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# EARTHSCOPE INSAR TRAINING:

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

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

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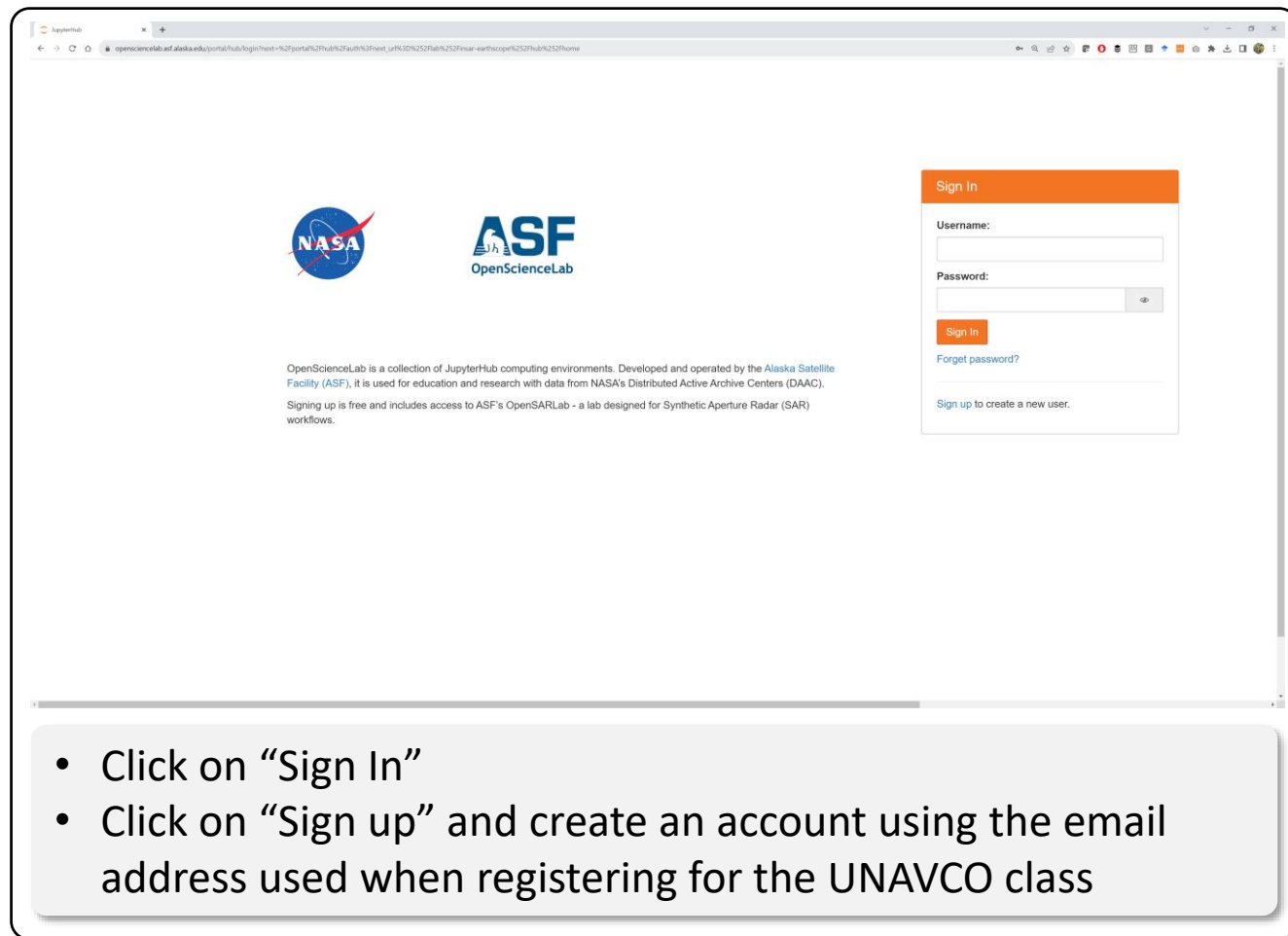
## Short Introduction to OpenScienceLab



# The UNAVCO InSAR Course OpenScienceLab Environment

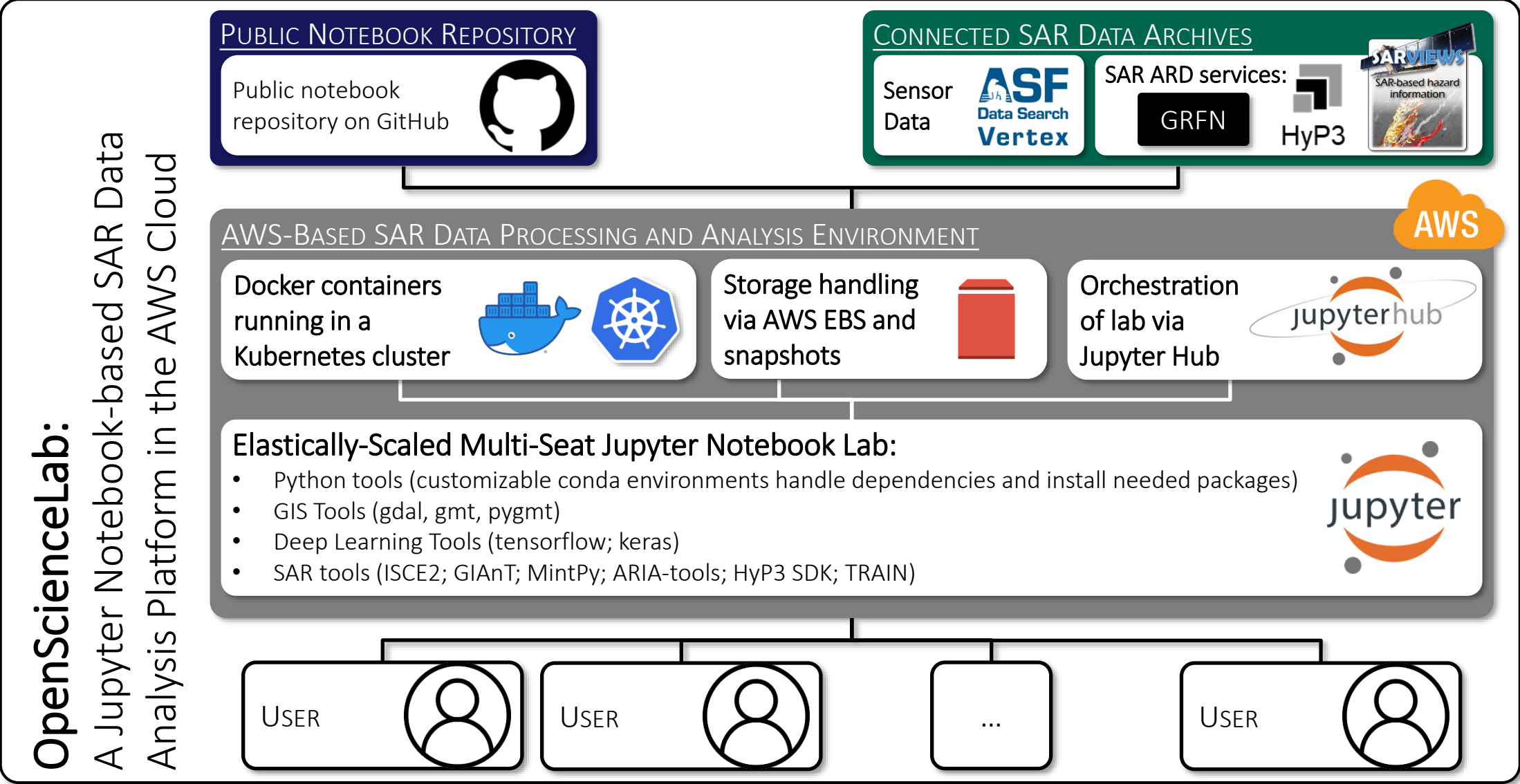
**URL:** <https://earthscope-insar.asf.alaska.edu>

- OpenScienceLab 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



# Concept of the EarthScope InSAR Course OpenScienceLab Environment

Web Address: <https://earthscope-insar.asf.alaska.edu>

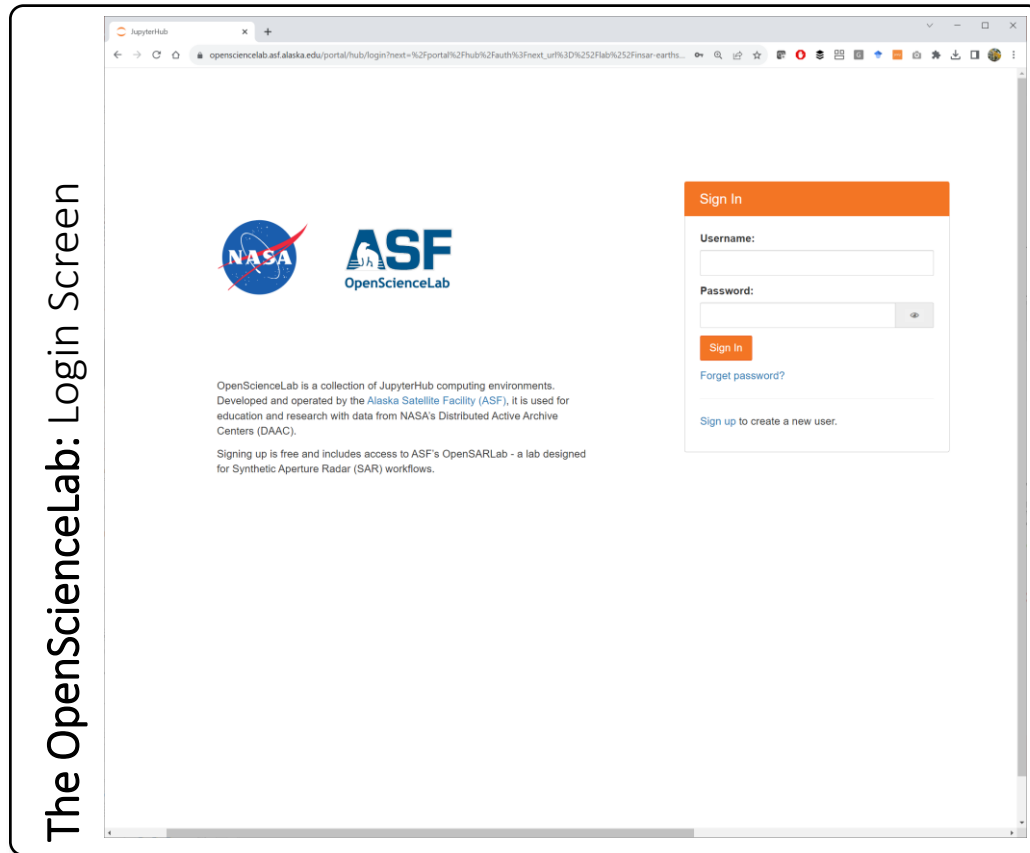


# Working Within the EarthScope OpenScienceLab

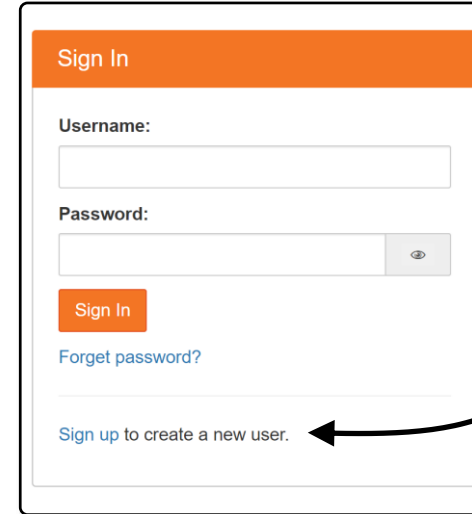
## Account Creation & Login

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

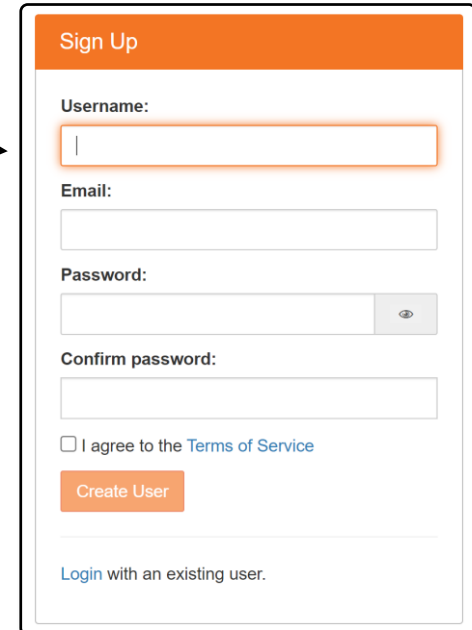
2. **Click on** “Sign in”



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



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



# Select the EarthScope InSAR Server Once You are Logged In

Select EarthScope InSAR Server

JupyterHub

Home Token

Go to Portal Home fmeyer Logout

## Server Options

- ☒ EarthScope InSAR  
Up to two users per machine. Memory guarantee - 12G, Max CPU - 16, Storage - 200G
- ☐ EarthScope InSAR - No Hook  
Do not run hook script. Useful for debugging non-starting servers.

Start

# Working Within the EarthScope OpenSARLab

## Features within the Notebook Lab

Need Help?

- Home screen features:

The screenshot shows the JupyterLab interface for EarthScope InSAR. The interface includes a file browser on the left, a central workspace with Notebook, Console, and Other tabs, and a top navigation bar. Callout boxes provide the following information:

- Logout and Server Shutdown:** Points to the 'Shutdown and Logout Page' link in the top navigation bar.
- Upload files from your local computer:** Points to the upload icon in the file browser.
- Create new notebooks:** Points to the 'base', 'base \*', and 'earthscope\_insar' notebook icons in the Notebook tab.
- Open a Terminal for Command-Line work:** Points to the 'Terminal' icon in the Other tab.
- All your notebooks are in the Geo-SInC folder:** Points to the 'Geo-SInC' folder in the file browser.
- Check on your Running Processes – Shut down Notebooks you don't:** Points to the 'conda\_environments' folder in the file browser.

Vertical text on the left side of the interface reads: "OpenSARLab: Home Screen".

# Working Within the OpenScienceLab

## Navigate to the Notebooks Relevant for this Training

- To find the **Jupyter notebooks related to this EarthScope InSAR training**, navigate to:

Geo-SInC/EarthScope2023

All training materials for this course are public and available at

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

OpenScienceLab: Notebooks for Training

The screenshot displays the JupyterLab web interface. The left sidebar shows a file browser with a search bar and a list of files and folders. The main area is titled 'Geo-SInC/EarthScope2023' and contains a 'Launcher' section with three Python notebook icons labeled 'base', 'base \*', and 'earthscope\_insar'. Below this is a 'Console' section with three similar Python notebook icons. At the bottom, there is an 'Other' section with icons for 'Terminal', 'Text File', 'Markdown File', 'Python File', and 'Show Contextual Help'. The top of the interface shows the 'JupyterLab' logo and a menu bar with options like 'File', 'Edit', 'View', 'Run', 'Kernel', 'Tabs', 'Settings', and 'Help'. The bottom status bar shows 'Simple' mode, memory usage 'Mem: 121.36 / 32768.00 MB', and a 'Launcher' button.



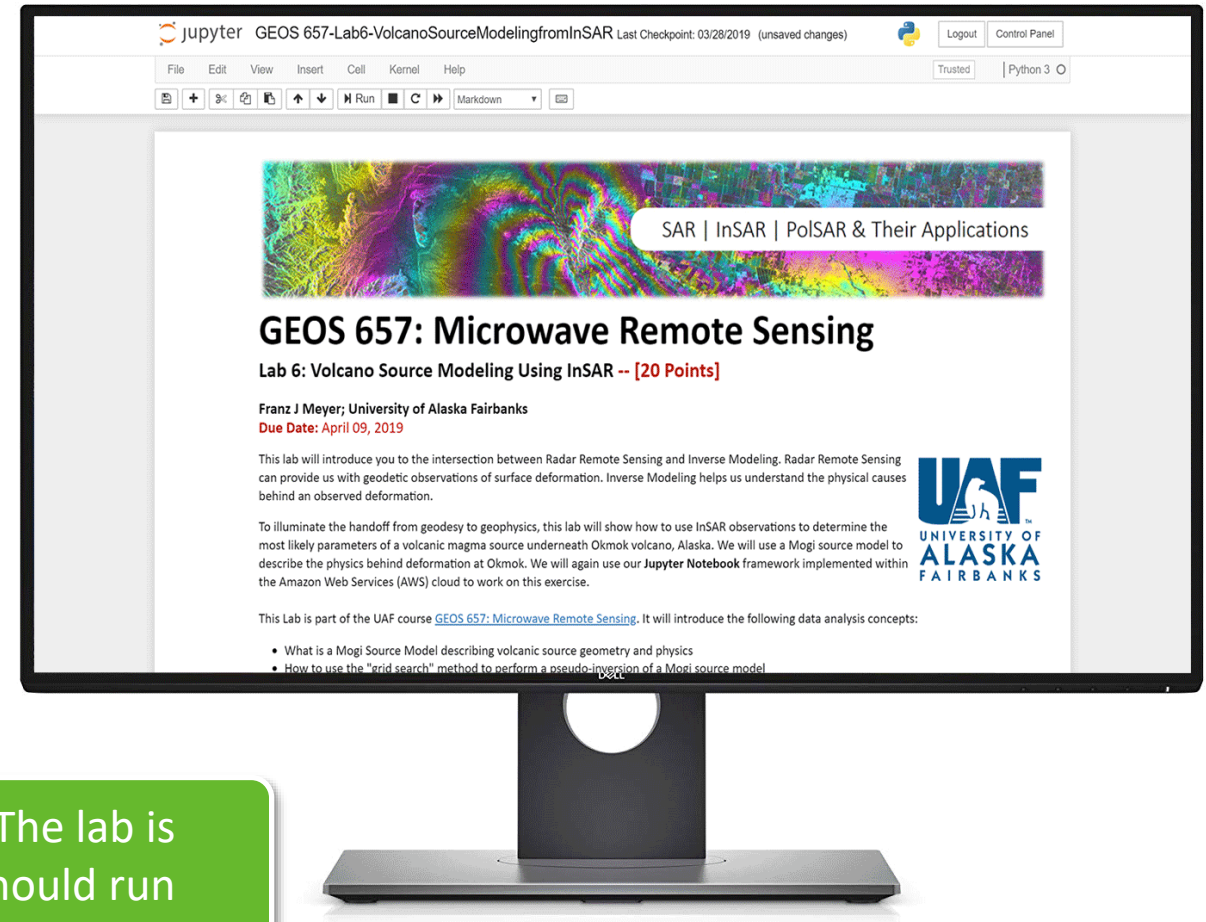
# Benefits of the Notebook-based OpenScienceLab

## 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 OpenScienceLab

- **Improved User Experience:**

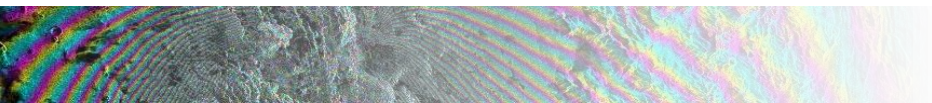
- Users have full access to sophisticated SAR data processing and analysis tools without need to install and maintain
- Existing Notebooks supporting SAR instruction, research and a range of applications
- Decently-sized compute environment without need for local processing hardware
- No data downloads (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 OpenScienceLab:

<https://earthscope-insar.asf.alaska.edu>

- Explore Environmental Signatures in Deep SAR data stacks



Example: Madre de Dios, Peru

