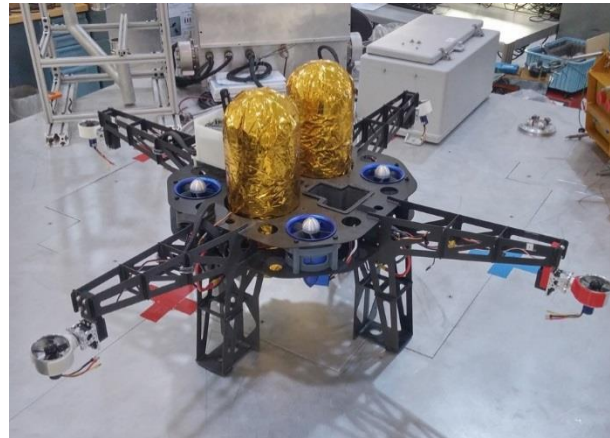
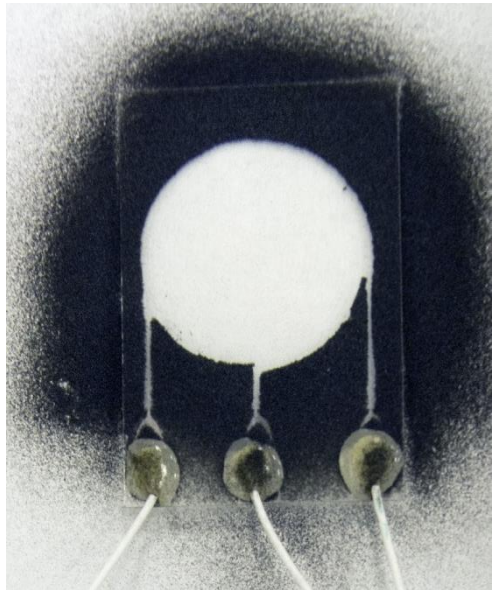
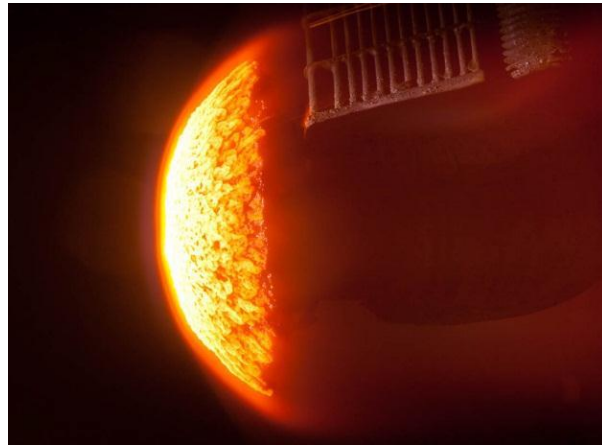


History and Flight Development of the Electrodynamic Dust Shield

Michael R. Johansen, Paul J. Mackey, Michael D. Hogue, Rachel
E. Cox, James R. Phillips III, and Carlos I. Calle

National Aeronautics and Space Administration, Kennedy Space Center





The Dust Problem

- *Dust from this equipment fell back onto the lower crewmember and into the cabin and seemed to bind the conveyor so as to require considerable force to operate it. – **Apollo 11 Mission Report***
- *The cohesive properties of lunar dust in a vacuum, augmented by electrostatic properties, tend to make it adhere to anything it contacts.– **Apollo 12 Mission Report***
- *After exposure to a dusty lunar environment, the both crewmen's suit wrist-ring disconnects were hard to rotate to the locked and unlocked position. – **Apollo 16 Mission Report***

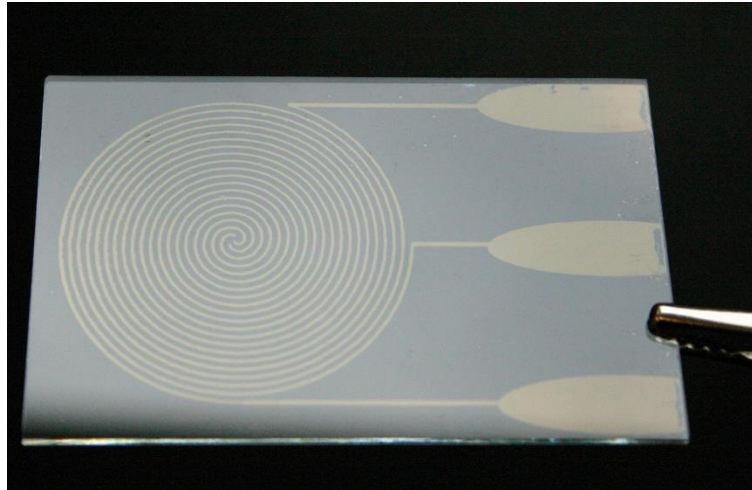


- Apollo 16 Moon Buggy Video

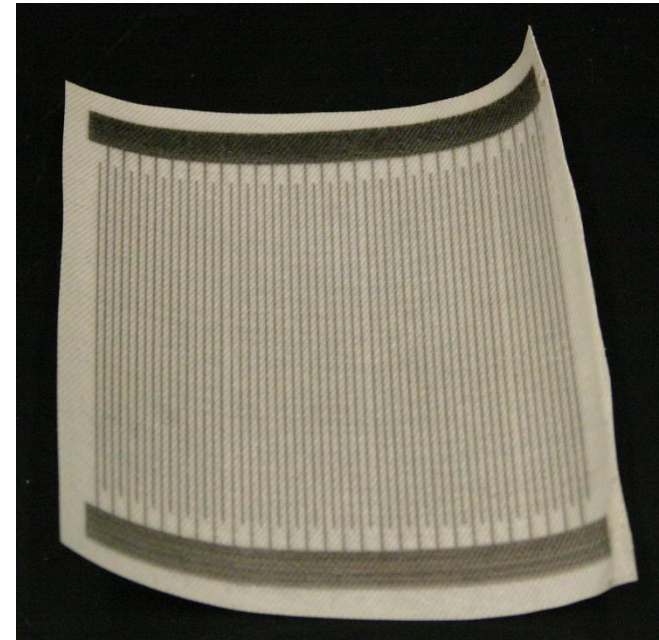
Electrodynamic Dust Shield



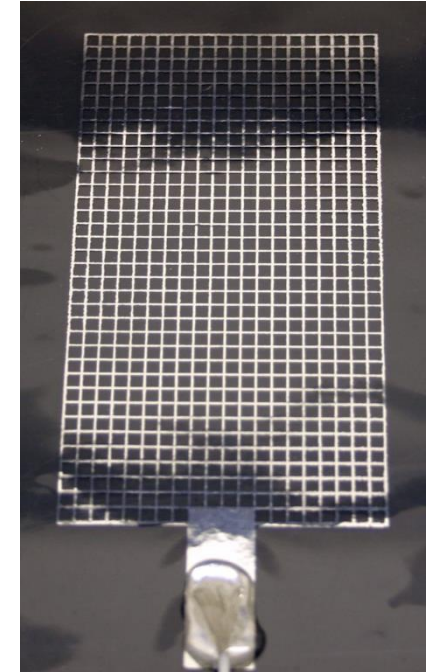
Cu/Kapton



ITO/glass



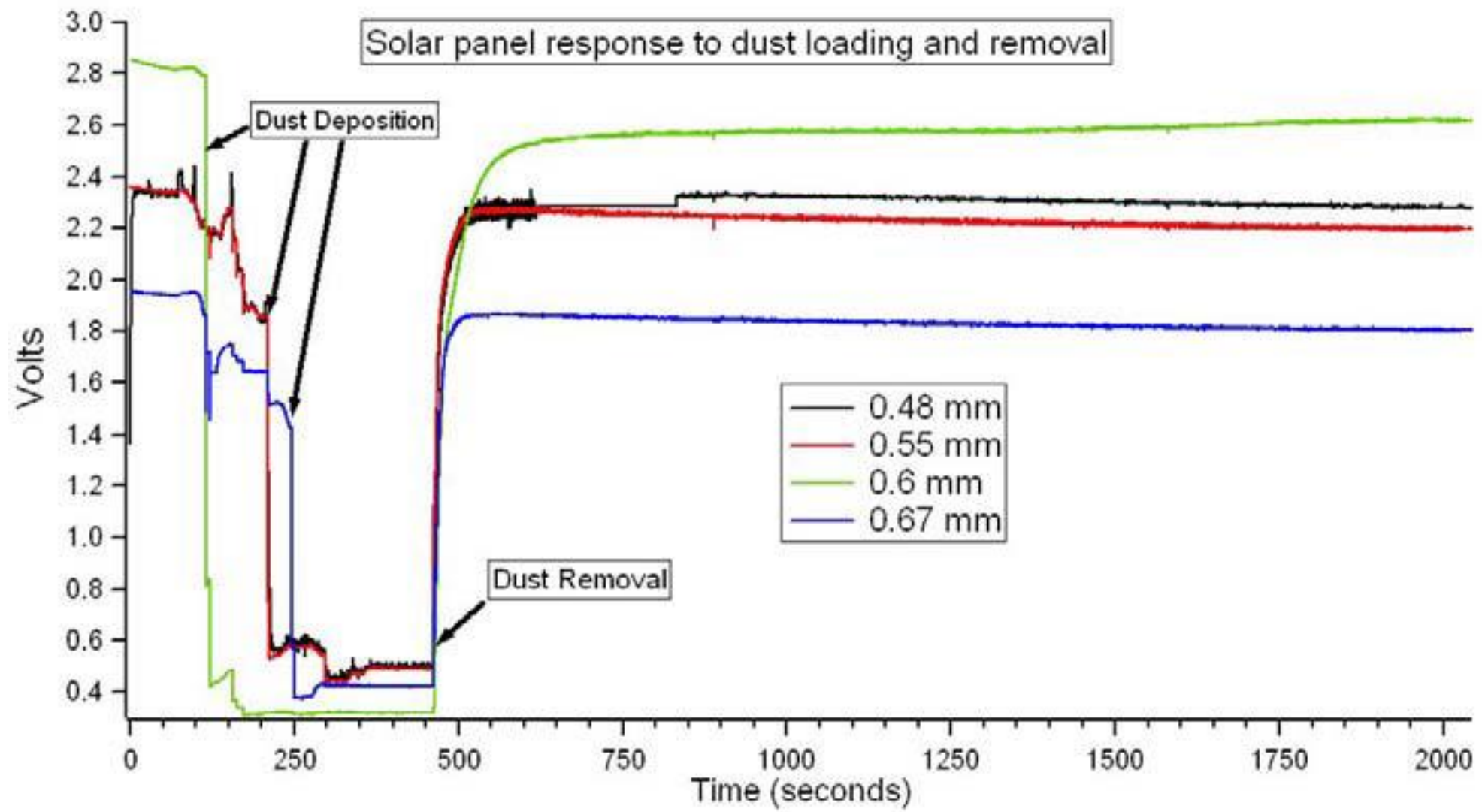
CNT/fabric



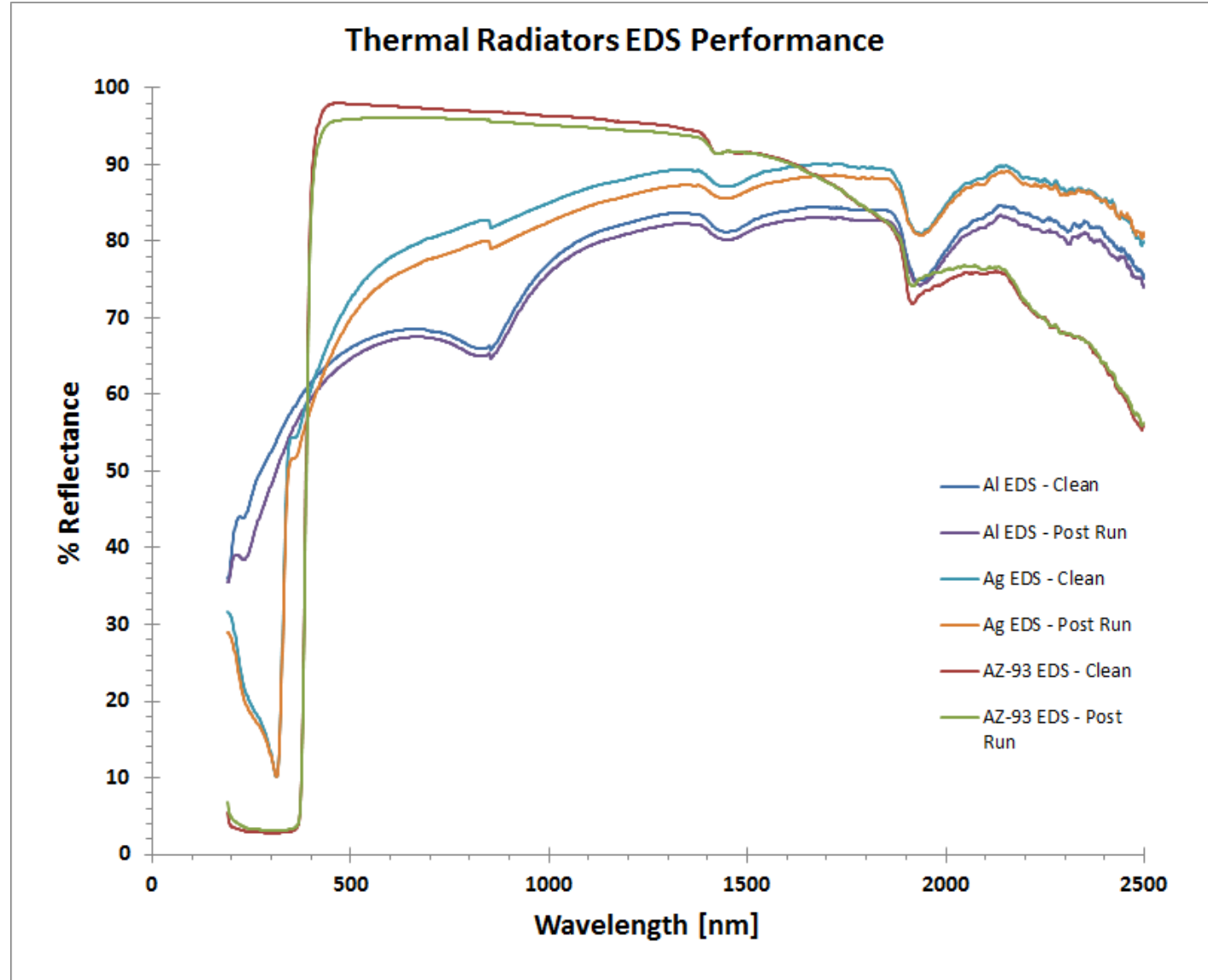
Ag/FEP

- EDS Operation Video

Testing



Testing



- RGF Video

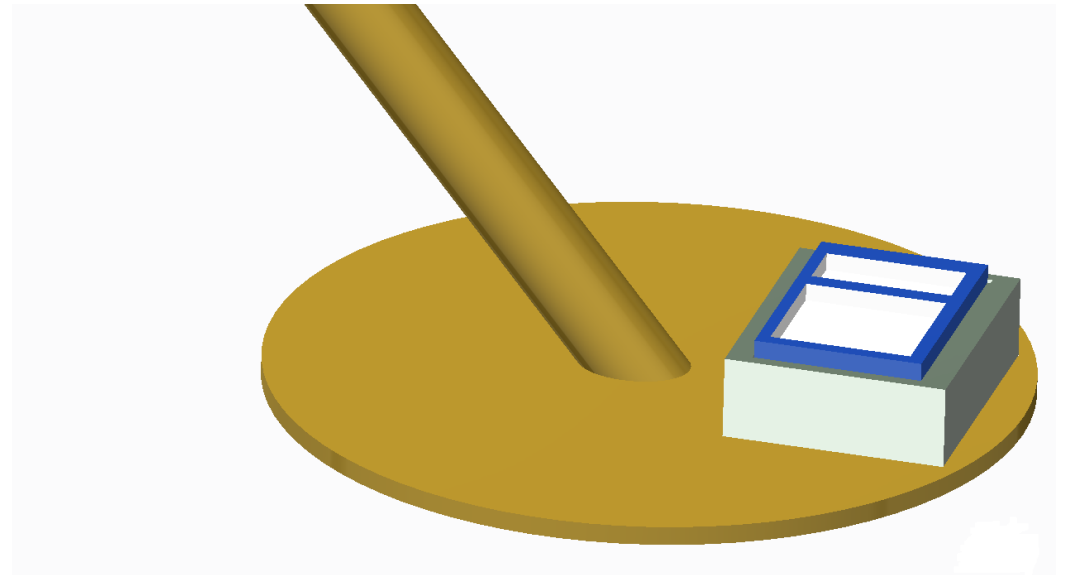
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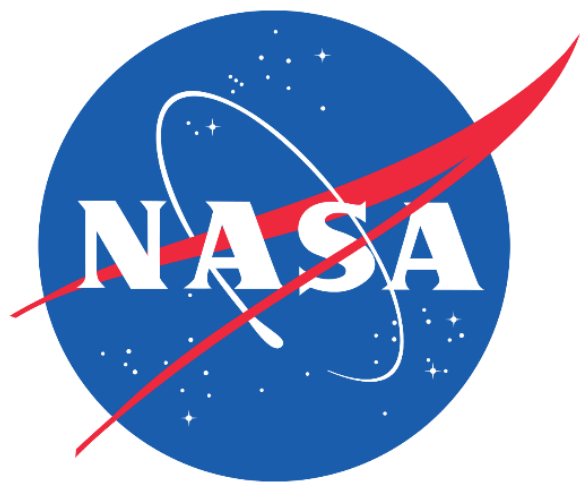
- Materials International Space Station Experiment
- Designed to test material response
 - Atomic Oxygen
 - Radiation
 - Vacuum
 - Thermal cycling
- Data from power supply and photos used to determine shield health
- Currently work - EDS with space compatible materials



Lunar CATALYST

- Lunar Cargo Transportation and Landing by Soft Touchdown
- NASA provides
 - Technical expertise
 - Test facilities
 - Loan equipment/software
- Mission concept – Fly EDS and electronics on footpad
- Current work – Reduce electronics footprint





**Exploration Research and
Technology Programs**

