New Mexico Research Spotlight Forum

4/17/2019 Advancing Resilience for Space Systems

Trusted Systems

PRESENTED BY:

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ABOUT YOURSELF

PhD – Nuclear and Radiation Chemistry (India)

Post-doc-Department of Surgery, Auckland Hospital, New Zealand

Nuclear Engineer-Brookhaven National Laboratory, NY

Nuclear Engineer – Sandia National Laboratories

- Research areas: Active neutron interrogation -In vivo body composition using prompt gamma neutron activation analysis, terrestrial carbon sequestration studies using pulsed neutron generators, Unexploded ordnance identification using neutron time-of-flight,
- Research group interests: Sensor Science - Terrestrial and space based

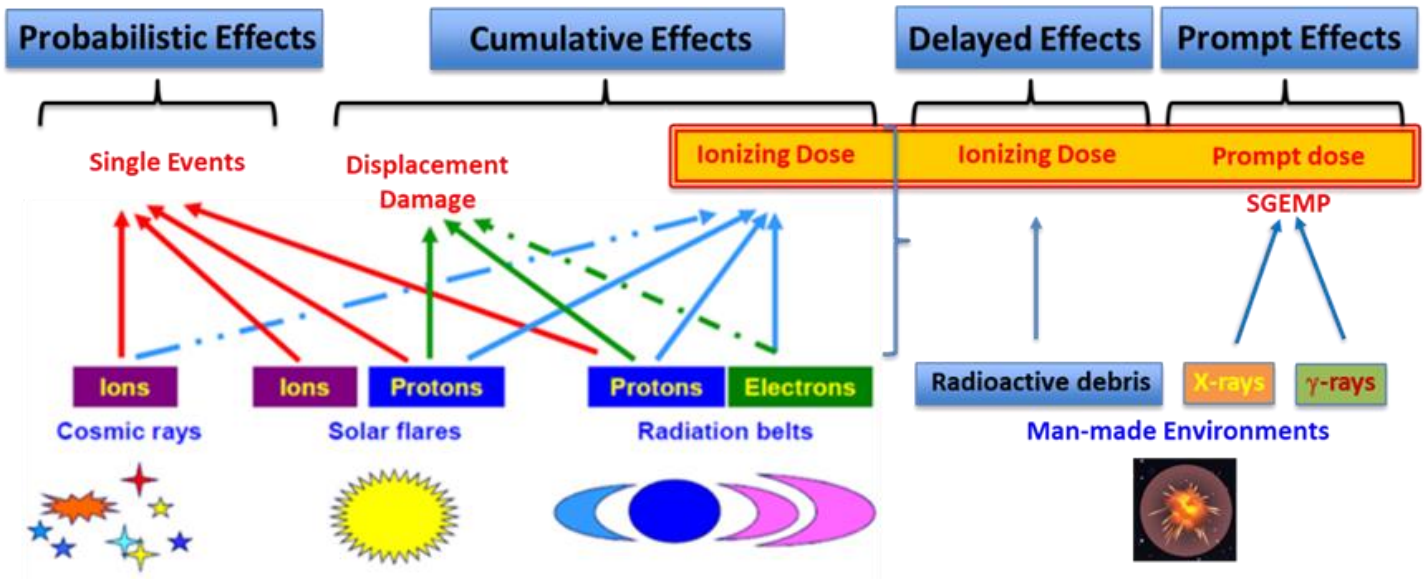
Lead for the Radiation Effects Qualification team for payload systems

Keywords:

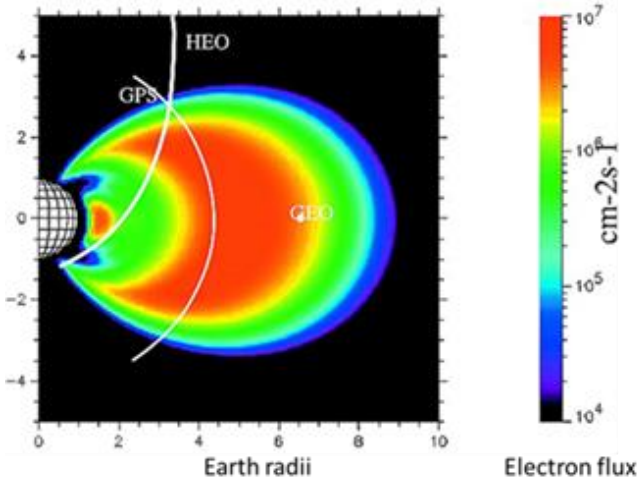
Neutron interrogation, space radiation effects, radiation testing

CURRENT WORK IN ADVANCING RESELIENCE FOR SPACE SYSTEMS

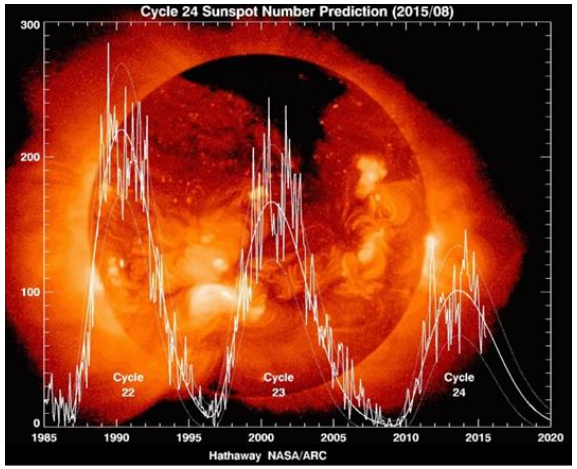
Detrimental effects due to space radiation environment



Electron flux at different distances



11 year solar cycle



Mitigation

- Model the environment
- Design the shielding (Cumulative Effects)
- EDAC (Probabilistic Effects)

Radiation Effects testing

SNL Co-60 Gamma Irradiation Facility

(1) TID (Total Ionizing Dose) -

(2) Single Event Effect- Heavy Ion, proton accelerators

- Expensive, bookings need to be made much ahead of time

FUNDING SOURCES

- No joint work with Universities

RESEARCH NEEDS

- **Require low cost testing tools for SEE**

- **Directly relevant for quick testing of COTS parts for "Trusted Systems"**