**Mini-conference entitled:**

# CENTRAL ARCTIC: BATTLEGROUND OF NATURAL AND MAN-MADE CLIMATE FORCINGS

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Throughout much of the year the central Arctic is an expanse of snow covered ice with a mean albedo between 75 and 80% and surface temperature well below $0^{o}C$. On average the snow on top of the ice melts and concentrates in puddles nested on top of the floes from around June 10 over most of the Arctic Ocean to about June 20 at the pole and refreezes during the last two weeks in August. The average albedo gradually drops to 50-55% and the surface temperature hovers between 0 and $2^{o}C$. This is the interval of summer in the central Arctic.

The direct impact of the change in temperature on the areally weighted global mean temperature is minor due to the small area of the polar cap. However, the indirect effect on the atmospheric circulation in the middle and low latitudes is significant due the changed surface energy income and lowered frequency of high air pressure events. In winter and spring these are closely associated with polar air outbreaks.

During the Pleistocene the arctic summer was affected by changing obliquity. In the case of low obliquity, the impact was exponentially magnified by the longer pathway of solar beam through the atmosphere. As a result, the equator-to-pole temperature contrast likely increased and the circulation vigor intensified significantly. The jet stream probably became less zonal and the frequency and amplitude of the arctic air outbreaks got larger. The transport of water vapor to the high latitudes probably also intensified. It is likely that with the obliquity substantially lower than today northern summers became considerably cooler and more variable. On the other hand, when the obliquity was close to $24.5^{o}$ as it was in the early Holocene, the climate of the central Arctic was probably considerably warmer.

In summary, the information on the energy balance and surface condition in central Arctic is of critical importance in climate studies on all time scales. How will this region react to the increased long-wave radiation income due to man-made greenhouse gases? How to the related increase of cloudiness? What could be the impact of decreasing shortwave surface radiation caused by orbital changes or increased turbidity of the atmosphere after volcanic explosions or increasing sulphate production? What is the impact of meltwater on the salinity in the northern North Atlantic and the thermohaline circulation?

We propose to overview and summarize the observational and modeling results available to date. Given sufficient interest, we can also organize a special issue for a relevant scientific journal.