

## **SpaceIce Satellite Communications Plan**

The overall goal of the SpaceICE mission is to investigate freeze-casting in the microgravity environment of low Earth orbit. Freeze-casting is a directional solidification technique that is used to fabricate porous materials with anisotropic, aligned pore structures. The SpaceICE mission aims to improve terrestrial fabrication of these materials by conducting experiments that allow us to develop an improved understanding of the role of gravity during the microstructural templating process.

Communications on board SpaceICE is provided by a GOMSpace NanoCom AX100 UHF radio. The radio interfaces to the flight computer via a UART serial link. It receives data for downlink, describing the state of onboard systems as well as measurements and images from the freeze casting experiment, from the flight computer and packetizes it according to the AX.25 protocol. For uplink it receives AX.25 encoded data and returns the unpacked data to the flight computer.

Ground control and telemetry reception will be provided by the UHF transceiver station at the University of Illinois Urbana-Champaign (UI UC). This ground station is owned and operated by UI UC, and the ground station license will be modified by them to cover this operation.