# COSMIAC Overview on Mil-Standards and Radiation

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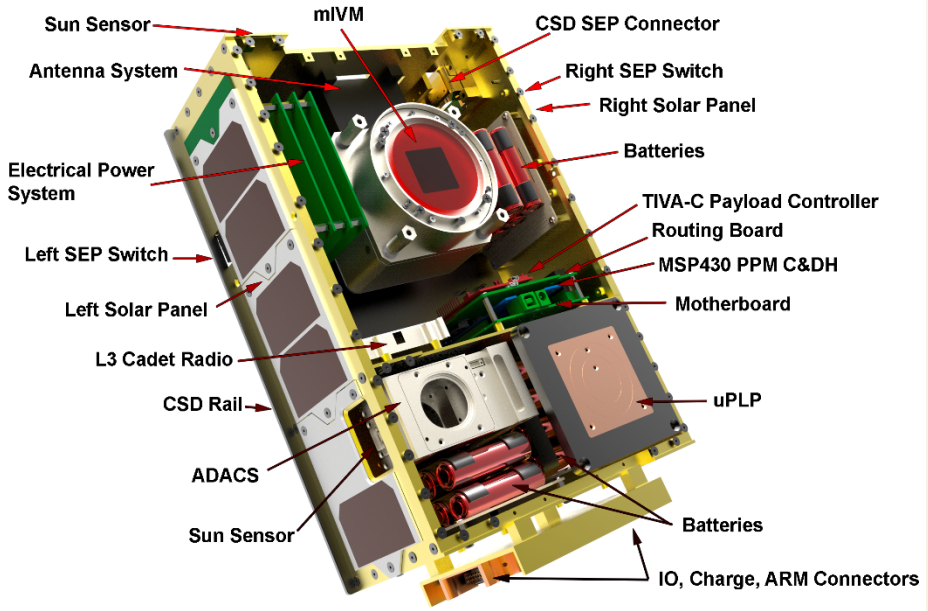
# Introduction

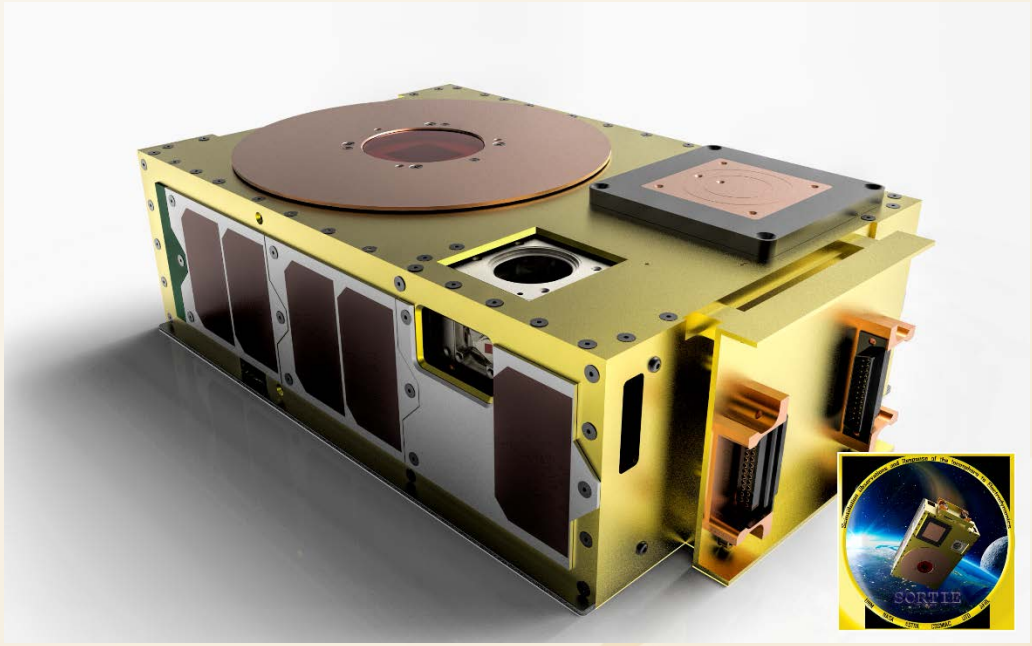
- COSMIAC serves as a Tier-2 Research Center under the School of Engineering at the University of New Mexico
- COSMIAC's role is to promote aerospace innovation through the reliable and responsible use of configurable technology in military and defense systems
- COSMIAC's nearly 14,000 square foot facility provides excellent design capabilities including laboratories, offices and cleanroom space
- Currently working on five different Nanosatellite programs and multiple payload programs

# Current Projects

## SORTIE: COSMIAC's 2nd 6U Satellite

- Scintillation Observations and Response of The Ionosphere to Electrodynamics (SORTIE) team is composed of ASTRA, COSMIAC, AFRL, University of Texas at Dallas and Boston College
- Mission will construct an atlas of ionospheric variability
- Funded by NASA for its Heliophysics Technology and Instrument Development or H-TIDeS program

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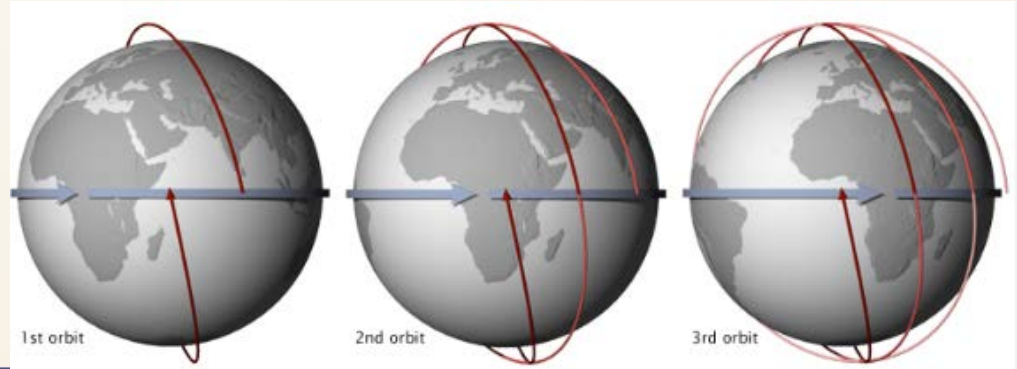
# How Radiation and Standards Merge

- Would love to work to get an AAQ module on Radiation mitigation
- At the SmallSat Conference it was announced that 26 countries were building CubeSats
- Moving towards smaller and lighter
- More and more solicitations are looking for nanosatellites to go further
- Carl is going to the moon – will arrive alive because powered down but then…
- COTS parts may not last in deep space – virtually no independent testing really done on today's cubesat components
- Past deep space missions depended on rad hard parts
- Someone at breakfast mentioned – how do it cheaper and more reliably

# If you are flying through the Van Allen Belts, you will have to think about Radiation

- Radiation hurts parts through total dose and through upsets
- If you are coming out of the ISS, you will be going through the belts so you will see upsets
- Shielding is only protection but that is weight restrictive
- Choosing not to do anything is still a decision

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# Government activities in Radiation Mitigation

- The “natural” radiation environment is well known
- Working to find government sponsors to independently test systems such as XACT, Clyde, Pumpkin, ….
- Most of the experts are very grey
- Finding young engineers to go into this field is very difficult
- The fun of writing standards
- What is difficult to find is a handbook on how to survive

# What are Standards good for (and not good for)

- Standards provide for guidance to developers
- In larger programs, they provide government entities the ability to leverage requirements on designers
- Standards allow nanosatellite designers the ability to think of things they might otherwise overlook
- In theory, they increase reliability by decreasing risk through imposing a repeatable process
- Risk mitigation costs money

# What are Standards good for (and not good for)

- Since the majority of CubeSats are going on nonmanned launches, repeatability might be cheaper - it might be less expensive to build two of something at 250k than one with extreme standards for 1.5m
- You can’t leverage large governmental requirements on universities and expect a spacecraft deliverable at $300k
- The ultimate (and hardest) objective is to determine how much “quality” you can afford in your budget

# Questions


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