

# Bay Area Geophysical Society Seminar Series



## SeaFOAM: A Permanent DAS Deployment for Scientific Applications and Ocean Monitoring in Monterey Bay, California

**Dr. Li-Wei Chen**

Postdoctoral researcher, Berkeley Seismological Laboratory

**September 28<sup>th</sup>, 2023 5 PM PST -- Hybrid Talk**  
**In-person in Room 265 at McCone Hall (UC Berkeley campus) and on [Zoom](#)**

### **Abstract:**

Distributed acoustic sensing (DAS) provides a promising new tool for seismic monitoring in ocean environments using existing fiber optic cables. We report on the first year of a permanent DAS deployment on the Monterey Accelerated Research System (MARS) cable in Monterey Bay, California. A DAS interrogator was installed on the 52 km offshore cable, acquiring continuous seismic data at 200 Hz sampling rate along the entire cable length. Our results demonstrate the system's capabilities for observing local and teleseismic earthquakes, acoustic waves, background ocean noise, marine mammal vocalizations such as whale calls, and the effects of major storms. Over 100 seismic events have been detected so far, including a M5.1 earthquake in October 2022. Noise levels and frequency content vary along the cable as a function of water depth, with microseisms dominating in shallow water and infragravity waves prevailing at depths exceeding 800 m. DAS data is streamed in real-time for earthquake monitoring and early

warning. This dataset is providing new insights into offshore seismicity, ocean-solid earth coupling mechanisms, and marine mammal behavior.

## Author:

Li-Wei Chen is a postdoctoral researcher at Berkeley Seismology Lab (BSL), specializing in seismological approaches to study Earth's deep interior and near-surface structure. His PhD research focused on developing and applying full-waveform inversion methods to image Earth's deep mantle. He introduced techniques like source stacking and cross-correlation to accelerate full-waveform inversions. He continues advancing seismic imaging methodologies, with a



focus on modeling anisotropy for improved images of Earth's complex interior structure and dynamics. His research combines large-scale computational seismology with in-depth analyses of seismic data.

Dr. Chen has extensively analyzed seismic anisotropy in the near-surface and lowermost mantle. His work revealed strong shallow anisotropy in Taiwan using earthquake coda waves. He also studied temporal variations in velocity and anisotropy in Hokkaido's near surface, providing insights into evolving stress, cracks, and fluid saturation. Additionally, he modeled lowermost mantle anisotropy to infer dominant slip systems and phase transitions.

Recently, Dr. Chen contributed to an offshore seismic experiment using distributed acoustic sensing (DAS) in Monterey Bay, California. This will be the topic of his presentation for the BAGS society.

## Zoom meeting information:

Zoom ID: 892 8277 2977

Password: BAGS4ever