:mkatz@mun.ca) | Chemistry | [mkielley@mun.ca](mailto:mkielley@mun.ca) |

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| **Energy & Power Technologies** | Power generation, energy storage, power distribution and control, thermal transport and control, electromechanical conversion technologies to enhance operational effectiveness and accelerate fielding of new pla  tforms/weapons. | Ronald Haynes  [rhaynes@mun.ca](mailto:rhaynes@mun.ca) | Math and Statistics | [mkielley@mun.ca](mailto:mkielley@mun.ca) |
| Scott MacLachlan  [smaclachlan@mun.ca](mailto:smaclachlan@mun.ca) | Math and Statistics | [mkielley@mun.ca](mailto:mkielley@mun.ca) |
| Alex Bihlo  [abihlo@mun.ca](mailto:abihlo@mun.ca) | Math and Statistics | [mkielley@mun.ca](mailto:mkielley@mun.ca) |
| Peter Pickup – Supercapacitors/fuel cells  [ppicku p@mun.ca](mailto:ppickup@mun.ca) | Chemistry | [mkielley@mun.ca](mailto:mkielley@mun.ca) |
| Mike Katz - energy storage  [mkatz@mun.ca](mailto:mkatz@mun.ca) | Chemistry | [mkielley@mun.ca](mailto:mkielley@mun.ca) |
| Travis Fridgen  [tfridgen@mun.ca](mailto:tfridgen@mun.ca) | Chemistry | [mkielley@mun.ca](mailto:mkielley@mun.ca) |
| Dave Thompson – artificial photosynthesis  [dthompson@mun.ca](mailto:dthompson@mun.ca) | Chemistry | [mkielley@mun.ca](mailto:mkielley@mun.ca) |
| Tariq Iqbal  [tariq@mun.ca](mailto:tariq@mun.ca) |  | [mkielley@mun.ca](mailto:mkielley@mun.ca) |
| John Quaicoe  [jquaicoe@mun.ca](mailto:jquaicoe@mun.ca) |  | [mkielley@mun.ca](mailto:mkielley@mun.ca) |
| Xiaodong Liang  [xliang@mun.ca](mailto:xliang@mun.ca) |  | [mkielley@mun.ca](mailto:mkielley@mun.ca) |
| Xili Duan  [xduan@mun.ca](mailto:xduan@mun.ca) |  | [mkielley@mun.ca](mailto:mkielley@mun.ca) |
| Luc Rolland luc.rolland@gmail.com |  | [mkielley@mun.ca](mailto:mkielley@mun.ca) |
| Ralf Bachmayer [ralf.bachmayer@gmail.com](mailto:ralf.bachmayer@gmail.com) |  |  |

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| **Human Systems, Terrain and Training** | Technologies to extend the capabilities of the human, enhance the capabilities of the human, sustain the human, or repair the human. | Mike Katz – gas masks  [mkatz@mun.ca](mailto:mkatz@mun.ca) | Chemistry | [mkielley@mun.ca](mailto:mkielley@mun.ca) |
| Erika Merschrod – artificial tissue scaffolds  [erika@mun.ca](mailto:erika@mun.ca) | Chemistry | [mkielley@mun.ca](mailto:mkielley@mun.ca) |
| Sarah Power  [sd.power@mun.ca](mailto:sd.power@mun.ca) | Engineering | [mkielley@mun.ca](mailto:mkielley@mun.ca) |
| Stephen M. Czarnuch [sczarnuch@mun.ca](mailto:sczarnuch@mun.ca) |  | [mkielley@mun.ca](mailto:mkielley@mun.ca) |
| Luc Rolland [luc.rolland@gmail.com](mailto:luc.rolland@gmail.com) |  | [mkielley@mun.ca](mailto:mkielley@mun.ca) |

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| **Materials & Manufacturing** | Modeling, development, fabrication and characterization of materials/structures at the atomic/molecular scale and understanding of associated applications. (e.g., mechanical, sensor, communications, and medical applications) | Chris Kozak  [ckozak@mun.ca](mailto:ckozak@mun.ca) | Chemistry | [mkielley@mun.ca](mailto:mkielley@mun.ca) |
| Mike Katz – porous materials  [mkatz@mun.ca](mailto:mkatz@mun.ca) | Chemistry | [mkielley@mun.ca](mailto:mkielley@mun.ca) |
| Fran Kerton  [fkerton@mun.ca](mailto:fkerton@mun.ca) | Chemistry | [mkielley@mun.ca](mailto:mkielley@mun.ca) |
| Erika Merschrod – optoelectronic materials, nanofabrication  [erika@mun.ca](mailto:erika@mun.ca) | Chemistry | [mkielley@mun.ca](mailto:mkielley@mun.ca) |
| Sam Nakhla  [stanakhla@mun.ca](mailto:stanakhla@mun.ca) | Engineering | [mkielley@mun.ca](mailto:mkielley@mun.ca) |
| Lorenzo Moro  [lmoro@mun.ca](mailto:lmoro@mun.ca) |  | [mkielley@mun.ca](mailto:mkielley@mun.ca) |
| Bruce Quinton [bruce.quinton@mun.ca](mailto:bruce.quinton@mun.ca) |  | [mkielley@mun.ca](mailto:mkielley@mun.ca) |
| Luc Rolland [luc.rolland@gmail.com](mailto:luc.rolland@gmail.com) |  | [mkielley@mun.ca](mailto:mkielley@mun.ca) |

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| **Next Generation Electronics** | Advancement of scientific understanding of new materials and devices to enhance exploitation and insertion of advanced microelectronics/nanoelectronics and reduce requisite supply chain risk. | Lihong Zhang  [lzhang@mun.ca](mailto:lzhang@mun.ca) |  | [mkielley@mun.ca](mailto:mkielley@mun.ca) |

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| **Quantum Technologies** | Quantum mechanics to perform otherwise intractable numerical calculations, provide ultra-secure communications, and simulate exotic materials. | Erika Merschrod – modeling, simulation, design  [erika@mun.ca](mailto:erika@mun.ca) | Chemistry | [mkielley@mun.ca](mailto:mkielley@mun.ca) |
| Travis Fridgen – modeling of the physical and chemical properties of new bio-metal materials  [tfridgen@mun.ca](mailto:tfridgen@mun.ca) | Chemistry | [mkielley@mun.ca](mailto:mkielley@mun.ca) |

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| **Sensory Technology & Exploitation** | Physics-based maritime, ground, air-borne, and space-borne sensing capabilities to include EOIR sensors, RF sensors, acoustic, magnetic, and seismic sensors; and associated signal processing, fusion, and modeling | Mike Katz-sensing and storage of chemicals  [mkatz@mun.ca](mailto:mkatz@mun.ca) | Chemistry | [mkielley@mun.ca](mailto:mkielley@mun.ca) |
| Erika Merschrod – SERS sensing  [erika@mun.ca](mailto:erika@mun.ca) | Chemistry | [mkielley@mun.ca](mailto:mkielley@mun.ca) |
| Christina Bottaro – MS sensing  [cbottaro@mun.ca](mailto:cbottaro@mun.ca) | Chemistry | [mkielley@mun.ca](mailto:mkielley@mun.ca) |
| Bruce Quinton  [bruce.quinton@mun.ca](mailto:bruce.quinton@mun.ca) | Engineering | [mkielley@mun.ca](mailto:mkielley@mun.ca) |
| Mohamed Shehata  [mshehata@mun.ca](mailto:mshehata@mun.ca) | Engineering | [mkielley@mun.ca](mailto:mkielley@mun.ca) |
| Octavia Dobre  [odobre@mun.ca](mailto:odobre@mun.ca) | Engineering | [mkielley@mun.ca](mailto:mkielley@mun.ca) |
| George Mann  [gmann@mun.ca](mailto:gmann@mun.ca) | Engineering | [mkielley@mun.ca](mailto:mkielley@mun.ca) |
| Siu O'Young  [oyoung@mun.ca](mailto:oyoung@mun.ca) |  | [mkielley@mun.ca](mailto:mkielley@mun.ca) |
| Vlastimil Masek  [masek@mun.ca](mailto:masek@mun.ca) |  | [mkielley@mun.ca](mailto:mkielley@mun.ca) |
| Weimin Huang  [weimin@mun.ca](mailto:weimin@mun.ca) |  | [mkielley@mun.ca](mailto:mkielley@mun.ca) |
| Octavia A. Dobre [odobre@mun.ca](mailto:odobre@mun.ca) |  | [mkielley@mun.ca](mailto:mkielley@mun.ca) |
| Lorenzo Moro  [lmoro@mun.ca](mailto:lmoro@mun.ca) |  | [mkielley@mun.ca](mailto:mkielley@mun.ca) |
| Eric Gill  [ewgill@mun.ca](mailto:ewgill@mun.ca) |  | [mkielley@mun.ca](mailto:mkielley@mun.ca) |
| Mohamed Shehata [mshehata@mun.ca](mailto:mshehata@mun.ca) |  | [mkielley@mun.ca](mailto:mkielley@mun.ca) |
| Luc Rolland [luc.rolland@gmail.com](mailto:luc.rolland@gmail.com) |  | [mkielley@mun.ca](mailto:mkielley@mun.ca) |
| Ralf Bachmayer [ralf.bachmayer@gmail.com](mailto:ralf.bachmayer@gmail.com) |  | [mkielley@mun.ca](mailto:mkielley@mun.ca) |

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| **Signal Processing & Commnications** | Achievement of reliable connectivity through undersea, surface, air and space layers through the development of robust, cyber-protected and adaptable networks. | Mohamed Shehata  [mshehata@mun.ca](mailto:mshehata@mun.ca) | Engineering | [mkielley@mun.ca](mailto:mkielley@mun.ca) |
| Mohamed Hossam Ahmed  [mhahmed@mun.ca](mailto:mhahmed@mun.ca) | Engineering | [mkielley@mun.ca](mailto:mkielley@mun.ca) |
| Octavia Dobre  [odobre@munc.a](mailto:odobre@munc.a) | Engineering | [mkielley@mun.ca](mailto:mkielley@mun.ca) |
| Dr. Telex Ngatched  [tngatched@grenfell.mun.ca](mailto:tngatched@grenfell.mun.ca) | Grenfell | [mkielley@mun.ca](mailto:mkielley@mun.ca) |
| Vlastimil Masek  ([masek@mun.ca](mailto:masek@mun.ca)) |  | [mkielley@mun.ca](mailto:mkielley@mun.ca) |
| Theodore Norvell [theo@mun.ca](mailto:theo@mun.ca) |

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| **Intelligent Integrated Systems** | Autonomous capability and products, open architectures & communications, sensors and other modular payloads, energy generations, monitoring, storage & propulsion. | Mohamed Shehata  [mshehata@mun.ca](mailto:mshehata@mun.ca) | Engineering | [mkielley@mun.ca](mailto:mkielley@mun.ca) |
| Mohamed Hossam Ahmed  [mhahmed@mun.ca](mailto:mhahmed@mun.ca) | Engineering | [mkielley@mun.ca](mailto:mkielley@mun.ca) |
| Theodore Norvell [theo@mun.ca](mailto:theo@mun.ca) |  | [mkielley@mun.ca](mailto:mkielley@mun.ca) |
| Stephen M. Czarnuch [sczarnuch@mun.ca](mailto:sczarnuch@mun.ca) |  | [mkielley@mun.ca](mailto:mkielley@mun.ca) |
| Lorenzo Moro  [lmoro@mun.ca](mailto:lmoro@mun.ca) |  | [mkielley@mun.ca](mailto:mkielley@mun.ca) |
| Luc Rolland [luc.rolland@gmail.com](mailto:luc.rolland@gmail.com) |  | [mkielley@mun.ca](mailto:mkielley@mun.ca) |
| Ralf Bachmayer [ralf.bachmayer@gmail.com](mailto:ralf.bachmayer@gmail.com) |  | [mkielley@mun.ca](mailto:mkielley@mun.ca) |

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| **Ballistic Missile Defence** | Advanced radar &scalable combat systems. |  |  | [mkielley@mun.ca](mailto:mkielley@mun.ca) |