

Living With a Star: Science That Matters to People – Past Accomplishments and Future Promise
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A hundred years ago, the sun-Earth connection (the field of LWS research and space weather impacts) was of interest to only a small number of scientists. Solar activity had little effect on daily life. Today, a single strong solar flare could bring civilization to its knees. Modern society has come to depend on technologies sensitive to solar radiation and geomagnetic storms. Particularly vulnerable are intercontinental power grids, interplanetary robotic and human exploration, satellite operations and communications, and GPS navigation. These technologies are woven into the fabric of daily life, from health care and finance to basic utilities. Both short- and long-term forecasting models are urgently needed to mitigate the effects of solar storms and to anticipate their collective impact on aviation, astronaut safety, terrestrial climate and others. Even during a relatively weak solar maximum, the potential consequences that such events can have on society are too important to ignore. The challenges associated with space weather affect all developed and developing countries. Work on space weather specification, modeling, and forecasting has great societal benefit: It is basic research with a high public purpose and the stated goal of LWS is to achieve the Sun-Earth, Sun-Planet system understanding. LWS science through the Targeted Research & Technology program tackles large-scale problems that cross discipline and technique (data analysis, theory, modeling, etc.) boundaries and identifies how the new understanding will have a direct impact on life and society. In this talk I will summarize some of the key accomplishments of this program and discuss the future possibilities.