Curriculum Vitæ– Eric J. Martin, Ph.D., M.Sc. (Eng.), B.Sc.(Eng.), B.A., P.Eng.

Personal Information

Eric John Martin
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Summary

Environmental engineer with interdisciplinary expertise in hydrogeology, environmental data analysis, and engineering education. Research focuses on data-driven approaches to groundwater systems, environmental monitoring, and subsurface characterisation. Teaching and supervision emphasise clarity, access, and inclusive practice, particularly for international and first-generation students. Active collaborations with national research bodies support applied and interdisciplinary projects spanning sustainability, climate resilience, and digital methods in environmental engineering.

Education

- Ph.D. Civil Engineering (Environmental), May 2017, Queen's University, Canada
  Gas Production and Mass Transfer During the Electrical Resistance Heating of Clay Lenses
- M.Sc. (*Eng.*) Civil Engineering (Environmental), May 2009, Queen's University, Canada
  Laboratory Study Evaluating Electrical Resistance Heating of Pooled Trichloroethylene
- B.Sc. (*Eng.*) Chemical Engineering, September 2003, Queen's University, Canada
- B.A. Comparative English Literature, September 2003, Queen's University, Canada

Academic Experience

Lecturer in Civil and Environmental Engineering - *University of Greenwich* *May 2024 - Present*
Chatham Maritime, United Kingdom

- Programme Lead for M.Sc. Civil Engineering (Water, Waste and Environment)
- Module Lead and course redeveloper for M.Sc. Contaminant Hydrogeology & Groundwater Remediation and M.Sc. Hydrosystems
- Supervising M.Sc. research projects on shallow and deep learning methods for geological fluid property characterisation from image classification of micro-CT slices
- Development of research programme on emerging contaminant characterisation & delineation and GRACE dataset hydrogeological investigation
- Revision and delivery of B.Sc. Fluid Dynamics, Hydrosystems, and Environment & Earth Materials
- Guest lecturer on B.Sc. courses : Professional Skills, Water Engineering, and Introduction to Groundwater Modelling
- External Assessor for postgraduate and postdoctoral awards for Taighde Éireann (Research Ireland)
- External assessor for Digital Technology Solutions (Software Engineering) End-Point Assessments (DTS EPA) for Ford Pro apprenticeship programmes
- Active collaborator with the Centre for Advanced Simulation and Modelling (CASM)

Scientific Committee Member/Trainer - *SYMPLE* *Nov. 2023 - Present*
Remote

- Contributor to European programme in applied hydrogeological modelling, emphasising decision-focused workflows and uncertainty reduction
- Development and curation of hydrogeology content for an online platform of academic teaching and learning, largely serving the global south
- Coordination with academics from Technische Universität Dresden, Germany and Universitá di Roma Sapienza, Italy in platform content curation

Data Study Group Facilitator/Participant - *The Alan Turing Institute DSG* *Jan. 2025*
London, United Kingdom (Remote)

- Facilitated collaborative research in partnership with the British Geological Survey (BGS) to automate detection of shallow gas hazards in legacy seismic records for offshore renewable energy planning
- Contributed to images classification workflows using Convolutional Neural Networks (CNNs) to identify gas chimneys, acoustic blanking, and bright spots
- Developed image processing and noise reduction pipeline for legacy seismic data scans
- Supported automation of seismic interpretation for offshore geohazard screening; results scheduled for publication in summer 2025

Data Study Group Facilitator/Participant - *The Alan Turing Institute DSG* *Sept. 2024*
London, United Kingdom

- Facilitated collaborative research in partnership with the British Geological Survey (BGS) to develop Machine Learning automation for Carbon Capture and Storage (CCS)
- Contributed to feature extraction workflows from petrographic thin section images to evaluate geological sequestration potential
- Collaborated on preprocessing and images classification using a random forest model ; parallel efforts by the team included Convolutional Neural Network (UNet) approaches to mineral and pore structure identification

Lecturer in Hydrogeology (Fixed-Term) - *University of Birmingham* *Sept. 2021 - Jul. 2022*
Birmingham, United Kingdom

- Supervised and mentored M.Sc. students through research projects, ensuring academic rigor and fostering expertise in hydrogeology
- Led fieldwork instruction, and data analysis for groundwater testing and equipment operation
- Revised and taught M.Sc. courses (approx. 20 students) : Groundwater Flow and Transport Theory ; Groundwater Organic Contaminant Pollution and Remediation ; Borehole Design, Construction and Maintenance ; Water Resources Studies ; and Further Topics
- Revised and taught B.Sc. course (approx. 60 students), Introduction to Hydrogeology

Term Adjunct Lecturer - *Queen's University* *May 2017 - Dec. 2019*
Kingston, Canada

- Delivered Numerical Methods for Engineers, a core course on Finite Difference methods, numerical analysis, and time series modelling in environmental and structural systems using MATLAB
- Delivered Chemistry for Civil Engineers, a core requirement course introducing redox reactions, reaction kinetics, equilibria, electrochemistry, and applied environmental chemistry topics including adsorption, ion exchange, and microbial processes
- Developed and delivered Professional Skills for Engineers, a core upper-year course focused on technical writing, verbal communication, and the social, ethical, and stakeholder dimensions of engineering practice

Graduate Researcher - *Queen's University* *May 2005 - Nov. 2017*
Kingston, Canada

- Academic and industrial research on multiphase fluid flow, power density, and heat/mass transfer during electrothermal remediation
- Conceived, designed, and conducted large-scale laboratory experiments using electrical resistance heating (ERH) to investigate gas formation and VOC removal from heterogeneous porous media
- Applied time-lapse imaging and grayscale image subtraction to track spatial and temporal signal evolution during gas migration experiments
- Quantified saturation dynamics and developed models for latent-heat-driven thermal behaviours and mass transfer at interfacial zones
- Developed and implemented novel measurement techniques to assess the influence of material composition on gas formation and transport
- Constructed conceptual and mathematical models for VOC diffusion during ERH, incorporating temperature, saturation, tortuosity, and stochastic migration paths
- Teaching assistant for Applied Hydrogeology and Chemistry at B.Sc. and M.Sc. levels
- Mentored M.Sc. and junior Ph.D. students in experimental design, data analysis, and academic development

Professional Experience

Regional Hydrogeologist - *Ontario Ministry of the Environment* *May 2017 - May 2024*
Kingston, Canada

- Hydrogeological assessment, forensic review and led case research for the Ministry of the Environment, Conservation & Parks (MECP), focusing on industrial, agriculture and and infrastructure projects
- Authored scientific study results for submission to a Provincial Environmental Review Tribunal, related to renewable energy infrastructure
- Designed, coordinated and oversaw multi-year groundwater chemistry studies, managed research by teams of field technicians
- Hydrogeological assessments for industrial, agricultural, and infrastructure projects to ensure compliance with environmental standards and regulations
- Coordinated environmental impact assessments and monitored groundwater quality for long-term projects, ensuring alignment with Provincial and Federal regulatory frameworks
- Collaborated with Indigenous stakeholders and government agencies to address environmental concerns in planned mining and infrastructure developments
- Provided expert input on environmental policies and regulatory compliance, contributing to environmental stewardship initiatives and enforcement actions

Environmental Scientist (Contract) - *Arktis Solutions* *Sept. 2016*
Baffin Island, Canada

- Environmental impact assessments in high north on behalf of Indigenous stakeholders of mining operation
- Ensured compliance with band and Federal regulatory requirements

Publications

- (In press) Leeming, K., Martin, E.J., Alfaro, J., Akintola, M., Japnanto, J., Patsiukova, J., Wang, L., Shiranirad, M., Organokov, M., Tohme, R. and Lu, Z. Data Study Group Final Report : British Geological Survey - Detecting Shallow Gas from Subsurface Seismic Images. *The Alan Turing Institute.*
- Leeming, K., Martin, E.J., Frayling, L., Baker, S., Tsiakmakis, D., Hazaridis, N., Dalton, D. and Kadochnikova, A. (2025). Data Study Group Final Report : British Geological Survey - Identifying Potential for Carbon Capture and Storage in Rock. *The Alan Turing Institute.* Available at : https ://doi.org/10.5281/zenodo.14973572 [Accessed 17 Apr. 2025].
- Mumford, K.G., Martin, E.J. and Kueper, B.H. (2021). Removal of trichloroethene from thin clay lenses by electrical resistance heating : Laboratory experiments and the effects of gas saturation. *Journal of Contaminant Hydrology*, 243, p.103892.
- Martin, E.J., Mumford, K.G., & Kueper, B.H. (2018). Removal of TCE From Clay Lenses by Multi-Phase Diffusion During Electrical Resistance Heating. In : *Proceedings of the 4th World Congress on New Technologies (NewTech'18).*
- Martin, E.J. (2017). Gas Production and Mass Transfer During the Electrical Resistance Heating of Clay Lenses. *Doctoral dissertation.*
- Martin, E.J., Mumford, K.G., Kueper, B.H., & Siemens, G.A. (2017). Gas formation in sand and clay during electrical resistance heating. *International Journal of Heat and Mass Transfer*, 110, pp. 855-862.
- Martin, E.J., Mumford, K.G., & Kueper, B.H. (2016). Electrical Resistance Heating of Clay Layers in Water-Saturated Sand. *Groundwater Monitoring & Remediation*, 36(1), pp. 54-61.
- Martin, E.J., & Kueper, B.H. (2011). Observation of trapped gas during electrical resistance heating of trichloroethylene under passive venting conditions. *Journal of Contaminant Hydrology*, 126(3), pp. 291-300.
- Martin, E.J. (2009). Laboratory study evaluating electrical resistance heating of pooled trichloroethylene. *Master's dissertation.*

Certifications and Membership

- Professional Engineers Ontario *Nov. 2021 - Present*
  Accredited, Practicing P.Eng
- Centre for Advanced Simulation and Modeling *Aug. 2024 - Present*
  Research Centre, University of Greenwich
- School of Hydrogeological Modeling and Project-Related Strategies *Nov. 2023 - Present*
  Scientific Committee Member and Trainer

Academic Citizenship

- External Assessor - Taighde Éireann - Research Ireland *2024-Present*
- External Assessor - Digital Technology Solutions End-Point Assessor *2024-Present*
- Outreach & Recruitment - University of Greenwich *2024-Present*

Funded Research

- The Alan Turing Institute Data Study Group, January 2025
  Principal Investigators : British Geological Society, K. Ezenwaka, K. Leeming,
  Facilitator/Researcher : Eric Martin
  Funding Agency : The Alan Turing Institute, UK Research and Innovation (UKRI)
- The Alan Turing Institute Data Study Group, September 2024
  Principal Investigators : British Geological Society, K. Leeming,
  Facilitator/Researcher : Eric Martin
  Funding Agency : The Alan Turing Institute,UK Research and Innovation (UKRI)
- Natural Sciences and Engineering Research Council (NSERC) Discovery Grant
  Principal Investigators : K. Mumford and B.H. Kueper, Supporting Researcher : Eric Martin
  Funding Agency : NSERC of Canada
- Natural Sciences and Engineering Research Council (NSERC) Strategic Grant STPGP
  Principal Investigator : B.H. Kueper, Supporting Researcher : Eric Martin
  Funding Agency : NSERC of Canada
- Natural Sciences and Engineering Research Council (NSERC) Discovery Grant
  Principal Investigator : B.H. Kueper, Supporting Researcher : Eric Martin
  Funding Agency : NSERC of Canada