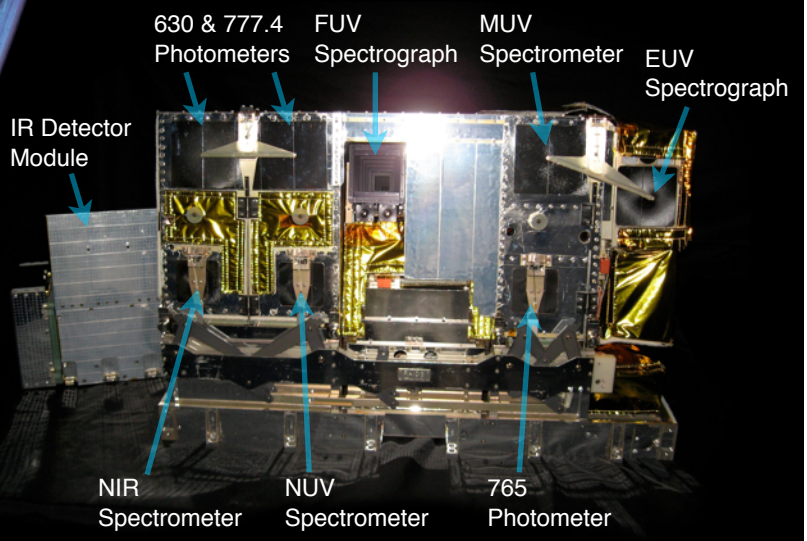
The RAIDS Experiment on the ISS

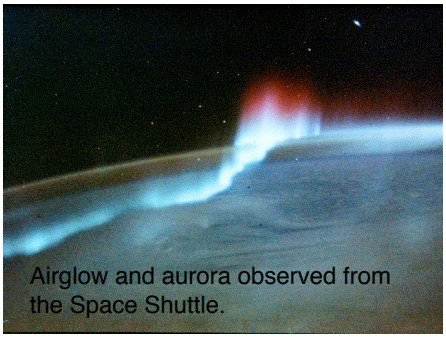
Fact Sheet



- **Objective: Complete description of the Major Constituents of the Thermosphere and Ionosphere**
  - Thermospheric temperature profiles
  - Neutral density, composition day & night
  - Minor species chemistry and abundance
  - Electron density profiles
- **Approach: UV & Visible Remote Sensing of Airglow**
  - Limb radiances from EUV (55nm) to NIR (870nm) covering 90–350 km altitude
  - Atmospheric composition retrieved by inverting limb radiances using state-of-the-art science algorithms
  - Monitor dynamic variability in response to space weather and forcing from lower atmosphere

Sensor Description

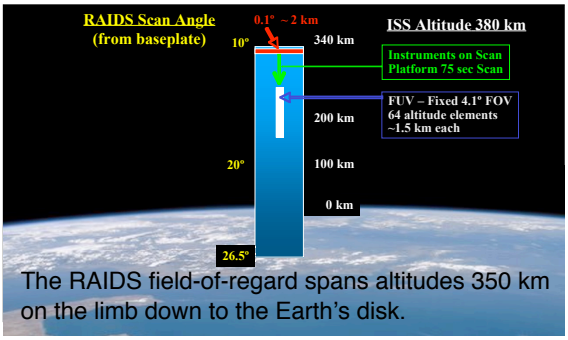
- 2 Spectrographs, 3 Spectrometers, 3 Photometers
- NUV, MUV, FUV, EUV, NIR spectra
- Passband 55–870 nm, varying spectral resolution
- Scan 90–350 km, 3-km altitude resolution
- ISS Orbit: 325-425km, 51.6° inclination



Airglow and aurora observed from the Space Shuttle.

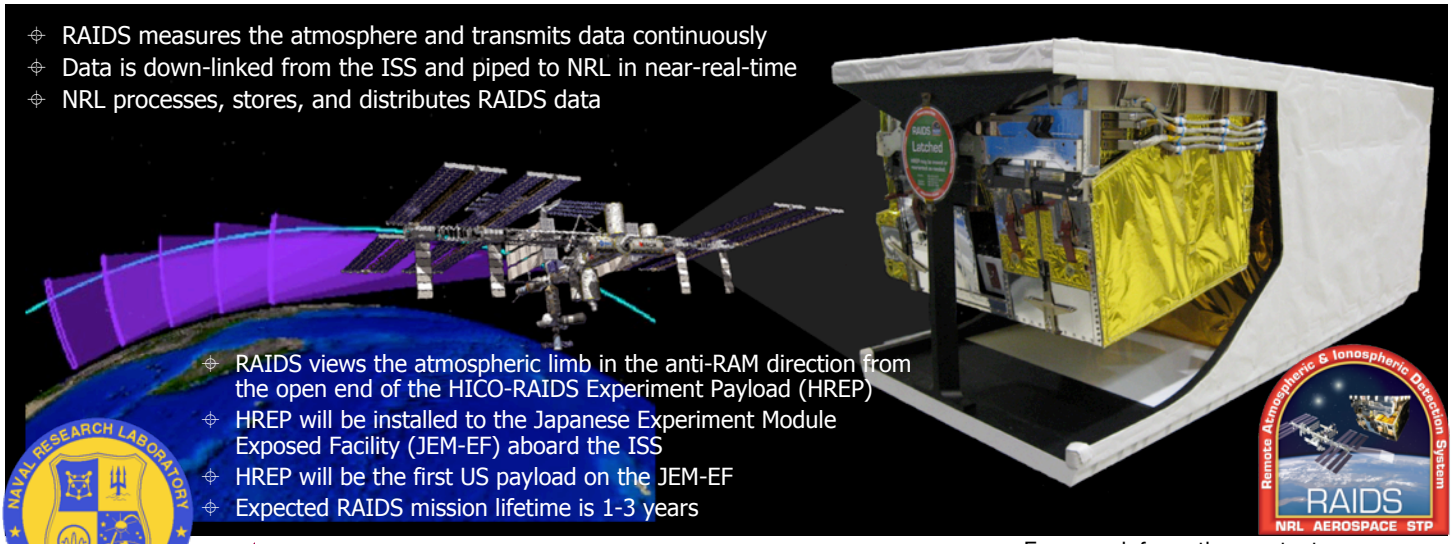
Airglow Remote Sensing

The Earth's upper atmosphere and ionosphere glow day and night due to processes driven by sunlight, solar wind, and chemistry. Naturally occurring airglow can be passively measured by ultraviolet and visible remote sensors to study the density, composition, and temperature of the ionosphere, thermosphere, and mesosphere.



The RAIDS field-of-regard spans altitudes 350 km on the limb down to the Earth's disk.

- RAIDS measures the atmosphere and transmits data continuously
- Data is down-linked from the ISS and piped to NRL in near-real-time
- NRL processes, stores, and distributes RAIDS data



- RAIDS views the atmospheric limb in the anti-RAM direction from the open end of the HICO-RAIDS Experiment Payload (HREP)
- HREP will be installed to the Japanese Experiment Module Exposed Facility (JEM-EF) aboard the ISS
- HREP will be the first US payload on the JEM-EF
- Expected RAIDS mission lifetime is 1-3 years

NAVAL RESEARCH LABORATORY WASHINGTON, D.C.

AEROSPACE

For more information contact:
Dr. Scott Budzien, RAIDS PI
Code 7669, Naval Research Laboratory
Washington, DC 20375-5352