



Contribution ID: 336

Type: **Oral presentation**

The Center for Oldest Ice Exploration (COLDEX) and Opportunities for International Collaboration

Friday, 7 October 2022 09:40 (20 minutes)

The Center for Oldest Ice Exploration (COLDEX) is a US NSF Science and Technology Center (STC) funded in 2021 and a new US contribution to IPICS Oldest Ice Goals. COLDEX is a multi-institution collaboration to find and analyze the oldest ice preserved in the Antarctic ice sheet. COLDEX is headquartered in the College of Earth, Ocean, and Atmospheric Sciences at Oregon State University.

COLDEX research goals are underpinned by several decades of international research on cores drilled through the polar ice sheets. This work has revealed how the composition of Earth's atmosphere and climate are linked on many time scales, from ice-age cycles to abrupt climate changes, and provides the groundwork for our understanding of human impacts on climate and the environment. However, the existing ice core data do not extend far enough back in time to reveal how the Earth system behaves under warmer than present conditions. Reaching these time periods is critical for understanding our future, and is also a significant challenge, requiring a coordinated approach and sustained collaboration of numerous research groups. COLDEX also addresses challenges in making polar science more equitable for people from diverse backgrounds and perspectives, and in making scientific knowledge from our work relevant, useful, and accessible to educators, policymakers, students, and a broad range of communities.

COLDEX activities include searching for a site for a 1.5 Ma ice core in the East Antarctic interior with new airborne data and modelling, development of existing and new ice margin sections where ice as old as 2.6 Ma has already been recovered, new rapid access tools and radar technologies, a broad program of ice core analysis, research on the social network of the center and its links to stakeholders and the public, education and professional development focused on ice core science and scientists and a focus on improving equity, diversity and inclusivity in our field.

COLDEX welcomes new partners, community involvement and international collaboration, including sharing information about site selection, developing new blue ice archives, deciphering the stratigraphy of complex old ice sections, new analytical developments, rapid access technologies and professional development programs for early career researchers.

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Track Classification: The Oldest Ice challenge, and the preservation of climatic signals in the deepest ice