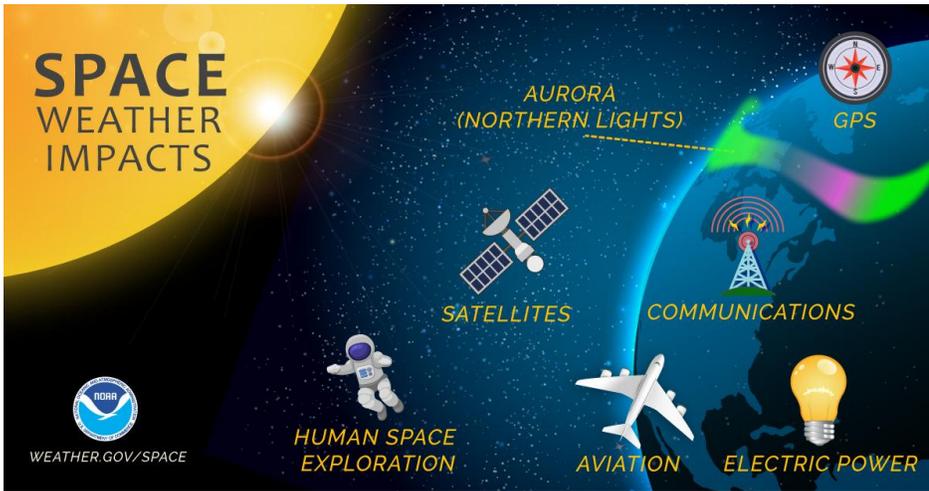


SPACE WEATHER SENSOR PACKAGES



Space weather refers to the dynamics of the Earth's space environment due to solar disturbances that directly impact technological systems such as satellite navigation and communication systems, power grids, and ground-and-aircraft-based HF radio communication. The team will help design a sensor package for a space weather instrument suite for research and citizen science applications. The

team will help design the packaging for the sensors, develop the web-based interface to connect the sensors to the database, visualization tools and other ancillary data to contribute to the study of space weather.

Space weather impacts are a natural hazard that disrupts technological systems that society greatly depends upon including communication, navigation and power distribution systems. Following the inspiration of the meteorology community and Weather Underground that connected backyard weather stations into the global weather system, this project will deploy magnetometers and other sensors everywhere to make a dense distributed array to enable new science and understanding of the Earth's space environment. Commercializing a low-cost space weather sensor package would enable deployment at a wide range of locations including K12 schools and citizen scientist's backyards. The UARTS Faculty Engineering/Arts Student Team (FEAST) will help design the packaging for a space weather sensor package for research and citizen science applications. The team will also help develop the web-based interface to connect the sensors to the database, visualization tools and other ancillary data to contribute to the study of space weather.

MEETING TIME AND LOCATION

TBD depending on SwUM (Spaceweather Underground Michigan) team's schedule and pandemic/post-pandemic meeting guidelines (virtual or in CSRB/B500 Magnetism Lab).

STUDENTS SOUGHT

PROTOTYPE HARDWARE SYSTEM (3)

- Student skills: embedded systems, sensors, system characterization (power, communication, magnetometer, GPS)
- Likely majors: SPACE, CLIMATE, EE, ME, CE, CS, ASTRO

PLUG & PLAY INSTRUMENT PACKAGE (3)

- Student skills: embedded systems, design, UX/UI
- Likely majors: ARTDES, ARCH, IOE, ME, SI, EARTH, ENVIRON

WEB & APP USER INTERFACE & DATABASE BACK-END (3)

- Student skills: web design, app design, UX/UI, databases
- Likely majors: ARTDES, PAT, SI, CS, IOE, EARTH, ENVIRON

FACULTY PROJECT LEAD



Mark Moldwin is an Arthur F. Thurnau Professor of Climate and Space Sciences and Engineering and Applied Physics within the University of Michigan's Department of Climate and Space Sciences and Engineering. He is currently the Faculty Director of M-Engin, a program within UM's M-STEM Academy to support undergraduates academically and professionally, the Executive Director of NASA's Michigan Space Grant Consortium and President of the American Geophysical Union's (AGU) Education Section. He is the principle-investigator on several NASA, NSF and DOD projects (including the NASA Artemis Lunar Gateway HERMES project, NSF's iMAGS project, and the Office of Naval Research's SENSOR project). He has been recognized for his research, teaching and service by numerous awards and is currently the 2019-2020 US-Norway Fulbright Arctic Chair.