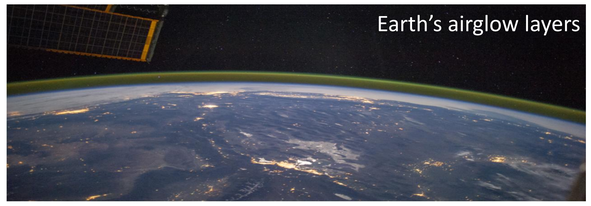
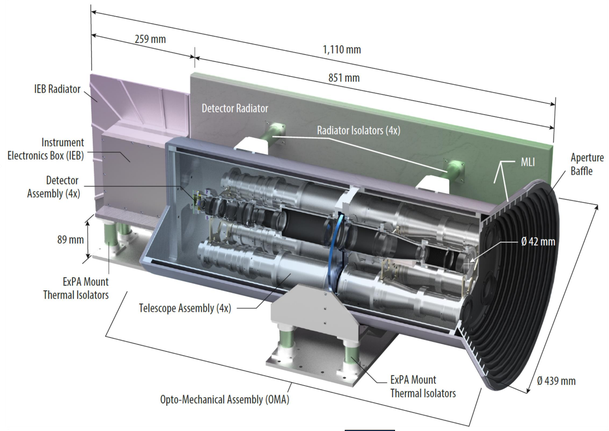
The Atmospheric Waves Experiment (AWE)

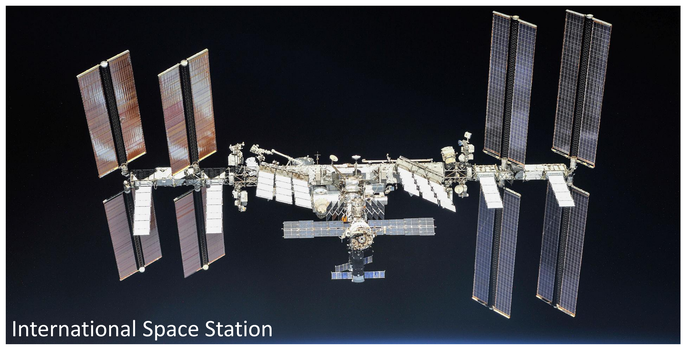
How does tropospheric weather influence space weather?

Principal Investigator: Prof. Mike Taylor, Physics Department/CASS, Utah State University

AWE is the first dedicated NASA mission to investigate global gravity waves properties in the upper atmosphere and their impacts on the ionosphere-thermosphere-mesosphere (ITM)





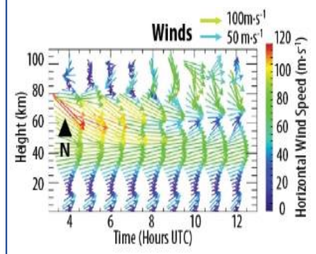


- 2-year mission on the ISS (Launch December 2023)
- Nighttime measurements
- ~15 orbits per day
- 4-day full coverage +/- 55° latitude
- 1 temperature map every second
- 600 km field-of-view
- 30-300 km gravity waves measurements at ~87 km
- State-of-the-art modeling
- Student collaboration program (USU and ERAU)

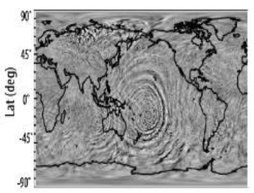
AWE Mission Operations Center at the Space Dynamics Laboratory

AWE Science Operations Center in the USU Physics Department

Global Models

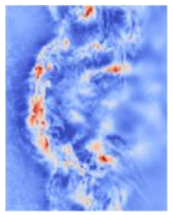


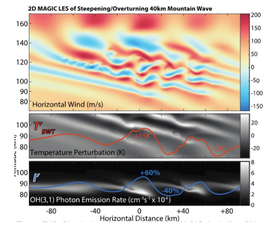
NAVGEM (NRL)



WACCM-X (NCAR)

Regional Models

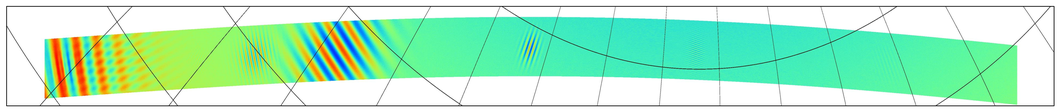

CGCAM (GATS)



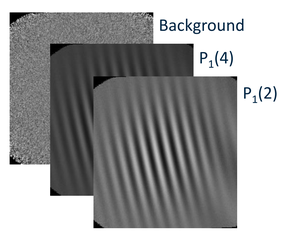
MAGIC (ERAU)

Science Objectives

- Quantify the seasonal and regional variabilities and influences of gravity waves near the mesopause (~87 km)
- Identify the dominant dynamical processes controlling gravity waves
- Estimate the wider role of gravity waves in the ITM

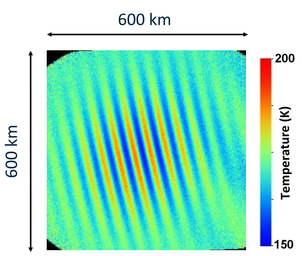

Temperature swath

Data Level 3



OH (3,1) emission lines images

Data Level 1



Temperature image

Data Level 2

AWE Space Dynamics Laboratory, Utah State University

NASA

UtahStateUniversity

University of Colorado Boulder

GATS

U.S. NAVAL RESEARCH LABORATORY

NCAR NATIONAL CENTER FOR ATMOSPHERIC RESEARCH

TELEDYNE JUDSON TECHNOLOGIES

EMBRY-RIDDLE Aeronautical University