Exploring the Ocean Floor with Synthetic Aperture Sonar

Dr. Jeremy Dillon

We are pleased to welcome Dr. Jeremy Dillon back to give a research talk on synthetic aperture sonar. Dr. Dillon will also discuss his career path that led to a scientific position in industry. Undergraduate and graduates students who may be wondering "Why take physics? why do a grad degree in physics or physical oceanography?" are especially invited to this presentation

DATE: Wednesday, October 30, 2013
TIME: 1:00 PM
PLACE: C2045

ABSTRACT: Synthetic Aperture Sonar (SAS) is a technology for generating high-resolution seabed imagery using a technique similar to Synthetic Aperture Radar (SAR). The forward motion of the sonar platform is used to synthesize an array that is much longer than the physical length by combining multiple pings in software. The resulting images have a resolution that is independent of both range and frequency, thereby circumventing the usual trade-off between range and resolution in conventional sonar.
The presentation will describe the principles of synthetic aperture imaging with an emphasis on the properties of the underwater environment that distinguish SAS from SAR. Many interesting SAS images will be presented from recent sea trials onboard a variety of autonomous underwater vehicles. Although naval mine warfare has been the main driver for development, it will be shown that SAS is truly a "dual-use" technology with great potential for subsea surveying, benthic habitat mapping, underwater archaeology, and mineral exploration.

Dr. Jeremy Dillon received the BEng degree in aerospace engineering from Carleton University in 1996, the MSc degree in aeronautics from the California Institute of Technology in 1999, the MSc degree in mathematics from Carleton University in 2006, and the PhD degree in physics and physical oceanography from Memorial University of Newfoundland in 2011. Dr. Dillon is currently a Senior Scientist with Kraken Sonar Systems in St. John's. His research interests are in optimal estimation, underwater acoustics, synthetic aperture sonar, and repeat-pass interferometry.

ALL ARE WELCOME!!!