FULLY FUNDED PHD POSITION IN ORGANIC PHOTOVOLTAICS AND MICROGRID DESIGN

ELECTRIFIED TRANSPORTATION AND MICROGRID DESIGN FOR NORTHERN AND REMOTE COMMUNITIES

Supervisor: **Dr. Muthukumaran Packirisamy**

Laboratory: **Optical-Bio Microsystems Lab**

Department: **Mechanical, Industrial and Aerospace Engineering**

University: **Concordia University, Montreal, Canada**

Start Date: May 2026, September 2026

PhD Fellowship: 35K CAD per year for 4 years

PROJECT OVERVIEW

This PhD project is part of a broader initiative to design clean, reliable, and resilient energy systems for remote and off-grid environments. It explores the integration of electric vehicles, renewable generation, and novel solar technologies into cold-climate infrastructure, aiming to reduce emissions and dependency on fossil fuels.

Dr. Packirisamy is a Concordia University Research Chair, member of the National Academy of Inventors, and Director of the Optical-Bio Microsystems Laboratory, equipped with state-of-the-art microfabrication and testing facilities. He will lead the work on novel organic solar cells for power generation for EVs and northern climate buildings.

ROLE DESCRIPTION

- Design, fabricate, and optimize novel organic solar cells and modules for high efficiency and durability in cold and low-light environments.
- Characterize electrical, optical, and thermal performance of organic photovoltaic devices under northern climate conditions.
- Develop vehicle-integrated organic solar panels, including flexible, lightweight, and customizable form factors for EV surfaces.
- Investigate organic solar cells for building-integrated applications, including roofs, façades, garages, and semi-transparent PV windows.
- Study integration of organic PV with EV batteries and power electronics for energy harvesting, storage, and auxiliary power.
- Evaluate long-term stability and degradation mechanisms of organic solar cells exposed to extreme temperature cycles.
- Collaborate with industry and community partners to translate lab-scale organic PV innovations into applied energy systems.
- Disseminate results through high-impact publications, patents, and conferences in photovoltaics and sustainable energy.

REQUIREMENTS

- Master's degree (or equivalent) in Mechanical Engineering, Electrical Engineering, Materials Science, Energy Engineering, or a closely related field.
- Strong background in photovoltaics, solar energy systems, organic electronics, or semiconductor materials.
- Experience with fabrication and characterization of solar cells or thin-film devices (organic PV experience is a strong asset).
- Knowledge of PV performance metrics, degradation mechanisms, and environmental testing.
- Familiarity with EV energy systems, battery storage, power electronics, or vehicle-integrated energy solutions (asset).
- Interest in northern, cold-climate, or remote-community energy challenges, including resilience and infrastructure electrification.
- Ability to work with experimental setups, data acquisition, and performance modeling.
- Programming or data analysis experience (e.g., MATLAB, Python) for energy system evaluation.
- Strong written and oral communication skills, with the ability to work in interdisciplinary and applied research teams.

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WHAT WE OFFER

- Fully funded PhD position, including a competitive stipend and support for research-related expenses.
- Supervision and mentorship from Professor Packirisamy, an internationally recognized leader in organic solar cells, Honorary Concordia University Research Chair, and member of the National Academy of Inventors.
- Access to state-of-the-art laboratories and fabrication facilities for organic photovoltaics, materials characterization, and energy systems research.
- Opportunities to work on cutting-edge applications of organic solar cells for electric vehicles and northern-climate buildings with real-world deployment potential.
- Collaboration with industry partners, Indigenous communities, and interdisciplinary research teams through Living Lab and electrification initiatives.
- Strong support for publications, patents, conference participation, and professional development, including training workshops and networking opportunities.
- A supportive, inclusive, and collaborative research environment within Concordia University's Mechanical, Industrial and Aerospace Engineering Department.

HOW TO APPLY

Please send the following documents in a single PDF file to **volt-age.recruitment@concordia.ca**:

- Cover letter explaining why you are a good fit for the position
- Academic CV
- Transcripts
- Names and contact information of 2 referees
- One writing sample, e.g., published journal/conference paper
- Any other documents that might benefit your file

Subject of the email: **Electrified transportation_Your name**

Deadline: Applications will be reviewed on a rolling basis.
For all questions, please contact Alisa Makusheva at alisa.makusheva@concordia.ca