Space Physics Exploration: Basic Research with a High Public Purpose

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From the first in situ measurements of trapped radiation by J.A. Van Allen and coworkers with Explorer 1 to the latest modern satellite observations, space physics research has been an exciting and compelling program of exploration. Evolving understanding of the Earth system and then the extension of this research to the environments of other planets such as Jupiter, Saturn, and Mercury has been a commingling of certain common themes as well as discovery of strikingly different properties from one system to the next. One key point is that much of the basic research performed concerning space physics systems also has profound societal relevance. The studies of acceleration properties – especially very high energy particles in the Van Allen belts – are absolutely central to space weather concerns that confront navigation, communications, remote sensing, and other operational human endeavors. It is a privilege as well as a challenge to continue to study space physics problems that both illuminate remote astrophysical processes as well as affect our daily, technology-dependent lives.