

Space Radiation Environmental Effects: The Natural Space Environment, Plasma, Geomagnetic Field, Solar Environment, and Ionizing Radiation. **Sources of radiation in Earth space:** Plasma, Trapped Particles, Solar Particles, Galactic (Cosmic) Rays. Potentials of surfaces in space

Space "Radiation" Effects: Spacecraft Charging (S/C), Total Ionizing Dose (TID), Displacement Damage, Single Event Effects (SEEs)

Effect of radiation on Materials: Metals, Alloys, and Metal-to-Metal Bonds, Polymers: Thermosetting Plastics, Thermoplastics, Adhesives, Elastomers. Ceramics, Graphite, and Glasses, Thermal-Control Coatings. Mechanical properties, Thermophysical properties.

Solar Radiation and its effects on Atmosphere: Solar radiation at the top of atmosphere, attenuation of solar radiation in the atmosphere, radiative transfer, thermal effects of radiation, photochemical effects of radiation.

TEXT BOOKS / REFERENCES:

1. Handbook of Radiation Effects Hardcover, Andrew Holmes-Siedle, Len Adams, Oxford University Press, 2nd Ed. 2002.
2. Spacecraft Environments Interactions: Space Radiation and its Effects on Electronic Systems, J. W. Howard, Jr., D. M. Hardage, NASA Technical documents, 1999.
3. Space Radiation Effects on Graphite-Epoxy Composite Materials, Scott Milan Milkovich, Carl T. Herakovich, George F. Sykes., NASA Technical document, 1984.