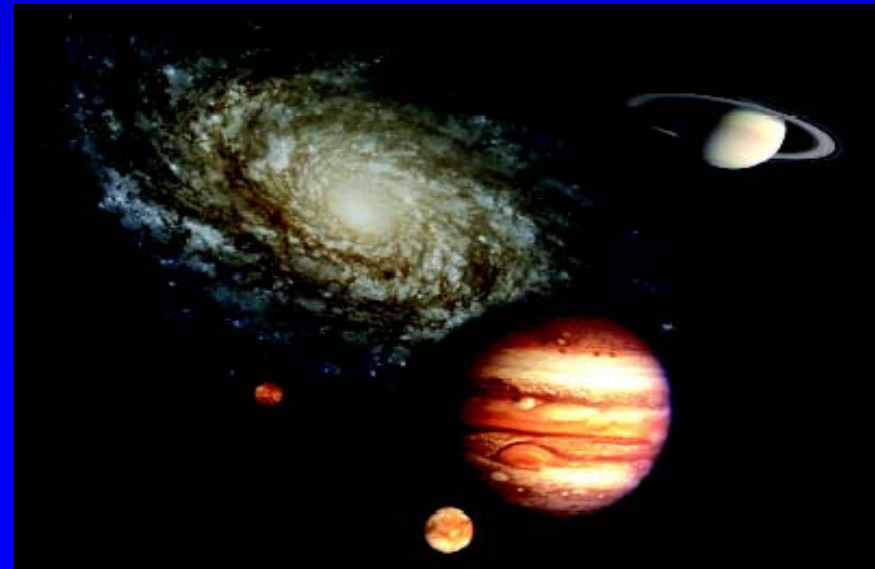




**Moon, Mars and Beyond  
Group Strategy  
Frank Bauer**

# Background

- On January 14, 2004, US President Bush proclaimed a new exploration initiative for NASA-- go to the Moon by 2020, Mars next and beyond Mars later
- NASA working on architecture and funding for new initiative
- Other international space agencies are investigating Exploration programs and developing their strategies for supporting this initiative



# NASA's Exploration Initiative Plans

- Safely return the Shuttle to flight operations, with retirement of Space Shuttle around 2010
- Continue to meet international commitments on ISS development and operations
  - Complete ISS construction
  - Utilize the ISS as an engineering and science testbed to further goals of Exploration
- Lunar robotic missions starting in 2008-2009
- Lunar human exploration missions starting in the 2015-2020 timeframe
- Mars human exploration missions when ready
- This is a journey, not a race

# Suggested Way Ahead

- Specific analyses and ARISS strategies for Exploration are needed NOW
- Specific analyses needed:
  - Path losses between the Moon and Earth (on different freqs)
  - Path losses between Mars and the Earth (on different freqs)
  - Types of ground antennas needed to communicate with systems near/on the moon and link margins
    - Voice
    - SSTV
    - Data
    - Band by band trade study
  - Type of ground antennas needed to communicate with systems near/on Mars and link margins
    - Voice
    - SSTV
    - Data
    - Band by band trade study

# Suggested Way Ahead (Continued)

- Strategies needed to move forward:
  1. What frequency bands do we recommend?
  2. What operating modes?
  3. Ground station recommendation
  4. Size/weight of on-board hardware and dimensions of antenna systems
  5. Where do we install our equipment? Robotic spacecraft? Crew Exploration Vehicle? Or other capabilities?
  6. How do we tie in education outreach with amateur radio equipment---why should the space agencies spend their money on our resource?
  7. Develop a communication strategy into the space agencies
  8. Etc.