GSA 2019 Short Course: 501. High Resolution Topography and 3D Imaging I: Introduction to Terrestrial Laser Scanning

**Abstract** This one-day course will provide faculty, students, and professionals with an introduction to terrestrial laser scanning (TLS a.k.a., ground-based lidar) for research and education. TLS provides high-resolution three-dimensional images of geologic features and is a powerful tool for applications ranging from outcrop mapping to analysis of earth-surface processes. The course will focus on TLS technology, data collection, processing and analysis, and examples of science and educational applications. A combination of lectures and hands-on demonstrations of TLS equipment and data processing will be used.

**Agenda**

8:00 AM Welcome & Course Introduction, About UNAVCO

8:30 AM Intro to laser scanning, Applications Examples (Crosby)

9:30 AM Break

9:50 AM Overview of Data Acquisition Concepts & TLS Workflow (Williams)

11:00 AM Hands on demos w/ scanner (1/2 group, 2x scanners - outside)

Overview of Data Processing and Analysis (1/2 group - classroom)

12:30 PM LUNCH

1:30 PM Hands on demos w/ scanner (1/2 group, 2x scanners)

Overview of Data Processing and Analysis (1/2 group - classroom)

3:00 PM Future trends, community support resources, educational resources. Afternoon session Q&A and concluding thoughts.

- Analyzing High Resolution Topography with TLS and SfM (SERC-hosted resources and curriculum for field education with TLS & SfM)
- UNAVCO Geodesy Field Education resources (links to UNAVCO support resources for field education, including TLS and SfM).

3:45 PM Review scan data

4:20 PM Participants fill out GSA course evaluations

4:30 PM Adjourn

**Additional resources:**

- **hh_tls_14_14022014_allreturns_upper.laz** (Rim Fire Yosemite, NP TLS sample dataset from S. DeLong, USGS)
- **2017 Big East LAS**
- **2018 Big East rockfall LAS**
- **2018 Big East rock block LAS**
- **2018 Big East all data LAS**