Living With a Star

A Systems Approach to Sun-Earth Science

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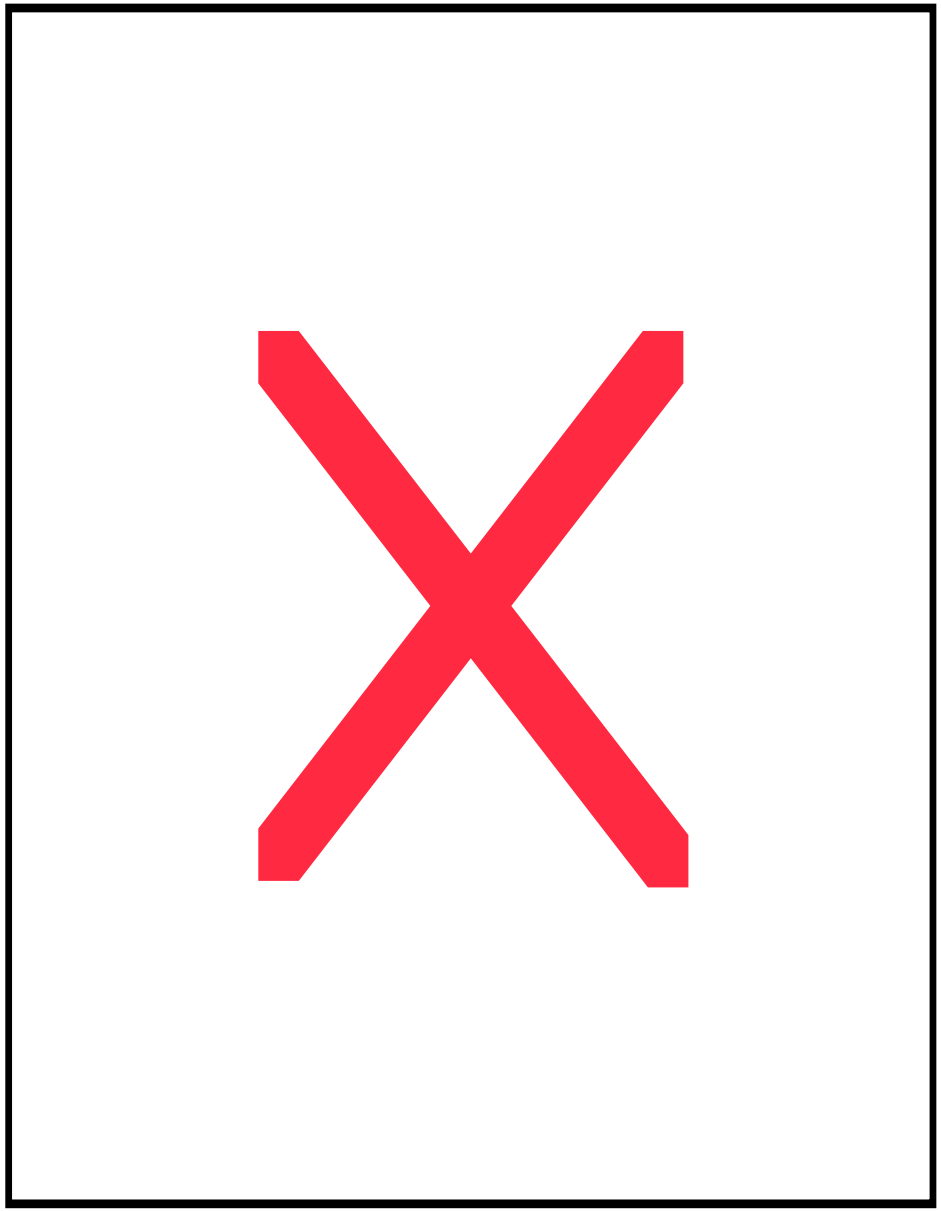
LWS Program Components

- **Science Missions**
  - –Solar Dynamics Observatory (SDO)
  - –Geospace (RBSP, MoO, ITSP)
  - –Sentinels
- **Applied Science Missions**
  - •Space Environment Testbeds (SET)
- **LWS Science (Targeted Research and Technology)**

Update to May 2006 MOWG

- SDO update (Dean Pesnell)
- Geospace MoO kickoff meeting (Barbara Giles)
- RBSP selection/kickoff meeting (Barbara Giles)
- Sentinels STDT report published
- SET update
- TR&T update (Mona Kessel)

- Solar Orbiter (Adam Szabo/Lika Guhathakurta)
- Solar Probe engineering risk mitigation studies (St. Cyr and later, Haydée Maldonado)
- Fall AGU session on system science to showcase TR&T results
- LWS Science Workshop, Boulder, September 2007
- GSFC Reorganization
- Solar Cycle 24 Prediction Panel



Sentinels STDT Report

http://sentinels.gsfc.nasa.gov

Space Environment Testbeds

SET-1 ride on USAF DSX-1

- Passed CDR

No future flight solicitations in budget

NRA for data mining activities

Solar Probe Status (1)

- *Solar Probe requires an augmentation to the LWS budget*

On-going Engineering Risk Mitigation Studies

- **Thermal Protection System (JHU/APL)**
- **Plasma Wave Instrument Antenna accommodation (JPL)**

Solar Probe Status (2)

- Plasma Wave Instrument (PWI) Antenna accommodation
  - Neil Murphy (JPL) is leading the activity
  - Participants:
    - Kurth, Ergun, McNutt, Farrell, Sittler, Tsurutani, Kirchner, Scime, Bale, Swenson, Kasper
  - ~Weekly telecons since Spring 2006
  - Plan to complete activities this CY
  - Product will be “white paper”:
    - Material properties suitable for antennae
    - “Figures of Merit” describing antenna trades

Fall AGU Session SH-08

A Systems Approach to Sun-Earth Science: LWS TR&T Progress after Five Years

Sponsor: SH CoSponsors: SA/SM

Convenors:

O. C. St. Cyr, NASA-Goddard Space Flight Center

L. Zanetti, JHU/Applied Physics Lab

Session Description

A “systems” approach to Sun-Earth science has taken root over the past few years. With the 2001 inception of NASA’s Living With a Star (LWS) Program, new opportunities were created for a systematic, goal-oriented research program targeting those aspects of the Sun-Earth system that affect life and society. Planning for a comprehensive network of spacebased assets providing new measurements began, and the first two missions are now in development -- Solar Dynamics Observatory (SDO) and Radiation Belt Storm Probes (RBSP). Science requirements and conceptual mission implementation have been defined for the Ionosphere-Thermosphere Storm Probes (ITSP) and the Solar Sentinels. LWS is a crosscutting initiative whose goals and objectives are relevant to NASA’s Exploration Initiative, as well as to NASA's Strategic Enterprises.

To provide immediate progress toward achieving system science goals, the Targeted Research and Technology (TR&T) component of the LWS program was developed. The TR&T element has solicited five rounds of proposals seeking quantitative understanding and predictive capability throughout the system. TR&T has funded independent research awards, focused science topic panels, and strategic capability challenges to enable a cross-disciplinary, integrated, system-wide understanding of how the Sun varies, and how Earth and planets respond. The focused science topic panels are a novel approach to collaborative science, and initial results appear promising.

In this session we solicit reports of progress in achieving system science goals through theory, modeling, and data analysis efforts. Abstracts from LWS TR&T recipients are especially encouraged.

45 Abstracts Submitted: Three Oral Sessions

Six Invited Talks from 2004 TR&T Focus Panel Leaders

LWS Science Workshops

- May 2000 in Greenbelt
- Nov 2002 at JHU/APL
- March 2004 in Boulder
- LWS support of many workshops

- 10-13 Sep 2007 in Boulder
  - Karel Schryver is Chair of the SOC
  - Stan Solomon and Steve Tomczyk are LOC

Solar Cycle 24 Prediction Panel

- A “decadal” panel convened by NASA and NOAA to predict the amplitude and timing of the next solar activity cycle
- Doug Biesecker (NOAA) is Chair
- First meeting was October 2-5, 2006
- More than 30 predictions considered
- Preliminary report by Space Weather Week (April 2007)

Heliophysics Organization at GSFC

Heliophysics Division Director
R.R. Fisher

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