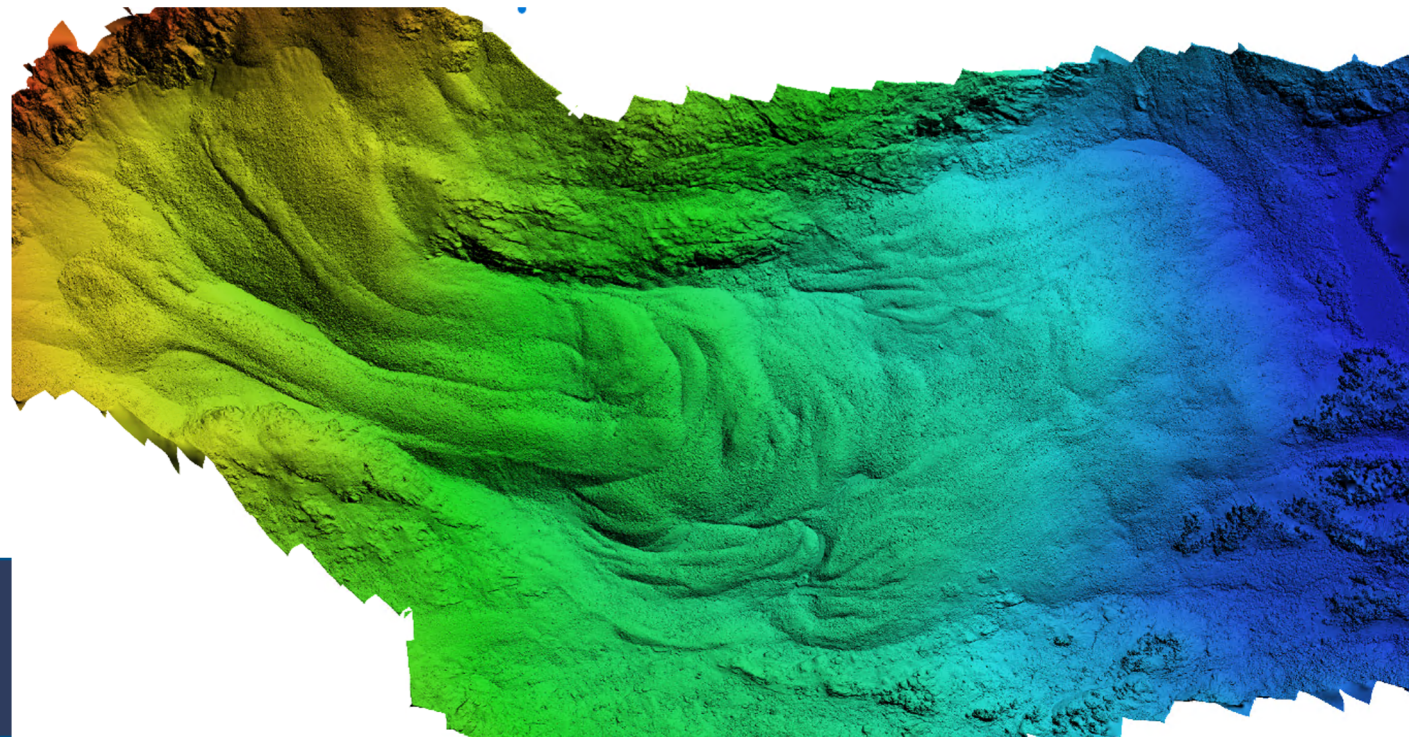


*2021 GSA Short Course 519:*

# INTRODUCTION TO STRUCTURE FROM MOTION PHOTOGRAMMETRY

**Ramon Arrowsmith (ASU)**  
**Chelsea Scott (ASU)**  
**Christopher Crosby (UNAVCO)**

October 4<sup>th</sup>, 2021  
Virtual



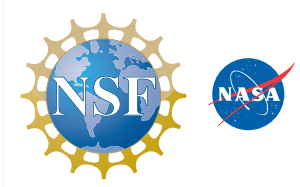
**Introduction** to SfM= lectures, hands-on demonstrations of SfM workflows, and data exploration.

**Overview** of the basic principles of SfM with emphasis on application examples, theory, practical considerations.

Will **not** provide you with detailed training in specific software or hardware.

**Goal** = solid intro to SfM and a foundation for future learning. We also hope that it will inspire you to explore the technology and to apply it to new applications.

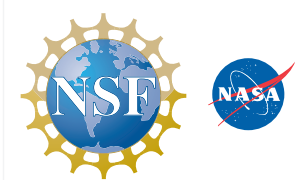




Course website:

<https://opentopography.org/workshops/GSA2021>

*We may update as the day progresses, so refresh early  
and often.*



## Agenda:

- 9:00 am Welcome and course introduction (Crosby)
- 9:20 am [Introduction to SfM and scientific motivations](#) (Arrowsmith)
  - [Introduction to SfM Photogrammetry](#)
  - [Coordinate systems and other basic concepts](#)
- 10:15 am *Break*
- 10:30 am [Faraglione, Vulcano Island, Sicily, Italy demo](#) (Scott)
  - [2018 Faraglione, Vulcano Island, Sicily, Italy \(simple demo\) dataset in OpenTopography](#)
  - [Faraglione sample image set](#)
  - [Faraglione SfM products](#)
- 11:15 am Overview of SfM data acquisition concepts & other topics (Crosby)
- 12:00 *Lunch break*
  - Take pictures and/or organize some data of your own (all)
  - Optional: Discussion in breakouts
- 12:45 pm Wrap up your lunch and begin running models (all)
- 1:15 pm Participants share models, group discussion of what worked and what didn't (all)
- 1:45 pm [Discussion of Mecca Hills Painted Canyon project](#) (Scott)
  - [Painted Canyon dataset in OpenTopography & Painted Canyon exercise page](#)
  - 3D mapping on point clouds and textured meshes in LIME/V3GEO
  - CloudCompare and Stereonet
- 2:30 pm Final discussion
- 3 pm *adjourn*
- post-3 pm Short course leaders available for additional informal discussion.



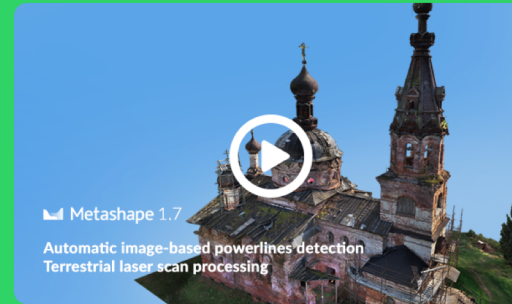
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## Discover intelligent photogrammetry with Metashape

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### Software:

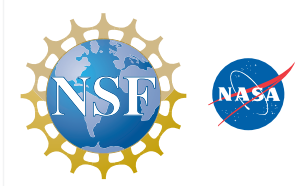
- **Agisoft Metashape Professional 1.7.4:** Proprietary SfM software available for Windows, MacOS, and Linux. A license will not be necessary for the course as we will use Metashape in demo mode, but please have the software installed on your machine before the short course begins.

Optional Software (will be demo'd but not required for hands-on activities):

- **CloudCompare 2.11.x Anoaia:** Open source point cloud software available for Windows, MacOS, and Linux. Please have the software installed on your machine before the short course begins. If you happen to have an older computer you may need to install a previous version of CloudCompare available under "Older stuff" on the downloads page.

- **Virtual Outcrop Geology Group LIME**

- **Stereonet 11**



# Let's make this event respectful and inclusive!

## SHOW RESPECT

- Keep questions concise and on topic.
- Be considerate and listen with an open mind.
- Avoid saying or doing anything that is or is likely to be perceived as harassment or bullying.

## BE INCLUSIVE

- Demonstrate that you welcome a diversity of individuals and their identities.
- Show that you value differing perspectives.
- Avoid exclusionary comments and behaviors based on any identity-based factors.

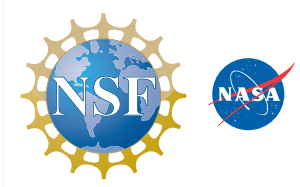
## SPEAK UP AND ACT RESPONSIBLY

- Report concerns to [ethics@geosociety.org](mailto:ethics@geosociety.org) or (720) 507-7523.
- Comply with GSA's [Events Code of Conduct](#).



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OF AMERICA®





***Name & affiliation?***

***Your interest in SfM & application area?***

***Previous SfM & lidar experience?***