ENHANCED DIGITAL ELEVATION MODEL FOR THE ARCTIC

Research Challenge
There is a lack of high-resolution, consistent, high-quality elevation data available for the Arctic. The team is able to construct digital elevation models (DEM) from sub-meter resolution stereo imagery from the National Geospatial Intelligence Agency. These data will be used by the Arctic research community to support activities that include sea level rise, ice mass balance, carbon cycling, coastal erosion, permafrost collapse and sustainable development.

Methods & Codes
The team developed the Surface Extraction from TIN-base Search-space Minimization (SETSM) code. It is a fully automated program for extracting DEMs from a stereo pair of source images.

Results & Impacts
The team produced 2-m posting DEMs of the Arctic with an average 4x repeat. All of these data have been released to the science community and the public through ArcticDEM.org. These data are being used by scientists, national geographic surveys, and regional and local governments for a broad range of applications.

Why Blue Waters
No other academic computer had the available capacity for this project. Blue Waters was able to execute the ArcticDEM workload without significantly impacting throughput of other projects.