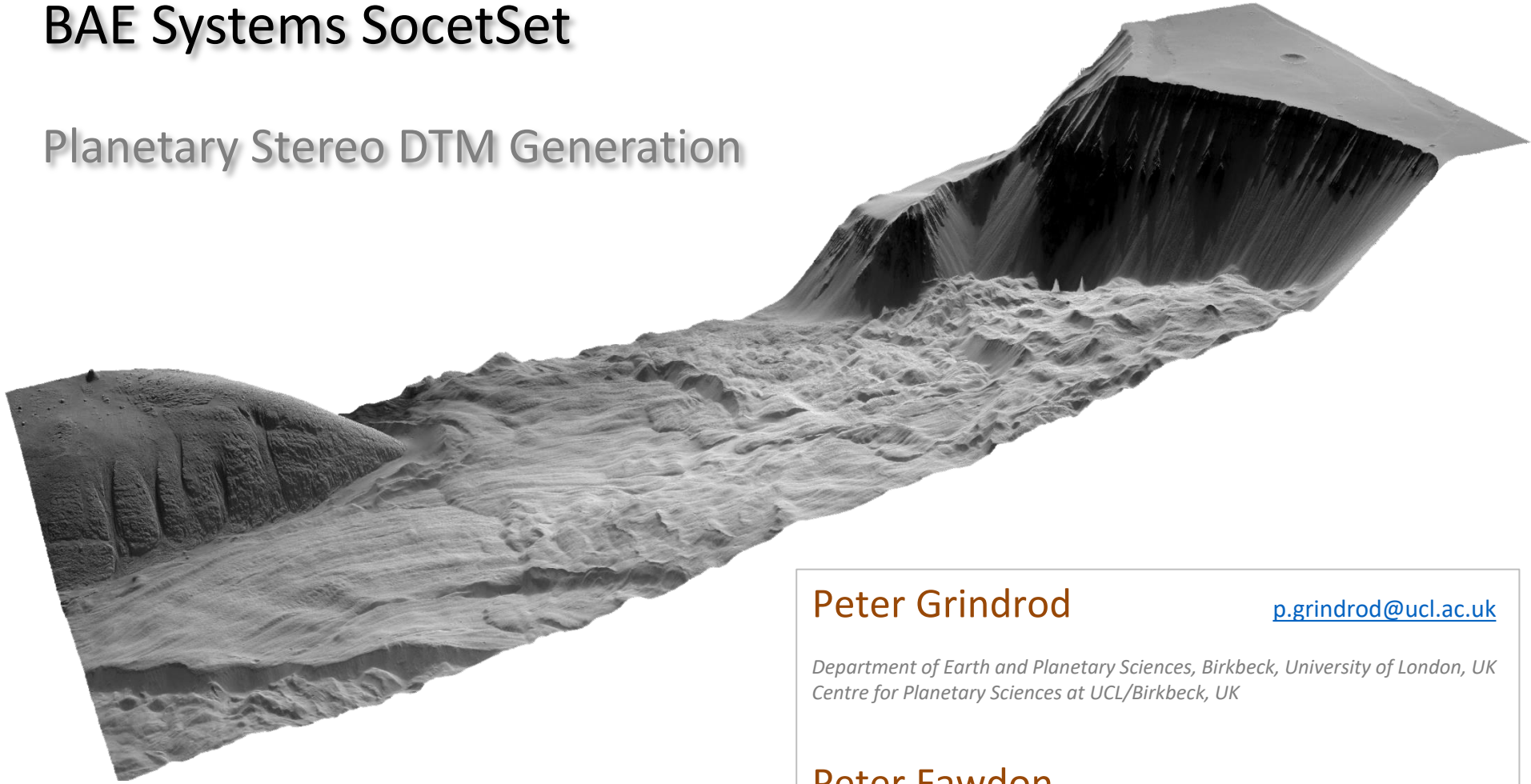


# Introduction to USGS ISIS and BAE Systems SocetSet

Grindrod & Warner (2014)  
*Geology*, 42, 795-798 [[OPEN ACCESS](#)]

## Planetary Stereo DTM Generation



**Peter Grindrod**

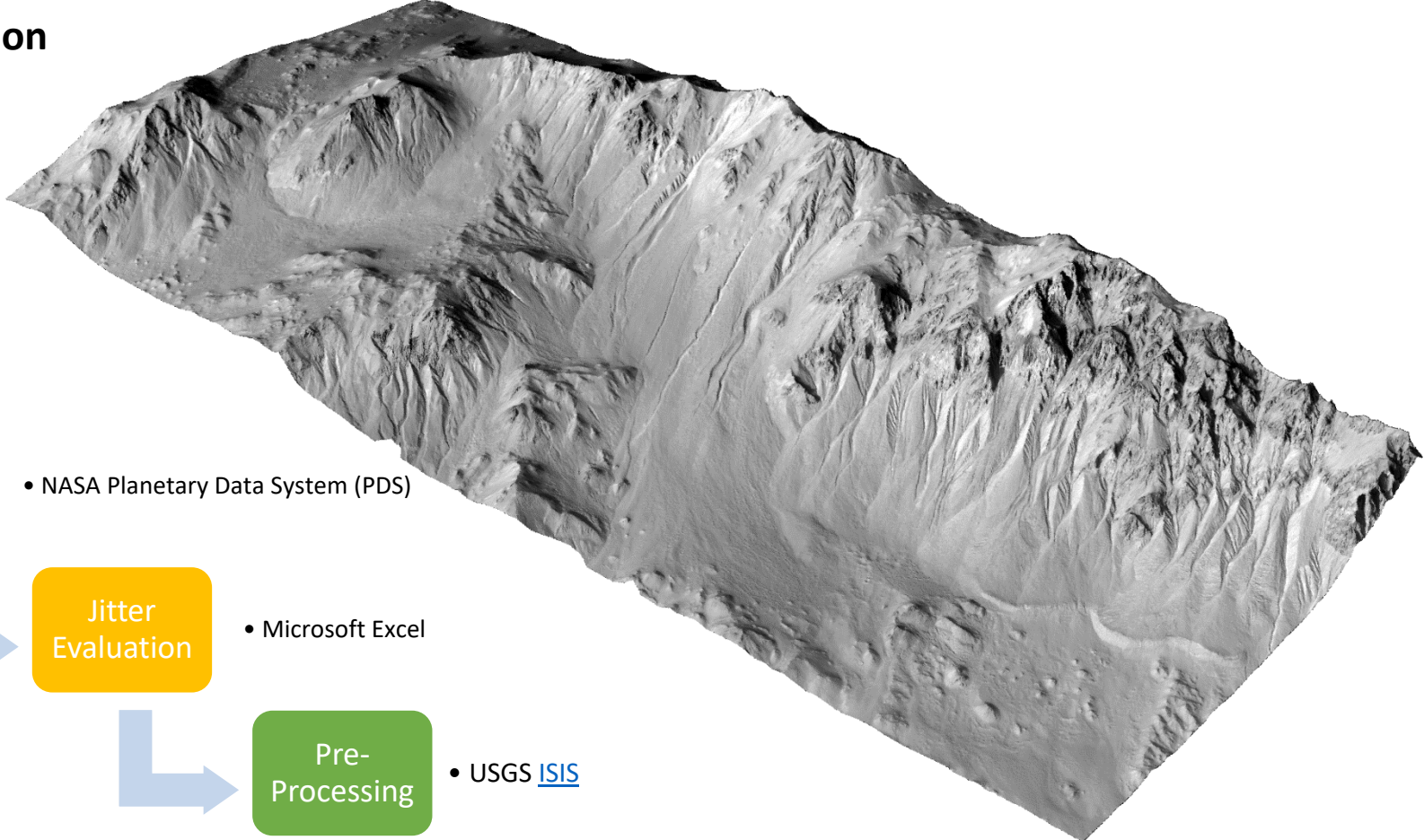
[p.grindrod@ucl.ac.uk](mailto:p.grindrod@ucl.ac.uk)

*Department of Earth and Planetary Sciences, Birkbeck, University of London, UK  
Centre for Planetary Sciences at UCL/Birkbeck, UK*

**Peter Fawdon**

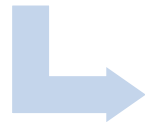
*Department of Earth and Planetary Sciences, Birkbeck, University of London, UK  
Centre for Planetary Sciences at UCL/Birkbeck, UK*

# Outline of Session



Data Collection

- NASA Planetary Data System (PDS)



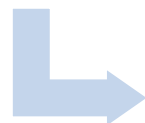
Jitter Evaluation

- Microsoft Excel



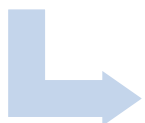
Pre-Processing

- USGS [ISIS](#)



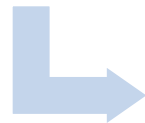
DTM Generation

- BAE Systems [SocetSet](#)



Post-Processing

- USGS ISIS



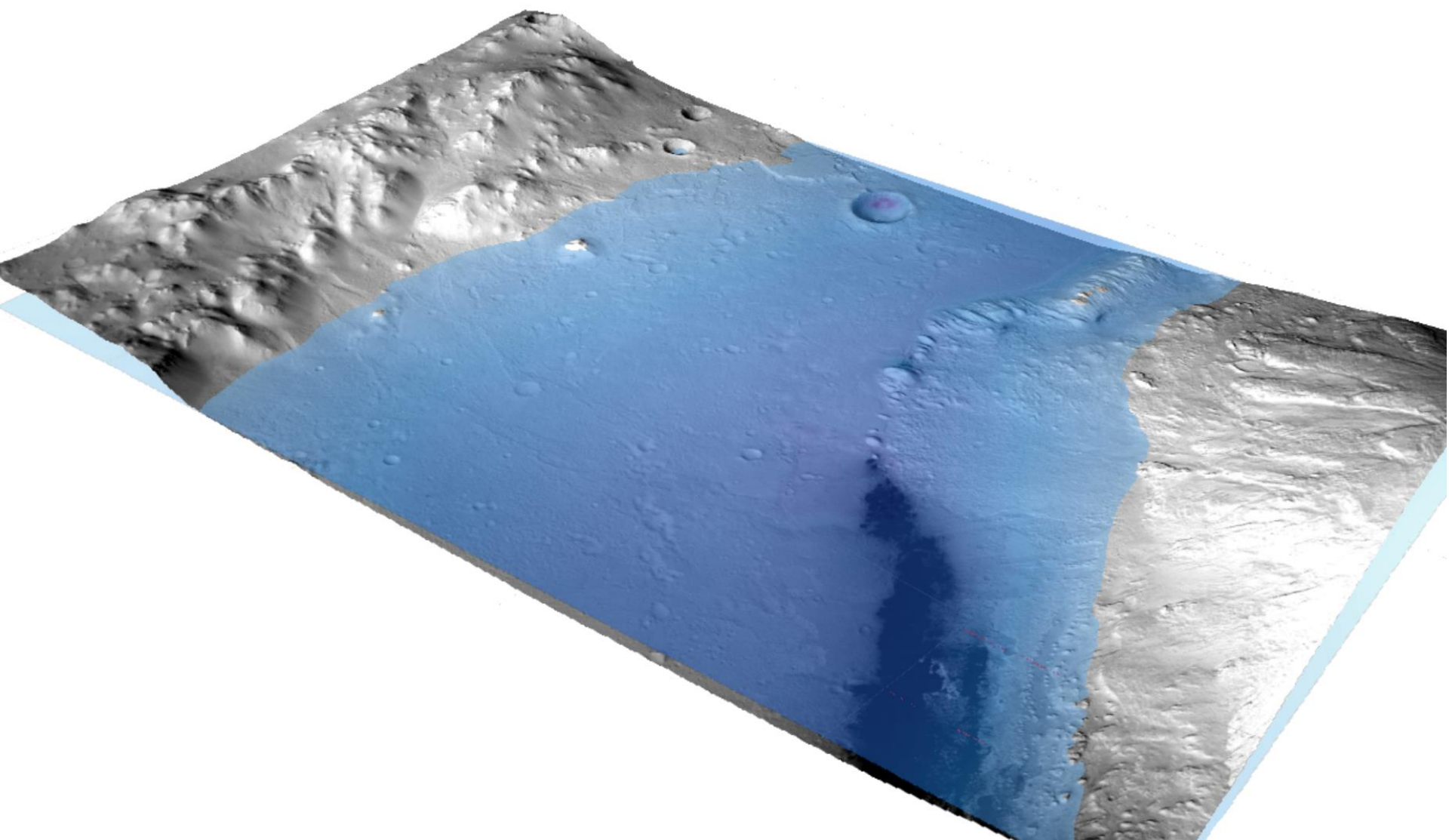
Analysis

- GIS

## USGS Stereo DTM Method

- A well validated method for planetary science
  - No need to justify results
  - Although do still need to assess quality
- Main disadvantages are cost of software and time taken
- We use the USGS method – extra (in depth) training available  
<http://astrogeology.usgs.gov/facilities/photogrammetry-guest-facility>
- Detailed tutorial for everything we'll do is here:  
[https://github.com/USGS-Astrogeology/socet\\_set/tree/master/SS4HiRISE](https://github.com/USGS-Astrogeology/socet_set/tree/master/SS4HiRISE)
- We will follow the tutorial, but skip most processing steps as takes too long
  - Typical CTX DTM generation: 3 – 4 hours
  - Typical HiRISE DTM generation: 1 – 2 days

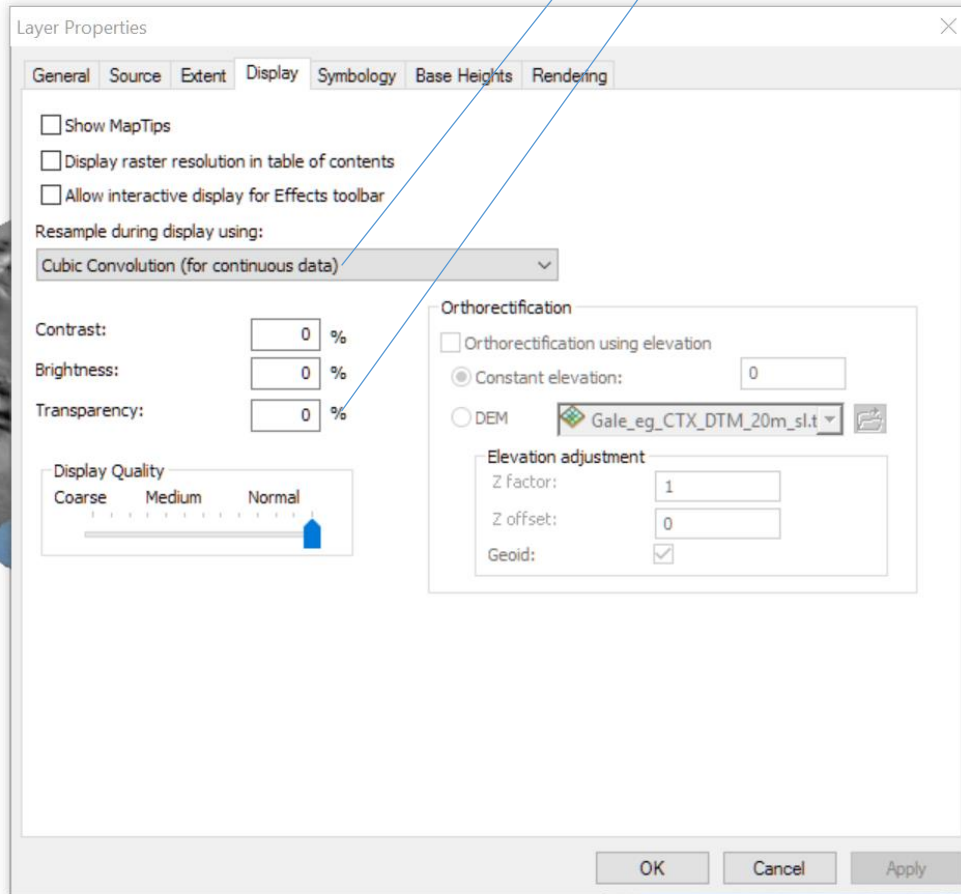
# 3D visualisation in Arc scene





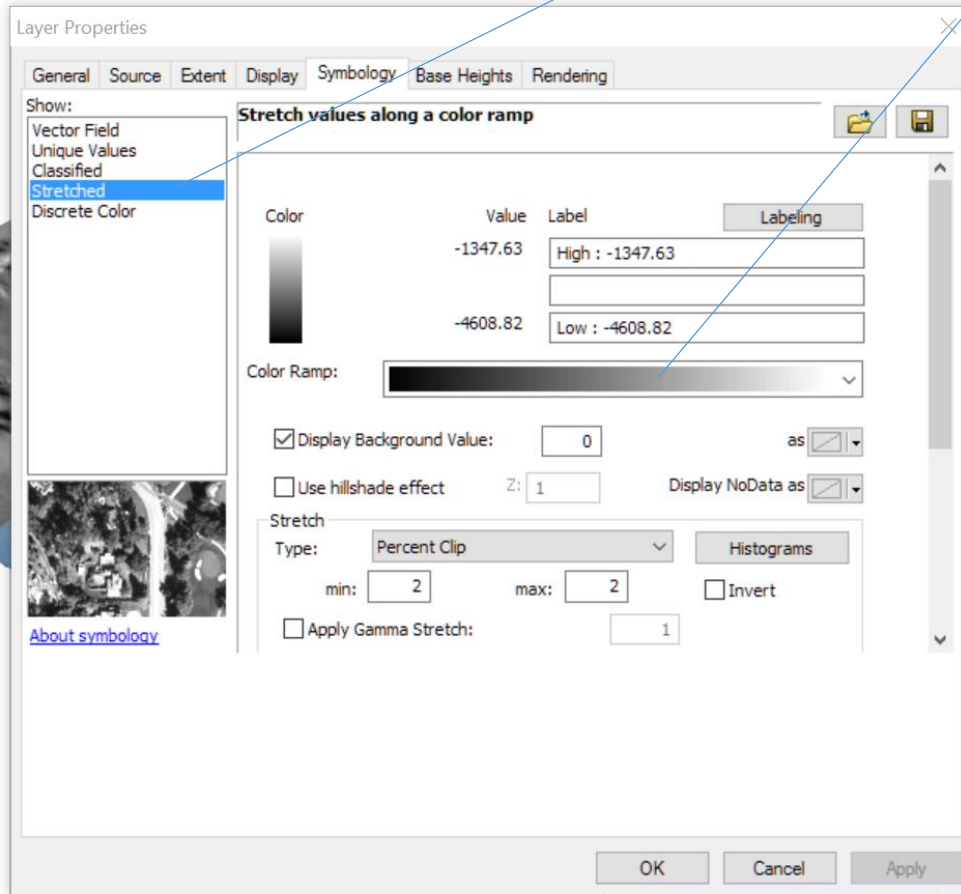
# Display

- Pixels or smoothed data?
- Transparency?



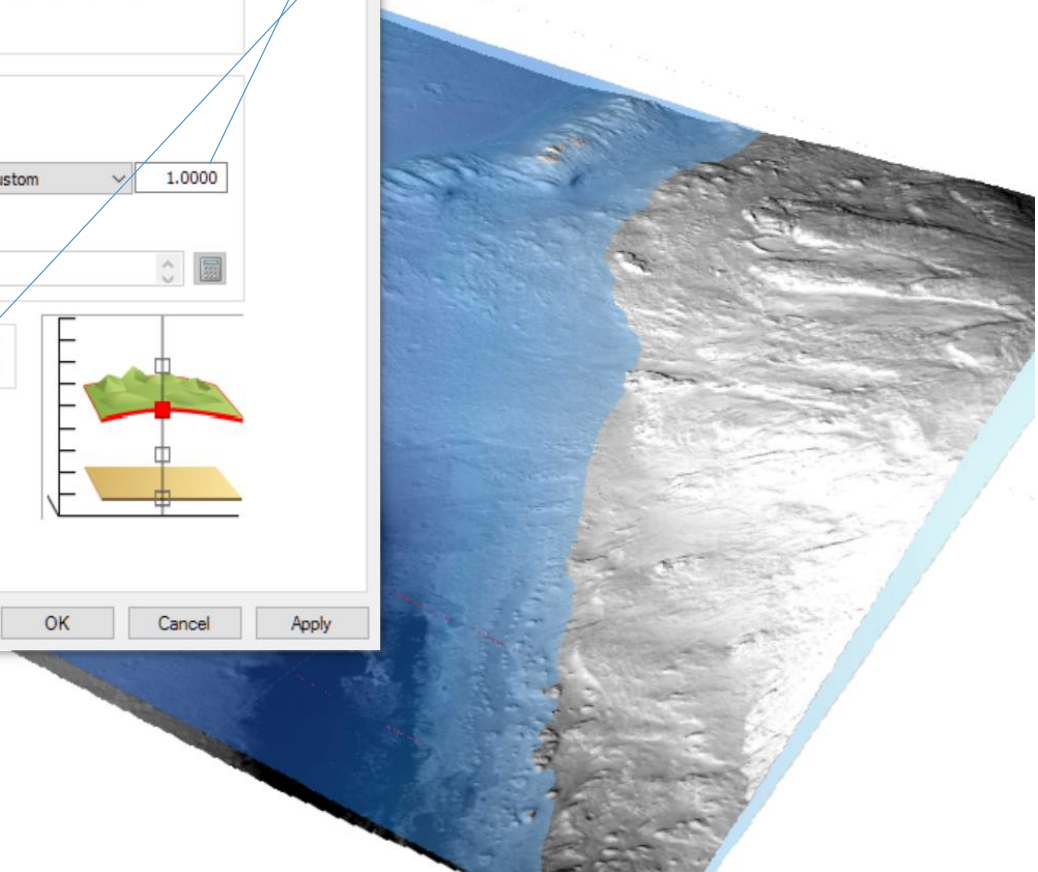
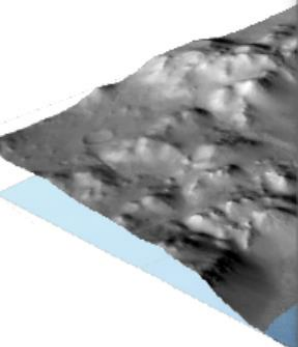
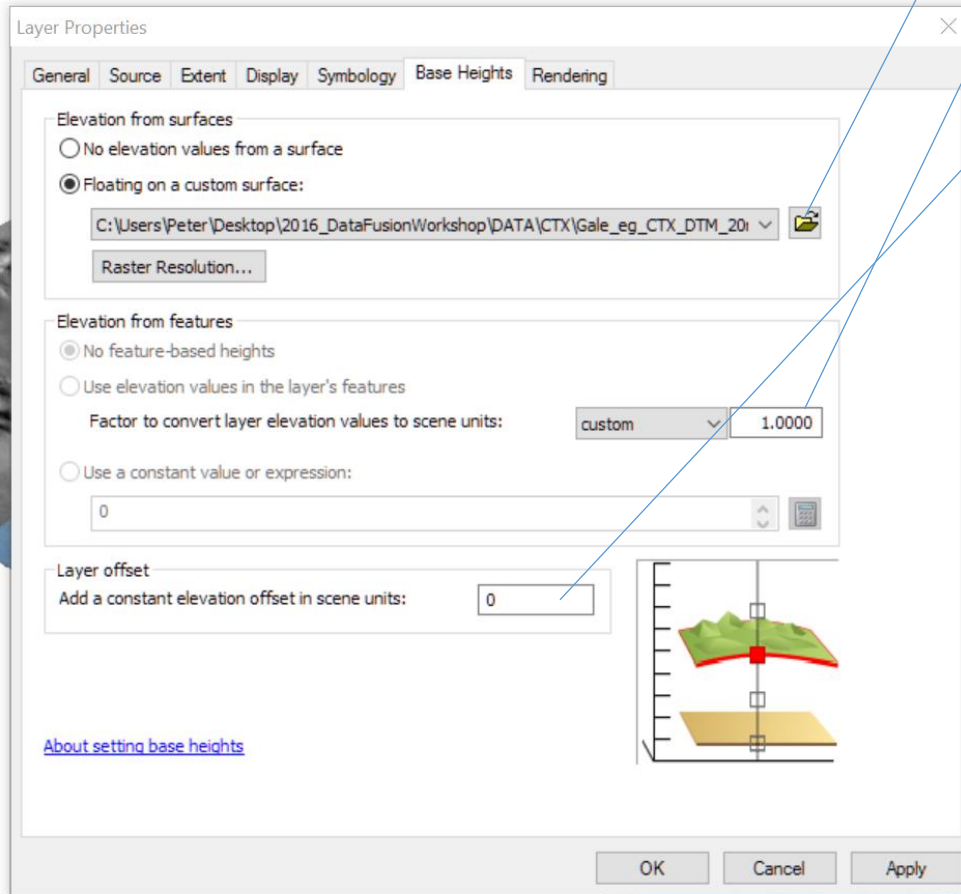
# Symbology

- How should the data be displayed
- What colour scale should the data use



# Base Heights

- Add elevation data to the Raster
- Vertical exaggeration?
- Want a layer to float above the rest?

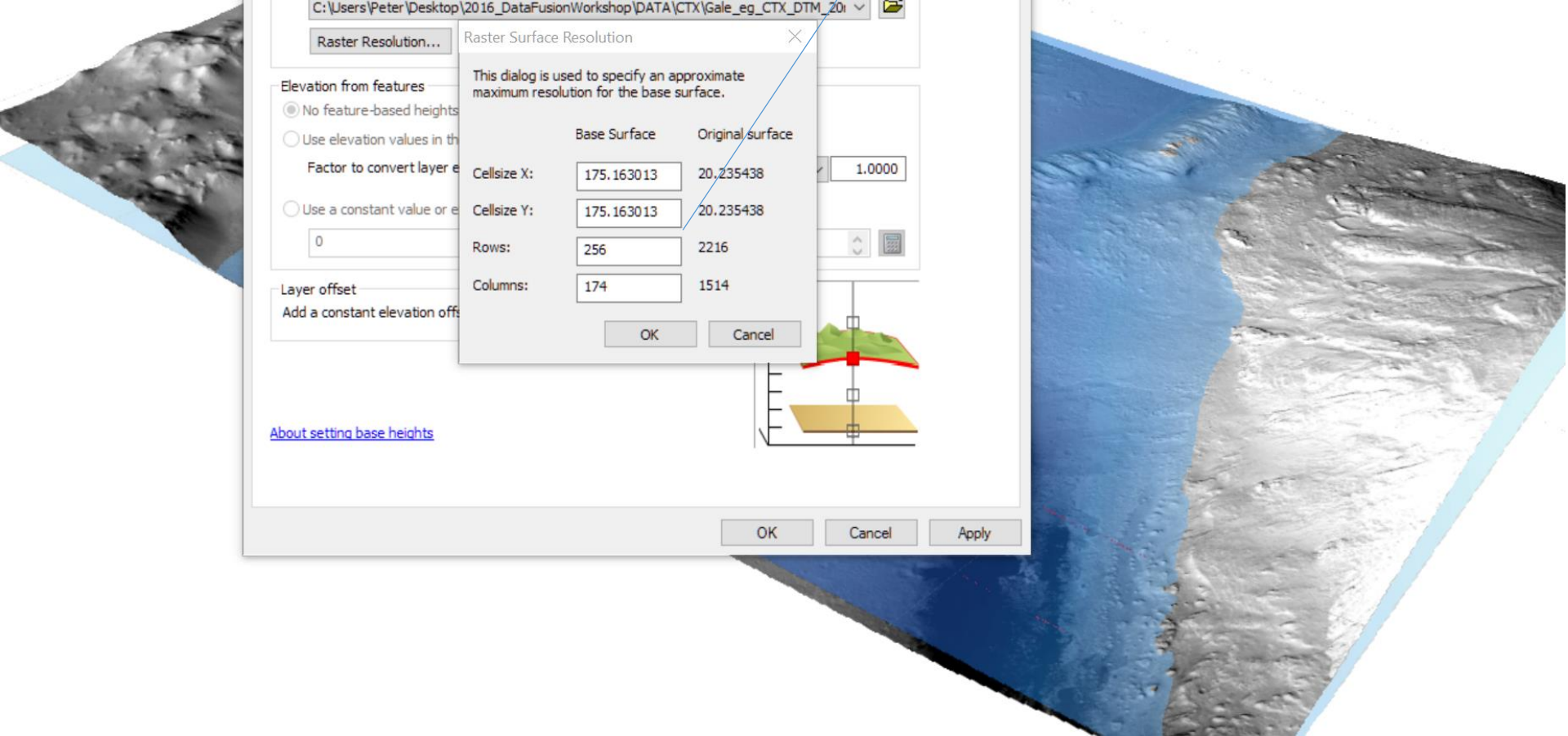


# Raster resolution

- How big do you want the pixels?

The screenshot shows the 'Layer Properties' dialog box in ArcGIS, with the 'Base Heights' tab selected. The 'Elevation from surfaces' section has 'Floating on a custom surface' selected, with the path 'C:\Users\Peter\Desktop\2016\_DataFusionWorkshop\DATA\CTX\Gale\_eg\_CTX\_DTM\_201...' chosen. The 'Raster Resolution...' button is highlighted, opening a sub-dialog titled 'Raster Surface Resolution'. This sub-dialog contains a table comparing 'Base Surface' and 'Original surface' parameters, and a 'Factor to convert layer elevation' set to 1.0000. A diagram at the bottom of the sub-dialog illustrates the relationship between the base surface and the original surface.

	Base Surface	Original surface	
Cellsize X:	175.163013	20.235438	1.0000
Cellsize Y:	175.163013	20.235438	
Rows:	256	2216	
Columns:	174	1514	





# Rendering

- What are should the layers be visualised in
- How much detail do you want to display (how much do you want your computer to cry)

