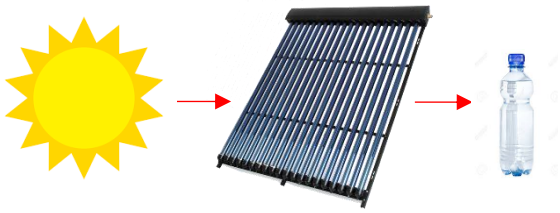
Carleton UNIVERSITY
Canada's Capital University



**Positions:** MASc and PhD students

**Research area:**

Design and field testing of a modular solar thermal water purification system for remote Indigenous community applications

**Supervisor**: Professor Jean Duquette

**Start date:** September 2023 (or earlier)

**Duration:** 2 years - MASc, 4 years - PhD

**Description:**

Remote Indigenous communities in Canada often face profound challenges in accessing clean drinking water and many depend on bottled water on a daily basis due to frequent long-term drinking water advisories. These communities are highly reliant on expensive fossil fuel as their energy supply, which could be used to provide high quality water, while also being under pressure from the federal government to meet GHG targets. With this background as the motivation for the proposed research, the long-term objective is to explore and advance the technologies associated with addressing the nexus of problems of water quality, energy use, and GHG emissions that will be useful to government, academia, and the private sector for guiding policy development, informing scientific inquiry, and providing potential pathways for commercialization, respectively. One such technology is a solar thermal assisted multi-effect distillation (solar-MED) water purification system. In the current project, graduate students will focus on breaking new ground in the design and optimization of solar-MED systems via numerical and experimental means. These systems operate at low temperature and make use of multiple tanks for evaporating non-potable feed water at sub-atmospheric pressures to produce fresh water. The shorter-term objectives being addressed relate to the translation of the solar MED system's effectiveness in hot arid climates where sunlight is abundant, in order to improve their performance in other remote and less favorable climate regions of the world and identifying evidence-based approaches for increasing system performance and reducing cost. In addition to the project aspects of the work, graduate students will be expected to attend conferences, and publish their work in international peer-reviewed journals.

**Stipend:**

- Domestic MASc students: Eligible students receive a minimum guaranteed funding package of $19,000/year plus TA (CGPA dependent). Additional top-ups will be provided for students awarded external scholarships (NSERC, OGS, etc…).
- Domestic PhD students: Eligible students receive a minimum guaranteed funding package of $40,000/year for four years (including RA, TA, and scholarships). Additional top-ups will be provided for students awarded external scholarships (NSERC, OGS, etc…).
- International graduate students: *International PhD students will receive a bursary that is equivalent to the cost difference between international and domestic PhD tuition. Qualified MASc and PhD students are eligible for RA, and TA positions based on student GPA and budget availability.*

Carleton UNIVERSITY

Canada's Capital University

**Eligibility:**

Candidates should

- have a strong background in heat transfer, fluid mechanics, and thermodynamics;
- be familiar with the engineering design process and open-ended problem solving;
- have experience with numerical modeling and simulation (*e.g.*, Matlab/Simulink, TRNSYS, ANSYS-Fluent), and/or experimental methods.

In addition, candidates should be highly motivated and self-directed, and demonstrate strong oral/written communication skills in the English language.

**Contact:**

Please email your CV, transcript(s) and a statement describing how your skills and qualifications fit the position (in a single pdf file to Jean Duquette at: jean.duquette@carleton.ca.)

In the body of the email, please include your name, desired start date, and whether you are a domestic or an international student.