

**GUAM EPSCoR • GUAM ECOSYSTEMS COLLABORATORIUM (GEC)
SPRING RESEARCH EXPERIENCE FOR UNDERGRADUATES**

Guam EPSCoR is a 5-year, \$6 million grant to the University of Guam from the National Science Foundation. The program aims to develop a Guam Ecosystems Collaboratorium to ensure the sustainability of coral reef ecosystems in the face of environmental change. Guam EPSCoR aims to situate Guam as a premier research and STEM (Science Technology, Engineering and Mathematics) education hub bolstering sustainability, economic development, and informed decision-making by engaging communities in 21st-century science.

In addition to its research goals, Guam EPSCoR seeks to increase the number and diversity of students who choose STEM careers by engaging students in its **Spring Research Experience (SRE) Program**. The SRE program is a semester-long program open to undergraduate students seeking research opportunities this spring. Student research training and tasks may include field work to investigate coral reefs or to deploy and retrieve oceanographic instruments, as well as work in the University of Guam Marine Laboratory's Molecular Lab. Selected students will learn about DNA extraction and sequencing and/or how to readout and analyze data to characterize marine environments. Ideal candidates are self-motivated, well organized, and have basic training or experience in lab procedures and microscopy.

The University of Guam and Research Corporation of the University of Guam are Equal Opportunity Employers that have received NSF funding to broaden the participation of underrepresented students in STEM fields. As such, the SRE Program remains open to all qualified students, but women, minorities, and students with disabilities are particularly encouraged to apply.

ELIGIBILITY:

- Must be a U.S. citizen and/or permanent resident of Guam
- Undergraduate student in good academic standing
- Must be able to commit 6-10 hours a week between February 11, 2019 - May 15, 2019. Schedules to be determined with Faculty Mentor.

BENEFITS:

- Research experience and training
- Faculty/Researcher mentoring
- \$3200 stipend
- Possible travel opportunities

DIRECTIONS: *Complete this application for the Guam EPSCoR GEC Spring Research Experience for Undergraduates. Please do not change the format. Please attach essay and transcript.*

APPLICATION SUBMISSION:

1. Drop off this application and transcript to:

Guam EPSCoR Office, University of Guam, Dean Circle House #4
Office Hours 8AM – 5PM, Monday - Friday

2. Or, you can email documents to Mellani Lubuag at lubuagm@uog.edu. *PDFs Only. Please use subject line: **SRE 2019***

SPACE IS LIMITED.

DUE DATE: January 28, 2019 by 5:00PM (CHST)

FOR MORE INFORMATION, CONTACT:

Mellani Lubuag, Program Manager
lubuagm@triton.uog.edu / (671) 735-0301/09

OCEANOGRAPHY:



Understanding the marine environment is essential to study coral reef ecology. As part of EPSCoR project, we describe physical and chemical characteristics of Guam’s coastal ocean by using oceanographic instruments on coral reefs. Collected data (e.g., water current, temperature, irradiance, dissolved oxygen) will be used to examine if any environmental parameters affect coral reef organisms and ecosystems. There will be an opportunity to deploy and retrieve the instruments in the field, then readout and analyze data to characterize the environment. Existing data will also be available. Assigned tasks will largely depend on the student’s interest. Other opportunities include tank experiment and field observations of coral bleaching/health, computational models (water current, larval transport, or both), and benthic habitat mapping.

Faculty Mentor: Dr. Atsushi Fujimura

CORAL ADAPTATION:



Tropical coral reefs are under many threats due to a rapidly changing climate and the accumulation of local stressors. Increasing observations suggest that genetic variation associated with thermal and light tolerance could provide the raw material necessary for adaptation to climate change in various coral species. This research project will aim at exploring and identifying patterns responsible for temperature and light adaptation in corals by conducting in situ experimental approaches. There will be opportunities to be introduced to genetic methods as well, depending on the candidate's interests and abilities. The ideal candidate(s) will be self motivated, well organized, and feel comfortable snorkeling.

Faculty Mentor: Dr. Sarah Lemer

CORAL BARCODING:



Corals are difficult to identify using morphology alone. Genetic barcoding can provide a means for comparing corals collected in Guam to corals from other places throughout the Pacific region. It is expected that some of Guam’s coral species diversity will be distinct from its conspecifics throughout the Pacific. The intern will become part of a team that will work in the molecular lab to extract DNA, PCR amplify molecular markers of interest and sequence these markers. Phylogenetic analyses will be used to elucidate the relationship of Guam’s corals to corals for which genetic data exists outside of Guam.

Faculty Mentor: Dr. Bastian Bentlage

TAXONOMY & GENETIC BARCODING:

Selected students will be trained in general molecular laboratory skills, including DNA extractions, polymerase-chain reaction, gel electrophoresis, DNA sequencing and DNA analyses. In addition, students will have the opportunity to learn about basic coral biology, taxonomy and morphology.

Faculty Mentor: Dr. David Combosch

BIOREPOSITORY:



Students assigned to the Biorepository function essentially as curatorial assistants. In this role they will participate in the collection and curation of specimens, following iDigBio protocols, tissue preservation, whole organism preservation, photographic documentation, 2-D and 3-D scanning for digitization of images or whole organisms or structures, data base utilization and maintenance, analysis of date, assistance with manuscripts preparation and maintenance of collections.

Faculty Mentor: Dr. Terry Donaldson

GUAM EPSCOR • SPRING RESEARCH EXPERIENCE FOR UNDERGRADUATES (SRE)

NAME: _____ **DATE OF BIRTH:** _____

CITIZENSHIP: USA Citizen/ Permanent Resident Other: _____

UNIVERSITY: _____ **MAJOR:** _____

TERM START (E.G. FA16): _____ **PROSPECTIVE GRADUATION DATE:** _____

CUM GPA: _____ **TRANSCRIPT ATTACHED:** Official Copy Unofficial Copy None/Pending

BEST WAY TO CONTACT YOU: _____ **PHONE NUMBER(S):** _____

EMAIL ADDRESS: _____

MAILING ADDRESS: _____

HIGHEST EDUCATION LEVEL COMPLETED BY MOTHER / FEMALE LEGAL GUARDIAN: _____

HIGHEST EDUCATION LEVEL COMPLETED BY FATHER / MALE LEGAL GUARDIAN: _____

DEMOGRAPHICS: *Please select one option for each demographic question. Participation is optional.*

GENDER: Male Female Prefer not to disclose

RACE: Pacific Islander Black/African American Native American/Alaska Native
 Hispanic/Latino Asian White Other: _____ Prefer not to disclose

ETHNICITY: Hispanic or Latino Not Hispanic or Latino Prefer not to disclose

PERSON WITH DISABILITIES: Yes No Prefer not to disclose

SHORT ANSWER: *In the section below list coursework or experiences that demonstrates why you might be an appropriate candidate for this program. Indicate current/ongoing with asterisks ****

COURSE WORK:

COURSE TITLE & NUMBER	

WORK EXPERIENCE:

Position Title	Employer	Duties	Dates Employed

VOLUNTEER EXPERIENCE:

Position Title	Organization	Duties	Dates

SHORT ESSAY QUESTIONS: Responses to all questions should be limited to this page.

1. HOW WOULD CONDUCTING RESEARCH WITH EPSCOR SUPPORT YOUR CAREER GOALS?

2. SUCCESSFUL CANDIDATES ARE RESPONSIBLE AND WORK WELL IN TEAMS. GIVE EXAMPLES OF HOW YOU HAVE DEMONSTRATED AND CONTINUE TO EXERCISE THESE QUALITIES.

FUTURE TRACKING: Please suggest the best way we can reach you in the future. (For example, you might list family telephone numbers, emails, social media and mailing addresses that are unlikely to change.)

RESEARCH PROJECT PREFERENCE: Please review page 2 of this application and indicate your research project interest. You may indicate two research interests.

#1

#2

SIGNATURE: Signature below indicates your interest in the Guam EPSCoR SRE Program and that the information provided in this application is accurate to the best of your knowledge.

Applicant Signature: _____ **Date:** _____