**A PhD position in the modelling of separation processes and negative emissions technologies is open in the Alternative Pathways for the Energy Transition (APEX) laboratory at Carleton University.**

**The Position**

The PhD candidate will **develop open-source process models** of negative emissions technologies (NETs), like [direct air capture of CO2 (DAC)](https://www.nature.com/articles/s41467-020-20437-0) and carbon capture, utilization and storage (CCUS). This will involve the development of a large database of process parameters for different NET systems; the development of Python models to represent NET systems; and the validation of computational model results using peer-reviewed literature and an understanding of engineering fundamentals.

These open-source models will be integrated into several large-scale network optimization models of the Canadian energy system that the APEX group is developing. Together, these models will support decisions on where to deploy Negative Emissions Technologies (NETs, like [direct air capture of CO2 (DAC)](https://www.nature.com/articles/s41467-020-20437-0) and carbon capture, utilization and storage (CCUS)) to minimize grid energy requirements and maximize renewable energy use. The overall goal of this research is to [guide successful near-term deployment](https://iopscience.iop.org/article/10.1088/1748-9326/abd19e/meta) of these technologies. This research is part of a six-year grant supported by Environment and Climate Change Canada (ECCC). As such, the PhD candidate will have the opportunity to brief ECCC and other government and industry stakeholders on the results of the research and modeling efforts.

**Qualifications**

We are looking for a candidate with a bachelor’s or master’s (preferable) degree in chemical engineering, mechanical engineering, industrial engineering, energy systems engineering, or related fields. In particular, the following requirements apply:

* Strong understanding of separation processes (solvent-based absorption and sorbent-based adsorption) and interest in deepening that understanding.
* Proven experience with process modeling software, such as Modelon or Aspen HYSYS
* Proven experience with Python coding
* Experience with algebraic modeling languages such as Pyomo, GAMS, or AMPL is considered a plus
* Proven ability to independently conduct research
* Proven ability to work individually as well as part of a team
* Excellent communication and writing skills
* Foreseen **starting date: September 2022** (negotiable)
* Location: Ottawa, ON, Canada

**How to apply**

Applications should include:

* A resume, highlighting academic achievements including publications, if applicable
* A **motivation letter** with a description of research interests and skills (2 pages max)
* An **unofficial transcript**
* The **name of two references**, their current position and relationship to the applicant

To ensure full consideration, candidates should apply by **June 30, 2022**although the position will remain open until filled**. To submit your application,**or for more information concerning this position, please email **Dr. Ahmed Abdulla** (ahmed.abdulla3@carleton.ca).

We appreciate all applicants' interest, though only those selected for further consideration will be contacted for an initial, short interview. Candidates should be prepared to share past examples of code or process models and discuss the fundamentals of separation processes during the interview.

**About Carleton University**

Carleton University is a dynamic and innovative research and teaching institution with a national and international reputation as a leader in collaborative teaching and learning, research and governance. With over 31,000 students in more than 100 programs of study, we encourage creative risk-taking, discovery, and the generation of transformative knowledge. We are proud to be one of the most accessible campuses in North America.

Carleton’s location in Ottawa, Ontario provides many opportunities for scholarship and research with numerous and diverse groups and institutions. Canada’s capital has a population of over one million and reflects the country’s bilingual and multicultural character. To learn more about our university and the City of Ottawa, please visit www.carleton.ca/about.

We are strongly committed to equity, diversity, and inclusion in the hiring process. Carleton University fosters diversity within its community as a source of excellence, cultural enrichment and social strength. We welcome those who would contribute to the further diversification of our university including, but not limited to women; visible minorities; First Nations, Inuit and Métis peoples; persons with disabilities; and persons of any sexual orientation, gender identity, or expression.

If you are selected for an interview, we ask you to reach out as soon as possible to discuss any accommodation requirements so appropriate arrangements can be made.