# LWS MOWG Report
## to SECAS

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# LWS MOWG Findings

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# General Comments

- Pleased to have Drs. Koskinen, Friis-Christensen, and Schwenn on LWS MOWG
- Continued aggressive pursuit of the basic research goals of SEC is crucial
- SEC has a role in the new Exploration Initiative
- LWS is in a unique position to support Exploration
- Concerned with SDO growth, but satisfied that LWS line was not cut in recent budget
- Concerned that SEC budget falls well short of enabling balanced program as recommended in the Decadal Survey Report
- Supports the concept of establishing a ‘Level 1’ NASA requirement for an end-to-end predictive capability for solar system environmental observations and modeling that will be the explicit responsibility of LWS and SEC
- Encouraged by manner in which the SEC Division is attempting to execute this complex, but singularly important program

# Lower Cost Implementation Approaches

- We find that LWS should return to its original theme of having integrated/concurrent observations in order to serve our broader mandate of supporting the Exploration Initiative.
- Alternative means of implementation should be explored. (e.g. PI mode, especially for upcoming IT and RB Storm Probes, without change in GMDT science scope)
- We find that an AO for a Heliospheric sentinels mission should come soon but only after IT and RB missions

# Budgetary Restoration

- The MOWG finds that a process must be put in place to determine what **level of funds** are required to carry out a sensible and prudent MO&DA program in SEC
- LWS needs the full SEC compliment of existing missions for a healthy space-weather program
- The comparatively low cost of existing missions provide an exceptional scientific return
- A ‘normal’ senior review can be useful only if a funding level is realistically established

# Workforce Development

- We find that every effort should be made to enable the community to participate in all aspects of the LWS missions
- The Exploration Vision places a significant burden on the future workforce
- The development of a future workforce has been most effectively achieved through a hands-on approach (e.g. Suborbital and Explorer programs)
- Graduate and undergraduate emphasis is particularly lacking from NASA

# Task Force and Workshop Inputs

- We find that LWS should actively promote to relevant groups within the NASA organization those areas of research that clearly support the new Exploration Vision
- The LWS MOWG endorses the established task force that has examined the SEP effects on humans
- We find that the other areas of application within LWS should be studied in a similar fashion (such as Global Circulation Models applied to Mars, aero drag/capture, communication through terrestrial and Martian ionosphere, transition through radiation belts, prediction of Solar mass ejections)
- We find that inclusion of independent input from such organizations as the CSSP would be highly valuable
  - e.g. a workshop under LWS MOWG and CSSP auspices

# Access to Space

- We find that NASA should reopen and pursue vigorously means to reduce launch costs
  - DoD secondary payloads
  - Existing Air Force effort to use existing assets such as ICBMs
  - the endorsement of and active support from the highest levels of NASA and the DoD will need to be obtained

# Partnerships

- We find that appropriate partnerships could be crucial for achieving the LWS scientific goals
- To be successful, partnerships must be made early in the program and at a high administrative level within each organization
- Examples
  - With ESA to look at Sun and look at magnetosphere/radiation belts dynamics
  - With Air Force to standardize secondary payload capability

# Missions of Opportunity

- With ever-increasing pressure on the Storm Probe budgets, the MOWG finds that missions of opportunities need to be vigorously pursued with sufficient flexibility to enable low-cost sensor suppliers and relatively rapid response

# Support for the PICARD Mission

- The MOWG is concerned about possible gaps in this time series from US satellites and endorses the French CNRS PICARD mission as one step toward ensuring such data continuity
- A complete inventory was not made by the MOWG of other missions that may also complement the LWS program

# Unique Constellations of Existing Spacecraft

- The MOWG endorses the proposal to jumpstart the Sentinels science program by taking advantage spacecraft constellations - e.g 2006-2008, the two STEREO spacecraft, Ulysses, ACE, SOHO, and Wind will all lie in a sector ideal for sampling Earth-directed CMEs.
- Operations must be maintained
- Cost effective strategy to meet LWS goal of simultaneous observations