



**UNITED STATES
COAST GUARD
ACADEMY**

Science Lecture Series

From Storms to Sporadic E: Evaluating Short-Timescale Impacts of Deep Convection over the Western Mediterranean

CDR Synge O'Leary

Department of Physics, US Coast Guard Academy

Thunderstorms can generate waves that travel into the upper atmosphere, but their effects on the ionosphere remain uncertain. This talk explores whether deep convection from the lower atmosphere can influence sporadic E's, thin layers of concentrated electrons found 90–120 kilometers above Earth. Using five years of satellite observations from the Western Mediterranean, this study compares the occurrence and intensity of these layers during convective and non-convective days. The analysis focuses on the six hours after peak convection, using statistical methods to distinguish potential storm-related effects from natural variability. The presentation will discuss how these layers form, how satellites detect them, and the potential connections between weather in the lower atmosphere and the ionosphere.

Wednesday, September 23rd, 2026

2000 - 2100

Dimick Auditorium

U.S. Coast Guard Academy

A native of the Big Island of Hawai'i, CDR Synge O'Leary graduated from the U.S. Coast Guard Academy in 2010 with a B.S. in Marine and Environmental Sciences. He began his active-duty career aboard CGC JARVIS (WHEC-725), a 378' ported in Honolulu, Hawai'i, serving as a Student Engineer. He then completed six months of training at the Naval Diving and Salvage Training Center in Panama City Beach, Florida, and returned to Honolulu as the diving officer aboard a 225', CGC WALNUT (WLB-205). Following his afloat assignments, CDR O'Leary attended naval flight training in Pensacola, Florida, earning his wings in 2016. As an MH-65 Dolphin short-range recovery pilot, he has served at Air Station Borinquen, Puerto Rico, and Air Station Atlantic City, New Jersey. CDR O'Leary earned a M.S. in Atmospheric Sciences from the University of Hawai'i at Mānoa in 2026.

**If you have any questions regarding the event, please contact Dr. Kanani K. M. Lee
(kanani.km.lee@uscga.edu) for more information.**