



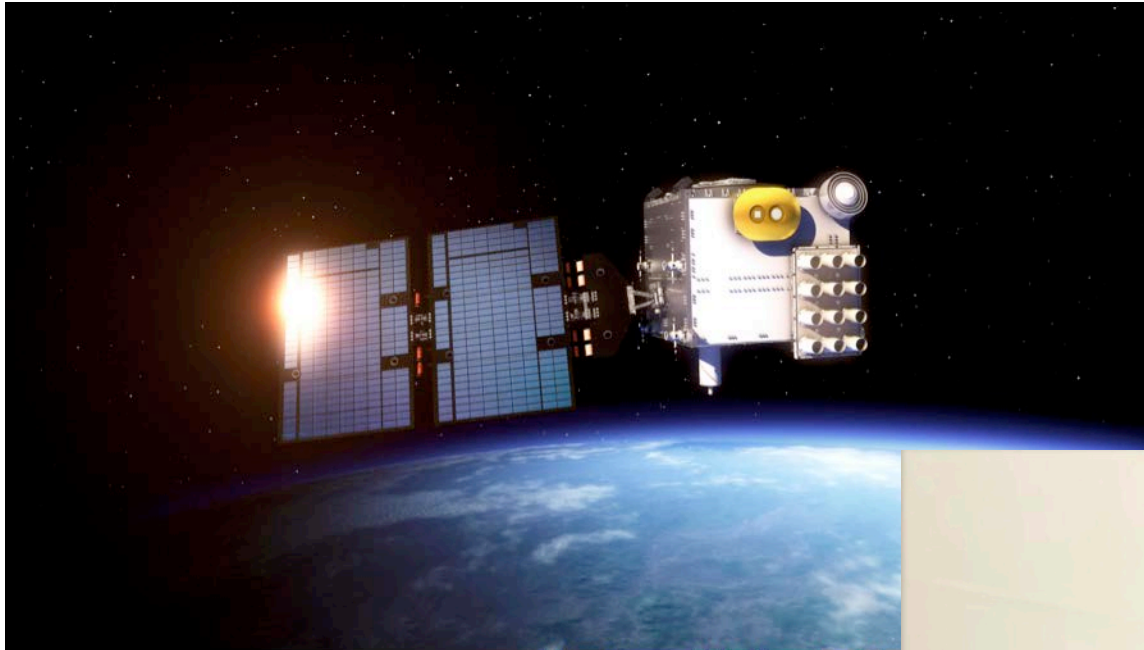
Scott England
CEDAR 2016
Santa Fe



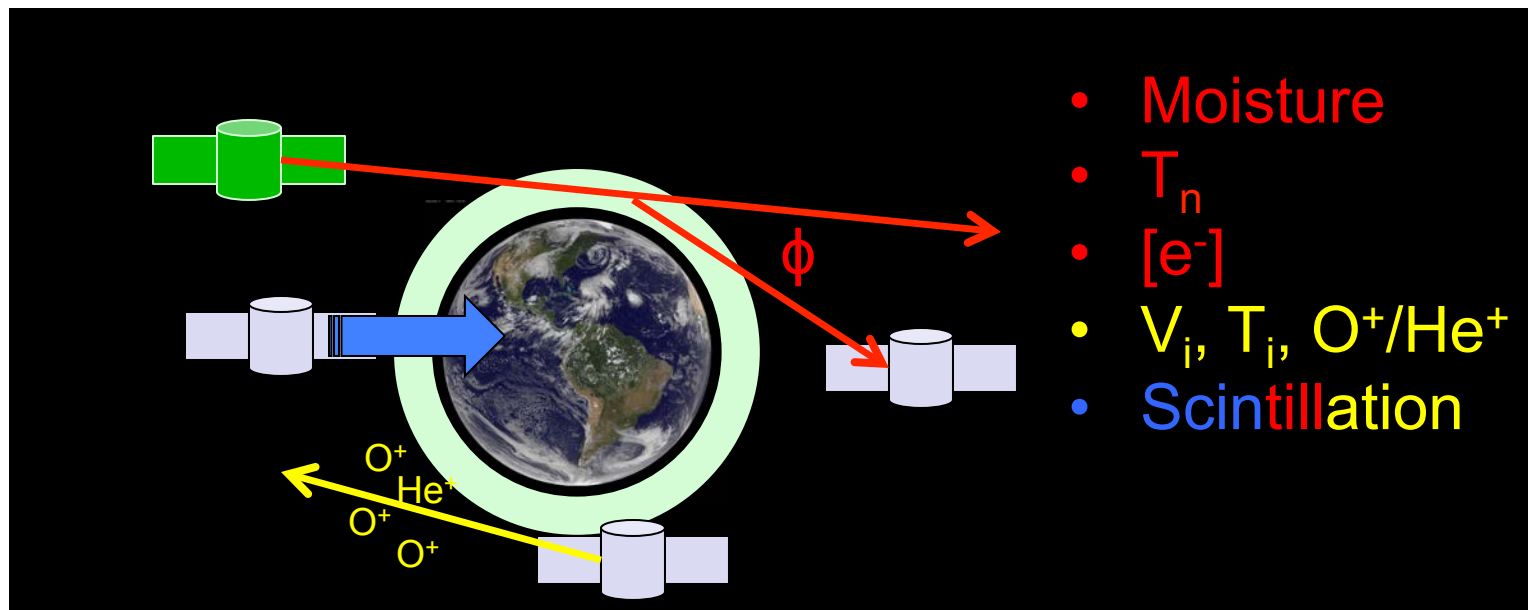
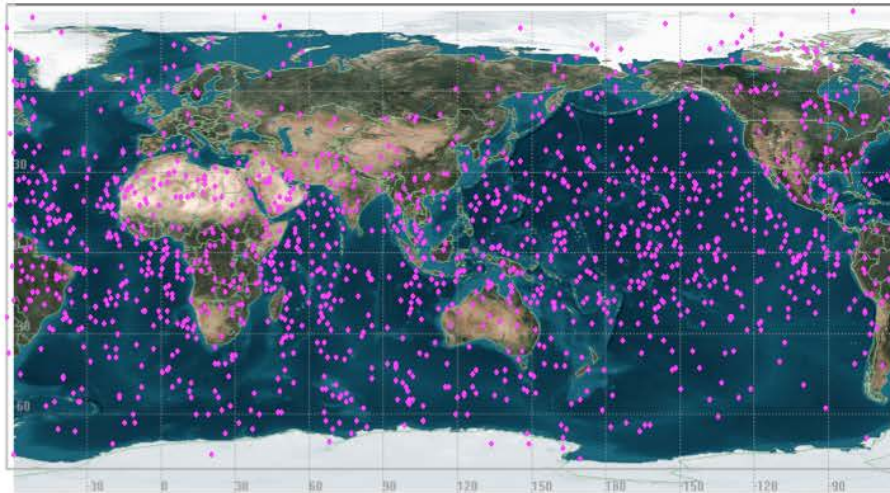
- Premise:
 - We have a real chance of solving some long-standing questions in our field over the next few years.
 - As best we can, we should use the opportunity we have with the new & upcoming spaceflight missions to push our field as far as we can.
- Some overview of the upcoming thermosphere/ionosphere missions:
 - COSMIC-2
 - ICON
 - GOLD
- One imagination of how we could use these as an observing system.
- How to leverage these to do more?
- Where to find more information & what to do next.

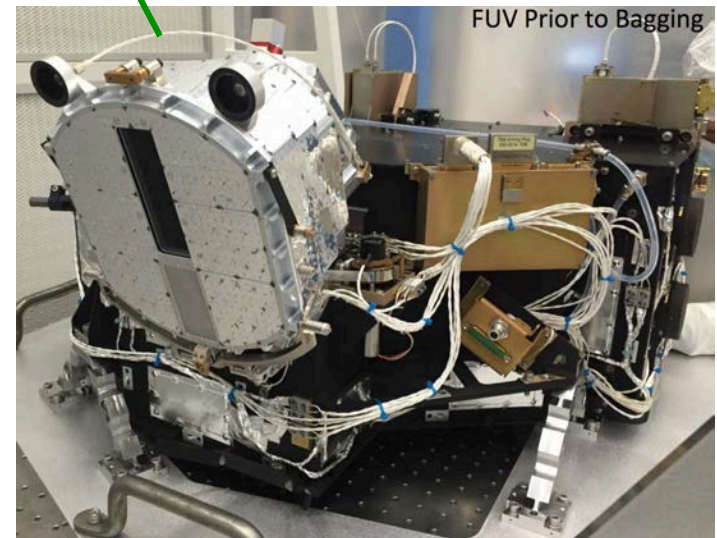
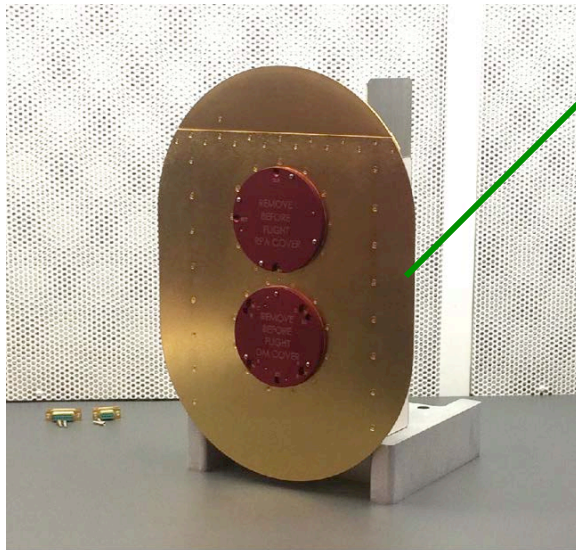
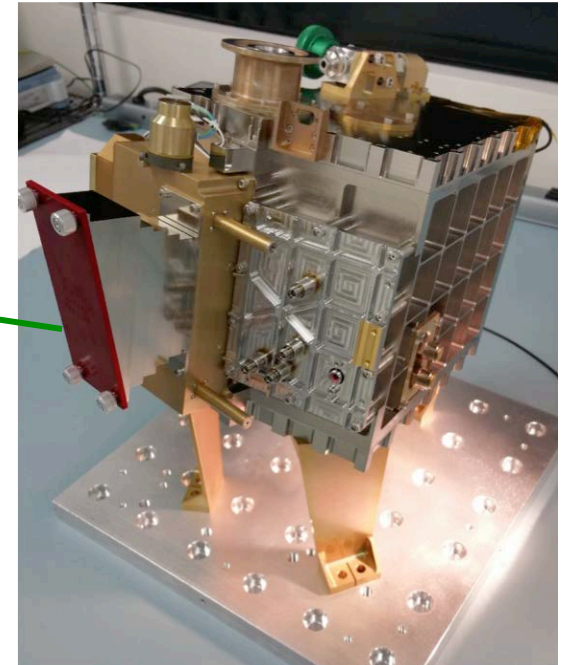
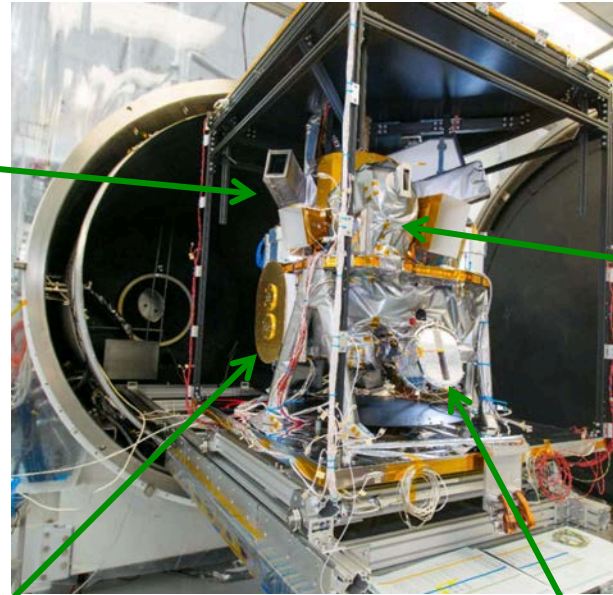
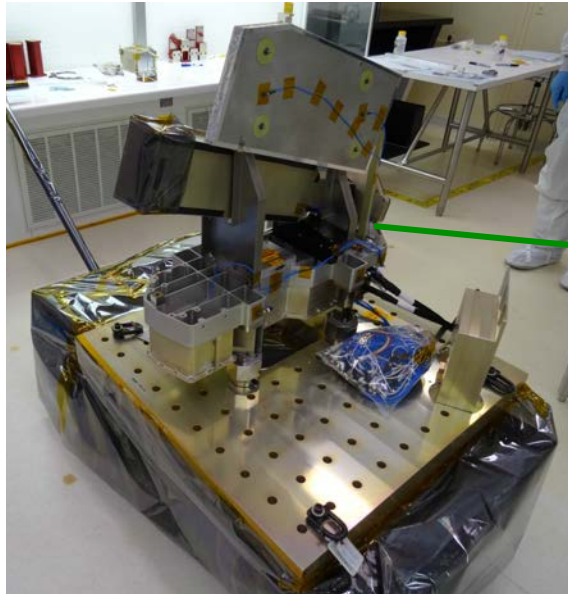
Major Spaceflight Missions **Recently Launched** or **Upcoming**

- Earth Science:
 - GPM February 2014 (Precipitation, cloud & latent heat proxies)
 - Jason-3 January 2016 (Charged particles, TEC)
 - GRACE-FO August 2017 (*In situ* thermospheric density)
- Middle/Upper Atmosphere & Ionosphere:
 - SWARM November 2013 (B, E, *in situ* density, cross-track drift)
 - COSMIC-2 March 2017 (Electron density, *in situ* ion drift, scintillation)
 - ICON June 2017 (Thermospheric wind, temp., O/N₂, O⁺ density, drift)
 - GOLD September 2017 (Thermospheric temp., O/N₂, O⁺ density)
- Magnetosphere:
 - RBSP/Van Allen August 2012 (Energetic particles, waves, composition)
 - MMS March 2015 (Energetic particles, waves, composition)
- Solar & Solar Wind:
 - SDO February 2010 (Solar atmosphere and interior)
 - DSCOVR February 2015 (Solar wind speed, density, B)
 - Solar Probe July 2018 (Energetic particles, waves, composition)
 - Solar Orbiter October 2018 (Solar atmosphere and solar wind)

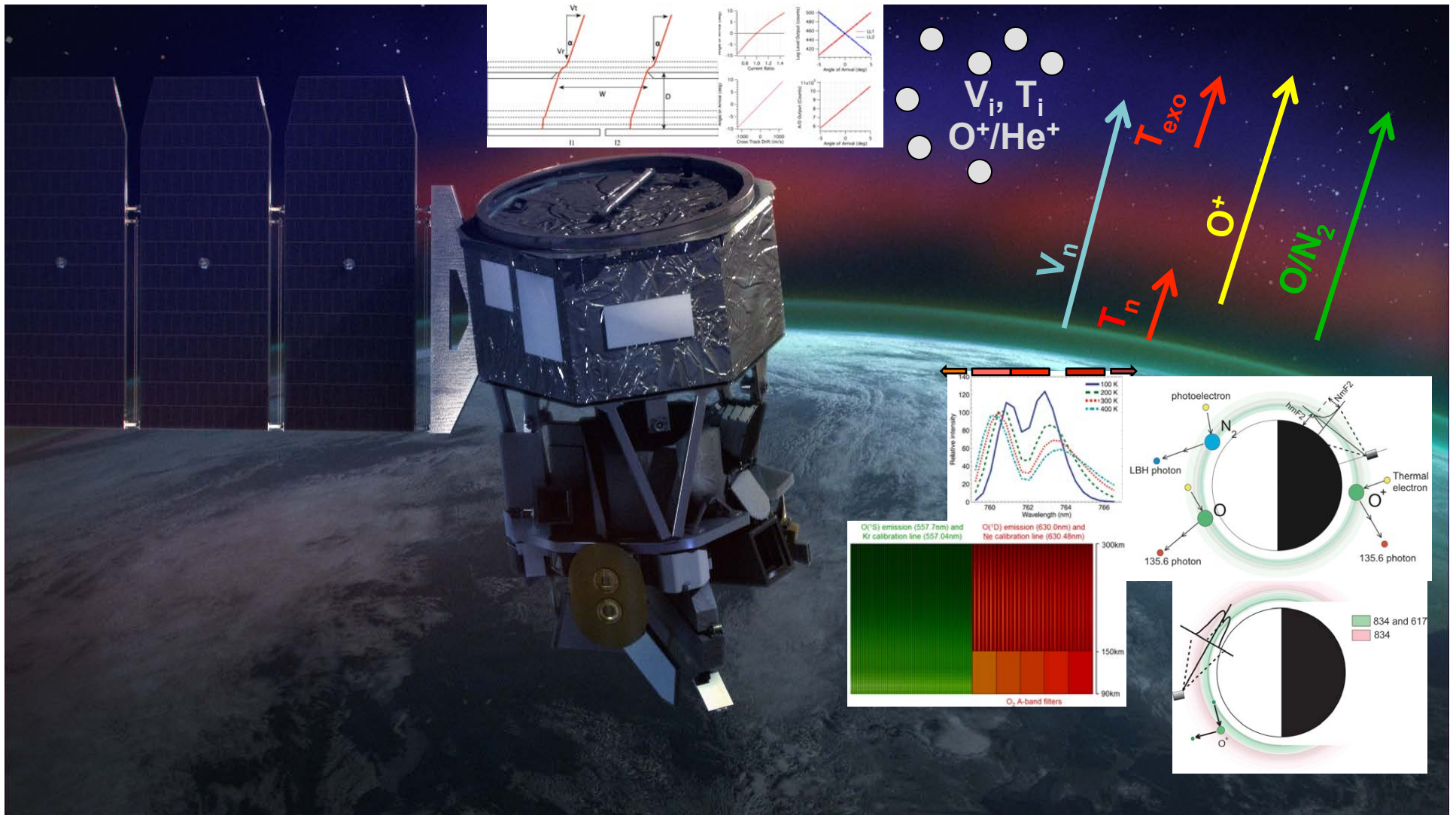


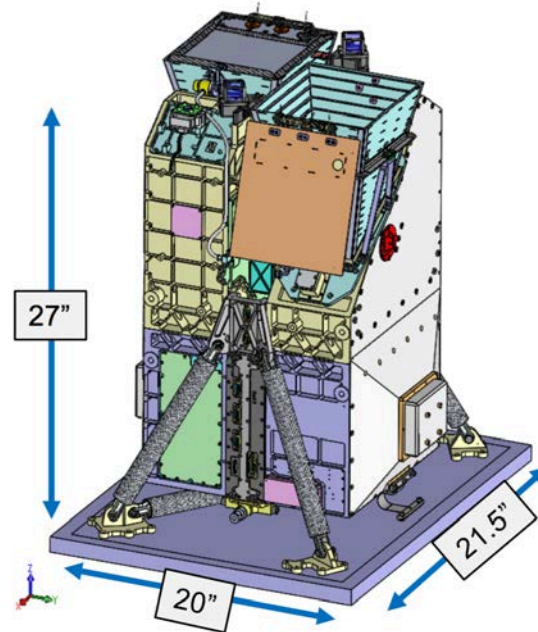
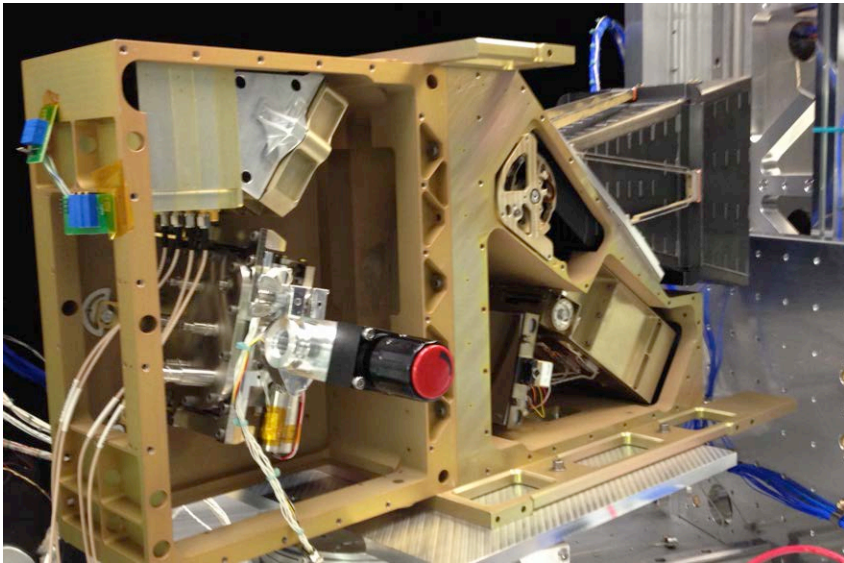
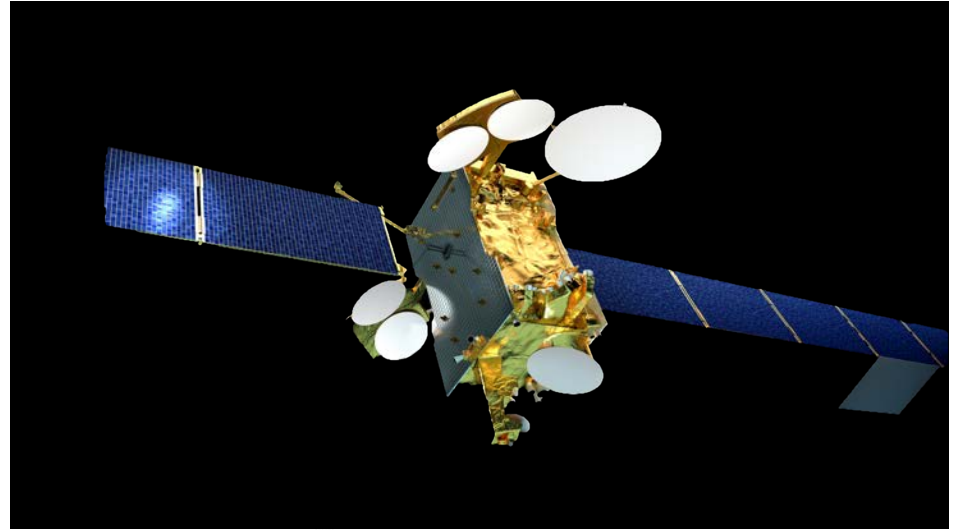
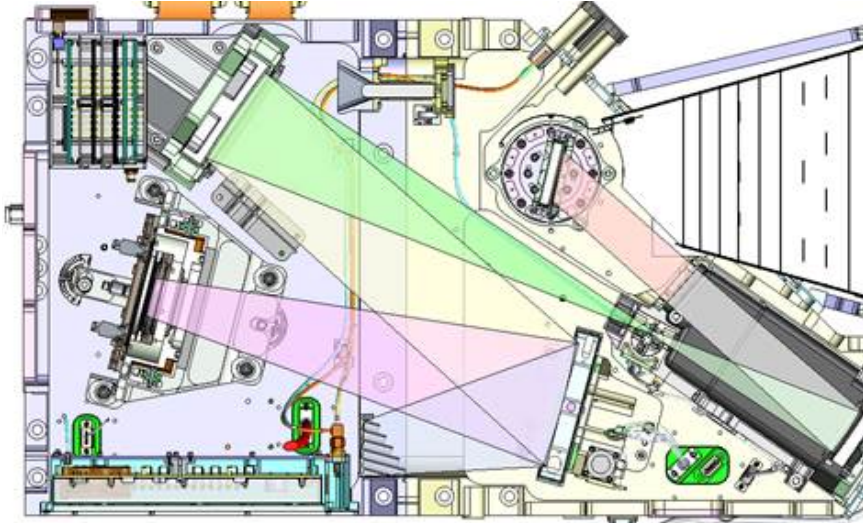
FORMOSAT-7 Occultations – 3 Hrs Coverage

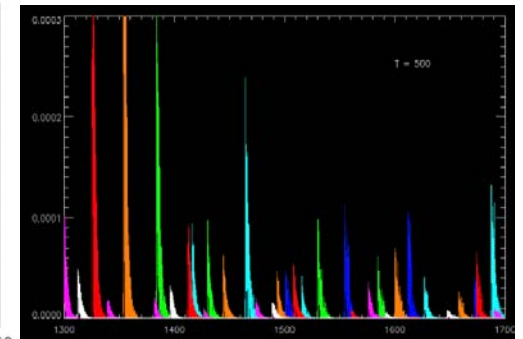
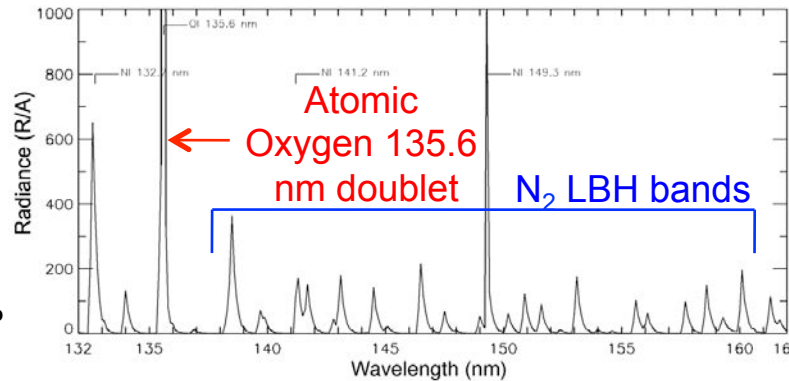
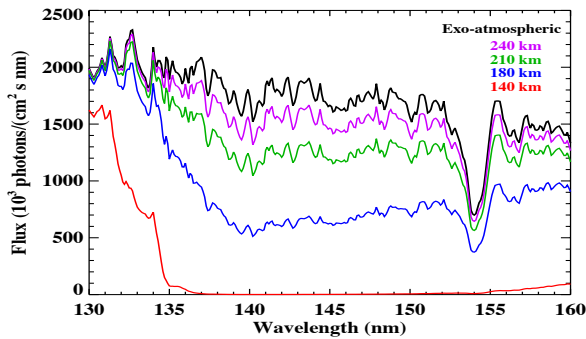
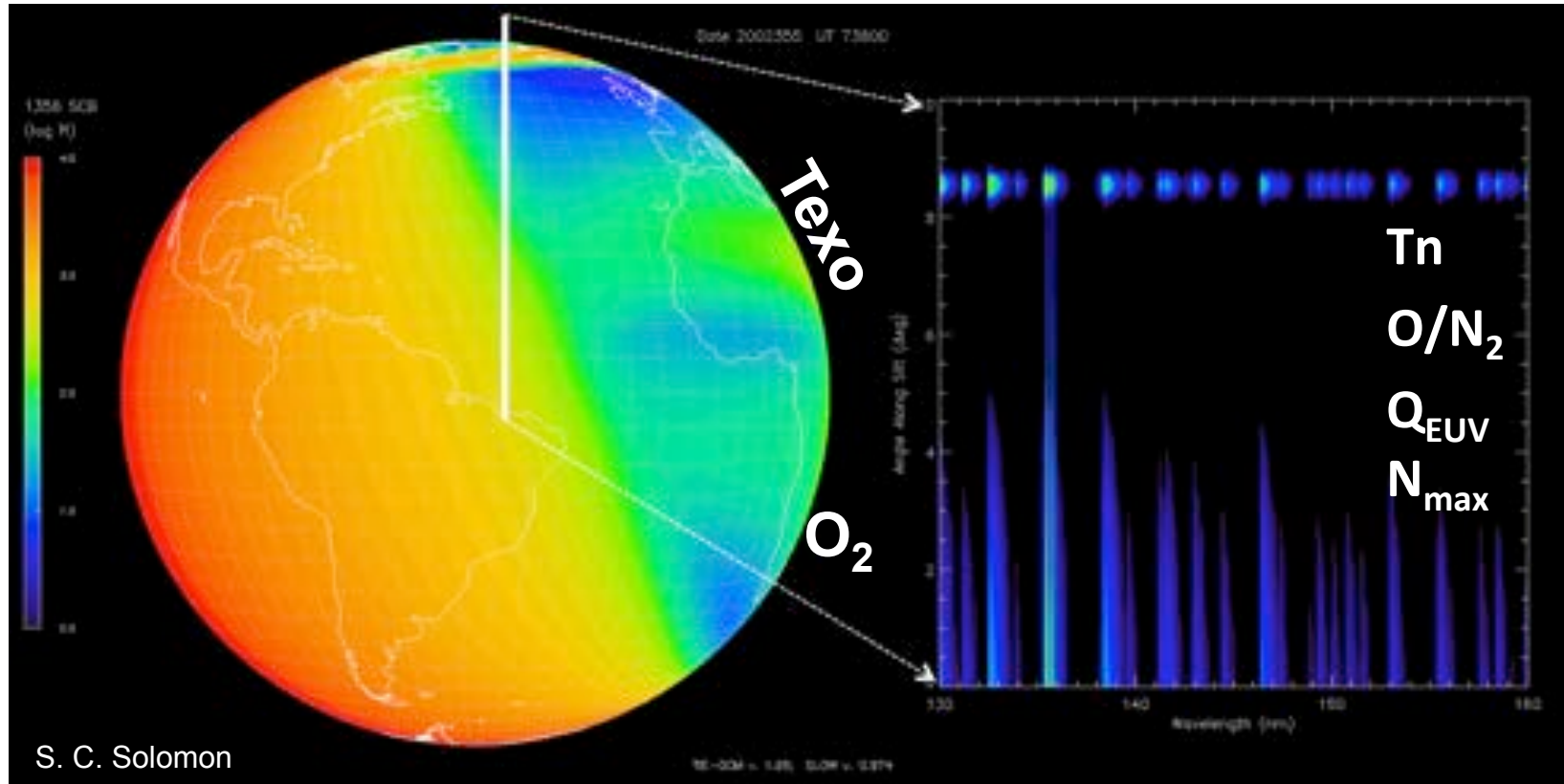


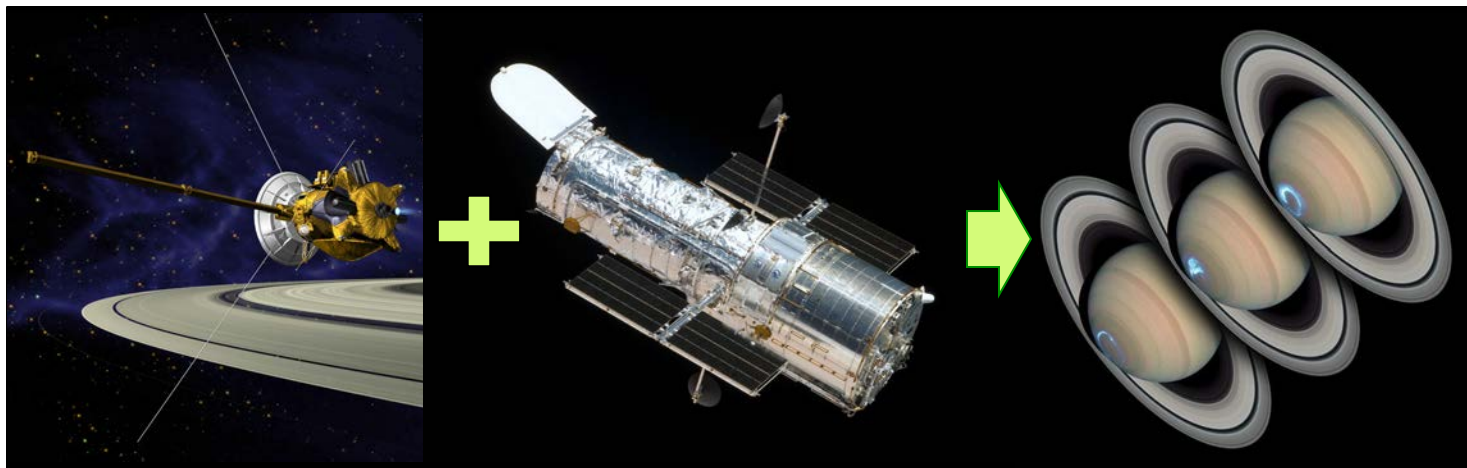
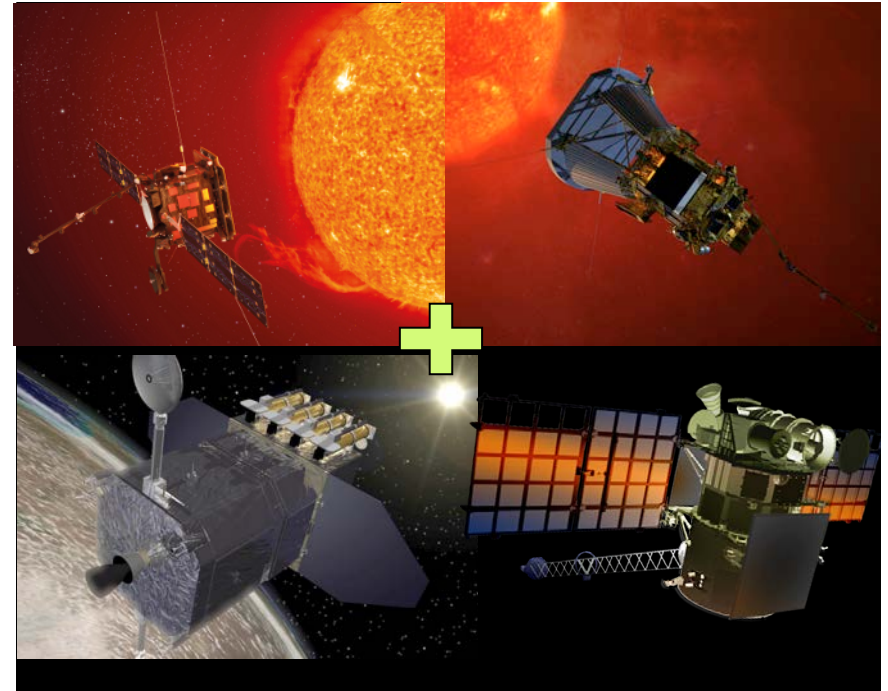
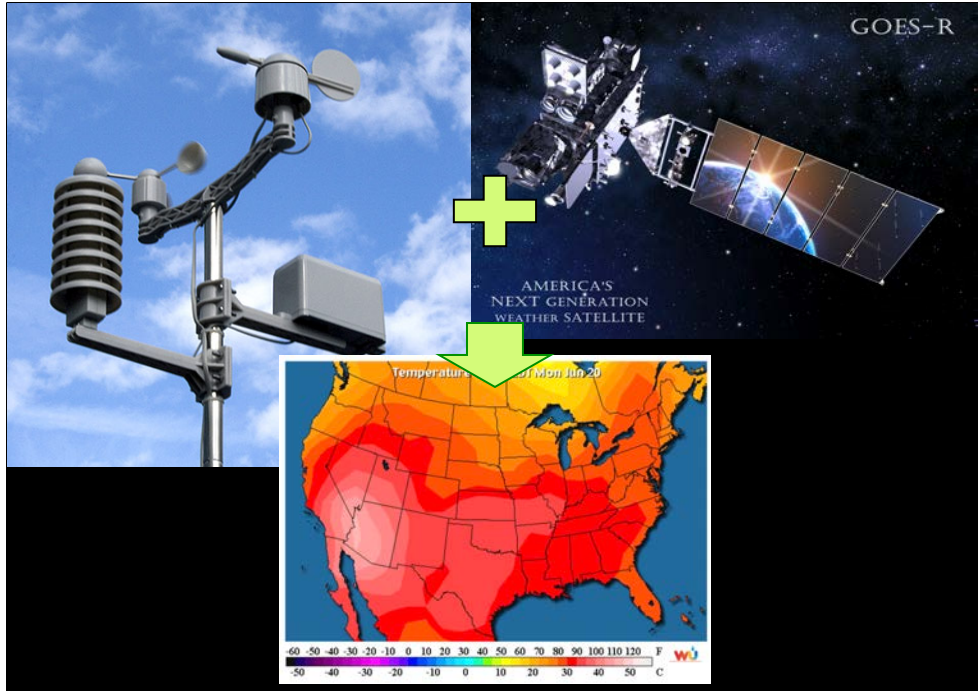


ICON Observations

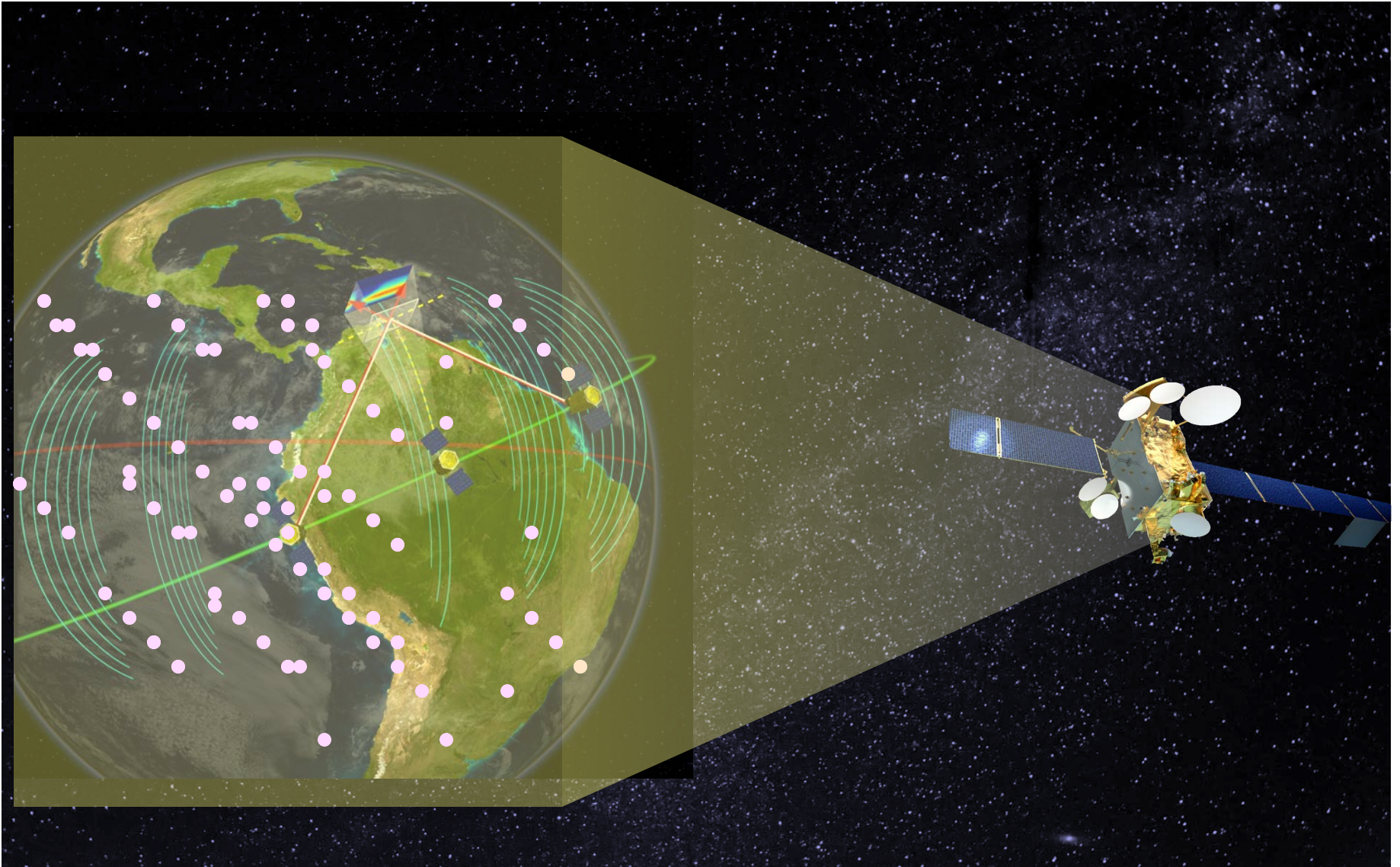








The COSMIC-2-ICON-GOLD Observatory



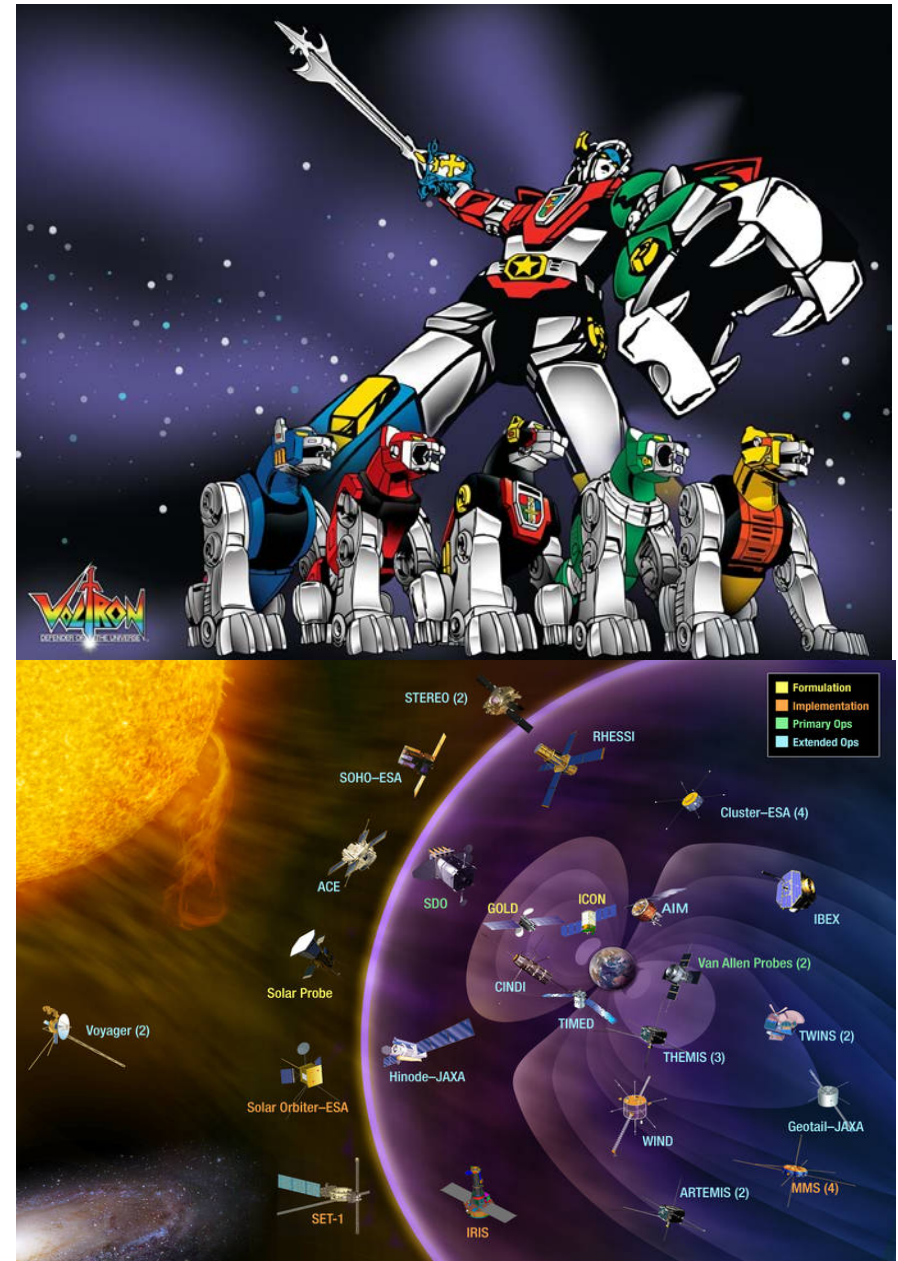
What can we do with this Observatory?

These missions are not funded under a grand plan for a coordinated observatory.

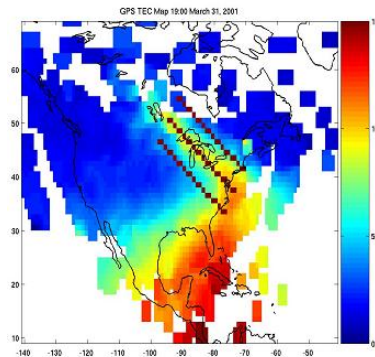
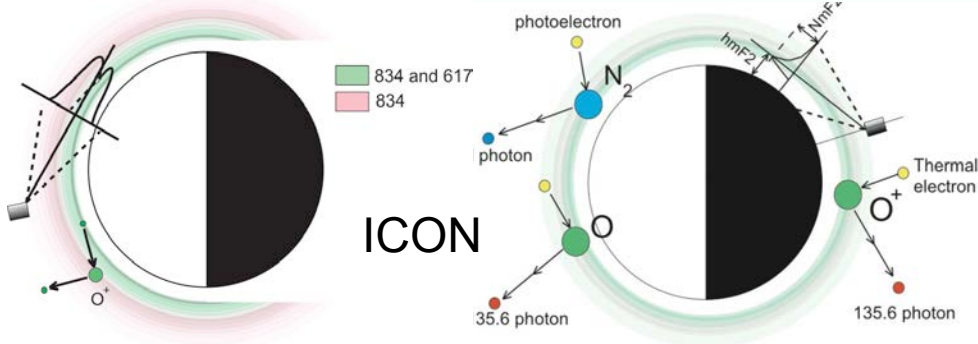
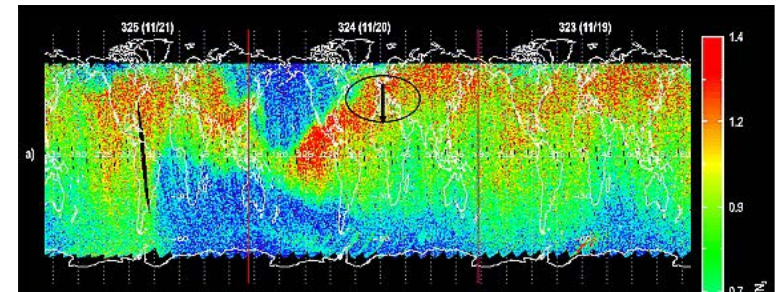
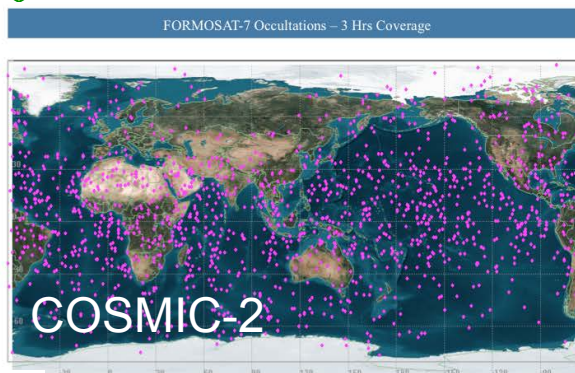
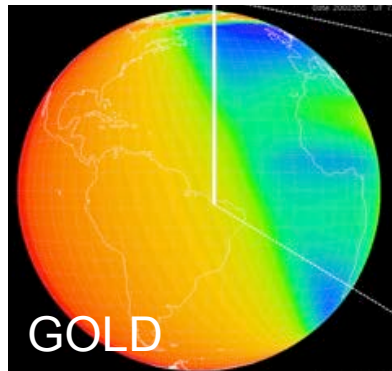
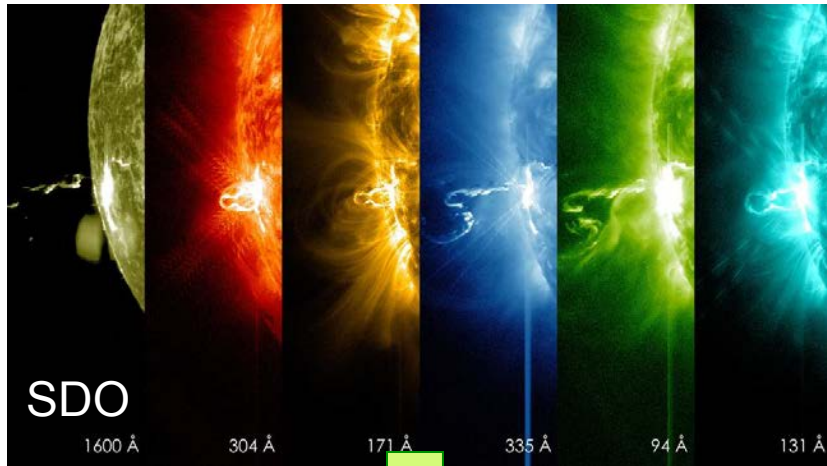
Each is selected & funded by different agencies to do its own mission, that stands on its own merits.

With the combination of assets we will have for the next few years, we have an unprecedented opportunity to study space weather.

As a though experiment, consider a combined CME/flare event.



What can we do with this Observatory?



CEDAR-GEM, June, 2016

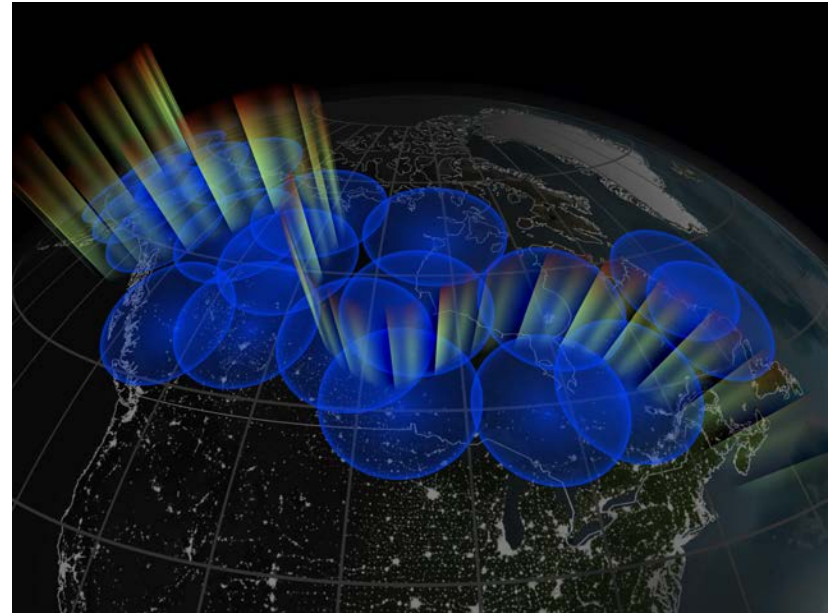
The major spaceflight missions provide opportunities to the community:

- Analyzing the data they produce,
- Combining these with ground-based assets, assimilative models etc.

THEMIS-GBO provides one example of leveraging the power of ground- and space-based sensors.

Organizational efforts underway:

- GEOGOLDICON, September 27-28th 2016.
- SA001, Fall AGU, December 2016.





Where to get more information

- COSMIC-2 – cosmic.ucar.edu/cosmic2
- ICON – icon.ssl.berkeley.edu, nasa.gov/icon
- GOLD – gold-mission.org, nasa.gov/gold
- Observation and analysis opportunities collaborating with the icon and gold missions, September 27-28th 2016 – hao.ucar.edu/geogoldicon
- Fall AGU – SA001 – Advances in low-latitude aeronomy from space- and ground-based observations