Decadal Survey – Where does Magnetospheric Physics Fit In?

• Processes; How Planets Work
  – Auroral energetics as input to atmospheres and surfaces (dominant energy input to the high latitudes of giant planets is magnetospheric in origin)
  – Magnetospheric sources/sinks
  – Interactions between parts of the system (planet, satellites, rings…)
  – Atmospheric loss
  – Upper atmospheric chemistry
  – Aurora as a means to probe the atmosphere
  – Response to solar wind input
  – Tie into extrasolar planets, e.g. low-frequency radio emissions

• The Origin and Evolution of Habitable Worlds
  – Radiolysis (is the surface endogenic but weathered, or is the surface exogenic or a combination?)
  – Weathering
  – Atmospheric loss
  – Origin of the atmosphere
  – Does radiation hinder life or promote it?

• Volatiles and Organics; The Stuff of Life
  – Boundary conditions
  – Atmospheric loss, Atmospheric source

• Should seek to be more inclusive of Solar and Space Physics Decadal Survey
Missions

• Flagship
  – **Any** flagship mission should be a system-wide study including fields and particles instruments
  – **Titan Orbiter**: upper atmospheric-ionospheric-magnetospheric coupling; atmospheric loss (requires orbiter)
  – **Europa Orbiter**: Magnetospheric interactions as a source atmosphere, source of magnetosphere, input to the state of the surface, and diagnostic of the interior
  – **Giant Planet Orbiters** Interiors and Atmospheres: Magnetosphere-Ionosphere coupling; Study magnetospheres of planets with large offset and tilted dipole moments
  – **Primitive bodies**
    • Primitive bodies: look for frozen-in magnetic field and escaping volatiles
    • Rings: ring-magnetosphere interactions
Missions, continued

• Outer Frontiers
  – Jupiter polar magnetosphere (Juno)
  – Ganymede orbiter
  – Outer planet aurora ( & plasma torii) monitor (UV, IR, radio, …) from Earth orbit
  – Outer planet flyby missions
  – …. More to come
Participants

- Crary
- Paranicas
- Paterson
- Burger
- Kurth
- Smyth

(Johnson, not present)