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# UNAVCO SAR TRAINING:

## INSAR PROCESSING AND TIME-SERIES ANALYSIS FOR GEOPHYSICAL APPLICATIONS:

### INSAR SCIENTIFIC COMPUTING ENVIRONMENT (ISCE), ARIA TOOLS, AND MINTPY

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## Short Introduction to OpenSARLab

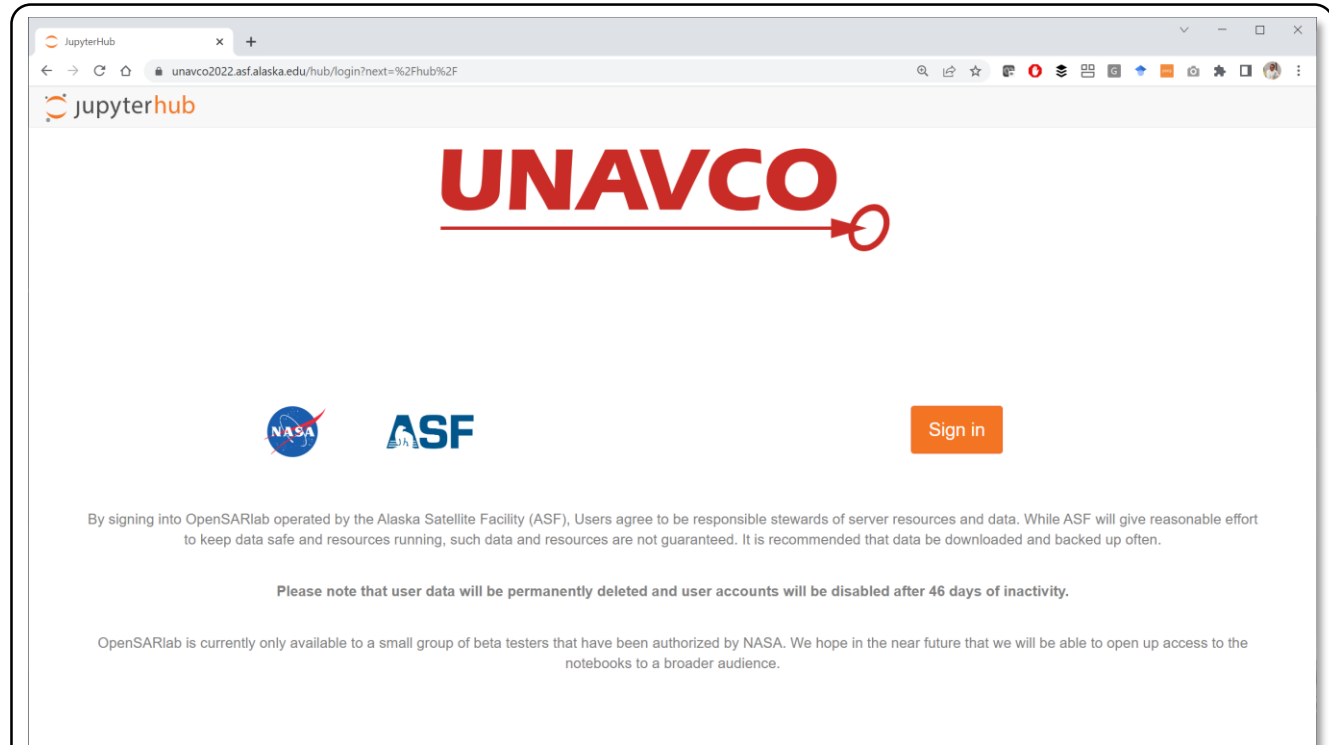




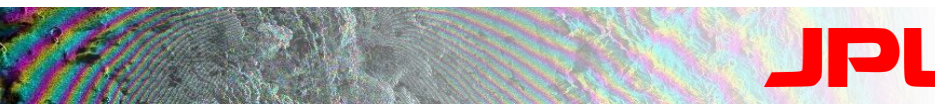
# The UNAVCO InSAR Course OpenSARLab Environment

URL: <https://unavco2022.asf.alaska.edu/>

- OpenSARLab is a pre-installed and fully cloud-based processing environment
- It can be used from any internet-enabled device with a web browser
- Sits next to the ASF archive in the Amazon Web Services (AWS) cloud → does not require data download to a local machine
- Broadly installed to support most python-based notebook development
- Contains all notebooks and software needed for this course

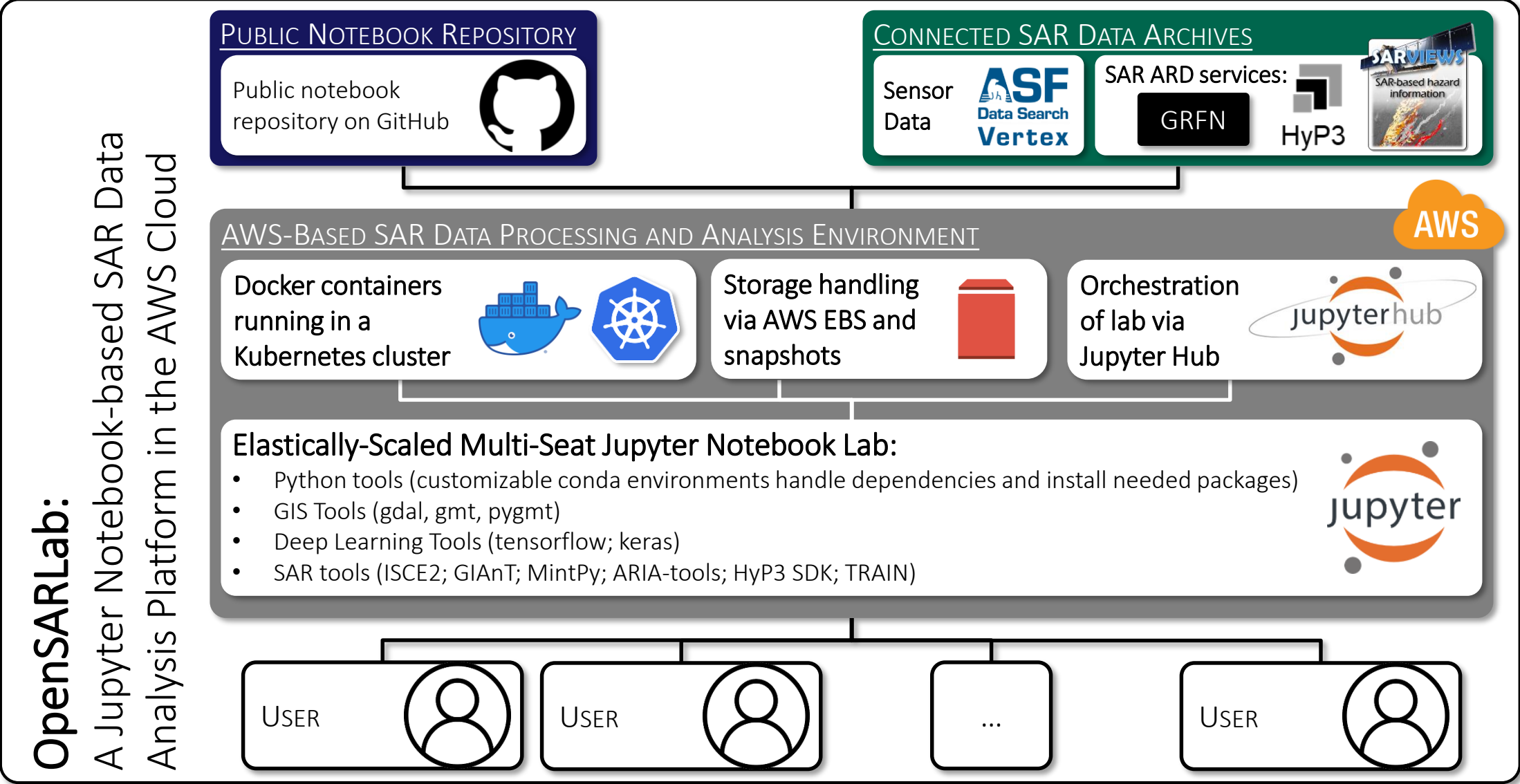


- Click on "Sign In"
- Click on "Sign up" and create an account using the email address used when registering for the UNAVCO class



# Concept of the UNAVCO InSAR Course OpenSARLab Environment

Web Address: <https://unavco2022.asf.alaska.edu/>

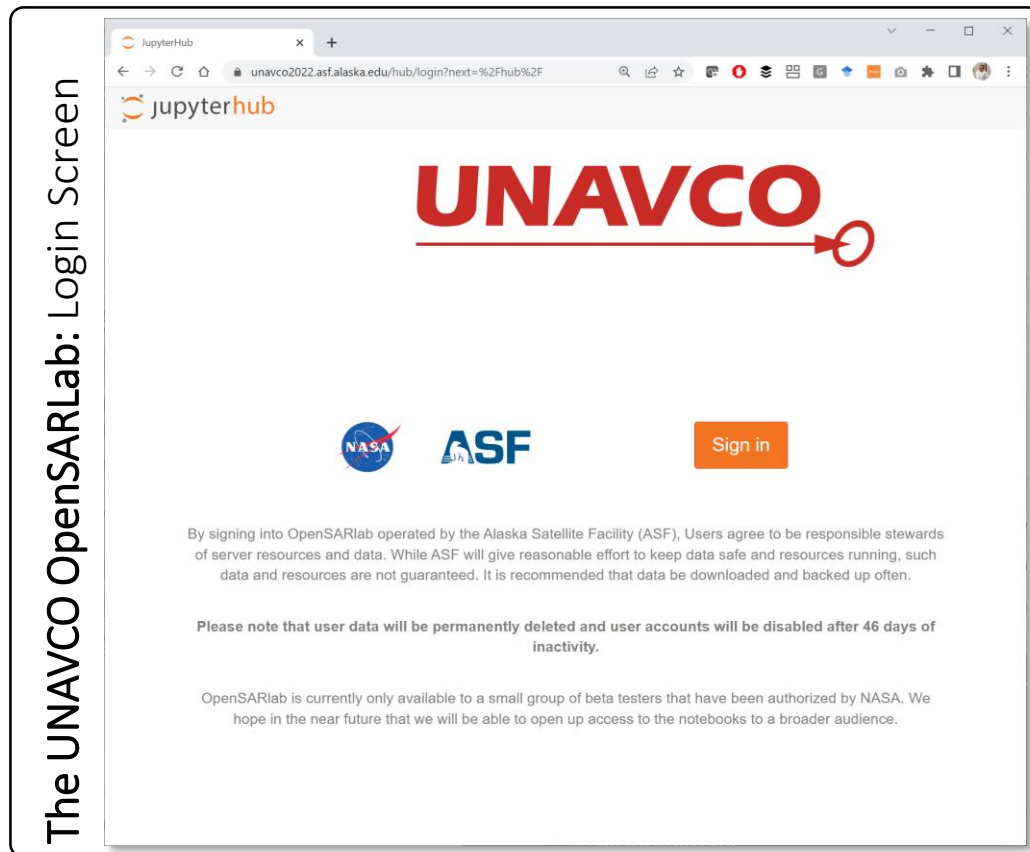


# Working Within the UNAVCO OpenSARLab

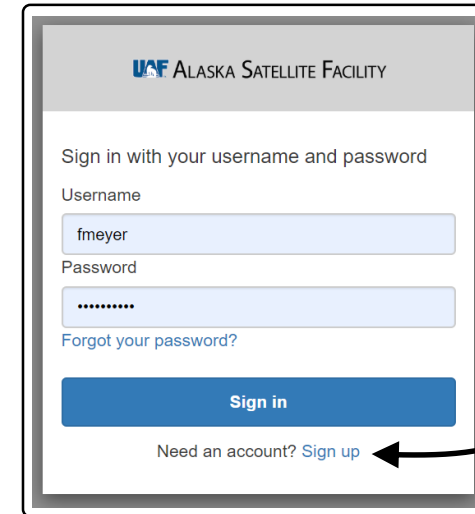
## Account Creation & Login

1. In your web browser, **navigate to:**  
<https://unavco2022.asf.alaska.edu/>

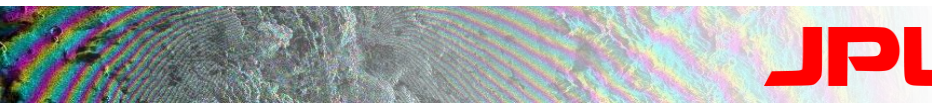
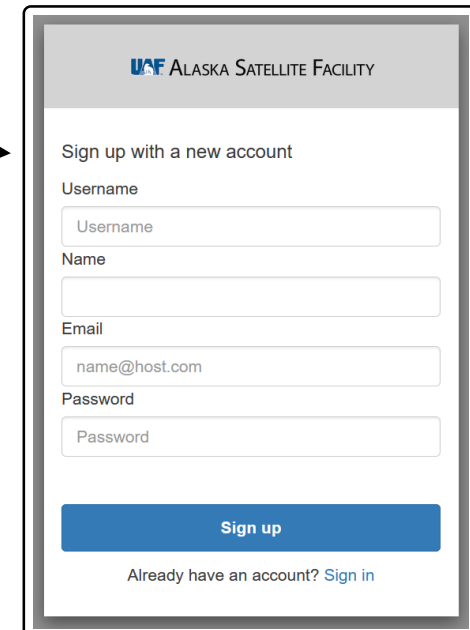
2. **Click on** “Sign in”



3. **First time user:** Click on “Sign up”



4. **Fill in the signup form** and submit [please use the email address associated with your UNAVCO InSAR course registration]



# Select the UNAVCO Server Once You are Logged In

Select UNAVCO Server

JupyterHub

unavco2022.asf.alaska.edu/hub/spawn

jupyterhub Home Token Services Groups fmeyer Logout

## Server Options

☒ **unavco**  
Memory guarantee - 12G, Max CPU - 16, Storage - 200G

Start

# Working Within the UNAVCO OpenSARLab

## Features within the Notebook Lab

Need Help?

- Home screen features:

The screenshot shows the UNAVCO OpenSARLab Notebook Lab interface. The top navigation bar includes links for 'unavco', 'OpenSARlab Docs', and 'Shutdown and Logout Page'. The main content area is divided into three sections: 'Notebook', 'Console', and 'Other'. The 'Notebook' section displays three Python 3 kernels: 'Python 3 (ipykernel)', 'Python [conda env:root] \*', and 'unavco [conda env:unavco]'. The 'Console' section also displays three identical Python 3 kernels. The 'Other' section contains icons for 'Terminal', 'Text File', 'Markdown File', 'Python File', and 'Show Contextual Help'. A sidebar on the left shows a file explorer with a search bar and a list of folders: 'conda\_environments', 'Geo-SInC', and 'lost+found'. A vertical label 'OpenSARLab: Home Screen' is positioned next to the sidebar. Several callout boxes with arrows point to specific features: 'Logout and Server Shutdown' points to the top right; 'Upload files from your local computer' points to the upload icon in the top left; 'Create new notebooks' points to the 'Notebook' section; 'Open a Terminal for Command-Line work' points to the 'Terminal' icon in the 'Other' section; 'All your notebooks are in the Geo-SInC folder' points to the 'Geo-SInC' folder in the sidebar; and 'Check on your Running Processes – Shut down Notebooks you don't' points to the 'Notebook' section.

Logout and Server Shutdown

Upload files from your local computer

Create new notebooks

Open a Terminal for Command-Line work

All your notebooks are in the Geo-SInC folder

Check on your Running Processes – Shut down Notebooks you don't

OpenSARLab: Home Screen

# Working Within the OpenSARLab

## Navigate to the Notebooks Relevant for this Training

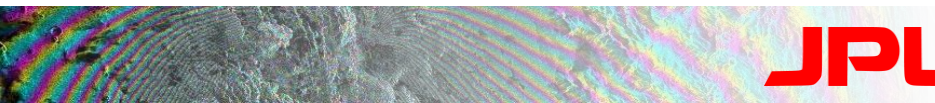
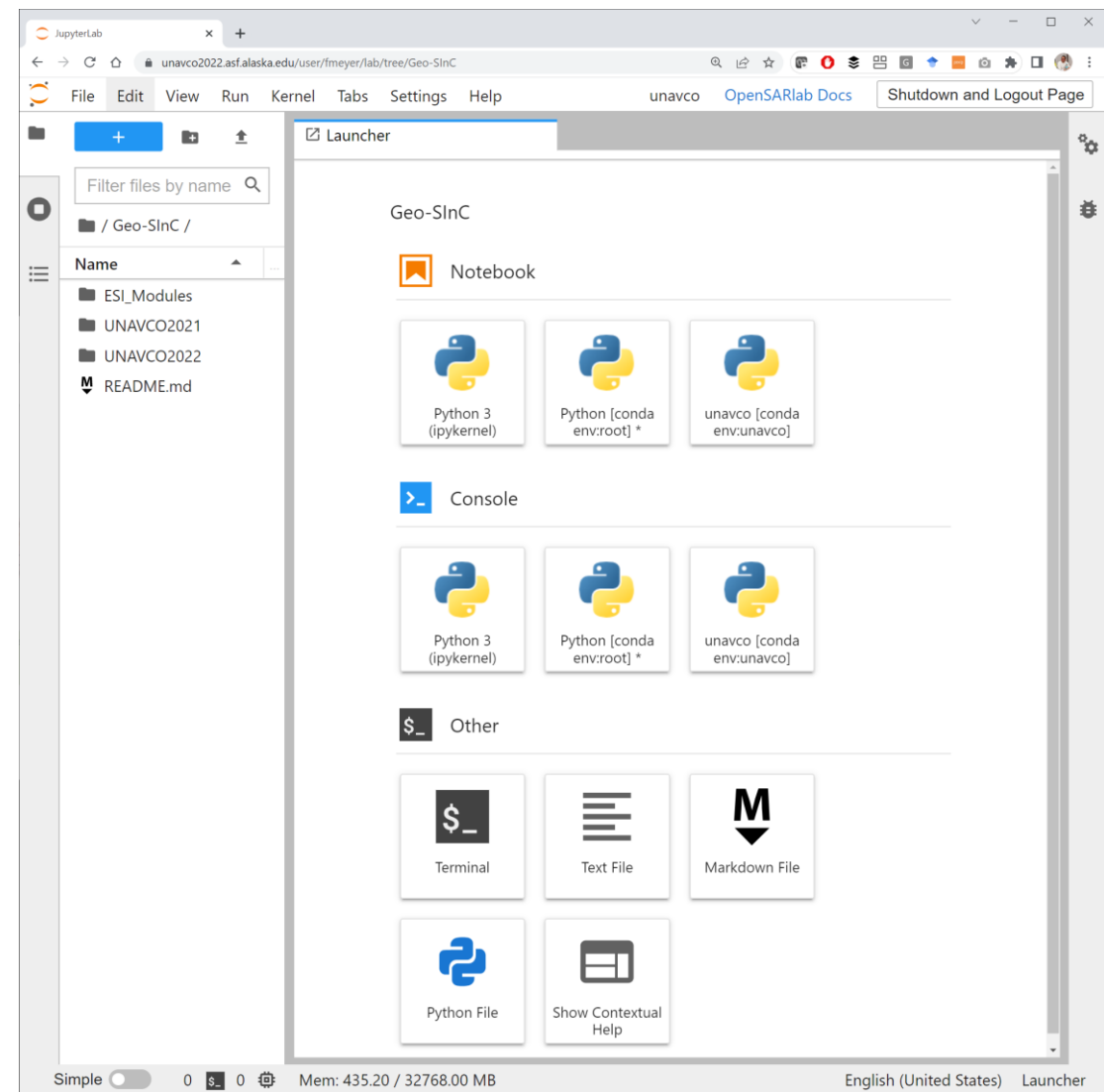
- To find the **Jupyter notebooks related to this UNAVCO SAR training**, navigate to:

Geo-SInC/UNAVCO2022

All training materials for this course are public and available at

<https://github.com/parosen/Geo-SInC>

The OpenSARLab: Notebooks for Training





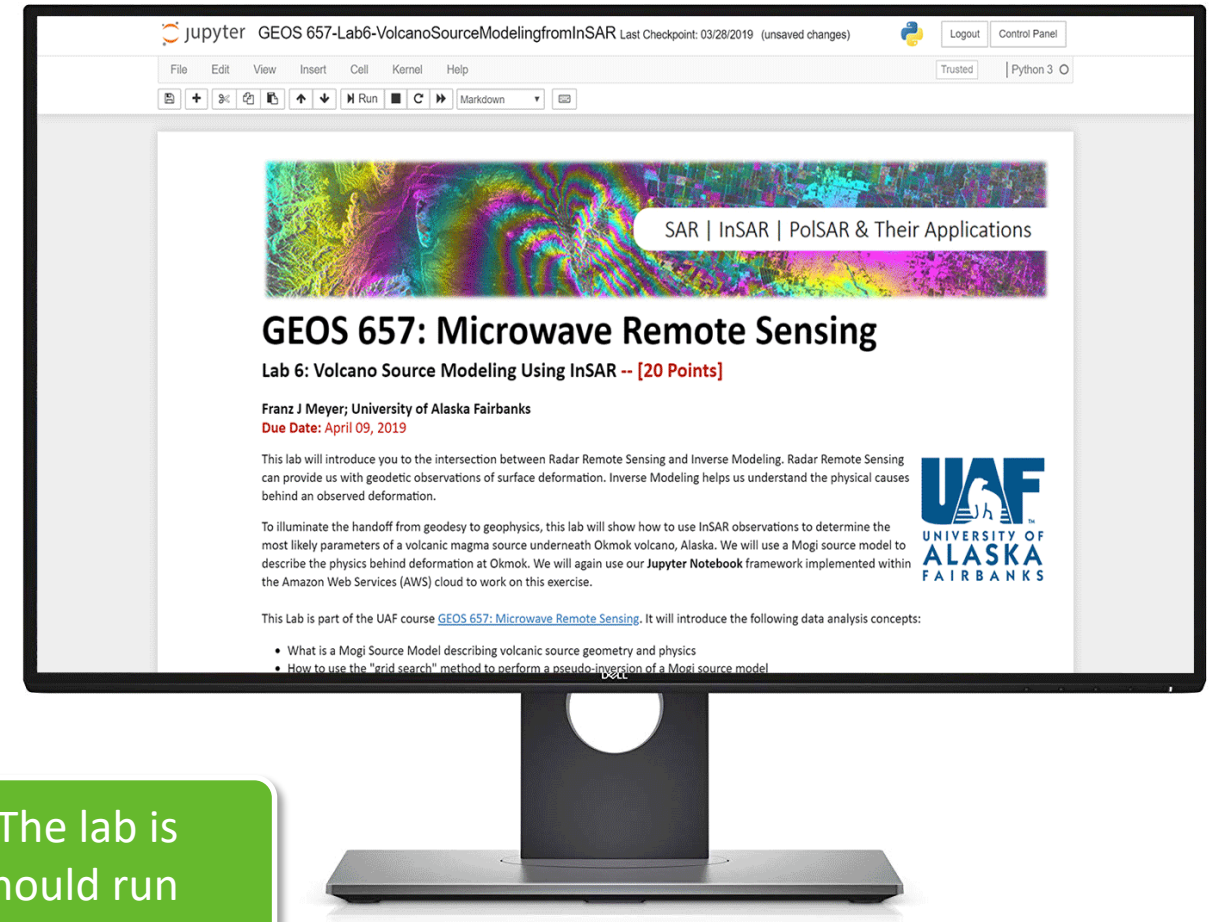
# Benefits of the Notebook-based OpenSARLab

## Jupyter Notebooks

- Jupyter Notebook benefits:

- Mix code with instructions and explanations
- Mix synthetic data for demonstration with real data for use in science and applications
- Easily expand existing code
- Vanilla entry to python programming
- Fully reproducible processing performance and processing results
- Heavy processing in the cloud → only download what you need

Have your own notebooks or notebooks from other authors? The lab is installed with a broad set of python tools → most notebooks should run out of the box





# Benefits of the Notebook-based OpenSARLab

- **Improved User Experience:**

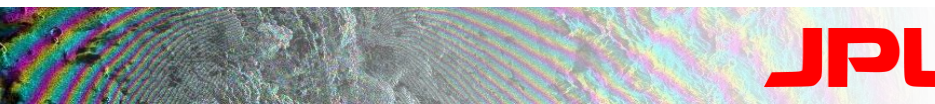
- Users have full access to sophisticated SAR data processing and analysis tools without need to install and maintain
- Existing Notebooks supporting SAR instruction, research and a range of applications
- Decently-sized compute environment without need for local processing hardware
- No data downloads (data remain in AWS) → lightning-speed performance; no need for local storage

- **Low Cost Implementation and Accelerated Research:**

- Instead of downloading data, processing in the cloud → cheaper than download and local processing
- Slow data download replaced by near immediate processing capabilities

- **Easily Extendable Collaboration Platform:**

- Easy sharing of notebooks and easy extension via Github
- Consistent notebook development both in format and functionality



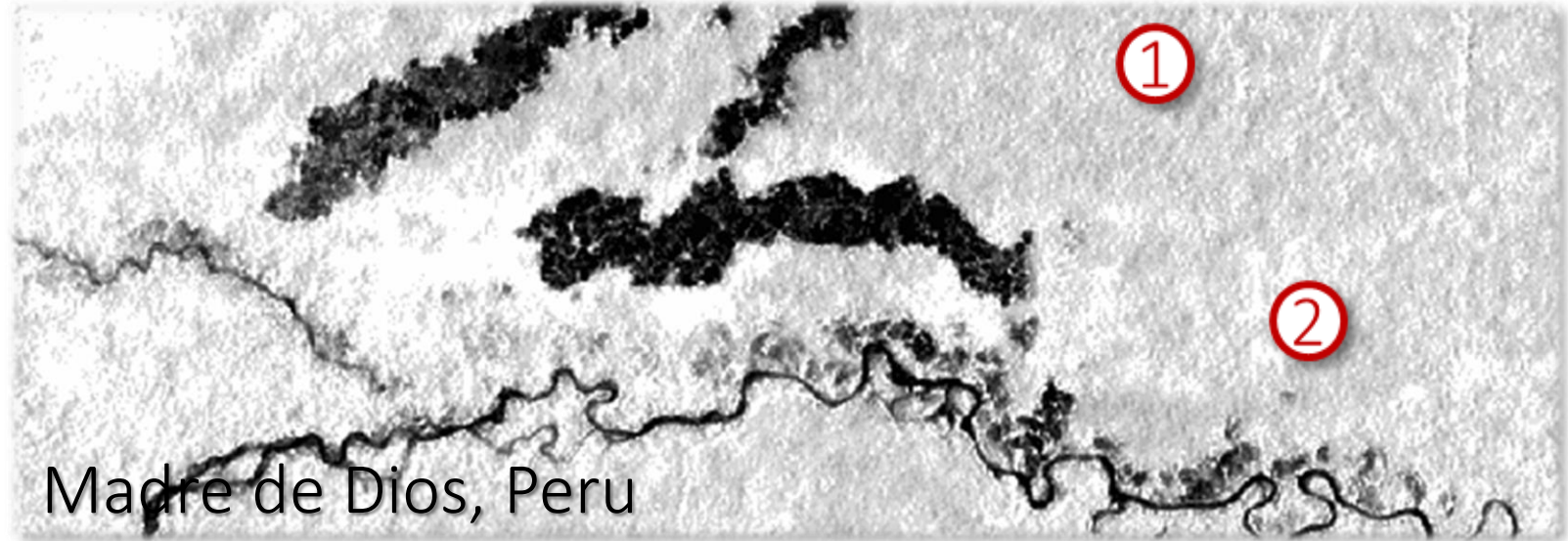
# The UNAVCO Cloud-based OpenSARLab:

<https://unavco2022.asf.alaska.edu/>

- Explore Environmental Signatures in Deep SAR data stacks



Example: Madre de Dios, Peru



Madre de Dios, Peru

