

International Pacific Research Center Special Seminar  
**An abrupt climate change event in Eastern Asia ~16,100  
years ago**

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As our planet is experiencing unprecedented greenhouse warming, sea level rise and ocean acidification the question arises whether the continuation of any of these trends could lead to threshold behavior either in physical or biological systems. Earth system computer models used to project future planetary warming still have difficulties in capturing the extremely variable climate during the last glacial period (~80-15 thousand years ago), which was characterized by abrupt warming transitions, unpredictable ice-sheet instabilities, and large-scale centennial to millennial shifts in ocean circulation. To elucidate the underlying physical processes and improve earth system models' capabilities to simulate spontaneous climatic transitions, climate scientists rely on accurate reconstructions and improved physical understanding of abrupt past climate changes on regional to global scales.

In this presentation I will take you on a journey that begins in the caves of Gangwon do in the northeastern part of South Korea, and ends in the discovery of a remarkable abrupt climate transition that occurred around 16 thousand years. This event was characterized by one of the most abrupt large-scale coolings recorded to date. Within 5-10 years the entire northern hemisphere plunged into a cold state, which lasted for about 100 years. To identify the causes of this event, we combined new geochemical and isotopic proxies from Korean stalagmites with isotope-enabled climate model simulations. The most likely explanation, which is consistent with the global fingerprint of the recorded event, is that a huge glacial meltwater lake burst into the northern North Atlantic, leading to increased ocean stratification, massive sea ice formation and large-scale reorganizations of leading to increased ocean stratification, massive sea ice formation and large-scale reorganizations of the atmospheric circulation, which impacted even remote regions such as the Korean Peninsula and Australia. Such events are not explicitly resolved in the current generation of climate models, which lack icesheet dynamics and complex hydrology.

**10:30am, Friday, January 12, 2024**  
Pacific Ocean Science and Technology Building, Room 414  
University of Hawai'i at Mānoa