

Peter G. Lelièvre – Curriculum Vitae

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Associate Professor
Department of Mathematics & Computer Science
Mount Allison University
Sackville, NB
Canada, E4L 1E4
plelievre@mta.ca

Statement on Equity, Diversity and Inclusivity

Fostering a diverse academic environment increases creativity and innovation. Diverse ideas, values and perspectives are inherently valuable for success. My research group values collaborative rather than competitive scientific progress, where researchers are supported with the tools they need to succeed. In following these values, we will conduct outstanding research and train the next generation of responsible and diverse scientists who represent our society and solve problems in the fields of Mathematics, Computer Science, Geophysics and beyond.

Degrees

PhD Geophysics

- 2009: University of British Columbia, Dept. of Earth and Ocean Sciences

MSc Geophysics

- 2003: University of British Columbia, Dept. of Earth and Ocean Sciences

BScH Physics and Mathematics

- 1999: Acadia University, Dept. of Physics

Employment History

Mount Allison University, Department of Mathematics and Computer Science

- 2020–present: Assistant Professor

Independent Consultant

- 2019: Vale Canada Ltd.

Memorial University of Newfoundland, Department of Earth Sciences

- 2012–2020: Research Scientist (Research Assistant III)
- 2009–2012: Postdoctoral Fellow

University of British Columbia, Department of Earth and Ocean Sciences

- 2004: Research Scientist with the UBC-Geophysical Inversion Facility (UBC-GIF)

Other Positions

- 2004: Field Geophysicist, G-tek Australia, Albion, Queensland, Australia
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Funding

External

- 2022: New Brunswick Innovation Foundation (NBIF) Research Assistantships Initiative (\$40,000)
 - “Improving geophysical imaging methods for agricultural dykes”
 - Mount Allison University, primary applicant.
- 2022: New Brunswick Innovation Foundation (NBIF) Research Professionals Initiative (\$25,000)
 - “Object-Oriented Programming Design for Multimodal Geophysical Inversion”
 - Mount Allison University, primary applicant.
- 2022: Atlantic Association for Research in the Mathematical Sciences (AARMS) Collaborative Research Group (CRG) Grant extension (\$12,500)
 - “Numerical Solution of Geophysical Inverse Problems”
 - Mount Allison University, primary applicant.
- 2021: Atlantic Association for Research in the Mathematical Sciences (AARMS) Collaborative Research Group (CRG) Grant (\$37,500)
 - “Numerical Solution of Geophysical Inverse Problems”
 - Mount Allison University, primary applicant.
- 2021: MITACS Accelerate Grant (\$50,000)
 - “Parallel Computing Solutions for Modelling Large Volume Geoelectrical Data Utilizing Unstructured Meshes”
 - Mount Allison University, primary applicant.
- 2021: NSERC Discovery Launch Supplement (\$12,500)
 - “Numerical Solution of Next Generation Inverse Problems for Geophysical Applications”
 - Mount Allison University, primary applicant.
- 2021: NSERC Discovery Grant (\$90,000)
 - “Numerical Solution of Next Generation Inverse Problems for Geophysical Applications”
 - Mount Allison University, primary applicant.
- 2020: NBIF Start-Up Award (\$50,000)
 - “Geophysical Imaging For Flood Risk Management”
 - Mount Allison University, primary applicant.

Internal

- 2022: Mount Allison President’s Research and Creative Activity Awards (\$15,000)
 - “Geophysical Investigation of the Tantramar Dykes for Flood Risk Management”
 - Mount Allison University, primary applicant.
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Publications

Life-time summary count

Books	1
Chapters in Books	1
Refereed Journals	29
Refereed Conference Proceedings	19
Other Conference Abstracts	61
Other Publications	2
Total	113

Books

- M. Moorkamp, **P. G. Lelièvre**, N. Linde and A. Khan (eds), 2016, Integrated Imaging of the Earth: Theory and Applications, John Wiley & Sons

Chapters in Books

- **P. G. Lelièvre** and C. G. Farquharson, 2016, Integrated imaging for mineral exploration, in *Integrated Imaging of the Earth: Theory and Applications*, eds. M. Moorkamp, **P. G. Lelièvre**, N. Linde and A. Khan

Articles Submitted to Refereed Journals

- C. Galley, M. Hannington, E. Bethell, A. Baxter and **P. Lelièvre**, 2024, Archean rifts and triple-junctions revealed from gravity modelling of the Superior Craton, *Nature Geoscience* - submitted July 2024.
- C. Galley, A. Baxter, M. Hannington, M. King, E. Bethell, **P. Lelièvre**, M. Fassbender, J. Jamieson, 2024, Quantifying Crustal Growth in Arc-Backarc Systems: Gravity Inversion Modelling of the Lau Basin, *Journal of Geophysical Research - Solid Earth*, submitted February 2024.
- X. Lu, H. Jahandari, **P. Lelièvre** and C. Farquharson, 2023, Parallel minimum-structure inversion of massive DCIP data, *Geophysics*, submitted September 26, 2023.
- **P. G. Lelièvre**, E. Vandenberg, H. Hebb, X. Lu, K. Butler and C. Farquharson, 2023, A protocol for assessing the effectiveness of electrical resistivity imaging for agricultural dike investigation, *Near Surface Geophysics*, submitted September 11, 2023.
- S. Vatankhah, **P. G. Lelièvre**, K. Matende and K. Mickus, 2023, Magnetic Surface Geometry Inversion of Kimberlites in Botswana, *Geophysical Prospecting*, submitted August 1, 2023.

Articles Published in Refereed Journals

- X. Lu, C. Farquharson and **P. Lelièvre**, 2024, Surface geometry inversion of transient electromagnetic data, *Geophysics*, 89, E177–E192.
- H. Jahandari, **P. Lelièvre** and C. G. Farquharson, 2023, Forward modelling of direct-current resistivity data on unstructured grids using an adaptive mimetic finite-difference method, *Geophysics*, 88, E123–E134.
- R. Brüning, M. Hajati, **P. G. Lelièvre**, T. Bernhard, S. Dieter and G. Dietrich, 2023, Facet Type Determination Based on Combined Atomic Force Microscopy and Electron Backscatter Diffraction, *Journal of Microscopy*, 290, 10–22.
- K. N. Matende, R. T. Ranganai, K. L. Mickus, **P. G. Lelièvre**, R. B. M. Mapeo, and C. D. Ramotoroko, 2023, Geophysical and Geological Investigation of the Spatial and Subsurface Extent of the Segwagwa and Masoke Ring Complexes in Southeast Botswana: Geotectonic Implications, *Journal of African Earth Sciences*, 197, 104766.
- S. Mukherjee, R. S. Bell, W. Barkhouse, S. Adavani, **P. Lelièvre**, and C. Farquharson, 2022, High Resolution Imaging Of Subsurface Infrastructure Using Deep Learning Artificial Intelligence On Drone Magnetometry, *The Leading Edge*, 41(7), 462–471.
- Z. Pastore, **P. Lelièvre**, S. A. McEnroe and N. S. Church, 2022, 3D joint inversion of scanning magnetic microscopy data, *Geophysical Research Letters*, 49, e2021GL096072.
- C. G. Galley, **P. Lelièvre**, A. Haroon, S. Graber, J. W. Jamieson, F. Szitkar, I. Yeo, C. Farquharson, S. Petersen and R. L. Evans, 2021, Magnetic and Gravity Surface Geometry Inverse Modelling of the TAG Active Mound, *Journal of Geophysical Research: Solid Earth*, 126, e2021JB022228.
- M. Darijani, C. Farquharson and **P. Lelièvre**, 2021, Joint and constrained inversion of magnetic and gravity data: A case history from McArthur River area, Canada, *Geophysics*, 86, B79–B95.
- A. Barnoud, V. Cayol, **P. G. Lelièvre**, A. Portal, P. Labazuy, P. Boivin and L. Gailler, 2020, Robust Bayesian joint inversion of gravimetric and muographic data for the density imaging of the Puy de Dôme volcano (France), *Frontiers in Earth Science*, 8:575842.
- C. G. Galley, J. W. Jamieson, **P. G. Lelièvre**, C. G. Farquharson and J. M. Parianos, 2020, Magnetic imaging of subseafloor hydrothermal fluid circulation pathways, *Science Advances*, 6, eabc6844.
- C. G. Galley, **P. G. Lelièvre** and C. G. Farquharson, 2020, Geophysical inversion for 3D contact surface geometry, *Geophysics*, 85, K27–K45.
- M. Darijani, C.G. Farquharson and **P. G. Lelièvre**, 2020, Clustering and constrained inversion of seismic refraction and gravity data for overburden stripping: Application to uranium exploration in the Athabasca Basin, Canada, *Geophysics*, 85, B133–B146.

- **P. G. Lelièvre**, D. Fournier, S. E. Walker, N. C. Williams and C. G. Farquharson, 2020, A proposed procedure for ameliorating edge effects in magnetic data transformations, *Geophysical Prospecting*, 68, 1999–2006.
- A. Barnoud, V. Cayol, V. Niess, C. Cârloganu, **P. Lelièvre**, P. Labazuy and Eve Le Ménédeu, 2019, Bayesian joint muographic and gravimetric inversion applied to volcanoes, *Geophysical Journal International*, 218, 2179–2194.
- **P. G. Lelièvre**, A. Barnoud, V. Niess, C. Cârloganu, V. Cayol and C. G. Farquharson, 2019, Joint inversion methods with relative density offset correction for muon tomography and gravity data, with application to volcano imaging, *Geophysical Journal International*, 218, 1685–1701.
- **P. G. Lelièvre**, A. E. Carter-McAuslan, M. W. Dunham, D. J. Jones, M. Nalepa, C. L. Squires, C. J. Tycholiz, M. A. Vallée and C. G. Farquharson, 2018, FacetModeller: Software for manual creation, manipulation and analysis of 3D surface-based models, *SoftwareX*, 7, 41–46.
- P. Zheglova, **P. G. Lelièvre**, and C. G. Farquharson, 2018, Multiple level-set joint inversion of traveltimes and gravity data with application to ore delineation: A synthetic study, *Geophysics*, 83(1), R13–R30.
- **P. G. Lelièvre** and Melissa Grey, 2017, JMorph: Software for performing rapid morphometric measurements on digital images of fossil assemblages, *Computers & Geosciences*, 105, 120–128.
- R. Bijani, **P. G. Lelièvre**, C. F. Ponte-Neto and C. G. Farquharson, 2017, Physical-property-, lithology- and surface-geometry-based joint inversion using Pareto Multi-Objective Global Optimization, *Geophysical Journal International*, 209(2), 730–748.
- A. Carter-McAuslan, **P. G. Lelièvre** and C. G. Farquharson, 2015, A study of fuzzy c-means coupling for joint inversion using seismic tomography and gravity data test scenarios, *Geophysics*, 80(1), W1–W15.
- Gradient and smoothness regularization operators for geophysical inversion on unstructured meshes, 2013, **P. G. Lelièvre** and C. G. Farquharson, *Geophysical Journal International*, 195(1), 330–341.
- Unified geophysical and geological 3D Earth models, 2012, **P. Lelièvre**, A. Carter-McAuslan, C. Farquharson and C. Hurich, *The Leading Edge*, 31(3), 322–328.
- Joint inversion of seismic traveltimes and gravity data on unstructured grids with application to mineral exploration, 2012, **P. G. Lelièvre**, C. G. Farquharson and C. A. Hurich, *Geophysics*, 77(1), K1–K15.
- Inversion of first-arrival seismic traveltimes without rays, implemented on unstructured grids, 2011, **P. G. Lelièvre**, C. G. Farquharson and C. A. Hurich, *Geophysical Journal International*, 185(2), 749–763.
- Computing first-arrival seismic traveltimes on unstructured 3D tetrahedral grids using the Fast Marching Method, 2011, **P. G. Lelièvre**, C. G. Farquharson and C. A. Hurich, *Geophysical Journal International*, 184(2), 885–896.
- Integrating geologic and geophysical data through advanced constrained inversions, 2009, **P. G. Lelièvre**, D. W. Oldenburg and Nicholas C. Williams, *Exploration Geophysics*, 40(4), 334–341.
- A comprehensive study of including structural orientation information in geophysical inversions, 2009, **P. G. Lelièvre** and D. W. Oldenburg, *Geophysical Journal International*, 178(2), 623–637.
- A 3D total magnetization inversion applicable when significant complicated remanence is present, 2009, **P. G. Lelièvre** and D. W. Oldenburg, *Geophysics*, 74(3), L21–L30.
- Selection for prey shell thickness by the naticid gastropod *Euspira lewisii* (Naticidae) on the bivalve *Protothaca staminea* (Veneridae), 2007, M. Grey, **P. G. Lelièvre** and E. G. Boulding, *The Veliger*, 48(4), 317–322.
- Magnetic forward modelling and inversion for materials of high susceptibility, 2006, **P. G. Lelièvre** and D. W. Oldenburg, *Geophysical Journal International*, 166, 76–90.

Articles Published in Refereed Conference Proceedings (Expanded Abstracts)

- X. Lu, **P. Lelièvre** and C. Farquharson, Parallel inversion of 3D direct-current resistivity and induced polarization data using unstructured tetrahedral grids, *International Meeting for Applied Geoscience & Energy (IMAGE) Expanded Abstracts*.
- S. Mukherjee, **P. Lelièvre**, C. Farquharson and S. Adavani, 2021, Three-dimensional inversion of geophysical field data on an unstructured mesh using deep learning neural networks, applied to magnetic data, *IMAGE Expanded Abstracts*.
- H. Jahandari, C. Farquharson and **P. Lelièvre**, *SEG Technical Program Expanded Abstracts*, 2021, Forward modelling of direct-current resistivity data on unstructured grids using an adaptive mimetic finite-difference method, *IMAGE Expanded Abstracts*.

- X. Lu, C. Farquharson, **P. Lelièvre**, G. Harrison and J.-M. Miehé, 2021, Surface geometry inversion of Preston Lake transient electromagnetic data, *IMAGE Expanded Abstracts*.
- X. Lu, **P. Lelièvre** and C. Farquharson, 2021, Surface geometry inversion of time-domain EM data, *IMAGE Expanded Abstracts*.
- C. Galley, **P. Lelièvre**, C. Farquharson, J. Jamieson, A. Haroon, S. Graber, S. Petersen and F. Szitkar, 2020, Modelling the geometry of the Trans-Atlantic Geotraverse seafloor massive sulphide deposit through magnetic surface geometry inversion, *SEG Technical Program Expanded Abstracts*, 1364–1368.
- X. Lu, **P. Lelièvre** and C. Farquharson, 2020, Surface geometry inversion of time-domain EM data, *SEG Technical Program Expanded Abstracts*, 1399–1403.
- C. G. Galley, **P. G. Lelièvre**, C. G. Farquharson and J. W. Jamieson, 2019, Modelling the subseafloor structure of seafloor massive sulphide deposits using surface geometry magnetic inversion, *International Workshop on Gravity, Electrical & Magnetic Methods and Their Applications*.
- C. G. Farquharson and **P. G. Lelièvre**, 2017, Modelling and Inversion for Mineral Exploration Geophysics: A Review of Recent Progress, the Current State-of-the-Art, and Future Directions, *Proceedings of Exploration 17: Sixth Decennial International Conference on Mineral Exploration*, edited by V. Tschirhart and M. D. Thomas, 51–74, invited.
- **P. G. Lelièvre**, K. Butler and C. G. Farquharson, 2016, Inversion for wireframe surface geometry applied to the Cocagne Subbasin, New Brunswick, Canada, *SEG Technical Program Expanded Abstracts*.
- **P. G. Lelièvre**, C. G. Farquharson and R. Bijani, 2015, 3D potential field inversion for wireframe surface geometry, *SEG Technical Program Expanded Abstracts*.
- Geophysical inversion for contact surfaces, 2012, **P. G. Lelièvre**, P. Zheglova, T. Danek and C. G. Farquharson, *SEG 82nd International Meeting Expanded Abstracts*.
- Constrained geophysical inversion on unstructured meshes, 2012, **P. G. Lelièvre**, C. J. Tycholiz and C. G. Farquharson, *SEG 82nd International Meeting Expanded Abstracts*.
- Joint inversion of seismic traveltimes and gravity data on unstructured grids with application to mineral exploration, 2010, **P. G. Lelièvre**, C. G. Farquharson and C. A. Hurich, *SEG 80th International Meeting Expanded Abstracts*.
- Integrating geologic and geophysical data through advanced constrained inversions, 2009, **P. G. Lelièvre**, D. W. Oldenburg and N. C. Williams, *Australian Society of Exploration Geophysicists (ASEG) 20th International Geophysics Conference Expanded Abstracts*.
- Constraining gravity and magnetics inversions for mineral exploration using limited geological data, 2009, N. C. Williams, **P. G. Lelièvre** and D. W. Oldenburg, *ASEG 20th International Geophysics Conference Expanded Abstracts*.
- Constraining geophysical inversions with geologic information, 2008, **P. G. Lelièvre**, D. W. Oldenburg and N. C. Williams, *SEG 78th International Meeting Expanded Abstracts*.
- 3D magnetic inversion for total magnetization in areas with complicated remanence, 2006, **P. G. Lelièvre**, D. W. Oldenburg and N. D. Phillips, *SEG 76th International Meeting Expanded Abstracts*.
- Magnetic forward modelling and inversion for materials of high susceptibility, 2002, **P. G. Lelièvre** and D. W. Oldenburg, *SEG 72nd International Meeting Expanded Abstracts*.

Additional Conference Presentations

- R. Mendoza, K. Butler and **P. Lelièvre**, 2024, Informing Dyke Rehabilitation and Re-engineering Strategies in the Upper Bay of Fundy through Geoelectric Imaging, *GeoMontréal 2024*, September 2024, Montréal, QC, Canada.
- C. Galley, **P. Lelièvre** et al., 2024, Quantifying crustal growth in the Lau arc-backarc system through gravity inverse modelling, *EGU General Assembly*, April, 2024.
- S. McEnroe, **P. Lelièvre** et al., 2024, What can we learn from magnetic surveys at different scales? Geological insight from mineral to airborne surveys in the Bjerkreim-Sokndal Layer Intrusion, Norway, *EGU General Assembly*, April, 2024.
- R. Mendoza, K. Butler and **P. Lelièvre**, 2024, Geoelectric Imaging of Flood Embankments in a Tidal Environment: Studying the Shepody dykelands near Riverside Albert, New Brunswick, *Atlantic Geoscience Society (AGS) Colloquium*, February 2024, Moncton, NB, Canada.
- J. Long, **P. G. Lelièvre** and C. Farquharson, 2023, Surface Geometry Inversion for Magnetotelluric Data, *American Geo-*

physical Union (AGU) Fall Meeting, December 2023, San Francisco, USA.

- X. Lu, C. Farquharson and **P. Lelièvre**, 2023, Surface geometry inversion of TEM data for thin, dipping conductors, 7th International Symposium on Three-Dimensional Electromagnetics, November 2023, Vancouver, Canada.
- X. Lu, **P. Lelièvre** and C. Farquharson, 2023, Uncertainty quantification of TEM surface geometry inversion, The 16th China International Geo-electromagnetism Workshop (CIGEW2023), August 2023, Shenzhen, China.
- S. Vatankhah, **P. Lelièvre**, X. Lu and C. Farquharson, 2023, An investigation of regularization and constraints in surface-geometry inversion, *Annual Conference of the International Association for Mathematical Geosciences (IAMG)*, August 2023, Trondheim, Norway.
- S. Vatankhah, **P. Lelièvre**, X. Lu and C. Farquharson, 2023, An investigation of regularization and constraints in surface-geometry inversion, *AARMS-CRG Mathematical Foundations of Scientific Machine Learning Workshop II*, July/August 2023, University of New Brunswick, Fredericton, NB.
- **P. Lelièvre**, E. Vandenberg, H. Hebb, K. Butler, X. Lu, and C. Farquharson, 2023, A protocol for assessing the effectiveness of electrical resistivity imaging for agricultural dike investigation, *European Geosciences Union (EGU) General Assembly*, April 2023.
- X. Lu, C. Farquharson, and **P. Lelièvre**, 2023, Uncertainty quantification of geophysical models constructed by surface geometry inversion using Markov chain Monte Carlo sampling, *EGU General Assembly*, April 2023.
- S. Mukherjee, S. Adavani, A. Morgan, W. Barkhouse, R. Bell, **P. Lelièvre**, and C. Farquharson, 2023, Scalable machine learning solution for commercial scale three dimensional geophysical inversions, *EGU General Assembly*, April 2023.
- K. Matende, K. Mickus, R. Ranganai, **P. Lelièvre**, R. Mapeo, and C. Ramotoroko, 2022, Geophysical and Geological Investigation of the Spatial and Subsurface Extent of the Segwagwa and Masoke Ring Complexes in Southeast Botswana: Geotectonic Implications, *Geological Society of America (GSA) Connects*, Abstracts with Programs, Vol. 54, No. 5, October 2022, Denver, USA.
- X. Lu, C. Galley, **P. Lelièvre**, and C. Farquharson, 2022, Surface geometry inversion of marine CSEM data, *EM Induction Workshop*, Çeşme, Turkey, September 2022.
- **P. Lelièvre**, C. Farquharson, C. Galley, X. Lu, and S. Mukherjee, 2022, Inversion of geophysical data on unstructured meshes using deep learning neural networks, *AARMS-CRG Mathematical Foundations of Scientific Machine Learning Workshop*, June 1-3, 2022, Memorial University, St. John's, NL (hybrid meeting attended remotely).
- X. Lu, C. Farquharson and **P. Lelièvre**, 2022, Computer modelling of electromagnetic and direct-current resistivity data for mineral exploration, *GAC-NL Annual Technical Meeting*, St. John's, NL, February 2022.
- E. Vandenberg, H. Hebb and **P. Lelièvre**, 2021, Geophysical Inversion for Flood Risk Management, *Science Atlantic Mathematics, Statistics and Computer Science (MSCS) Division Conference*, October 2021 (virtual meeting).
- **P. G. Lelièvre**, Z. Pastore, N. Church, M. Lee, H. Oda and S. McEnroe, 2021, Constrained Magnetic Vector Inversion of Scanning Magnetic Microscopy Data for Modelling Magnetization of Multidomain Mineral Grains, *EGU General Assembly*, April 2021 (virtual meeting).
- X. Lu, C. Galley, **P. G. Lelièvre** and C. Farquharson, 2020, Surface geometry inversion of potential field and electromagnetic geophysical data, *AGU Fall Meeting*, December 2020 (virtual meeting).
- C. Galley, J. W. Jamieson, **P. G. Lelièvre**, C. Farquharson and J. Parianos, 2020, Imaging Subseafloor Hydrothermal Systems, *AGU Fall Meeting*, December 2020 (virtual meeting).
- **P. G. Lelièvre**, D. Fournier, S. Walker, N. Williams, and C. Farquharson, 2020, Assessing and ameliorating edge effects in magnetic data transformations, *EGU General Assembly*, April 2020, Vienna, Austria.
- **P. Lelièvre**, M. Darijani, C. Galley, P. Zhiglova and C. Farquharson, 2019, No Magic Bullet: Three Integrated Imaging Problems, Three Solutions, *International Union of Geodesy and Geophysics (IUGG) General Assembly*, July 2019, Montréal, Canada, invited.
- **P. G. Lelièvre**, C. Galley and C. Farquharson, 2019, Incorporating Geological and Geophysical Data To Determine Surface-Based Model Geometry, *Geological Association of Canada - Mineralogical Association of Canada - International Association of Hydrogeologists (GAC-MAC-IAH) Conference*, May 2019, Québec City, Canada.
- **P. G. Lelièvre**, C. Galley and C. Farquharson, 2019, 3D Geophysical Inversion for Surface-Based Model Geometry, *EGU General Assembly*, April 2019, Vienna, Austria.
- **P. G. Lelièvre**, A. Carter-McAuslan, M. Dunham, C. Galley, H. Jahandari, M. Vallée and C. Farquharson, 2018, Lessons

- learned, and hardships endured, when performing geophysical numerical modelling directly on geological models, *Canadian Exploration Geophysical Society (KEGS) Symposium*, March 2018, Toronto, ON, Canada.
- **P. Lelièvre**, A. Barnoud, C. Cârloganu, V. Cayol, C. Farquharson and V. Niess, 2018, Joint inversion of gravity and muon tomography data on unstructured meshes, *EGU General Assembly*, April 2018, Vienna, Austria.
 - J. Long, X. Lu and **P. G. Lelièvre**, 2017, Electromagnetic forward modelling for realistic Earth models using unstructured tetrahedral meshes and a meshfree approach, Colin Farquharson, *AGU Fall Meeting*, December 2017, New Orleans, USA, invited.
 - **P. G. Lelièvre** and M. Grey, 2016, JMorph: A digital tool for measuring fossils, *Canadian Paleontological Conference (CPC)*, August 2016, Sydney, NS, Canada.
 - **P. Lelièvre** and C. Farquharson, 2016, Inversion of Potential Field Data for Contact Surface Geometry, European Association of Geoscientists and Engineers (EAGE) 78th Conference and Exhibition, May 2016, Vienna, Austria.
 - **P. Lelièvre**, A. Carter-McAuslan and C. Farquharson, 2016, Joint Inversion of Gravity and Seismic Tomography Data for a Magmatic Massive Sulphide Exploration Example, EAGE 78th Conference and Exhibition, May 2016, Vienna, Austria.
 - **P. Lelièvre** and C. Farquharson, 2016, 3D Geologically Constrained Inversion on Unstructured Meshes for the Voisey's Bay Eastern Deep-sea Deposit, EAGE 78th Conference and Exhibition, May 2016, Vienna, Austria.
 - **P. G. Lelièvre**, R. Bijani and C. G. Farquharson, 2016, Geophysical inversion with multi-objective global optimization methods, *EGU General Assembly*, April 2016, Vienna, Austria.
 - **P. G. Lelièvre**, R. Bijani and C. G. Farquharson, 2016, Lithological and surface geometry joint inversions using multi-objective global optimization methods, *EGU General Assembly*, April 2016, Vienna, Austria.
 - **P. G. Lelièvre**, C. Juhlin and C. G. Farquharson, 2016, Joint and constrained inversions in a complex geological setting, example from the Skellefte District, M. A. Garcia Juanatey, *New Advances in Geophysics 2016 (BGA - NAG 2016)*, February 2016, London, England.
 - **P. G. Lelièvre**, R. Bijani and C. G. Farquharson, 2015, Joint geophysical inversion with multi-objective global optimization methods, *AGU Fall Meeting*, December 2015, San Francisco, USA.
 - **P. G. Lelièvre**, C. Juhlin and C. G. Farquharson, 2015, Joint and constrained inversions in a complex geological setting, example from the Skellefte District, M. A. Garcia Juanatey, *AGU Fall Meeting*, December 2015, San Francisco, USA.
 - **P. G. Lelièvre**, R. Bijani and C. G. Farquharson, 2015, Integrating geological model surfaces into 3D geophysical inversions, *Society for Geology Applied to Mineral Deposits (SGA) General Assembly*, August 2015, Nancy, France.
 - M. A. Garcia Juanatey, **P. G. Lelièvre** and C. G. Farquharson, 2015, Joint and constrained inversions in the Skellefte District, *EGU General Assembly*, April 2015, Vienna, Austria.
 - **P. G. Lelièvre**, C. G. Farquharson and R. Bijani, 2015, 3D stochastic geophysical inversion for contact surface geometry, *EGU General Assembly*, April 2015, Vienna, Austria.
 - **P. Lelièvre** and C. G. Farquharson, 2015, Mesh- and surface-based geophysical inversion of IOCG deposits, *Atlantic Geoscience Society (AGS) Colloquium*, February 2015, Sackville, NB, Canada.
 - **P. Lelièvre** and C. Farquharson, 2014, 3D geophysical inversion for contact surfaces, *EGU General Assembly*, April/May 2014, Vienna, Austria.
 - A. Carter-McAuslan, **P. Lelièvre** and C. Farquharson, 2014, Joint inversion of gravity and seismic tomography data for modelling magmatic massive sulphide bodies, *EGU General Assembly*, April/May 2014, Vienna, Austria.
 - **P. G. Lelièvre**, A. Carter-McAuslan, C. G. Farquharson and N. C. Williams, 2014, Choices for effectively incorporating geological constraints into geophysical inversion, *KEGS Symposium*, March 2014, Toronto, ON, Canada.
 - Geophysical joint inversion honouring geological constraints from 3D models, **P. Lelièvre** and C. Farquharson, *Earth Modelling 2013*, October 2013, Vancouver, BC, Canada.
 - Integrating geological constraints into 3D geophysical inversions using unstructured meshes, **P. Lelièvre**, C. Farquharson and C. Tycholiz, *SGA General Assembly*, August 2013, Uppsala, Sweden.
 - Gravity and seismic tomography joint inversion: a synthetic study modelling magmatic massive sulphide type bodies, A. Carter-McAuslan, **P. Lelièvre**, and C. Farquharson, *EGU General Assembly*, April 2013, Vienna, Austria.
 - Integrating geological constraints into 3D geophysical inversions using unstructured meshes, **P. Lelièvre**, C. Farquharson and C. Tycholiz, *EGU General Assembly*, April 2013, Vienna, Austria.

- Joint inversion of seismic traveltimes and gravity data: A synthetic study using geologically realistic models from the Voisey's Bay deposit, A. Carter-McAuslan, **P. G. Lelièvre** and C. G. Farquharson, *AGU Fall Meeting*, December 2012, San Francisco, USA.
- Constrained geophysical joint inversion, **P. G. Lelièvre**, A. Carter-McAuslan, C. J. Tycholiz and C. G. Farquharson, *SEG 82nd International Meeting Workshop W-18: A Working Guide to 3D Inversion Methods in Mining Geophysics*, November 2012, Las Vegas, USA.
- Constrained geophysical joint inversion on unstructured meshes, **P. G. Lelièvre**, A. Carter-McAuslan, C. Tycholiz, and C.G. Farquharson, *Earth Modelling 2012*, October 2012, Montréal, QC, Canada.
- Refining 3D Earth models by unifying geological and geophysical information on unstructured meshes, **P. Lelièvre**, A. Carter-McAuslan, C. Tycholiz, C. Farquharson and C. Hurich, *EGU General Assembly*, April 2012, Vienna, Austria.
- Parameterization of the Earth's subsurface to flexibly emphasize distinct rock units, **P. Lelièvre**, P. Zheglova, T. Danek and C. Farquharson, *EGU General Assembly*, April 2012, Vienna, Austria.
- Refining 3D Earth models through constrained joint inversion on flexible unstructured meshes, **P. G. Lelièvre**, A. Carter-McAuslan, C. Tycholiz, C. G. Farquharson and C. A. Hurich, *KEGS Symposium*, March 2012, Toronto, ON, Canada.
- Unified geophysical and geological 3-D Earth models, **P. G. Lelièvre**, C. G. Farquharson, and C. A. Hurich, *EGU General Assembly*, April 2011, Vienna, Austria.
- Creating 3-D Earth models that unify geological and geophysical information, **P. G. Lelièvre**, C. G. Farquharson, and C. A. Hurich, *AGS Colloquium*, February 2011, Fredericton, NB, Canada.
- Joint Inversion of Seismic Traveltimes and Gravity Data on 3D Unstructured Grids for Mineral Exploration, **P. G. Lelièvre**, C. G. Farquharson, and C. A. Hurich, *AGU Fall Meeting*, December 2010, San Francisco, USA.
- Inversion of First-Arrival Seismic Traveltimes on 3D Unstructured Grids Without Ray Tracing, **P. G. Lelièvre**, C. G. Farquharson, and C. A. Hurich, *AGU Fall Meeting*, December 2010, San Francisco, USA.
- Joint inversion of seismic travel times and gravity data on 3D unstructured grids with application to mineral exploration, **P. G. Lelièvre**, C. G. Farquharson, and C. A. Hurich, *EGU General Assembly*, May 2010, Vienna, Austria.
- Joint and Cooperative Inversion Strategies for Mineral Exploration, **P. G. Lelièvre**, N. D. Phillips and D. W. Oldenburg, *AGU Fall Meeting*, August 2007, San Francisco, USA.
- Software for Reliable Classification of Metallic Ordnance and Non-Ordnance Items, **P. G. Lelièvre** and D. W. Oldenburg, *UXO/Countermines Forum*, March 2004, St Louis, USA.
- Magnetic forward modelling and inversion for materials of high susceptibility, **P. G. Lelièvre** and D. W. Oldenburg, *UXO/Countermines Forum*, September 2002, Orlando, USA.

Outreach Publications

- X. Lu, C. Galley, C. Farquharson and **P. Lelièvre**, 2022, Surface geometry inversion of geophysical electromagnetic data, *MTNet EMinar*, Online Web Seminar, 30 November 2022, <http://www.mtnet.info/EMinars/EMinars.html>.
- Research Spotlight highlighting the work in C. G. Galley et al. (2021): "Exploration and Evaluation of Deep-Sea Mining Sites", 14 February 2022, Research Spotlight, Eos.org, Aaron Sidder, <https://eos.org/research-spotlights/exploration-and-evaluation-of-deep-sea-mining-sites>.

Technology Transfer

Software Development

- JCube: software for determining facet types based on combined analysis of atomic force microscopy and electron backscatter diffraction; **P. G. Lelièvre**, R. Brüning, M. Hajati; provided to Atotech, Berlin, Germany, in 2022.
- MAGNUM: software for Multi-modal Applied Geophysical Numerical modelling on Unstructured Meshes (Fortran and C++); **P. G. Lelièvre**, R. Bijani, C. G. Galley, H. Jahandari, C. Tycholiz; available since 2015; provided to Geo Data Solutions and Geotexera.
- FacetModeller: creation of 3D geological models from cross-sections (Java); **P. G. Lelièvre** and G. Blades; openly available since 2015; provided to High Power Exploration, Geo Data Solutions and Geotexera.
- PODIUM: software for Preparation Of Data for Inversion on Unstructured Meshes (Fortran and C++); **P. G. Lelièvre**,

- R. Bijani and C. G. Galley; openly available since 2009; provided to Vale, High Power Exploration, Geo Data Solutions, Geotexera and EmPact-AI.
- JMorphy: software for morphometrics on digitalized images (Java); **P. G. Lelièvre** and M. Grey; openly available since 2010.
 - GIFTools: visualization and processing of geologic and geophysical information for use in geophysical inversions (Matlab and Fortran); **P. Lelièvre**, N. Williams, R. Shekhtman, G. Nash, N. Phillips, and D. Oldenburg; provided to UBC-GIF, Vancouver, BC, Canada, in 2009.
 - MeshTools2D: visualization and creation of 2D geophysical models (Matlab); **P. G. Lelièvre** and N. C. Williams; provided to UBC-GIF, Vancouver, BC, Canada, in 2009.
 - TMV3D: 3D geophysical inversion software for total magnetization vector (Fortran); **P. G. Lelièvre**, D. W. Oldenburg and Y. Li; provided to UBC-GIF, Vancouver, BC, Canada, in 2009.
 - MorphLab: software for morphometrics on digitalized images (Matlab); **P. G. Lelièvre** and M. Grey; openly available since 2008.
 - UXOLab: software for advanced discrimination of UXO (Matlab); S. Billings, **P. Lelièvre**, L. Pasion, L. Beran and D. Oldenburg; provided to U.S. Army Engineer Research and Development Center, U.S. Army Engineering and Support Center Huntsville, Sky Research, G-tek Australia and the Colorado School of Mines Center for Gravity, Electrical and Magnetic Studies in 2004.
 - MagNLF3D: 3D forward modelling software for high susceptibility magnetics (Fortran); **P. G. Lelièvre** and D. W. Oldenburg; provided to Fullagar Geophysics, Queensland, Australia, in 2003.

Patents Awarded

- UXOLab: Software for advanced discrimination of UXO, 2004, S. Billings, **P. Lelièvre**, L. Pasion, L. Beran and D. Oldenburg.

Scholarly and Professional Academic Activities

Thesis Examination

- 2023 Jul., External Examiner, Mahtab Rashidifard, PhD, University of Western Australia, Crawley, Australia, July 2023, *The integration of regional reflection seismic profiles and gravity datasets with different spatial coverage associated with geological models.*
- 2021 Feb., External Examiner, Daniel Boulay, MSc, University of New Brunswick, Canada, *Commissioning a three-dimensional electrical resistivity imaging system for seepage monitoring at an embankment dam abutment.*

Editorial Positions

- 2019–present: Associate Editor, Geophysical Prospecting
- 2015–2016: Associate Editor, Wiley-Blackwell

Visiting Scientist Invitations

- Speaker, geophysical inversion workshop convener and scientific collaborator, Clermont-Ferrand Centre for Volcano Research (ClerVolc), December 2017, Clermont-Auvergne University-CNRS, Clermont-Ferrand, France.

Invited Conference Presentations

- **P. Lelièvre**, M. Darijani, C. Galley, P. Zheglova and C. Farquharson, 2019, No Magic Bullet: Three Integrated Imaging Problems, Three Solutions, *International Union of Geodesy and Geophysics (IUGG) General Assembly*, July 2019, Montréal, Canada.
- C. Farquharson, J. Long, X. Lu and **P. G. Lelièvre**, 2017, Electromagnetic forward modelling for realistic Earth models using unstructured tetrahedral meshes and a meshfree approach, *AGU Fall Meeting*, December 2017, New Orleans, USA.

Convened Conference Sessions and Workshops

- Advancements in Magnetic Field Studies and Natural Resources Exploration, M. Fedi, M. Milano, **P. Lelièvre** and S. Liu, *EGU General Assembly 2024*, Session EMRP2.2, April 2024, Vienna, Austria.
- Advancements in Magnetic Field Studies and Natural Resources Exploration, M. Fedi, M. Milano, **P. Lelièvre** and S. Liu, *EGU General Assembly 2023*, Session EMRP2.8, April 2023, Vienna, Austria.
- 3-D Geological Models as Scientific Tools for Joint Inversion, Uncertainty Quantification, and Machine Learning, F. Wellmann, **P. Lelièvre**, S. Devriese, C. Farquharson and C. Bond, *EGU General Assembly*, Session TS8.1, April 2023, Vienna, Austria.
- 3D Computer Geological Modelling for Geophysicists and How to Integrate Geological and Geophysical Computer Earth Modelling, S. Devriese, C. Farquharson and **P. Lelièvre**, *SEG/AAPG IMAGE*, Workshop 09, September 2021, Denver, USA (virtual meeting).
- Joint inversion methods and other interpretation strategies to integrate multi-disciplinary geophysical data, M. Moorkamp, **P. Lelièvre**, N. Linde and A. Khan, *AGU Fall Meeting*, NS51A and NS53A, December 2015, San Francisco, USA.
- Structural interpretation and evolution of mineral systems from geological, geochemical and geophysical data, T. Blenkinsop, P. Sorjonen-Ward, **P. Lelièvre** and K. Gessner, *EGU General Assembly*, ERE6.1, April 2015, Vienna, Austria.
- Investigations of the Earth utilizing geophysics, **P. Lelièvre** and K. Butler, *AGS Colloquium*, February 2015, Sackville, NB, Canada.
- Structural interpretation and evolution of mineral systems from geological, geochemical and geophysical data, C. Juhlin, J. Raith, K. Gessner, M. Jessell, **P. Lelièvre** and P. Sorjonen-Ward, *EGU General Assembly*, ERE3.1, April 2014, Vienna, Austria.
- Constrained geophysical inversion, **P. Lelièvre** and C. Hurich, *EGU General Assembly*, absorbed by ERE3.1, April 2013, Vienna, Austria.
- Joint inversions and other strategies to integrate multi-disciplinary geophysical data, M. Moorkamp, B. Heincke and **P. G. Lelièvre**, *AGU Fall Meeting*, NS34A, NS31B, December 2012, San Francisco, USA.

Workshops Attended

- Speaker and participant at *A working guide to 3D inversion methods in mining geophysics*, Workshop W-18 at SEG 82nd International Meeting, November 2012, Las Vegas, USA.
- Participant at *Constrained inversion and presentation of AEM data of different systems with the Aarhus Workbench*, at ASEG 20th International Geophysics Conference, February 2009, Adelaide, Australia.
- Trainer at the 2008 (July) Instructional Skills Workshop (ISW) Facilitator Development Workshop held at the British Columbia Institute of Technology (BCIT), Burnaby, BC, Canada.
- Participant at the 2006 (July) ISW Facilitator Development Workshop held at the British Columbia Institute of Technology (BCIT), Burnaby, BC, Canada.

Editorial Duties for Peer-Reviewed Publications

The number of publications for each institution is indicated in parentheses:

- Associate Editor, *Geophysical Prospecting* (31)
- Associate Editor, Wiley-Blackwell (3)

Referee Duties

Life-time summary count		
Journals	139	in 19 titles
Expanded Conference Abstracts	9	in 2 titles
Grant Applications	10	in 4 titles
Total	158	

Below, the number of reviews for each title is indicated in parentheses.

Referee for Peer-Reviewed Journals

- Acta Geophysica (3), Computers and Geosciences (4), Geophysical Journal International (34), Geophysical Prospecting (5), Geophysics (57), Icarus (3), IEEE Access (1), IEEE Trans. on Geoscience and Remote Sensing (1), Interpretation (5), Journal of Applied Geophysics (11), Journal of Geophysical Research – Solid Earth (3), Mathematical and Computational Applications (1), Minerals (1), Near Surface Geophysics (1), Nonlinear Processes in Geophysics (2), Ore Geology Reviews (1), Pure and Applied Geophysics (2), Surveys in Geophysics (3), Transmissions on Geoscience and Remote Sensing (1).

Referee for Peer-Reviewed Expanded Conference Abstracts

- SEG International Meetings (4), GEM International Meetings (5)

Referee for Grant Applications

- NSERC Discovery Grants (1), NSF Grants (1), MITACS Accelerate Grants (7), ETH Zurich Research Commission (1)

Supervision

Abbreviations:

- University of New Brunswick (UNB)
- Mount Allison University (MtA)
- Memorial University of Newfoundland (MUN)

Postdocs

- Saeed Vatankhah, November 2022 – present, Supervisor, Postdoc, MtA.
- Mehrdad Darijani, Jan 2021 – July 2023, Co-supervisor with Colin Farquharson (MUN), Postdoc, MUN.
 - Has started a company, Geotexera, to provide services using the academic software developed by myself and collaborators.
- Xushan Lu, Feb 2022 – July 2022, Supervisor, Postdoc, MtA.
 - Now a Postdoc with Dr. Colin Farquharson, Department of Earth Sciences, MUN.
- Jianbo Long, Sep 2021 – Mar 2022, Supervisor, Postdoc, MtA.
 - Now a Postdoc with Dr. Shunguo Wang, Centre for Geophysical Forecasting, Department of Electronic Systems, NTNU, Trondheim, Norway.
- Chris Galley, Jan–Feb, 2022, Supervisor, Postdoc, MtA.
 - Now a Postdoc with Mark Hannington, Ottawa-Carleton Geoscience Centre, Department of Earth Sciences, University of Ottawa.
- Hormoz Jahandari, Aug–Jan 2021, Supervisor, Postdoc, MtA.
 - Now an employee with Dias Geophysical Ltd., Saskatoon, SK.

PhD Students

- Chris Galley, 2020–2022, Supervising committee, PhD, MUN.
 - Thesis: *The three dimensional modelling of seafloor hydrothermal alteration through voxel and surface based magnetic inverse modelling.*
 - Best Student Paper, Mining Session, Society of Exploration Geophysicists (SEG) Annual Meeting, 2021.

MSc Students

- Rocelle Mendoza, Feb 2023 – present, co-supervised with Dr. Karl Butler (UNB), MSc student, UNB.
- Dmitriy Danchenko, Jan 2021 – May 2024, co-supervised with Dr. Karl Butler (UNB), MSc student, UNB.

Undergraduate Students

- Nicholas Nagy, Summer 2024, Supervisor, Undergraduate Research Assistant, MtA. (planned, offered and accepted)
- Mehrad Hajati, Fall/Winter 2023/24, Supervisor, Honours Thesis, MtA.

- Recipient of the 2024 Calvert Award (\$1300), an internal award in the Department of Mathematics and Computer Science at MtA.
- Mehrad Hajati, Summer 2022 and 2023, Co-supervisor with Dr. Ralf Brüening (MtA Physics), Undergraduate Research Assistant, MtA.
- Eli Vandenberg, Summer 2021 and 2022, Supervisor, Undergraduate Research Assistant, MtA.
 - Recipient of the 2022 Calvert Award (\$1258), an internal award in the Department of Mathematics and Computer Science at MtA.
 - Second place Research Talk, Science Atlantic Mathematics, Statistics and Computer Science Division Conference 2021.
- Heidi Hebb, Summer 2021, Supervisor, Undergraduate Research Assistant, MtA.
- Annie Levesque, Summer 2021, Supervisor, Undergraduate Research Assistant, MtA.

Technicians

- Oluwalopeye (Lopsii) Olagoke, Aug 2022 – July 2023, Supervisor, Computer Programmer, MtA.

Teaching

Mount Allison University, Dept. of Mathematics and Computer Science

- 2021/2022–W: MATH 1151 “Applied Calculus”
- 2021/2022–F: MATH 2321 “Statistical Methods for Data Science”
- 2021/2022–F: MATH 1151 “Applied Calculus”
- 2020/2021–W: MATH 3311 “Probability and Statistics I”
- 2020/2021–W: MATH 1151 “Applied Calculus”
- 2020/2021–F: MATH 1151 “Applied Calculus”

Mount Allison University, Dept. of Geography and Environment

- 2015/2016–W: GENS 3991 “Natural Hazards”
- 2015/2016–F: GENS 4951 “Meteorology for Aviation”
- 2012: GENS 3991 “Natural Hazards”
- 2012: GENS 3991 “Natural Hazards”

University of British Columbia, Department of Earth and Ocean Sciences

- 2008: EOSC 595–TA1 “Teaching and Learning in the Earth and Ocean Sciences”
- 2007–2008: TA Training Program

University of British Columbia, Centre for Teaching and Academic Growth

- 2006–2009: Graduate Student Facilitator

Academic Honours and Awards

Honours

- 1999: Academic Scholar, Acadia University
- 1996–1999: Dean’s List, Faculty of Pure and Applied Science, Acadia University

Awards

- 2010: NSERC Postdoctoral Fellowship (\$80,000)
- 2006: Egil H. Lorntzen Scholarship, UBC (\$6,500)
- 2004: Graduate Entrance Scholarship, UBC (\$3,000)
- 2001: Egil H. Lorntzen Scholarship, UBC (\$4,000)
- 2000: Thomas and Marguerite MacKay Memorial Scholarship, UBC (\$4,000)
- 2000: NSERC Postgraduate Scholarship (\$17,300)
- 1998–1999: MacKay Memorial Scholarship in Physics, Acadia University (\$2,157)
- 1997–1998: MacKay Memorial Scholarship in Physics, Acadia University (\$2,157)
- 1996–1997: Physics Department Scholarship, Acadia University (\$1,500)
- 1995: Fred C. Manning Scholarship, Acadia University (\$250)

Professional Honours and Awards

- 2012: Outstanding Reviewer, Geophysics
 - 2006: Best Student Paper, SEG 76th International Meeting (\$750)
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Last updated: July 22, 2024