Next generation rain jacket finishing via droplet manipulation research positions available
University of Toronto, Department of Mechanical Engineering

Postdoctoral fellow / MASc (2 positions available, each for 2 years), starting **Jan – May, 2023**.

Prof. Golovin invites applicants to apply for two positions available in the Durable Repellent Engineered Advanced Materials (DREAM) Laboratory, for an industrially sponsored research project aiming to innovate rain-protective fabrics that are also highly breathable.

Below are project details, specific roles, and desired qualifications. Interested candidates should email Dr. Golovin with a cover letter and CV and specifically mention the "rain jacket project" in their email to kevin.golovin@utoronto.ca.

Project Background
Rain protection is typically provided by hydrophobic plastics that do not allow for liquid or gas permeation. While this keeps rain out, it also keeps sweat in, which prevents evaporative cooling and leaves those perspiring in rainy co nditions often wetter from sweat than from rain. In partnership with lululemon athletica, the DREAM Laboratory will be designing porous rainwear that utilizes next-generation droplet manipulation that will keep rain out but allow for evaporative cooling. This will be achieved using bio-inspired fabric finishes that are derived from green chemistry.

Desired qualifications
This project would benefit from knowledge in materials, textile modification, organic chemistry, and droplet fluid mechanics. The project, though not limited to purely experimental research, will require the fabrication and evaluation of treated fabric swatches. As such, strong experimental skills are essential. Knowledge of wettability theory, surface engineering, textile engineering, textile finishing/dying, and general experimental design is desirable. Successful candidates will be expected to meet (virtually and in-person) regularly with lululemon personnel, and strong soft skills (presentation, report writing, ideation) are essential.

Postdoctoral and MASc positions
The postdoctoral fellow should have a strong background in academic research with a focus on chemistry, textile finishing, coatings, or fluid mechanics and more specifically droplets. The postdoctoral fellow will be expected to design and perform experiments, synthesize and characterize fabric finishes and finished fabrics, and analyze data / write reports and scientific publications on the results. The postdoc should also mentor the MASc student, present their finding in regular meetings with lululemon, and generally manage the project. The MASc student should have a degree in Engineering, preferably in fluid mechanics, materials, chemical engineering, or a related field.

The DREAM Lab values diverse viewpoints, backgrounds, and inclinations. Those traditionally underrepresented in higher education are particularly invited to apply.