Comparative Aurora Workshop

Conveners: Marina Galand & Renée Prangé

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Comparative Aurora

- **Cross-body**
  - Intrinsic magnetospheres (e.g., Earth, Giant planets)
  - Induced magnetospheres (e.g., Venus, Mars, Titan)
- **Cross-wavelength:** IR, visible, UV, X-rays, (radio)
- **Cross-scale:** spatial & temporal scales

Format of the workshop

- **Invited presentations (40 min each)**
  - 20-25 min talk + 15-20 min discussion

- Randy Gladstone: *Planetary X-ray auroras*
- Tom Stallard: *Infrared aurora*
- David Brain → François Leblanc:
  Aurora at planets lacking global magnetic fields
- Mervyn Freeman: *Auroral complexity*

- **Further discussion (1h20):**
  - Posters (2 min presentation) [more 19:00-20:30]
  - Additional contribution (1-2 viewgraphs)

GUIDELINES
for
THE DISCUSSION

WHAT DO WE KNOW? WHAT MUST WE FOCUS ON?

- **Earth, Jupiter, Saturn, Uranus:**

- To identify magnetospheric source regions and processes and to assess their variability

- To evaluate the main energy sources driving the aurora (e.g., planet, solar wind, moons)

- To assess the ionospheric state (e.g., conductances) and to estimate the role of the ionosphere on the magnetosphere (large and local scales)

- **Venus, Mars:**

-To identify the solar wind-ionosphere coupling

  - Nature of precipitating particles (origin)

  - Triggering effect from the solar wind?

*** Titan? Comets? Mercury?**

Modeling

- Transport model of precipitating particles
- + ionospheric model
- + 3D radiative transfer
- Ionosphere-Magnetosphere interaction (MHD?)
- Solar wind - (Magnetosphere) - Ionosphere coupling
- Planetary space weather: Sun - Interplanetary medium - (Magnetosphere) - Ionosphere

Observations

- **Morphology and dynamics:**
  - Uranus and Neptune?
  - Mars and Venus?
- **Ionospheric parameters (e.g., flows, Te):** giant planets?
- **Planetary space weather:** earth-based telescope dedicated to planetary observations + solar wind measurements
- **Others?**

General

- Extrapolation from Earth to other bodies
  - Similar approach but different context:
    - Interpretation of auroral brightness
    - cross-scale
  - Exoplanets

Comparative Aeronomy: website + mailing list

http://www.bu.edu/csp/uv/cp-aeronomy/aeronomy-sol-sys.html

or

Google “comparative aeronomy”

For more info, email: mgaland@imperial.ac.uk