2024 Workshop: Sounding Rocket Science

Long title
Using sounding rockets to advance scientific understanding of the ionosphere-thermosphere system through independent missions and combined efforts like "Grand Challenge Initiatives for Rocket and Balloon Research --- Mesosphere / Lower Thermosphere and CU
Conveners
Meghan Burleigh
Kolbjørn Blix
Robert Pfaff
Steve Kaeppler
Claire Gasque
meghan.r.burleigh.civ@us.navy.mil
Description

Sounding rockets provide a unique observational platform into difficult to probe altitudinal regimes of the ionosphere-thermosphere (IT). Coupled with complimentary ground- and spaced-based measurements, sounding rocket campaigns facilitate data, modeling, and machine learning studies that advance our understanding of the IT system. This workshop aims to highlight new science from recent launches, questions that upcoming rockets will investigate, as well as what we are still learning from the older datasets. Of special interest are the ongoing Project Mesosphere/Lower Thermosphere (M/LT) and the proposed Project CUSP Solar Max program (2025-2030), primarily taking place at the Norwegian rocket ranges of Andøya and Svalbard. These Grand Challenge Initiatives (GCI) are “follow-ons” to the highly successful GCI-Cusp campaign, led by Andøya Space of Norway, that launched 12 sounding rockets, including those provided by NASA, Norway, and Japan, from Andøya and Svalbard between Dec 2018 and Dec. 2021.
This workshop will share short presentations of ongoing research using sounding rocket campaign data and discuss possible topics for both Grand Challenge Initiative programs. Student contributions are highly encouraged.

Agenda

Meghan Burleigh - Session Intro

Kristina Lynch - "Isinglass, Gneiss, and the aurora"

Don Hampton - "(Recent and upcoming) Chemical Tracer Experiments using Sounding Rockets"

Andrew Pepper - "The Impact of the Neutral Wind on the Rate of Joule Heating"

Aroh Barjatya - "Distributed in-situ measurements from a sounding rocket platform in the MLT region"

Mark Conde - "Neutral Wind and Ion Drifts Measurements Derived from Chemical Releases from the C-REX-2 Sounding Rocket"

Rob Pfaff – "Grand Challenge Initiatives (GCI)"

Doug Rowland – "Grand Challenge Initiatives – CUSP Status Report"

Glyn Collinson – "Endurance"

Diana Loucks – "Polar Latitude Atmospheric Space Measurement ad Analysis (PLASMA)"

Justification

Sounding rockets have been facilitating scientific discovery through the decades. This workshop aims to bring the scientific community together to showcase recent advances, foster future collaborations, and encourage student participation.

Related to CEDAR Science Thrusts:
Encourage and undertake a systems perspective of geospace
Explore exchange processes at boundaries and transitions in geospace
Explore processes related to geospace evolution
Develop observational and instrumentation strategies for geospace system studies
Workshop format
Short Presentations
Keywords
Sounding rockets, ionosphere, thermosphere
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