Mapping Triton

Dr. Emily Martin

Center for Earth and Planetary Studies

National Air and Space Museum

Smithsonian Institution

In 1989, the Voyager 2 spacecraft encountered the Neptune system and returned images of its largest moon (~1350 km radius), Triton. Triton was revealed to have a young, geologically active surface. The geological activity has been linked to its dynamical history as a likely captured Kuiper Belt Object (KBO) making it a close relative to Pluto and other KBOs. Triton contributes to the diverse population of icy satellites, but its origin is unique relative to those of the other planets. The capture of Triton by Neptune, likely resulted in a massive heating event that resulted in resurfacing, possibly by cryovolcanism.

To-date, no peer-reviewed, detailed and digital geologic map exists to characterize, classify, and identify geologic surface units and features on Triton. Mapping of Pluto and Charon is in progress, but as no comparable geologic map of Triton exists, a direct comparison between these KBOs cannot be performed at a fundamental level.

I am working to create an accessible Triton data archive that will recover and restore original data products and provide context for future investigations by creating a geologic map across Triton's Neptune-facing hemisphere, the only region of Triton that has ever been imaged. I am producing a USGS Scientific Investigations Map of the Neptune-facing side of Triton at 1:5M. I will present the progress of this map as well as discuss the challenges of planetary geologic mapping, data restoration, and producing data products for the planetary science community.