

FATIMA: FOG AND TURBULENCE INTERACTIONS IN THE MARINE ATMOSPHERE (MURI: FY 21-26)

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Objectives

- **Quest?** - Identify/quantify/parameterize/simulate microphysical, physicochemical, turbulence, and thermodynamic processes underlying the marine fog lifecycle, by parsing information across 15 decades of nonlinearly interacting (synoptic to aerosol) scales
- **Modus Operandi?** Collect unique field data aboard research vessels and on land, evoke a repertoire of NWP/high-resolution simulations, capitalize on community research tools

Technical Approach

- Deploy an unprecedented array of extant leading-edge instruments and research models to elicit biogeochemophysical processes at or across scales relevant to marine fog
- Develop novel instruments and models to delve into smallest scales (turbulence, aerosols, droplets) & radiative processes
- Seek truly multidisciplinary, international collaboration - universities, government and industry - to pool resources and personnel



Fatima-2023 Yellow-Sea campaign on R/V Onnuri

FY24 Annual Accomplishments

- Integration of Fatima Grand Banks field campaign data, high-resolution and mesoscale (WRF, COAMPS) simulations, satellite observations, reanalysis products, and theoretical models to elicit many new details underlying marine fog dynamics – all encapsulated in a *BAMS* article
- Data from novel Fatima instruments [C&D-CAMS; tethered, gimbed radiometers; super-combo system] unraveled new fog physics
- 19 published/accepted journal papers + 9 in revision; 18 STEM Participants; 2 new PhDs; 1 special issue in QJRMS; AMS & AGU sessions