Priority: Integration of Basic and Applied Research

Prepared by: **The American Commercial Space Weather Association (ACSWA)***

Summary of Impacts

- Much basic research with potential application to space weather operations is not effectively transitioned to help mitigate potentially hazardous effects of space weather.
- Customer requirements are not well communicated to the research community in a way that new knowledge can be better targeted to real world problems.
- The development of tailored products must be undertaken by those who understand the fundamental physics of space weather phenomena and the technological applications that drive customer requirements.

Background and Relevance

Space weather is a discipline that sits at the intersection of fundamental research and applied science. As described by Stokes (1997), federal investments in use-inspired basic research is most effective in leading to both new understanding and societal benefits. With the growing recognition of the hazards to technology and human health posed by space weather events, it is critical to ensure that new knowledge is transitioned to technological applications in a timely and effective way. For this activity, the commercial space weather community that has evolved over the last two decades plays a unique role in that it explores innovative ways to apply the outcomes of research to meet customer requirements. Commercial space weather companies provide the essential link between the research community and the growing number of space weather customers. Traditionally, the SBIR and STTR programs have been effective mechanisms for supporting commercial sector applied research activities, but these opportunities are limited. Targeted programs that encourage and support partnerships between private sector space weather companies and researchers in academia and government laboratories are needed to prevent the stove pipes that impede transition of research to operations. In a manner analogous to design for manufacturing, research, and applications have to be integrated ab initio. In this manner, both fundamental research and the technical applications will progress in tandem.

5-10 Year Goals

Over the next 5 to 10 years it is imperative that the government leadership:

- Establish programs that support and encourage partnerships between the research community and the private sector companies focused on meeting customer requirements.
- Involve the commercial sector as a full partner in the strategic planning of research to ensure scientific priorities are well aligned with customer needs.
- Transition federal space weather operational activities to commercial sector companies to lower costs and ensure reliability and continuity.

Reference:
Stokes, Donald E., *Pasteur's Quadrant*, Brookings Institution Press, Washington, D. C, 1997.

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