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# Introduction to the session US4

# Toward a model/data synergy for understanding large change in Earth Climate History from the first glaciation of the Earth to the Quaternary.

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**This session is devoted to show how interdisciplinary approaches may greatly help understanding large climate changes occurring along the Earth History. Throughout the solicited abstracts, it very clearly appears that, from Proterozoic to the last interglacial / glacial cycles of Quaternary, the synergy of models and data allows reconstructing and addressing the major causes of climate changes. Therefore, the collaboration of different scientists is very often fruitful to shed light on these complex problems where carbon cycle, climate, tectonics, solar forcing are intricate.**

**In introduction to the session, we will discuss the possibility to produce global crises as "cold run away" episodes so called "Snowball Earth" during the Proterozoic and why the conditions for glaciations since 500Ma have drastically changed and are since only regional. Because glaciations are now dominated, by tectonics and carbon cycle, the large disturbance of this latter by human activities could also lead to the destabilisation of the present day ice sheets, as predicted by coupled climate-ice sheet models. This, in turns, could lead to a much more variable climate than the one experienced by the Earth during the Holocene.**