Project Details

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Program Element: Cross-Discipline Infrastructure Building Programs

Topic: Magnetic Flux Ropes from the Sun to the Heliosphere

Project Title:
LWS workshops: Coupling the Multiphysics of the Heliosphere from the Deep Interior to the Corona: Simulation, Modeling and Data Assimilation

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Summary:
We propose a series of 5 annual workshops during the 2014-18 period with the purpose of enabling interactions between interdisciplinary research groups under the NASA-NSF Space Weather Modeling Collaborations, with other Living With a Star (LWS) space weather focused efforts, and with the broader heliophysics community. The NASA Heliophysics roadmap emphasizes the importance of coupling the wide range of multiphysics elements that interact to constitute Space Weather. In particular, the workshops will focus on the LWS science queue Heliospheric Magnetics (HMag) : Understand the flow and dynamics of transient magnetic structures from the solar interior to Earth. The massive amount of data from the LWS mission, SDO, is providing breakthroughs in our understanding of the variability of the Sun. We anticipate similar achievements from the IRIS mission. We also anticipate that the emergence of global evolutionary models of the solar interior, magnetic field, and corona will use this new generation of data, combined with improvements in ground observations, to validate models and assimilate observational data, thus providing improved understanding of the dynamics and improved accuracy in the forecasting of space weather. The proposed series of annual workshops will stimulate innovations in our ability to link the dynamics of transient magnetic structures from the solar interior to Earth. They will focus on the development of realistic quantitative models that take advantage of the NASA advanced supercomputing resources available for these studies. The focus on global supercomputer

modeling will be a new and unique feature of the proposed workshops that distinguish them from other LWS workshops. The workshops will provide key support to the NASA-NSF Space Weather Modeling Collaborations projects. They will be organized using conference facilities provided by NASA Ames Research Center. The funds are requested for organizational and logistics support, as well as for travel support of students and young researchers to attend the workshops and get them involved in the development of innovative cross-disciplinary topics in support of the LWS program.

Publication References:

no references