Marine Meteorology and Space Weather ONR Code 322MM

11 June 2024

Ocean, Atmosphere, and Space Research Division

ONR Code 322MM Program Officers

Daniel P. Eleuterio

daniel.p.eleuterio.civ@us.navy.mil

Joshua H. Cossuth

joshua.h.cossuth.civ@us.navy.mil

Katherine L. Mulreany

katherine.l.mulreany.civ@us.navy.mil

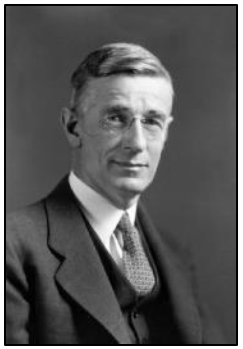
Bruce A. Fritz

bruce.a.fritz4.civ@us.navy.mil

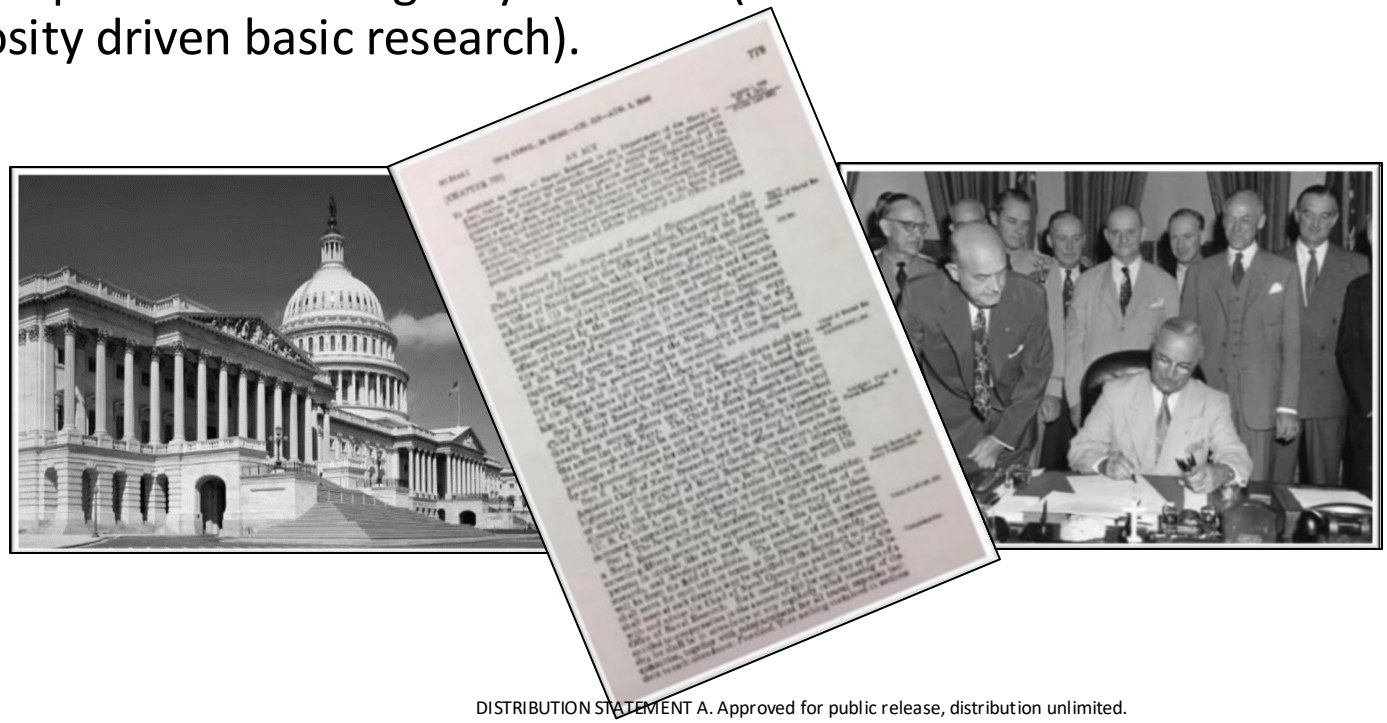
Office of Naval Research

Founded in **1946**, ONR was the first permanent US federal agency devoted to the support of scientific research.

- ONR was the model for the National Science Foundation (established in 1950).
- ONR is a research **"mission agency"** for Basic and Applied Research relevant to the Naval Forces just as NOAA and NASA are use-inspired for their agency missions (while NSF is devoted to curiosity driven basic research).



Vannevar Bush "Science: The Endless Frontier"

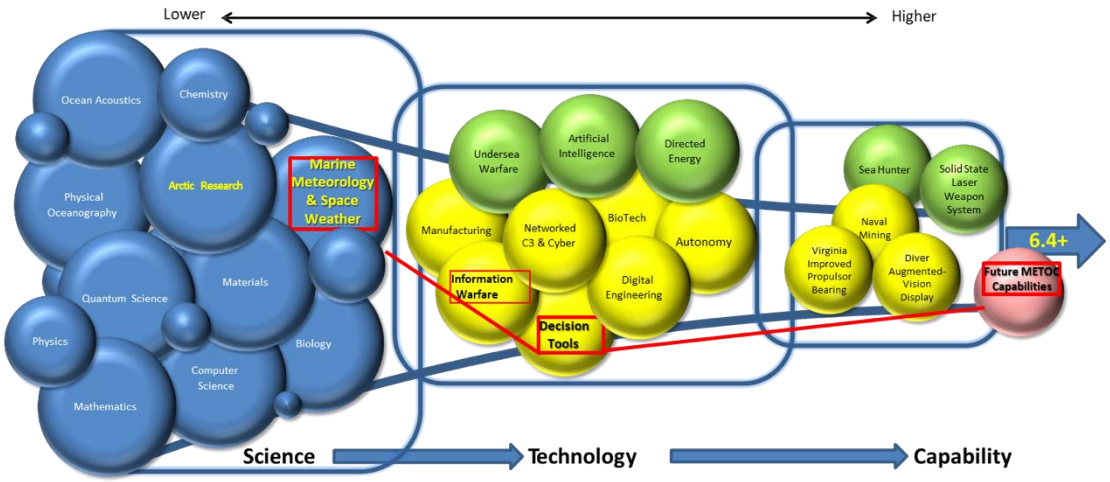


Space Weather

Research Area

- **Impact**
  - Civil and other DoD ionospheric research does not sufficiently address the Navy's needs for Bottom-Side Ionospheric (BSI) conditions in regional maritime applications for HF Radar and Communications applications.
- **Hard Problems**
  - Improved prediction of Sporadic E, Equatorial Spread F, Polar Auroral clutter, transient effects of TIDs.
  - Improved sensing of regional conditions using nontraditional means.
- **Key Stakeholders**
  - Research partners, Naval Information Warfare Forces, Navy METOC

- **Research thrusts**
  - Understanding and prediction of low latitude and high latitude irregularities away from ground-based observing systems
  - Ionospheric drivers from below/ coupling between the stratosphere and thermosphere
  - Global assimilation of non-traditional ionospheric measurements
  - Space-based and maritime remote sensing applications
  - Communication applications
  - Low cost innovations (Cubesats, secondary payload sensors)
  - High latitude modeling



Basic and early Applied Research (BAR - 47%)

Disruptive Technology (INPs - 14%)

Enabling Capabilities (TCs - 7%, FNCs - 13%, Tech Maturation - 16%; Total - 36%)

Adv. Component Dev. & Prototypes – 1.2%)

*Percentage of PB22

Multidisciplinary University Research Initiative (MURI)

- Objective: Develop a quantitative numerical representation of lower atmosphere gravity wave coupling through mesospheric-ionospheric fate modeling that is underpinned by the theoretical models while matching the current observationally based empirical models from generation, propagation, and dissipation in the thermosphere-ionosphere, leading to improved numerical representation and prediction of ionospheric structure beyond diurnal solar forcing.

- Awards under this topic will be no more than $1.5M per year for 5 years, supporting no more than five funded faculty researchers. Exceptions warranted by specific proposal approaches may be discussed during the white paper phase of the solicitation.

✓ 4 White Papers received and have been reviewed

❑ Feedback being compiled for re-distribution to proposers

23 August 2024 – application Inquiries and Question cutoff

6 September 2024 – 5:00 PM Eastern Time Applications due

1 will be selected for funding

For questions, contact any of the Research Topic Chiefs:
Daniel Eleuterio, ONR 332, 703-696-4303, daniel.p.eleuterio.civ@us.navy.mil
Josh Cossuth ONR 332, 703-696-0703, joshua.h.cossuth.civ@us.navy.mil
Bruce Fritz, ONR 332, 202-404-1102, bruce.a.fritz4.civ@us.navy.mil
Julie Moses, AFOSR, 703-696-9586, julie.moses@us.af.mil

Student Funding Opportunities

NREIP

- Stipends ($7.5k for new undergrad, $9k for returning undergrad, $11.5k for graduate)
- Citizenship eligibility varies by host lab
- Applications open Aug 1st for 2025

SMART Scholarship Program

- Full tuition and education related expenses
- Stipend of $30,000 - $46,000 a year
- Summer research internships from 8 to 12 weeks
- Health Insurance & misc. allowance
- An experienced mentor at Sponsoring Facilities
- Employment placement at a DoD facility

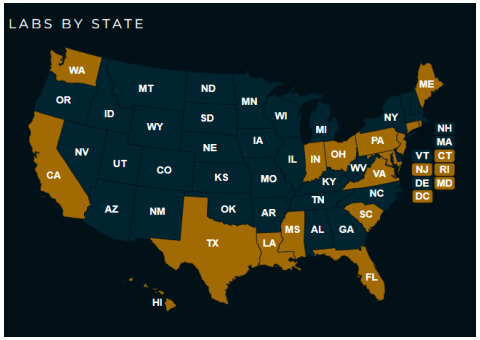
SEAP 8 Week Internship

- Must be in high school grades 9-12; at least 15 years of age, & US Citizen. $4k stipend

NREIP NAVAL RESEARCH ENTERPRISE INTERNSHIP PROGRAM

Department of Defense DoDSTEM Science · Technology · Engineering · Mathematics SMART

SEAP SCIENCE & ENGINEERING APPRENTICESHIP PROGRAM



https://www.nre.navy.mil/education-outreach/naval-stem

Early Career Funding Opportunity

Young Investigator Program

N0001424SF004

- **15 - 20 new awards** by the Navy each year (~3 from ONR Code 32)
- **~ 20% success rate**
- **$250,000 / yr for three years** awards, with the possibility of additional support for capital equipment or collaborative research with a Navy laboratory
- A few of the applicants receiving an ONR Young Investigator award will also be selected to receive a Presidential Early Career Award for Scientists and Engineers (PECASE), which provides an additional $200k/yr for 5 years)
- Eligibility: This program is open to U.S. citizens and permanent residents holding tenure track or permanent faculty positions at U.S. institutions of higher education, within five years of starting their appointment


MIT News
ON CAMPUS AND AROUND THE WORLD
SUBSCRIBE

MIT Haystack scientists prepare a constellation of instruments to observe the solar eclipse's effects

In a first, four different technologies will monitor changes in the upper atmosphere, locally and across the continent, as the sun's radiation dips.

Jennifer Chu | MIT News
April 4, 2024

2013-2015 Riccardo Bevilacqua
Measuring Spatio-temporal Variations in Upper Atmosphere via Nano Satellites and WINCS

2022-2025 John Swoboda
Novel Ground-based Ionospheric Sensing

https://www.nre.navy.mil/work-with-us/funding-opportunities/fiscal-year-fy-2025-young-investigator-program-yip

Other Funding Opportunities

Defense University Research Instrumentation Program (DURIP)

- FY25 proposals could request $50,000 to $3,000,000
- FY26 Announcement likely open in fall/winter, due winter/spring 2025
- https://www.nre.navy.mil/work-with-us/funding-opportunities/department-defense-dod-fiscal-year-2025-defense-university

Professor Simon Shepherd checks the theodolite in preparation for aligning the antenna poles of the newest addition to the Super Dual Auroral Radar Network (SuperDARN) in Iceland. (Photo by Nat Alden '23)

SBIR / STTR

- N23A-T022 Lightweight Mirrors for Microsatellites and Small Satellites (Outpost Technologies, AlMMC Mirrors)
- N231-070 Ultraviolet Solar Blind Sensors for Microsatellites and Small Satellites (Adroit, AlGaN alternative to PMTs)
- N182-137 F-region (thermospheric) Dayside Neutral Wind Measurement from a CubeSat (SSRC)

FY25 DURIP Call (closed)

SBIR/STTR

Summary

Long Range BAA N00014-23-S-B001 (via the 322MM Team Page)

- https://www.nre.navy.mil/organization/departments/code-32/division-322/marine-meteorology-space
- Formal Planning Letters/ Full Proposals encouraged by July 1 annually for the following Fiscal Year (Oct 1st)

322MM Website:

Questions?

Bruce A. Fritz
- bruce.fritz@nrl.navy.mil

Daniel P. Eleuterio
- daniel.p.eleuterio.civ@us.navy.mil

Backup

NSF INTERN

Supplemental Funding Opportunity

- Up to $55K for up to 6 months of internship with host.
- PI must submit the supplemental request through an active NSF award
- Funds: travel, tuition and fees, health insurance, stipend, temporary relocation costs, materials + faculty co-mentoring.
- 250+ INTERNs supported each year

Dear Colleague Letter: Research Internships for Graduate Students at AFRL (NSF-AFRL INTERN)

There might be other INTERN opportunities in FY24, be on the lookout!