

J1A: Targeted Outcome to Capabilities to Implementation

Targeted Outcome: Phase 2005-2015, Safeguarding our Outbound Journey
Determine Extremes of the Variable Radiation & Space Environments at Earth, Moon, & Mars

Required Understanding

Variability of Space Environments: at & between Earth, Moon & Mars

CME Associated Planetary & Interplanetary Radiation Responses

Cosmic Rays: Low Earth Orbit Out to Moon & Mars

Internal Processes of Magnetospheric Radiation Enhancements

High Speed Stream Associated Radiation Responses

Causes of Surface, Atmosphere, Ionosphere & Magnetosphere Environment Enhancements

Processes That Lead To Extreme Environments

Enabling Capabilities & Measurements

Determine relationships of trapped & SEP fluxes plus atmosphere & ionosphere changes with solar-interplanetary conditions

Measurements of atmospheric, ionospheric, magnetospheric & interplanetary environment enhancements & conditions of occurrence

Assimilative & theoretical models to provide linkage between observables & near term plus future environmental enhancements

Measurements needed from planetary atmospheres through interplanetary medium

Implementation Phase 1: 2005-2015

Great Observatory

Current Missions:

TIMED, Soho, ACE, Cassini, Cluster, etc.: Extend environment data bases & inform on current environment conditions in support of model development & testing

Enabling

Model Development:

To provide linkage between spatial regions plus source-response relationships

Enabling

SDO, RBSP, ITSP to provide new environmental measurements and provide the data for new model and theory development relevant to particle acceleration, ionosphere structure and responses plus measure variability of photonic inputs to Earth and Mars atmospheres. Inner Sentinels at end to start analyses of inner heliosphere SEP acceleration and propagation

LWS

Contributing

MMS: Additional environmental measurements and data for new model and theory development plus data on SEP magnetotail access

Enabling Partner w Exploration

DATA MINING Program:

Required to determine extreme: Combine all past & current observations to find extreme environments with reasonable probability (Virtual Observatory)

STP

Theory Program:

To understand responses of planetary (Earth, Moon, Mars) & interplanetary environments to solar and internal drivers

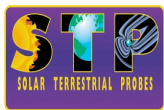
LCAS Campaigns:

Upper atmosphere & ionosphere responses to energy inputs + determine atmospheric GCR & SEP shielding efficiencies (has direct Mars applications)

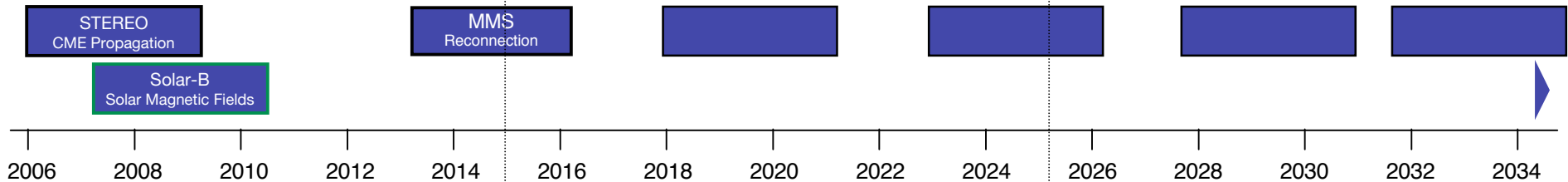
Step 5: Known Resources to be applied

In Development

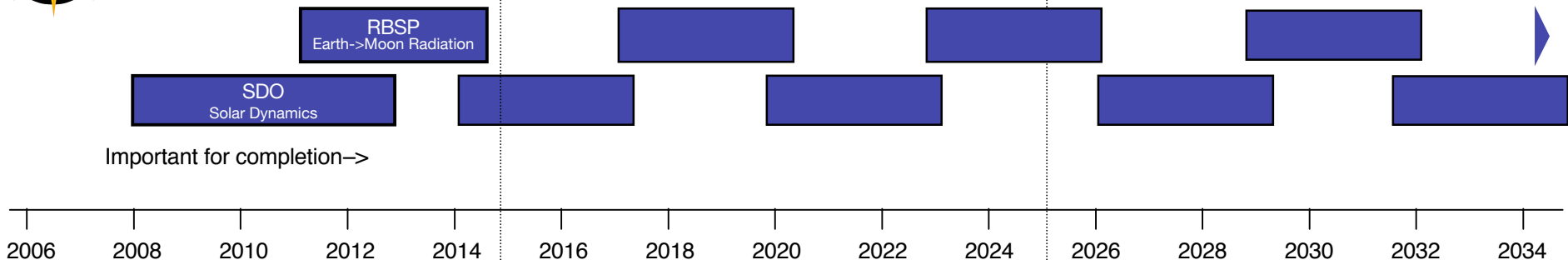
Partnership



Low- to mid cost, multi-objective, strategically planned for fundamental space physics and space weather investigations
 Current Resources: 1 launch per 5 years



Low- to mid-cost, multi-objective, strategically targeted for Life and Society Science investigations,
 Recommended: 1 launch per 3 years



Explorers, single objective, strategically selected to respond to new knowledge/decision points,
 Recommendation: 1 launch per 2 years

