

# CREMM



## **Cosmic Ray Energetics And Mass**

for the International Space Station

Principal Investigator: Professor Eun-Suk Seo, University of Maryland

#### **Science Mission Statement**

Extend the energy reach of direct measurements of cosmic rays to the *highest energy* possible to investigate cosmic ray origins, acceleration and propagation.

#### **Physical Characteristics**

• Payload total mass: 1258 kg

Payload Dimensions: 1.85 m x 0.95 m x 1 m

Launch scheduled on SpaceX-12 in 2017

Nominal data collection of 3 years on the JEM-EF

#### **Operations**

- Data produced at ~500 kbps, or ~5 GB/day
- 32 GB of onboard data storage (4-fold redundant)
- 24/7 monitoring from the Science Operation Center (SOC) at UMD
- Continuous downlink of housekeeping and science data in near real-time
- continuous commanding window to monitor and control the health of the instrument

### Collaborating Institutions

- University of Maryland, USA
- Penn State University, USA
- · Northern Kentucky University, USA
- NASA Goddard Space Flight Center, USA
- National Autonomous University of Mexico, Mexico
- KyungPook National University, Korea
- Sung Kyun Kwan University, Korea
- LPSC Grenoble and CESR Toulouse, France

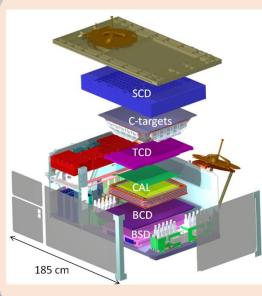
NASA GSFC WFF (inc. CSC/Vantage, SGT, and NMSU PSL) - project management and engineering support. NASA JSC ISS Program Office - launch support and the ISS accommodation. NASA MSFC -flight operations





#### **Detector Systems**

- Silicon Charge Detector (SCD) 4 layers of 2x2 cm silicon pixels used to determine incident particle charge
- Carbon Targets (C-targets) Layers of carbon plates to induce hadronic interactions for measurement in the calorimeter
- **Top/Bottom Counting Detector (TCD/BCD)** Plastic scintillator for electron/proton distinction
- Calorimeter (CAL) 20 layers of alternating tungsten plates and scintillating fibers used to measure incident particle energy and trajectory within the instrument
- Boronated Scintillator Detector (BSD) Boron-doped scintillator to capture thermal neutrons from hadronic interactions in the calorimeter providing additional e/p distinction
- Science Flight Computer (SFC) The onboard computer used to control detectors, assemble events and store science data



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