



Monitoring Changes in Arctic Permafrost Using Geophysical Methods

Room 303,
Fok Ying Tung Remote Sensing Science Building,
The Chinese University of Hong Kong

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3:30 - 5:00pm

Speaker

Dr. Lin Liu

Faculty of Science

The Chinese University of Hong Kong



Dr. Lin Liu recently joined CUHK's new Earth System Science Programme under the Faculty of Science. He is a geophysicist by training, from an undergraduate program in Wuhan University, a PhD in the University of Colorado. Before joining the CUHK, he was a George Thompson Postdoc Fellow at Stanford University, working with the radar remote sensing and environmental geophysics groups. His study applies a wide range of geophysical techniques to the Earth's complex cryospheric systems, aiming to quantify and understand their significant changes in a warming climate. He conducted four field trips in polar regions including Alaska and Greenland. The next one in planning is a trip to the Tibet Plateau.

Abstract

The Arctic climate has experienced more rapid warming than anywhere else on Earth over the past several decades, and this trend is expected to continue over the next century. Observed evidence shows that the active layer and permafrost are already undergoing changes in response to this warming trend. Changes in the thermal state of permafrost and active layer dynamics have profound effects on terrestrial ecosystems, on hydrologic and landscape processes, and on human infrastructure in the Arctic and Sub-arctic. Thawing permafrost could potentially emit carbon dioxide and methane to the atmosphere and will play a major role in future climate change. I present our recent studies on permafrost structures and dynamics using Interferometric Synthetic Aperture Radar (InSAR), Ground Penetrating Radar (GPR), and Surface Nuclear Magnetic Resonance (SNMR). I will demonstrate the necessity and benefits of combining multiple methods.