



Six new positions in Bioenergy at the University of Calgary

In 2016, the University of Calgary was awarded \$75 million over seven years from the [Canada First Research Excellence Fund](#) (CFREF) for its initiative entitled: “**Global Research Initiative in Sustainable Low carbon Unconventional Resources**”. The goal of this research is to dramatically reduce the impact of energy extraction and production on the environment.

One of the CFREF themes focuses on **bioenergy** and includes the air capture of carbon dioxide, organic photovoltaics, production of algal biomass, conversion of biomass to methane and other products, and life cycle assessment. For this theme, we are currently recruiting 4 PhD students and 2 postdoctoral fellows.

Successful candidates will join a multidisciplinary team of materials chemists, microbial ecologists, bio- and chemical engineers, currently consisting of 5 principal investigators and >10 postdoctoral fellows, PhD students and undergraduates. We seek applications from qualified candidates within 1-4 years of their PhD degree (as postdoctoral fellows) and motivated young scientists with a passion for clean energy and interdisciplinary research (as PhD students). The required qualifications are as follows:

1. **(1 PDF large area organic photovoltaics):** PhD in chemistry, physics or materials science with an emphasis on organic electronics and/or solar cells. The ability to fabricate and test organic solar cell devices. Experience with large area module fabrication is desired. The successful candidate will be expected to optimized small area organic solar cells, establish protocols for large area films and module fabrication, and oversee integration of the photovoltaic with algal growth. More information: Greg Welch (gregory.welch@ucalgary.ca).
2. **(1 PhD materials synthesis):** BSc and/or MSc in chemistry or materials science. Demonstrated research ability in synthetic chemistry and/or materials science. The student will be responsible for the design, synthesis, and characterization of novel photoactive materials for use in organic solar cells. More information: Greg Welch (gregory.welch@ucalgary.ca).
3. **(1 PhD air capture of carbon dioxide):** MSc in chemistry, chemical engineering or materials science with a passion for absorption in packed beds reactors and familiarity with metal organic frameworks and/or ion exchangers and nanostructuring of solids. The student will be responsible for the material selection and optimization of air capture of carbon dioxide. More information: George Shimizu (gshimizu@ucalgary.ca).
4. **(1 PhD downstream processing of biomass):** MSc in biochemical, chemical, or environmental engineering, or microbial ecology with a passion for anaerobic digestion and/or thermochemical conversion and/or biorefineries. The student will be responsible for development and optimization of biomass conversion pathways. More information: Hector de la Hoz Sieglar (hdsieglar@ucalgary.ca).

5. **(1 PDF algal cultivation):** PhD in algal biotechnology with an emphasis on optical approaches to determine photosynthetic yields/productivity. The successful candidate will develop optical approaches (e.g. hyperspectral imaging, chemometrics) to assay and optimize photobioreactor performance. More information; Marc Strous (mstrous@ucalgary.ca).
6. **(1 PhD life cycle assessment):** MSc in engineering with a passion for life cycle assessment and/or analysis of techno/economic feasibility in a clean energy context. More information: Joule Bergerson (jbergers@ucalgary.ca).

In addition, each candidate will be required to work within a team environment and so excellent communication skills and the ability to work effectively with a diverse group of interdisciplinary researchers is a must.

In assembling the CFREF research teams, aggressive diversity and equity targets are in place and so applications from qualified female candidates are especially encouraged.¹

Postdoctoral positions offer stipends of \$55,000 CAD/year for two years, plus benefits, travel and computer allowance, and operating budgets. PhD positions offer stipends of \$25,000 CAD/year and have guaranteed funding for 4 years. PhD students are expected to follow the rules outlined by the hosting department. All students and post-doctoral fellows will be expected to apply for major funding opportunities they are eligible for (e.g. NSERC, Killam, AITF, Banting)

Applications should consist of a current CV, a list of 2-3 referees with contact information and a cover letter indicating which area you are interested in and what your availability is. The search will continue until the team is assembled. Please send applications to Natalia Babanova (nbabanov@ucalgary.ca).

Background information

Hendsbee AD, Sun JP, Law WK, Yan H, Hill IG, Spasyuk DM, Welch GC (2016) Synthesis, Self-Assembly, and Solar Cell Performance of N-Annulated Perylene Diimide Non-Fullerene Acceptor. *Chemistry of Materials*. 28:19, 7098-7109.

Sharp CE, Urschel S, Dong X, Brady AL, and Strous M (2017). Robust, high-productivity phototrophic carbon capture at high pH and alkalinity using natural microbial communities. *Biotech Biofuels* 10: 84. doi 10.1186/s13068-017-0769-1.

Canon-Rubio KA, Sharp CE, Bergerson J, Strous M, De la Hoz-Siegler H (2016) Use of highly alkaline conditions to improve cost-effectiveness of algal biotechnology. *Applied Microbiology and Biotechnology* 100:4, 1611-1622.

Vaidhyanathan R, Iremonger SS, Shimizu GKH, Boyd PG, Alavi S, Woo TK (2010) Direct observation and quantification of CO₂ binding within an amine-functionalized nanoporous solid. *Science* 330: 650-653.

¹ *The University of Calgary recognizes that a diverse staff/faculty benefits and enriches the work, learning and research experiences of the entire campus and greater community. We are committed to removing barriers that have been historically encountered by some people in our society. We strive to recruit individuals who will further enhance our diversity and will support their professional success while they are here. We encourage all qualified applicants to apply.*