

Title:

The Space Weather Operational Readiness Development (SWORD) Center – a focal point for international collaboration in space weather research

Authors:

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Abstract:

The Space Weather Operational Readiness Development (SWORD) Center is an international, multi-disciplinary focal point where space weather researchers, operational forecasters, industry partners, and the space weather community will collaborate on transformative research to improve forecasts and nowcasts of the orbital and cis-lunar space environment. SWORD research will focus on coupling the UMich Geospace model, part of the Space Weather Modeling Framework (SWMF), with the CU Whole Atmosphere Model with Ionosphere Plasmasphere Electrodynamics (WAM-IPE), both of which are currently operational at the NOAA Space Weather Prediction Center (SWPC). In addition, SWORD will develop new data assimilation systems, based on the NOAA JEDI framework, for both the operational WAM-IPE model and the NCAR Whole Atmosphere Community Climate Model – Extended (WACCM-X) research model. SWORD research will include advanced physics-informed machine learning research to enhance computational efficiency as well as cloud-based model development and deployment systems to accelerate the transition to operations at NOAA. SWORD consists of research teams from the University of Colorado (CU) Boulder, the University of Michigan (UMich) Ann Arbor, NCAR's High Altitude Observatory, the University of Alaska, and the University of Iowa, in partnership with Amazon Web Services, SpaceX, LeoLabs, GeoOptics, and Muon Space. In addition to close coordination with NOAA/SWPC through the NOAA Technical Transition Representative (TTR), SWORD will leverage international partnerships with the UK Met Office Space Weather Operations Center and the South African Space Agency Space Weather Forecasting Office to expand the reach of NASA space weather research. Opportunities for additional international partnerships are actively encouraged. SWORD public outreach and educational development efforts will be coordinated through the University of Alaska Space Weather UnderGround (SWUG) program.