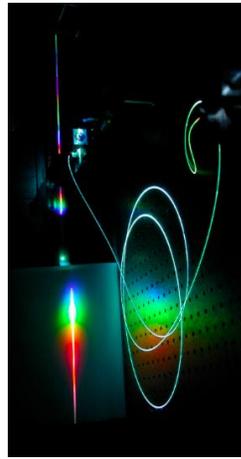
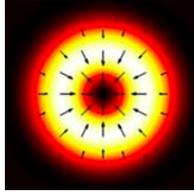
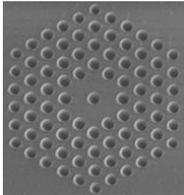




Le génie pour l'industrie



Quantum communications and metrology using specialty optical fibers (Ph.D. student or postdoctoral scholar)

The potential applications of optical *vortex* beams have yet to reach their maturity. One area of vigorous investigation relates to their potential ability to dramatically enhance the data transmission capacity of optical networks through space-division multiplexing (SDM) schemes [1]. Advances in SDM depend notably on the design, fabrication and testing of novel specialty optical fibers [2,3]. Recent works have also shown promising use of optical vortices and SDM in **quantum communications** and towards a future quantum Internet [4,5].

One of the objectives of a new [Research Chair in ETS](#) is to contribute in the development of novel photonic devices (sources, sensors, fibers, etc.) and methods in the field of **quantum communications** and **quantum metrology**. The chosen candidate will participate on one or several research projects that will put to work the unique **specialty optical fibers**, multiple lasers and advanced instruments used for the generation, transmission and monitoring of the vortex beams and their quantum states. A background in quantum optics and/or metrology is desirable for this position. The project will benefit from state-of-the-art facilities in micro-nano-fabrication and characterization capabilities of materials and optoelectronic devices within the [LACIME](#) laboratory in ETS, which is welcoming its members this year in new offices as well as expanded lab space and technical capabilities. Our research group is also part of the strategic photonic cluster [COPL](#) which offers additional opportunities for networking, internships, technical support, visibility and collaboration.

Interested applicants are invited to contact [Bora Ung](#) (he/him) at bora.ung@etsmtl.ca for more information. Our group is committed to fostering a safe and inclusive learning and work environment where students and scholars coming from diverse backgrounds are encouraged to achieve their personal growth and life goals.

[1] A.E. Willner *et al.* *Advances in Optics and Photonics* 7, 66–106 (2015)

[2] B. Ung *et al.* *Optics Express* Vol. 22, No. 15 (2014)

[3] M. Sharma, P. Pradhan and B. Ung. *Scientific Reports* 9:2488 (2019)

[4] B. Ndagano *et al.* *Journal of Lightwave Technology* Vol. 36, No. 2 (2018)

[5] G.B. Xavier and G. Lima. *Nature Communication Physics* 3:9 (2020)