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UC **SANTA BARBARA**
Department of Earth Science

Earth Science Colloquium

THURSDAY April 23rd., 2020 • 2:00 PM

Biotic changes through the Ediacaran-Cambrian transition: insights from Arctic Norway

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The first abundant macroscopic organisms in the fossil record make their appearance at the end of the Neoproterozoic Era. These are collectively termed Ediacara-type organisms, and mark the diversification of multicellular life. Digermulen Peninsula, part of the northernmost Norwegian mainland, contains a nearly continuous sequence of shales, siltstones, and sandstones deposited from the Cryogenian to the Ordovician. Integrated palaeontological and sedimentological data from such a rare locality recording this interval, allows us to investigate the sequential biotic changes during the Ediacaran-Cambrian transition on the Baltica palaeocontinent.

Early Ediacaran strata on Digermulen contain large organic-walled microfossils of single-celled eukaryotes (acanthomorphic acritrachs) and unusual tiny remains of multicellular tissue. Above the Mortensnes diamitite correlated with the Gaskiers glaciation, the first macroscopic Ediacara-type impressions are abundant, including discoidal and rangeomorph fossils and the possible bilaterian *Dickinsonia*. A striking decline in the diversity of soft- bodied ediacarans corresponds to increasing diversity of trace fossils showing expansion behavioural complexity through bioturbation. Depauperate diversity marks the latest Ediacaran and the earliest Cambrian, and the ediacarans are replaced by organically- preserved putative annelid worm *Sabellidites* and an increasing diversity of skeletal organisms like trilobites.

In this talk I'll present results from several field seasons, focusing on (1) the cryptic origin of multicellularity before the appearance of macroscopic fossils, (2) evolution of microscopic eukaryotes through the Ediacaran glaciation and the appearance of animals, and (3) how the Digermulen macrofossil assemblage fits into our understanding of the Ediacaran evolutionary biotas and their demise during the late Ediacaran increase in bioturbation.