2020 Workshop: Initiative MLT

Long title
Grand Challenge: Initiative Mesosphere / Lower Thermosphere
Grand Challenge
Conveners
Douglas Rowland
Kolbjørn Blix
Jøran Moen
Lehmacher, Gerald
Description

This is a planning meeting to discuss science investigations and topics as well as logistics planning for the upcoming Grand Challenge Initiative -- Mesosphere/Lower Thermosphere (GCI-MLT). GCI-MLT is a follow on to the successful GCI-Cusp campaign which has been ongoing since Dec 2018. GCI-MLT will have an expanded scope, with more international participation, a more geographically diverse set of observations, and more diversity in platforms (ground-based, balloon, aircraft, rocket, satellite) to address critical problems in MLT physics. GCI-MLT is an "umbrella" designed to coordinate and provide synergies for projects that will be funded through regular funding agencies. GCI-MLT does not provide funding, but it does provide a way for us all to work together and maximize the impact of our research. We will discuss the GCI-MLT white paper in development, as well as existing and potential plans for investigations that may fit into the GCI-MLT. We anticipate forming GCI-MLT around several existing rocket and balloon missions, and then developing proposals for other investigations (ground-based, balloon, rocket, aircraft, satellite) that will fit around these "anchor" missions. Of particular interest for this meeting are proposals for balloon, rocket, and aircraft investigations that may be proposed to NSF and NASA in fall 2020.

More info on the Grand Challenge Initiative CUSP (predecessor) & M/LT: https://www.grandchallenge.no/

Agenda

1700-1705: Kolbjørn Blix (ASC, Norway)| Agenda Information (pdf)

1705-1710: CHAIR: Doug Rowland (NASA Goddard, USA) | GCI intro – CUSP status, M/LT plans

1710-1715: Gerald Lehmacher (Clemson Uni., USA) | The Vorticity Experiment (VortEx) 2022: an update (pdf)

1715-1720: Wojciech Miloch (U of Oslo, Norway) | Lower ionosphere - thermosphere and space weather activities at the University of Oslo, Norway

1720-1725: Boris Strelnikov (IAP, Germany) | Scientific questions for sounding rockets (by B. Strelnikov and F.-J. Lübken)

1725-1730: Henriette Trollvik (U of Tromsø, Norway) | Mesospheric Dust Studies Using Rocket Observations

1730-1735: Jörg Gumbel (Stockholm University, Sweden) | ORIGIN - a proposed rocket campaign connecting O, O2 and OH in the Earth's nightglow

1735-1740: William Ward (University of New Brunswick, Canada) | Untangling dynamics and transport in the mesopause region

1740-1745: Nickolay Ivchenko (KTH, Sweden) | "SYSTER" rocket project as part of ESA Daedalus Phase A campaign

1745-1750: David Miles (University of Iowa) | Sounding Rocket Magnetometer Options (Pre-recorded)

1750-1755: Yun-Hang Cho (University of Sheffield, UK) | Overview of the Sheffield Space Initiative and Opportunities with GCI M/LT

1755-1800: Richard Collins (University of Alaska Fairbanks, USA) | Wave Activity Forcing of E-Region (WAFER) Richard Collins for the WAFER team

1800-1805: Oliver Drescher (DLR MORABA, Germany) | HAS - Development of a thrust controllable research platform to hover in the middle atmosphere (Pre-recorded)

1805-1810: Vladimir Yushkov (Central Aerological Observatory, Russia) | Sounding Rocket in Russia (Pre-recorded)

1810-1815: Peter Dalin (Swedish Institute of Space Physics) | Stratospheric Observations of Noctilucent Clouds - SONC experiment

1815-1820: Joan Stude (German Aerospace Center / DLR Institute of Atmospheric Physics) | Future plans on deploying our rocket mass spectrometer ROMARA

1820-1825: Diego Janches (NASA/GSFC, USA) | Balloon Sodium Lidar to measure Tides in the Antarctic Region (B-SoLiTARe)

1825-1830: Xiaoyan Zhou (University California, Los Angeles, USA) | The BALBOA Project: BALloon-Based Observations for Sunlit Aurora

1830-1835: Oleg Ugolnikov (Space Research Institute, Russian Academy of Sciences) | Noctilucent Clouds Size Estimation from All-Sky Monitoring: Color and Polarization Approaches (Pre-recorded)

1835-1840: John Plane (University of Leeds, UK) | Questions in mesospheric chemistry

1840-1845: Mattias Abrahamsson (SSC, Science Services Division, Sweden) | Esrange Space Center – a launch and measurement site for GCI M/LT

1845-1850: Liz MacDonald (NASA GSFC, USA) | Citizen Science and the Grand Challenges

1850-1855: Tomasz Noga (Lukasiewicz Research Network - Institute of Aviation) | Polish Contribution to GCI M/LT

1855-1900: Hein Olthof (T-Minus Engineering B.V., Holland) | Use of micro sounding rockets for supporting 4D atmospheric measurements

1900-1905: Martina Faenza (Nammo Raufoss AS, Norway) | Nucleus, Norwegian sounding rocket for mesosphere research

Justification

According to the GCI M/LT white paper the project is planned to start in 2022 with the VortEx campaign. This gives us a perfect opportunity to plan complementary and new campaigns during and after VortEX. The white paper has entries from 9 nations on possible science topics, technologies, platforms, ground based observatories and potential research partners. To ensure the best possible scientific outcome and

value for the funding institutions money, we should use this workshop to do short (5 min) presentations (either live or pre-recorded) on proposed/planned experiments/campaigns and allow discussions/comments. In the end of the session the organizers will propose the formation of a GCI M/LT PI-coordination group, as well as time/place/type of follow-up meeting.

Summary

Meeting started 1700 CET and lasted until 20:10 CET.
Zoom counter showed steadily 100 participants, which was max allowed for our session in Zoom. We apologize to those who were denied access to the meeting due to the maximum limit of 100 participants for which the session was set up.
We had 24 planned talks, 1 was cancelled but will be posted online. A couple had technical issues, but overall it went as planned.

Lot's of new ideas for science projects and cross country/Atlantic cooperations in M/LT research from 2022 as part og GCI. At the end of the meeting, a GCI M / LT coordination group was set up consisting of representatives from all 9 GCI M/LT countries, plus dedicated coordinators for the program itself and for student rocket(s). This group becomes an important part of the job of operationalizing the project's white paper and the good ideas presented thorugh the talks in this session. To increase the chances for success , the GCI M/LT should start planning for a broad participation at the **25th ESA Symposium on European Rocket and Balloon Programmes and related Research** which will take place on **6-10 June 2021 in Biarritz, France**. Links to this very important biannually scientific gathering concering activities at Andøya Space Center (Norway) and ESRANGE Space Center (Sweden) will be posted as soon as they are released.

The session was recorded, and these recordings and some selected talks (those who had technical difficulties) will be made available shortly through the GCI website: https://www.grandchallenge.no/

GCI M/LT Coordination Group:
Chair: Douglas Rowland (NASA Goddard, USA)
Program Coordinator: Kolbjørn Blix (ASC, Norway)
Student Rocket Coordinator: Chris Koehler (U of Colorado/COSGC)
Gerald Lehmacher (Clemson, USA)

Takumi Abe (ISAS/JAXA, Japan)
Wojciech Miloch (UiO, Norway)
Ingrid Mann (UiT, Norway)
William Ward, (New Brunswick, Canada)
Boris Strelnikov (IAP, Germany)
Jörg Gumbel (Stockholm University, Sweden)
John Plane (University of Leeds, UK)
Tomasz Noga (Lukasiewicz Research Network - Institute of Aviation, Poland)
Oleg Ugolnikov (Space Research Institute, Russian Academy of Sciences)

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