

SEMINAR ANNOUNCEMENT

Prof. Ziad Saghir

LOCATION: Seminar room of the Mechanical Engineering Department (1B11)

DATE: March 1, 2019 (Friday) at 10:30 am

All the faculty members, research assistants and students are invited.

From Ground Base Experiment to the International Space Station (ISS): Lessons Learned

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Abstract

Microgravity environment offer a unique opportunity to study flow behavior in the absence of gravity. Different experiments were conducted by the speaker on board the Space Shuttle, Unmanned FOTON satellite and recently on board the International Space Station. This talk will give the audience a 14 years' experience of conducting research on board different space vehicle. In particular recent effort have been in oil recovery. An accurate simulation of the various forms of mass flux is important in oil exploration and optimal oil recovery. The diffusion and thermodiffusion coefficients of binary hydrocarbon mixtures have been measured and analyzed in detail elsewhere, as one step forward. Here we measured the separation in a ternary hydrocarbon mixture of tetrahydronaphthalene, isobutylbenzene, and dodecane at five different compositions due to thermal gradients, and we determined the Soret and diffusion coefficients of this mixture. The thermodiffusion experiment was conducted by means of a Mach-Zehnder Interferometer (MZI) using two wavelengths and in a low gravity environment on board the International Space Station (ISS).

Biography

Prof M. Ziad Saghir is a Professor at Ryerson University and Canada's most experienced reduced-gravity researcher. He is Canada's top performer at leveraging departmental and provincial research funds with national (NSERC, CSA) and international funding agencies to pursue Canadian space science objectives onboard the International Space Station (ISS). His talent as a space scientist and university educator is consistently requested by the international space physical science mission community. He leads a group of very strong graduate students and post-docs that come from academia and industry, with interest in and application to deep hydrocarbon reservoirs. His innovation is recognized internationally through consistent invitations from European researchers that identify him as applying the maximum knowledge gained from long-duration gravity-driven phenomena in fluid physics to industrial processes. He has been PI or Co-I of Foton-M2 and M3 SCCO recoverable satellite missions (2007), the ISS SODI-IVIDIL (2009) and DSC (2010) missions, the ISS SODI-DCMIX mission (2011-15), and was the national coordinator of the CSA discipline working group on the role of gravity in metals and alloys. Canada's contribution to the SODI-DCMIX mission is to clarify the role of gravity on the movement of hydrocarbons across temperature gradients-important knowledge for Canada's deep oil reservoir sector (Hybernia Oil field and Northern exploration of oil reservoir deposits). Over the past decade, Prof. Saghir has been working in collaboration with TOTAL and researchers in France to apply innovation to benefit Canada's competitiveness in hydrocarbon extraction from oil reservoirs, a top priority of the Federal Government. He has published over 200 scientific journal paper related to energy. He is currently the chair of the International conference on Thermal Engineering (www.ictea.ca).