

## AMS Short Course Agenda Outline

### Visualizing 2D and 3D Geoscience Data in Python

#### Prework:

Attendees are not required to follow along in order to derive the maximum benefit from this workshop. Nonetheless, those who wish to actively participate during the event are recommended to perform the following checks prior to the workshop:

- Test if you can open Binder (through the link that will be provided before the event)
- Test if you can download and open the notebooks (through the links that will be provided before the event)
- Download and install VAPOR Python ([How to install VAPOR python](#))

| Topic                                                                         | Duration | Learning Outcome                                                                                                                                                      |
|-------------------------------------------------------------------------------|----------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Basics of geoscience data visualization in Python                             | 30 mins  | Basic information about the techniques and tools that can be used for plotting data sampled on both structured (lat-lon) and unstructured (flexible) meshes in Python |
| Visualization of structured (lat-lon) grids in Python                         | 40 mins  | Demonstration of structured (lat-lon) grids visualization using Matplotlib and Cartopy in several plotting categories through GeoCAT-examples and GeoCAT-viz          |
| Break                                                                         | 10 mins  |                                                                                                                                                                       |
| Interactive and high-performance visualization in Python                      | 20 mins  | Introduction of novel techniques and tools (e.g. Holoviz) that can be used for scalable visualization geoscience data                                                 |
| An introduction to unstructured grids (flexible mesh) visualization in Python | 25 mins  | Introduction to GeoCAT's another Python tool, Uxarray, and its plotting capabilities for data sampled on unstructured meshes                                          |

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|----------------------------------|---------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Break                            | 10 mins |                                                                                                                                                                                        |
| 3D data visualization            | 15 mins | <ul style="list-style-type: none"> <li>• Basics of 3D visualization techniques and their use cases</li> <li>• Data visualization pipeline in VAPOR</li> </ul>                          |
| Introduction to VAPOR Python API | 45 mins | <ul style="list-style-type: none"> <li>• Introduction to the VAPOR Python API</li> <li>• Tutorial on how to incorporate VAPOR for 3D data visualization in python workflows</li> </ul> |
| Wrap-up and future engagement    | 15 min  | <ul style="list-style-type: none"> <li>• Opportunities to engage and contribute to the software</li> </ul>                                                                             |