# POSTDOCTORAL RESEARCHER

## AI, Underwater Acoustics & Imagery for Marine Ecology

Develop new methods. Build multimodal labeled datasets.

Mentor the next generation of ocean researchers.

| $75,000/year | Honolulu, Hawai‘i | Start by Jan. 1, 2027 |
|---|---|---|
| fixed salary | on-site at UH Mānoa | funding currently available through Dec. 31, 2027 |

## A Distinctive Methods-Development Opportunity

The **Marine Innovation Lab for Leading-edge Oceanography (MILLO)** in the University of Hawai‘i at Mānoa Department of Ocean and Resources Engineering is recruiting a postdoctoral researcher to lead computational methods development at the intersection of **underwater acoustics, signal processing, AI/machine learning, computer vision, and marine ecology**. The postdoc will work with a unique, existing multi-year California kelp-forest dataset containing paired underwater imagery and multi-hydrophone passive-acoustic array recordings. The research program will be developed jointly with Dr. Camille Pagniello around the postdoc's technical expertise, scientific interests, and the opportunities presented by the dataset.

## Potential Research Directions

### 01 Detection, classification & localization

Develop statistical-, physics-, and AI-based algorithms for **biological-sound detection, classification, localization, tracking, and density estimation**, with beamforming, propagation models, and array-processing approaches using the multi-hydrophone passive-acoustic arrays.

### 02 Multimodal AI

Integrate passive acoustics and underwater imagery to associate fish species with biological sounds and investigate **when, where, and by which species** sounds are produced.

### 03 Collective acoustic behavior

Develop agentic or agent-based approaches to understand how individual calling behavior gives rise to **fish choruses and collective acoustic dynamics**.

### A major component: human-in-the-loop AI annotation

Design and maintain a scalable annotation + quality-control pipeline for acoustic and/or imagery data, including label definitions, model-assisted pre-labeling, active learning or uncertainty-based review, expert QC, provenance, and versioned datasets for algorithm training, validation, and benchmarking.

## Who Will Thrive in MILLO

We are looking for someone who wants to be a **visible senior member of MILLO**: someone who takes ownership of research, helps shape technical direction, and wants a **leadership and mentoring role with students**. MILLO is highly interactive and conversational. We troubleshoot together, bounce ideas around informally, and have a good sense of humor while doing serious science. The right person will be generous with their expertise, communicate openly, help students become confident and independent, and be excited to **write grants and develop new research proposals** that shape the group's next directions.

### Leadership & mentorship are central to the role.

The postdoc will mentor students on related projects, teach technical skills, provide constructive feedback, support increasing independence, share expertise, and contribute to grant/proposal development and day-to-day lab leadership.

## Core Qualifications

- **PhD by the start date** in oceanography, acoustics, ocean engineering, electrical engineering, computer science, marine science, or a closely related quantitative field.
- Demonstrated research expertise in **underwater acoustics / acoustic signal processing** or **AI / machine learning / computer vision**, with emphasis on developing methods rather than only applying existing tools.
- **Strong Python and MATLAB** skills, experience validating quantitative methods, and a record of peer-reviewed publication.
- **Previous experience mentoring undergraduate researchers is required**; graduate-student mentoring is desirable.
- Initiative, follow-through, clear communication, and the ability to work independently while contributing actively to a collaborative group.

### Technical Experience

*Especially relevant:* detection, classification, localization, tracking, and density-estimation algorithms; computer vision/deep learning; multimodal or physics-informed AI; human-in-the-loop annotation or active learning; acoustic propagation; and, where relevant, array processing/beamforming with multi-hydrophone passive-acoustic arrays. **Marine ecology or fish/animal behavior is desirable but secondary to strong technical expertise.**

## How to Apply

Apply through **RCUH website** at https://www.rcuh.com/opportunities/job-openings/ and search ID # **226737**. Applicants will also complete a supplemental survey on the MILLO Group website: https://pagniello-lab.github.io/join-us.html#postdocs

- **Cover letter (max 2 pages)**: research background and technical interests, why MILLO fits your next stage, and 1-2 research questions or methodological problems you would pursue with the acoustic and/or imagery datasets.
- **Curriculum Vitae (CV)**.
- **Contact information for 2–3 professional references**.
- **Primary-author scientific writing sample** (peer-reviewed publication, submitted manuscript, or manuscript in preparation).

### Important practical details

**On-site at UH Mānoa five days/week**; no remote work or relocation support. **Funding ends Dec. 31, 2027**; applicants should start by Jan. 1, 2027 to receive approximately one full year of funding. Extension requires additional funding. **Due to the compressed hiring timeline, this position is unlikely to accommodate employer-sponsored visa processing.**