



Living With a Star Sentinels

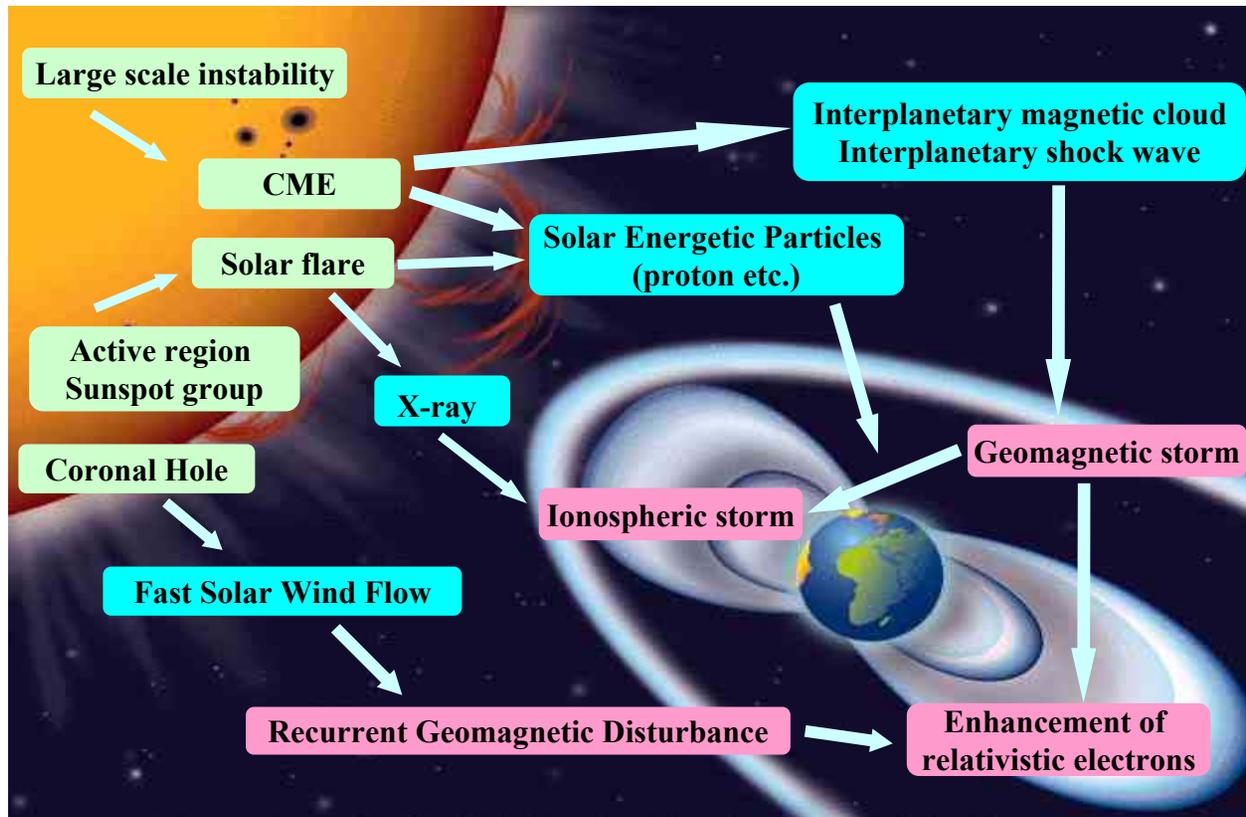
Heliospheric Strategy Panel Report

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LWS MOWG

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Discover, understand and model the **connection** between solar phenomena and geospace disturbances.



- The LWS Science Architecture Team and Sentinels Pre-Formulation Team presented science objectives, observational strategies and possible mission scenarios to NASA HQ. March 2000 – July 2001
- International LWS program initiated. May 2001
- LWS SAT Findings and Report July – September 2001
- First Heliospheric Strategy Panel Meeting. November 2002
- Second Heliospheric Strategy Panel Meeting April 7-8, 2004
- HSP Report Completed May 2004
- LWS Sentinels SDT formed Early 2004



Objectives:

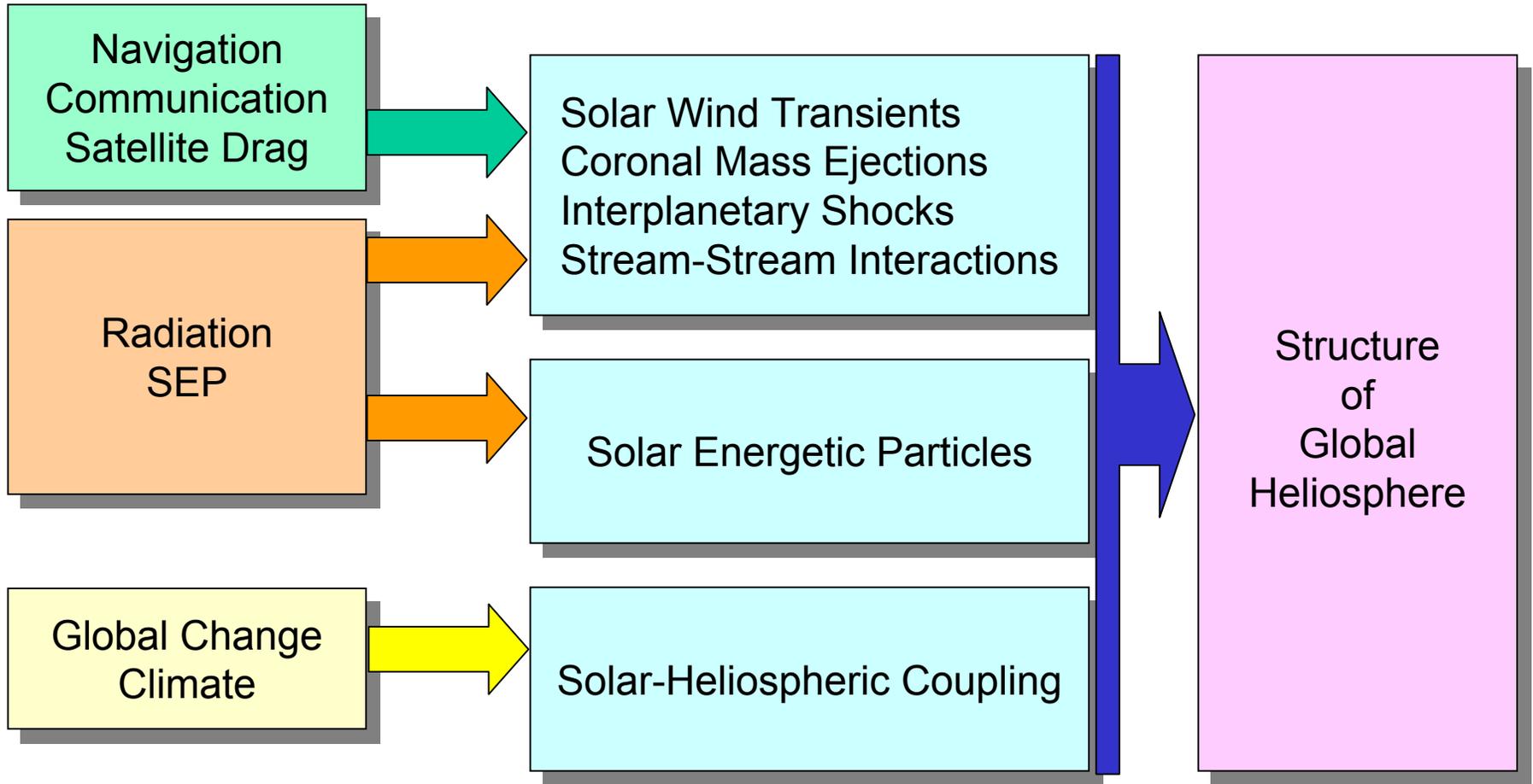
Assist the LWS Sentinels Project Scientist by identifying the near-term strategy to make progress towards the LWS heliospheric science objectives. In particular:

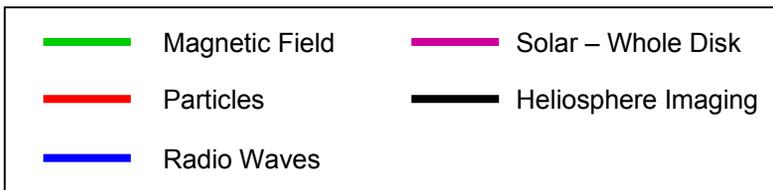
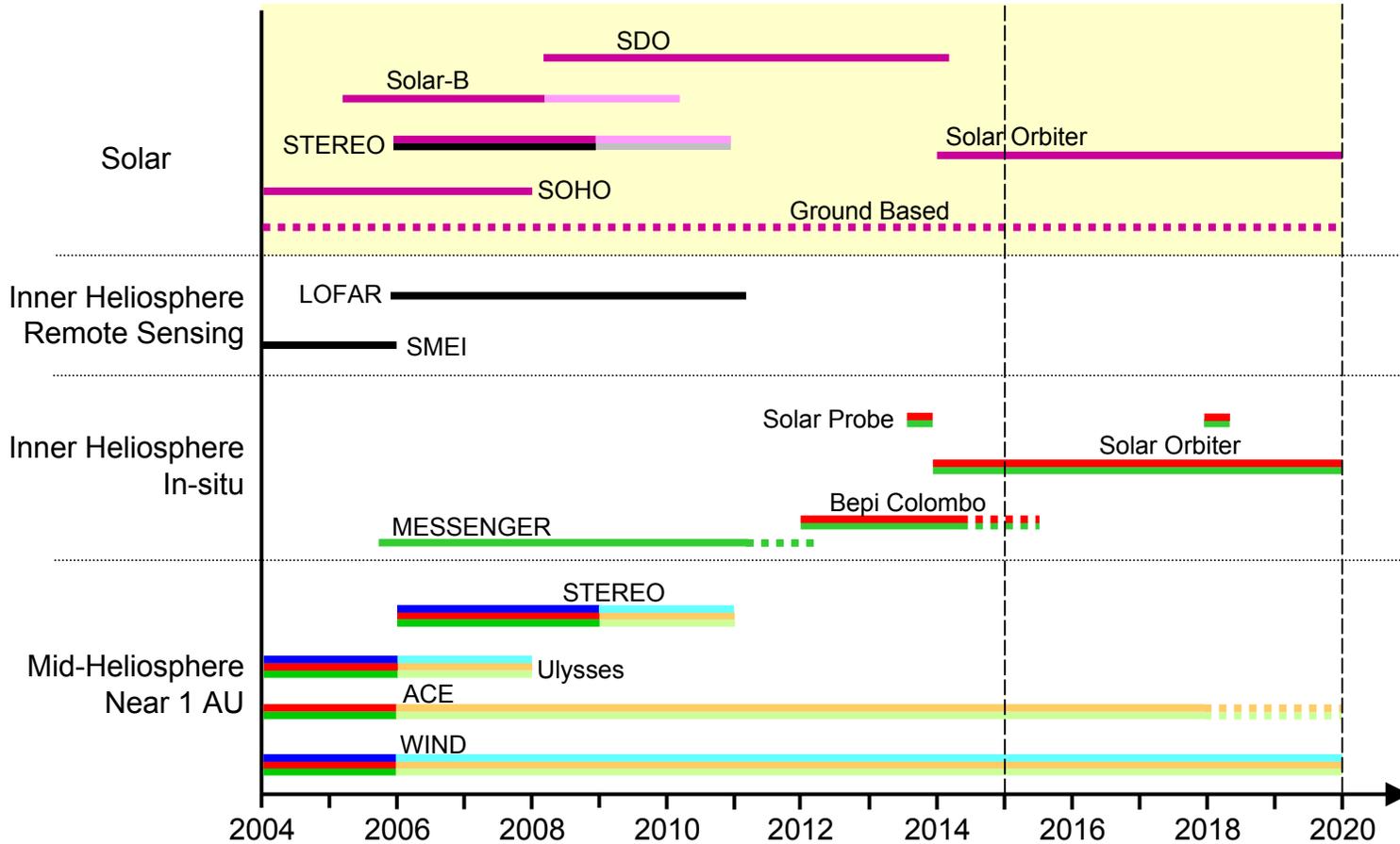
- Identify heliospheric measurements required to accomplish the LWS program objectives.
- Determine to what extent current and future assets could be used to contribute toward the LWS heliospheric objectives and make recommendations for improved utilization.
- Identify current and past mission data sets relevant for the LWS heliospheric objectives that are not publicly available and suggest possible solutions.



Societal Impacts

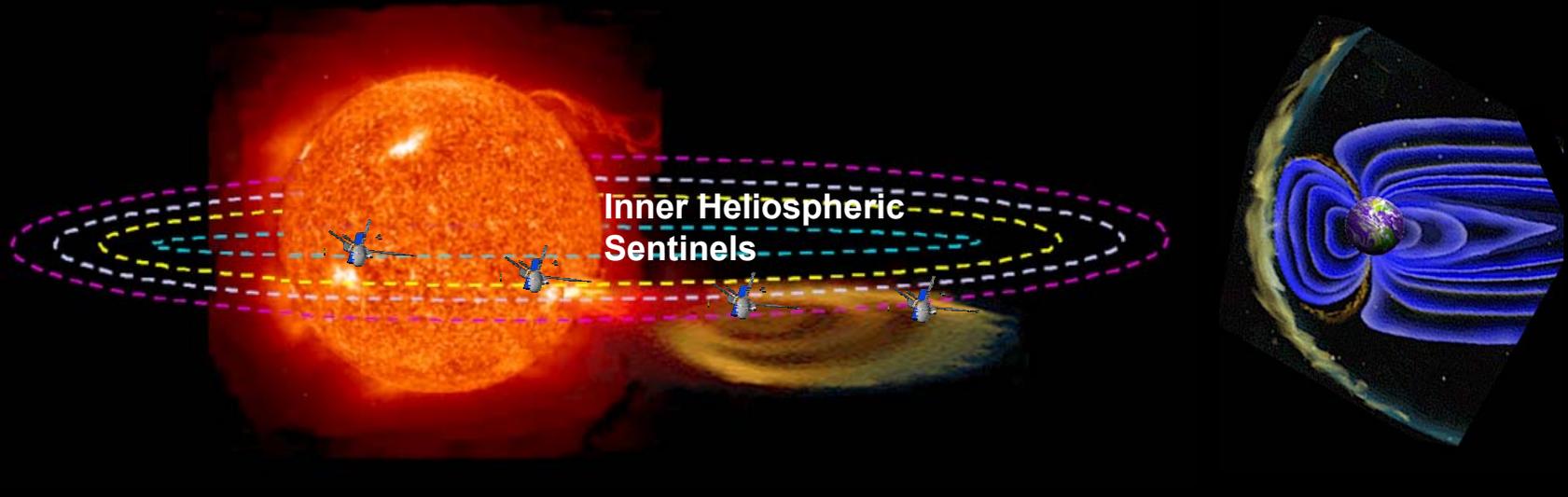
Sentinels Science Focus Areas





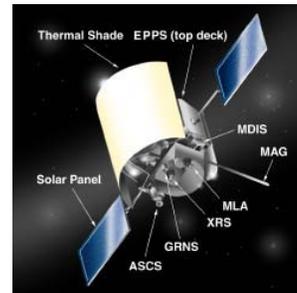


- Multiple inner heliospheric (< 0.5 AU) in-situ observations will be necessary to fulfill the Sentinels science objectives beyond those provided by any of the existing or planned missions.

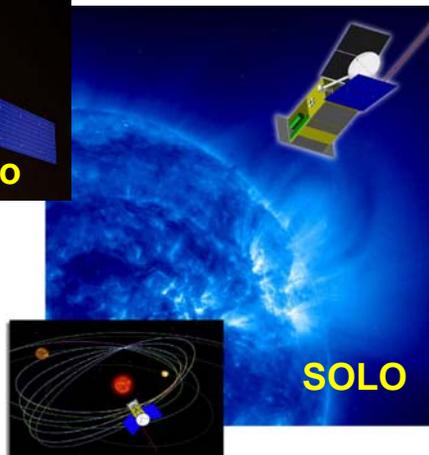
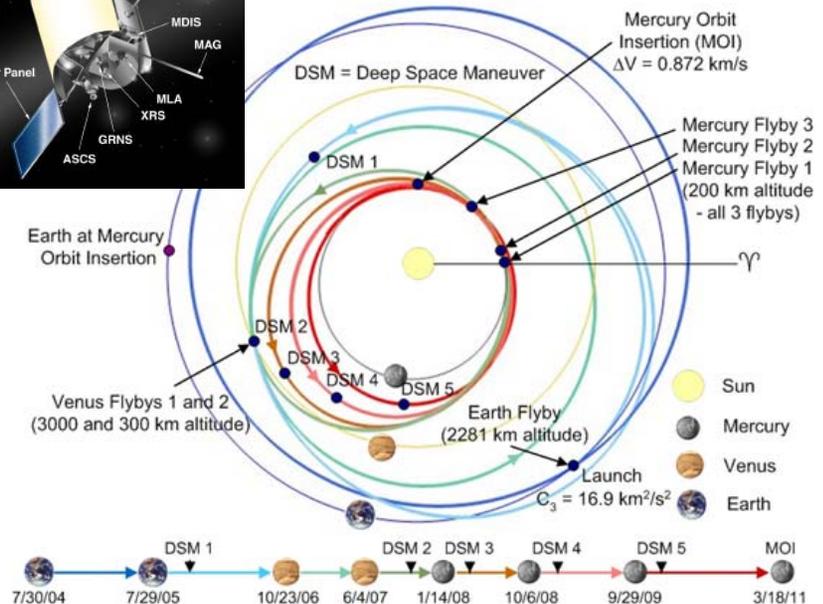




- MESSENGER will be the only mission flying through the inner heliosphere during this decade. It is recommended that cruise data be collected and telemetered to Earth.



MESSENGER

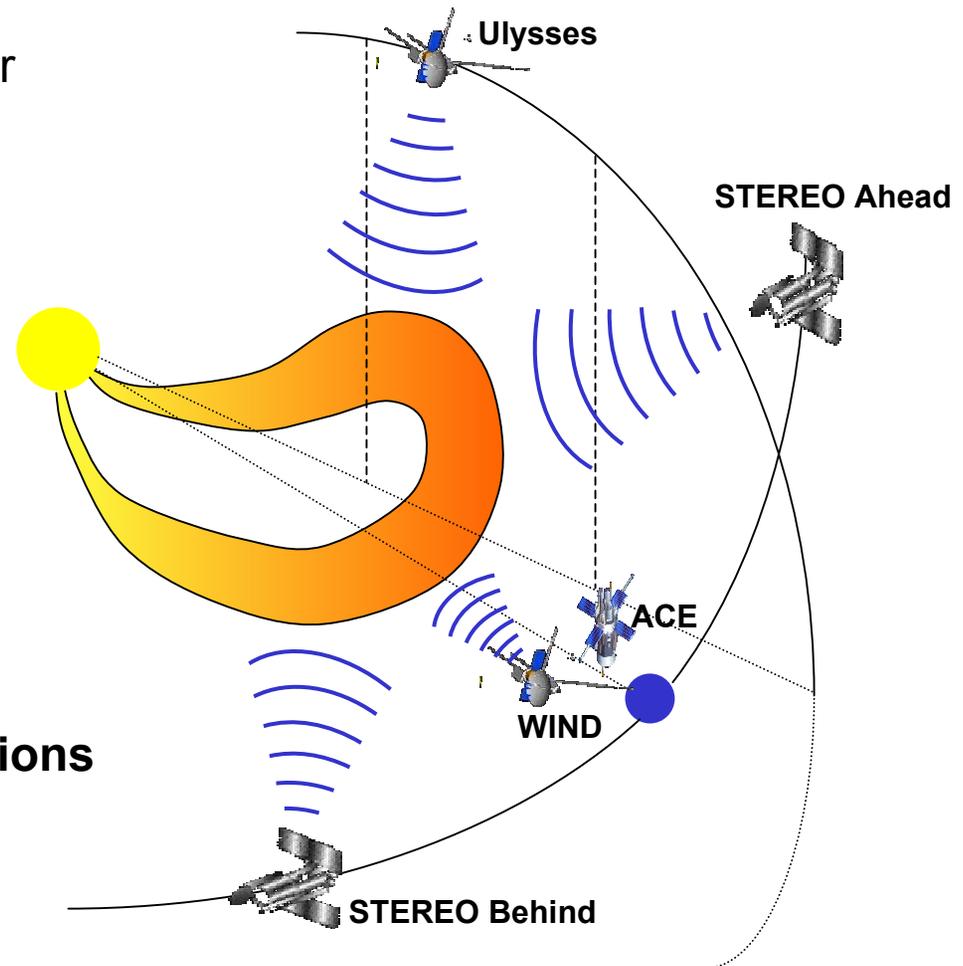


- Continued support for *in-situ* solar wind data collection for the European Bepi-Colombo and Solar Orbiter missions through the ILWS program.



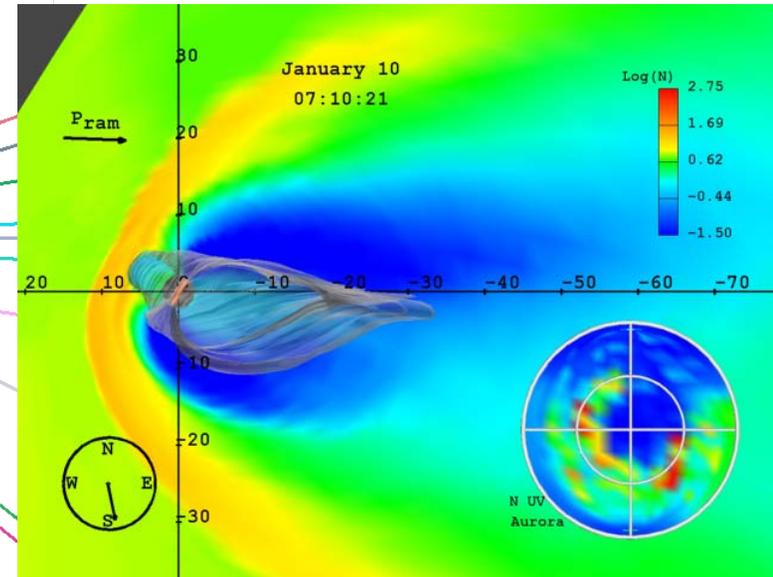
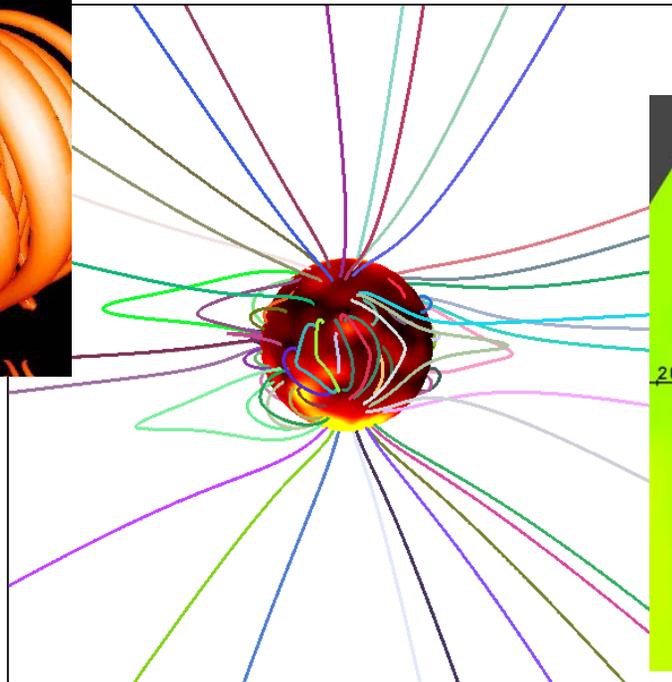
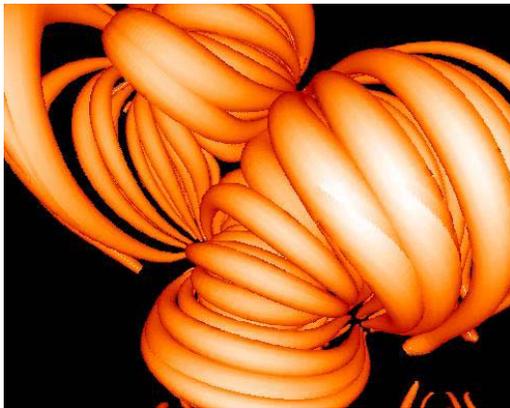
- The Sentinels science objectives focusing on the near 1 AU angular extent of SEP beams and CMEs, shock modulation of energetic particles and compositional fingerprints of the solar origin of ejecta can be addressed by coordinating the **unique 3D configuration afforded by: STEREO Ulysses L1 Cluster (ACE, WIND).**

Ulysses, ACE and WIND operations should be extended to overlap with STEREO.



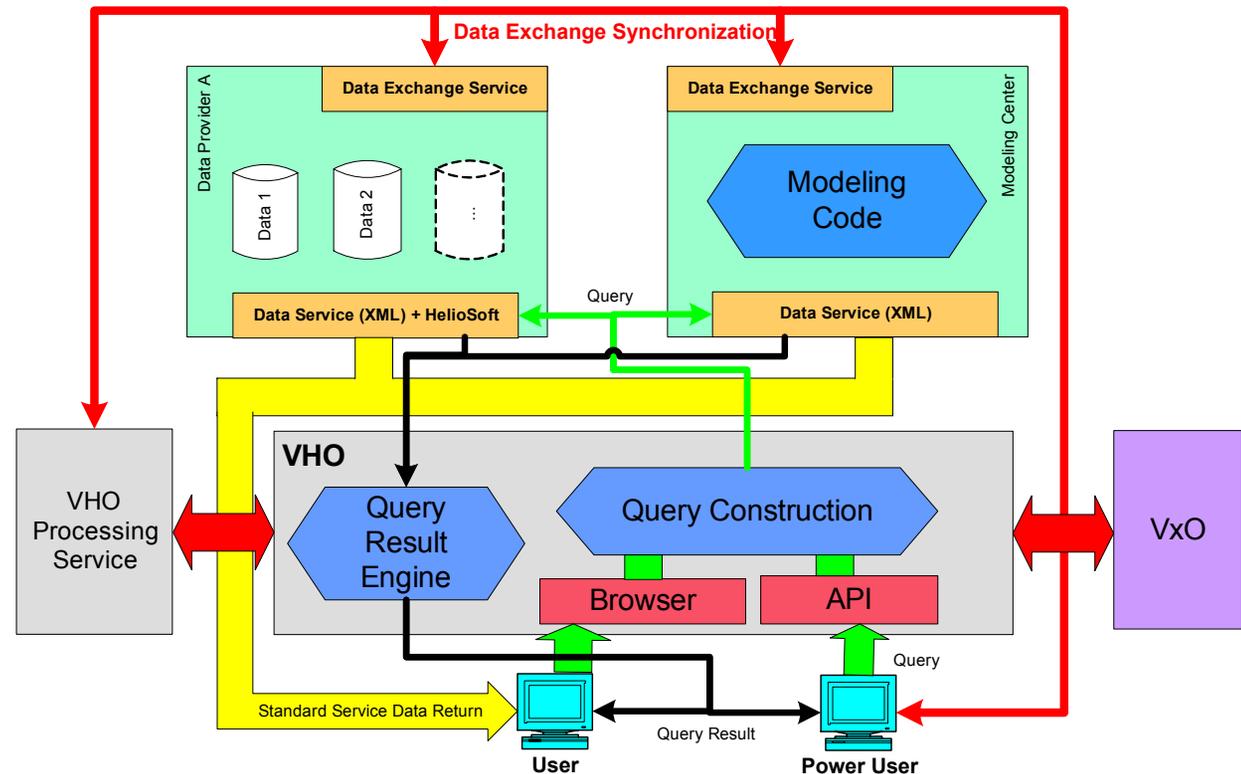


- Targeted heliospheric science research that aims to connect solar, interplanetary and magnetospheric observations should be vigorously supported even before the launch of any dedicated Sentinels spacecraft.
- It is recommended that either a dedicated LWS Sentinels research line or a more substantial TR&T segment focused on the heliosphere be established.





- It is recommended that a modest distributed data system be established to connect the spacecraft that were not originally designed as a coordinated system.
- It is recommended that a proposal opportunity be identified where small data restoration proposals could be peer reviewed from Sentinels perspectives.





- Sentinels is in an excellent position to respond to the challenge of forecasting the radiation environment at the Moon and Mars. An improved understanding of the longitudinal extent and variation of interplanetary transients and large SEP events will be directly relevant for the health of the astronauts and of critical life-support equipment.
- The global heliospheric approach of Sentinels will enable improved forecasting even when Mars will be on the other side of the Sun.
- Currently available assets can support research to improve our understanding of the radiation environment during a lunar mission.





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