POLYTECHNIQUE MONTRÉAL

LE GÉNIE EN PREMIÈRE CLASSE

SÉMINAIRE DU DÉPARTEMENT DE GÉNIE PHYSIQUE

Jeudi 3 octobre 2019 – 11h00

Pavillon Lassonde, salle L-2710

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Light at Heart - Fiber optics from laboratory to market

Endoscopy has changed modern medicine by allowing physicians to explore inner organs with minimal trauma. Single optical fiber endoscopes offer the potential to further increase patient comfort and increase access to remote organs through miniaturization. Current research focuses on sub-millimeter endoscopy using dedicated optical fibers for imaging large volumes of tissue. One such fiber - the double clad fiber - allows many imaging modalities to be performed simultaneously for greater diagnostic sensitivity and specificity. Double-clad fiber couplers combine the properties of single-mode fiber light delivery with the high collection efficiency provided by multimode fibers. They are used in multiple sensing and imaging applications including surface plasmon resonance, optical coherence tomography, confocal and nonlinear microscopy. Recent work allowed increasing their performance to quasi-lossless transmission through the single-mode core combined with >85% transfer efficiency of multimode light. This presentation will focus on applications of double-clad fiber couplers as well as on the brief history of their commercialization.

Caroline Boudoux *is a full professor & rookie entrepreneur and she obtained her PhD from the Harvard-MIT Health Sciences and Technology program (USA) in biomedical optics in 2007. She then completed a post-doctoral fellowship at École Polytechnique (France) on coherent control applied to nonlinear microscopy before launching her laboratory at École Polytechnique Montréal (Canada). Her research topics range from laser-tissue interactions, to novel hardware, such as lasers and fiber optics couplers, for imaging. These couplers are used in medical institutions worldwide, in applications ranging from optical coherence tomography (OCT) and confocal micro-endoscopy imaging to laser coagulation. With a colleague, Prof. Nicolas Godbout, she co-founded Castor Optics Inc., a spin-off company commercializing a new line of double-clad fibers couplers in a strategic partnership with Thorlabs Inc. She is the author of Fundamentals of Biomedical Optics, a comprehensive textbook for senior undergraduate and graduate students, as well as two other textbooks. She has won several teaching and research awards, including a Fulbright fellowship in 2015 to spend a sabbatical year at Stanford University.*

Vous êtes tous les bienvenus.

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