

Postdoc & PhD Positions in Plasma-Agriculture

The future of greenhouse farming is carbon negative. Our collaborative project **PLANET** establishes technologies to free greenhouse and indoor farming from its dependence on noxious pesticides and carbon-intensive nitrogen fertilizers. A new vision for a healthier and safer environment is shaped by using plasmas to electrify chemistry.

PLANET is a consortium of over 10 research groups from *Polytechnique Montréal*, *McGill University*, *Laval University*, *Agricultural Research Institute IRDA*, *Cinteq*, as well as the largest greenhouse producer in Quebec *GenV* and Ontario greenhouse producer *Growcer*. We work with *Les Producteurs en Serre du Québec*, the *Mohawk Council of Akwesasne*, as well as with Polytechnique's student technical society *Aquapoly*.

As a postdoc/PhD in the project PLANET, you will develop and understand novel plasma processes – your responsibilities include:

- developing energy efficient plasma processes in plasma liquid interaction
- developing and using plasma diagnostics for plasma and liquids
- developing an understanding of plasma generation of nitrogen and oxygen species in complex liquids
- working with an interdisciplinary team to scale the process and understand the technology's potential to reduce the carbon footprint of agriculture
- publishing and presenting your research results

Project **PLANET** has a duration of four years.

Its three research axes combine fundamental science & engineering, socioeconomic & ecological impact and sustainability to find applied solutions for electrification of greenhouse farming.

Your profile:

- You have a background in plasma science and technology
- You have a good university record
- You are curious and dedicated
- You have demonstrated good research abilities in peer reviewed publications and conference presentations (requirement for postdoc and asset for PhD)

A) Fundamental Science and Engineering



Local production of CO₂-neutral nitrogen fertilizers to limit dependence on high carbon-footprint mineral fertilizer and GHG intensive international supply chain



Local production of non-polluting pesticides, increasing production-yield by combating fungal infections and pathogens

B) Socio-Economic and Ecological Impact



Establish a **self-sustaining decentralized approach** for small- & large-scale greenhouse producers, remote and indigenous communities, urban farming



Engage with greenhouse producers to determine **valuation and increase adoption of plasma-based practices and technologies** for resilient greenhouse farming.

C) Sustainability and Applied Solutions



Enabling sustainable electrification of greenhouse production by CAPEX/OPEX and **lifecycle analysis**, with tailored carbon and environmental footprints



On-demand nitrogen nutrient and pesticide production for controlled farming, minimizing nitrogen use, ready for integration into smart farming concepts

Applications should be sent to planet@polymtl.ca using the subject line

"R251 – PLANET Postdoctoral Fellow" or "R252 – PLANET PhD".

Please send your application as a single **PDF file including** full CV, university grades, awards and scholarships, a cover letter describing research interests and goals (max. 1 page), full list of publications highlighting with a short explanation your most relevant peer reviewed works, contact information of three references.