https://tinyurl.com/y6htkvje
Zoom ID: 862 3645 1608
Password: Earth

UC **SANTA BARBARA**
Department of Earth Science

Earth Science Colloquium

Thursday November 5th., 2020 • 2:00 PM

Can snowball Earth reconcile
a freshwater ancestry for living phototrophs with the marine fossil record?

Paul Hoffman
Department of Earth and Planetary Science
Harvard University

Molecular phylogenomic habitat evolution suggests that many modern cyanobacteria and eukaryotic phototrophs evolved in freshwater, radiating into the marine realm only in late Proterozoic - Phanerozoic time. This is surprising in view of the marine fossil record of such organisms back to at least 2.02 and 1.04 billion years ago, respectively. We can reconcile this apparent conflict by assuming that all modern organisms derived from the survivors of Cryogenian snowball epochs, when phototrophy would only have been possible in supraglacial meltwater (freshwater) and hypersaline dry-valley lake environments. This reconciliation is possible if pre-snowball (pre-Cryogenian) marine fossils represent stem groups, lacking direct descendents in living flora.

About our speaker today:

Over a 55-year career, Paul Hoffman demonstrated the great antiquity of reef complexes and plate tectonics, established the cratonic structure of North America, postulated the succession of pre- Pangean supercontinents, and legitimized the Snowball Earth hypothesis for Cryogenian glaciations.

Educated at McMaster University (Canada) and Johns Hopkins University (USA), he worked for the Geological Survey of Canada (1969-92), University of Victoria (1992-94) and Harvard University (1994-08). He was a visiting lecturer in geology at UCSB in 1970-71. His best known papers are A Neoproterozoic snowball Earth (1998), Did the breakout of Laurentia turn Gondwanaland inside-out? (1991) and United Plates of America: the birth of a craton (1988). A recipient of many honors and awards, he remains an active field geologist, working primarily on Neoproterozoic carbonates and associated glacial deposits in Namibia, the African Southwest.