LASP's Solar Influence Group Overview

Over the last three decades the LASP Solar Influence Group has established an extremely strong program devoted to measuring the sun's irradiance over an ever-widening wavelength range, from soft X-rays through the near infrared. The scientific objectives for the Solar Influence Group are to measure irradiance with state-of-the-art accuracy and precision and to understand solar variability and its influence on the terrestrial environment (with emphasis on atmospheric processes and climate).

LASP's Solar Influence Group has more than doubled over the past six years from being a group of six Research Scientists with three NASA satellite programs (UARS SOLSTICE, TIMED SEE, and SORCE) to a group of 17 scientists and graduate students with four NASA satellite programs (TIMED SEE, SORCE, SDO EVE, Glory TIM) and two NOAA satellite programs (NPOESS TSIS and GOES-R SIS). These projects involve satellite instruments that are developed and fabricated at LASP to measure the solar irradiance and are operated from LASP. The PI-mode SORCE mission is by the far the largest project in this group as it includes 5 solar irradiance instruments built at LASP and involves the operation of the SORCE spacecraft. Most scientists in this group work on 2-4 of the various projects as the project objectives overlap significantly. This group is expected to continue its steady growth as the NOAA opportunities lead to instrument development well into the 2010s.

Much of this growth has been enabled by satellite projects lead by Gary Rottman, who recently retired in 2005 and was the group leader. With Gary's retirement, the PI positions for SORCE, Glory, and NPOESS have been transferred to Tom Woods, Greg Kopp, and Peter Pilewskie, respectively. In addition, Tom Woods is the new group leader and is also PI on TIMED SEE, SDO EVE, and GOES-R SIS.

Based largely on the satellite measurements, the solar research of this group has provided new and exciting results, such as improved understanding of the solar variations in the visible and near infrared (J. Harder, J. Fontenla, G. Rottman, E. Richard), flare variations throughout the ultraviolet (T. Woods, F. Eparvier, P. Chamberlin, W. McClintock, M. Snow), first detection of flares in the total solar irradiance (TSI) (G. Kopp), and advances in irradiance accuracy (G. Lawrence, G. Rottman, G. Kopp, J. Harder, W. McClintock, F. Eparvier). M. Snow and C. Pankratz are leading this group to develop a new data center for all of these solar irradiance data sets, called the LASP Interactive Solar Irradiance Datacenter (LISIRD, http://lasp.colorado.edu/lisird). While most research is focused on data analysis, there has also been recent advances in solar irradiance modeling from J. Fontenla and P. Chamberlin.

There is also significant scientific interest and sharing of scientists between multiple groups at LASP. For example, P. Pilewskie, S. Schmidt, J. Harder, E. Richard, W. McClintock, F. Eparvier, M. Snow, and T. Woods are involved with terrestrial atmospheric and cloud studies with the LASP Atmospheric Group. In addition, there is significant research interaction between the Space Plasma Group with P. Chamberlin, F. Eparvier, W. McClintock, and T. Woods. Furthermore, W. McClintock is a key member of the LASP Planetary Group by developing UV instruments for planetary research and is also PI on the Messenger MASCS instrument, which is on its way to Mercury. The professor links to the academic departments have historically been

non existent for the Solar Influence Group until 2005 when P. Pilewskie joined CU as Associate Professor in PAOS and now in January 2006 with the addition of M. Rast as Associate Professor in APS. M. Rast was hired as part of the NSF grant (PI: Dan Baker) to teach solar physics for the national space weather program. Both are key additions to the LASP Solar Influence Group in strengthening the education contributions for CU and attracting students to the NASA and NOAA projects.