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Hemispherical Grid Retarding Field Analyzer Redesign for Secondary Electron Emission Studies

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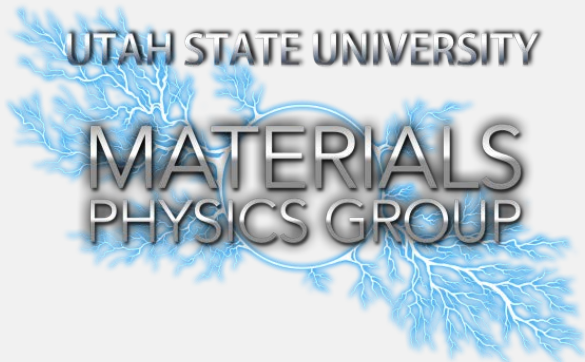
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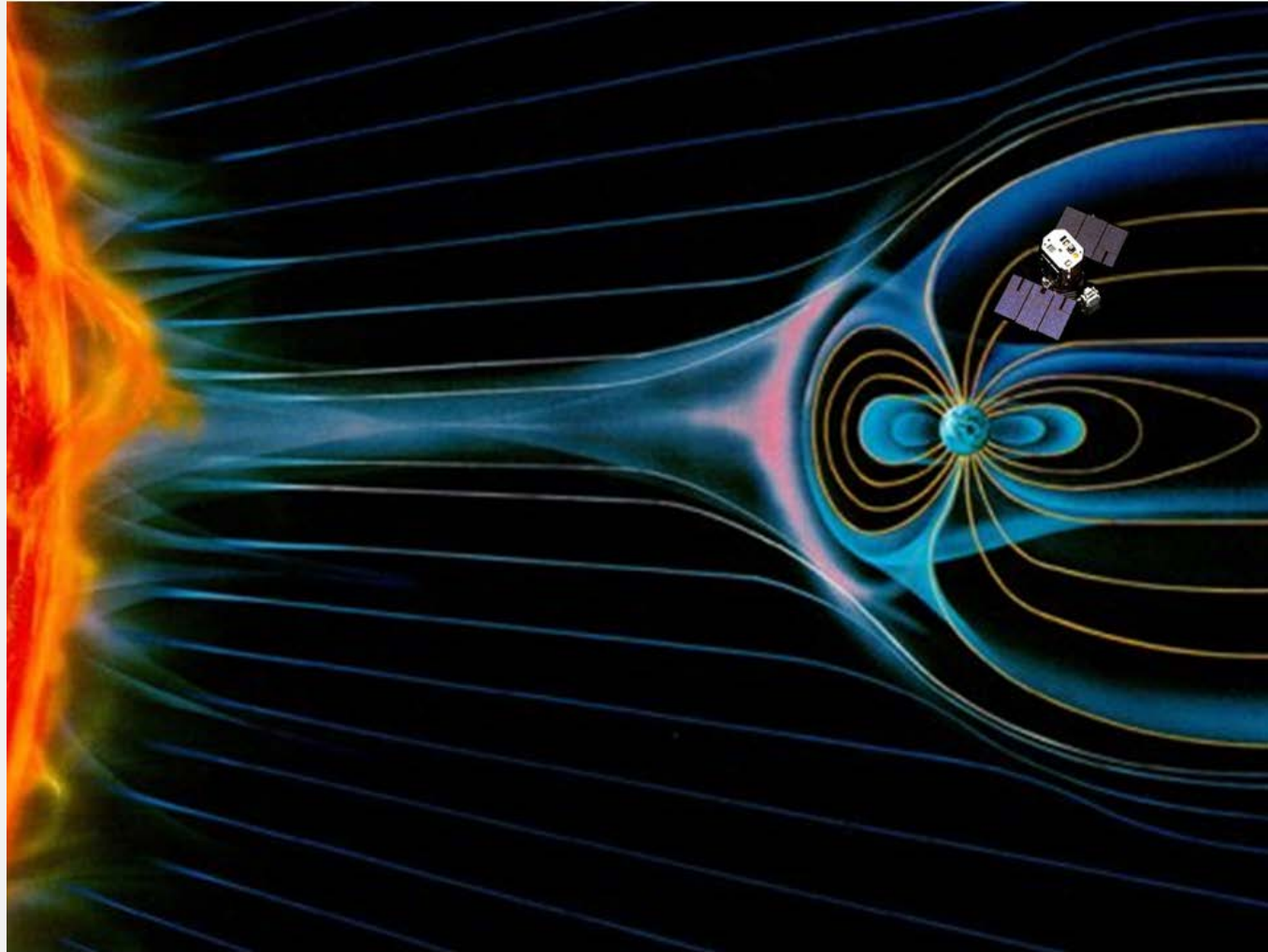


Hemispherical Grid Retarding Field Analyzer Redesign for Secondary Electron Emission Studies

Gregory Wilson



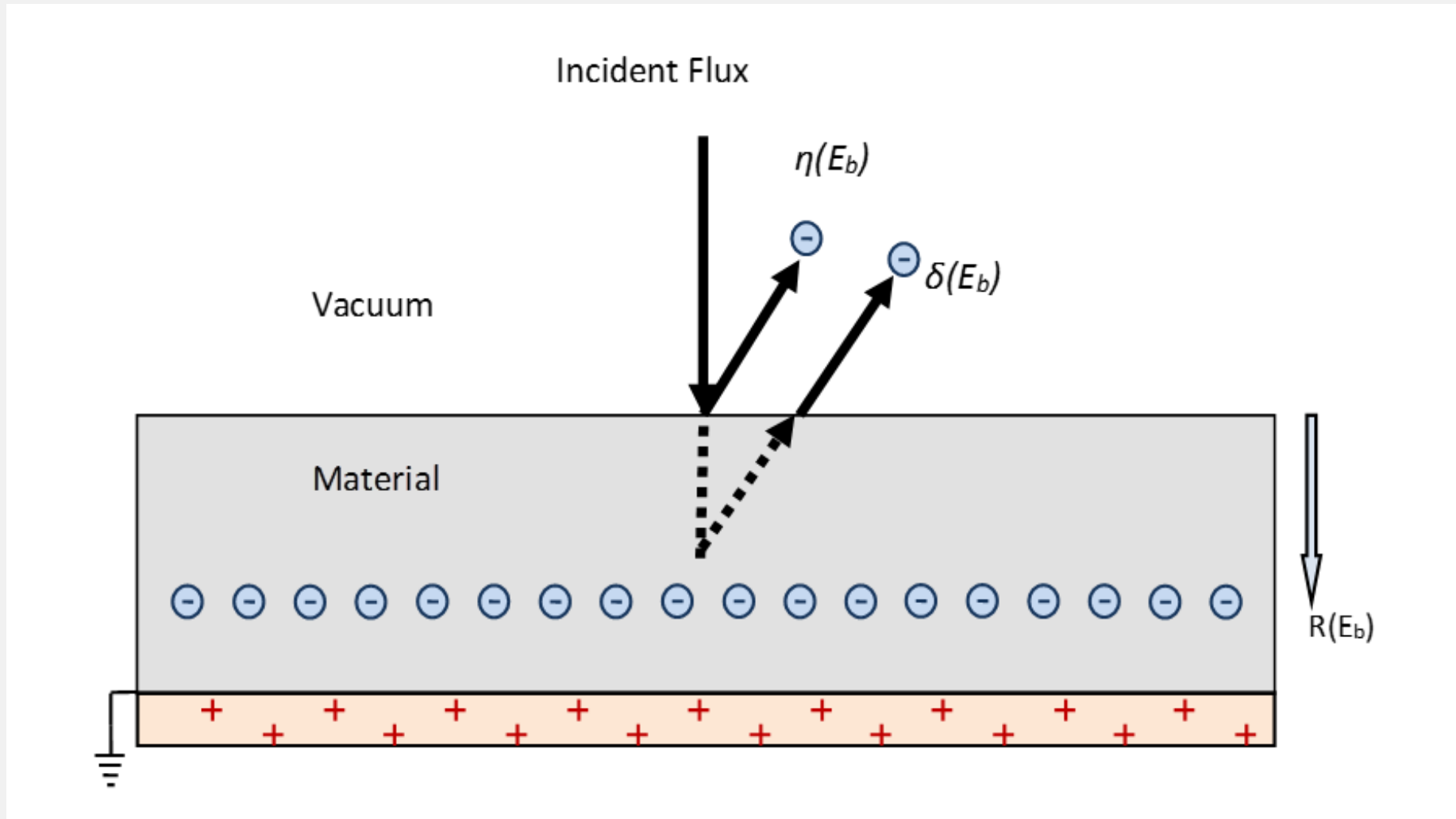
Introduction



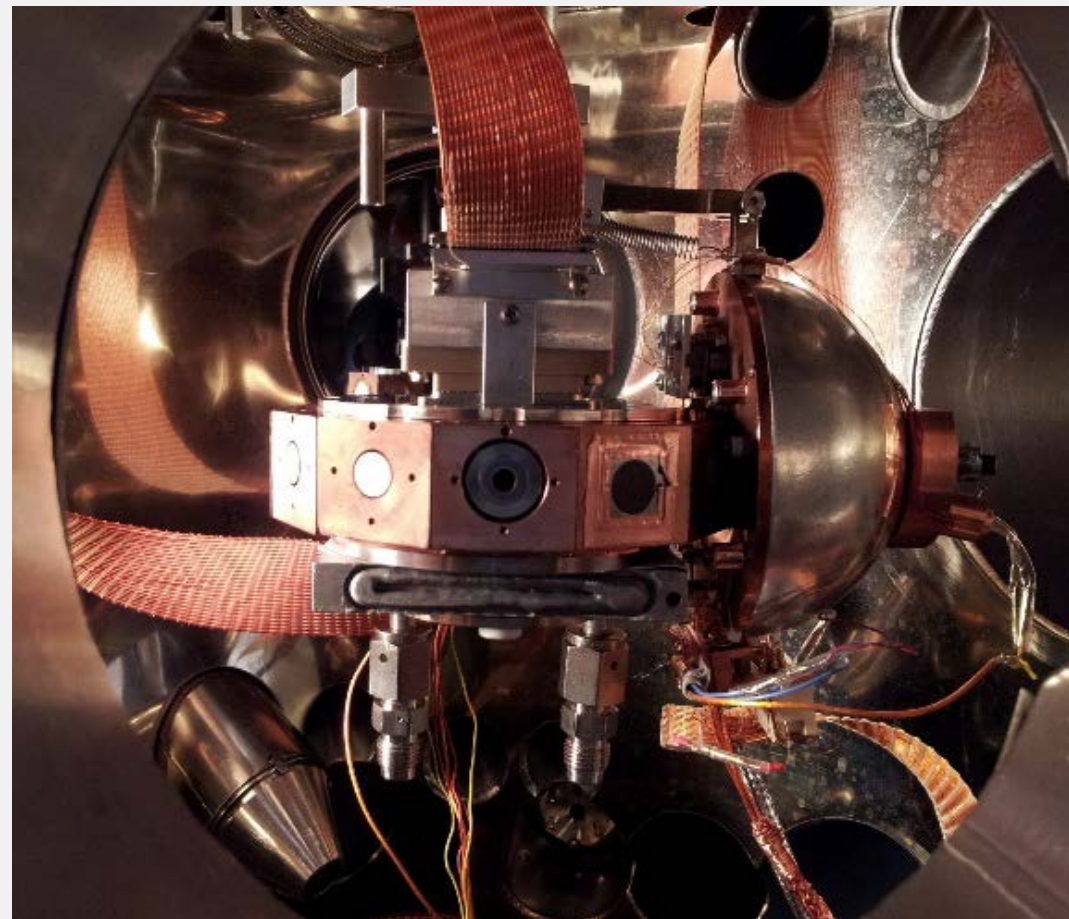
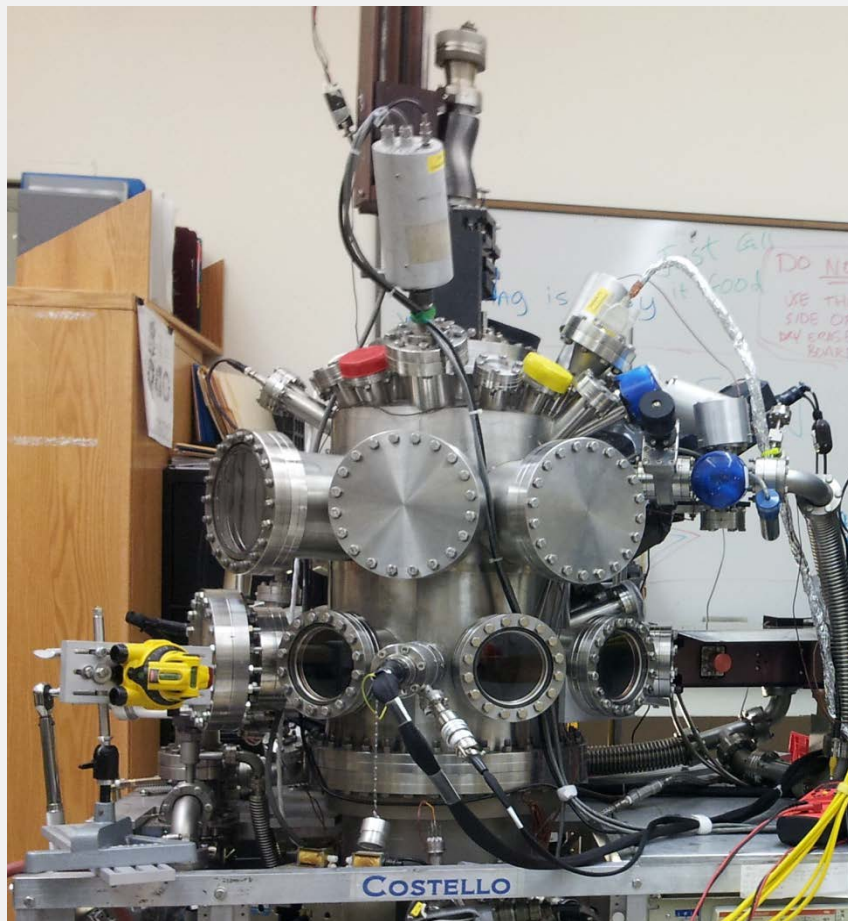
Introduction



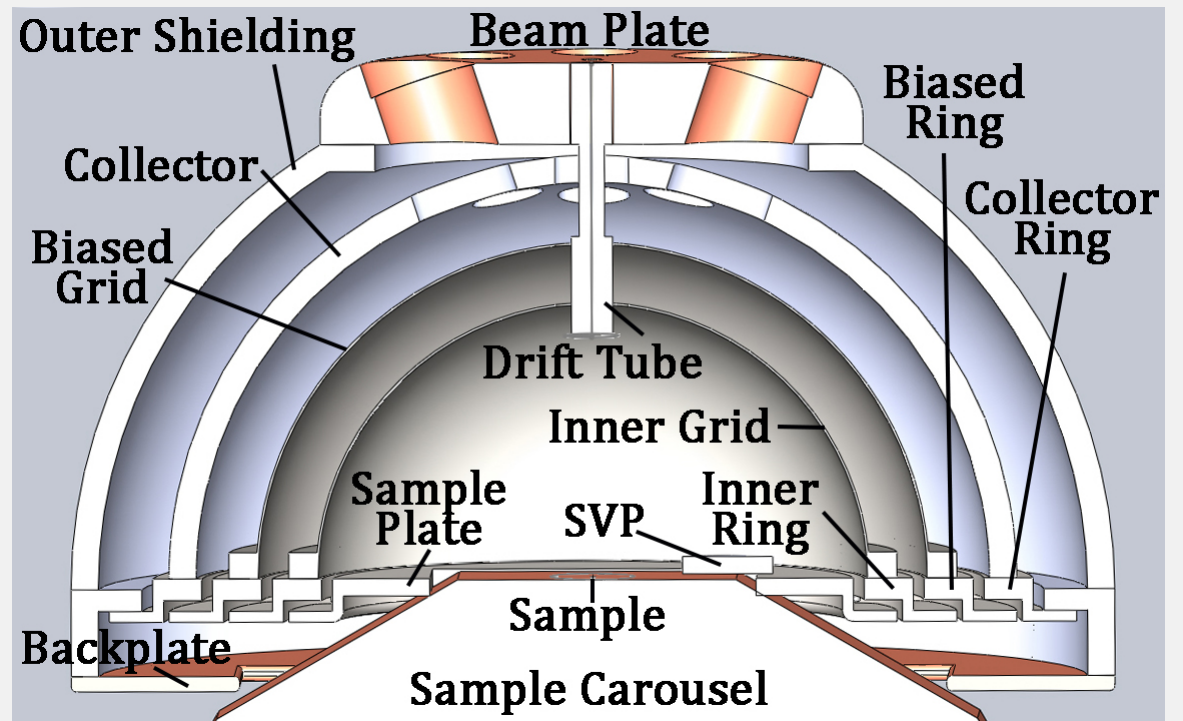
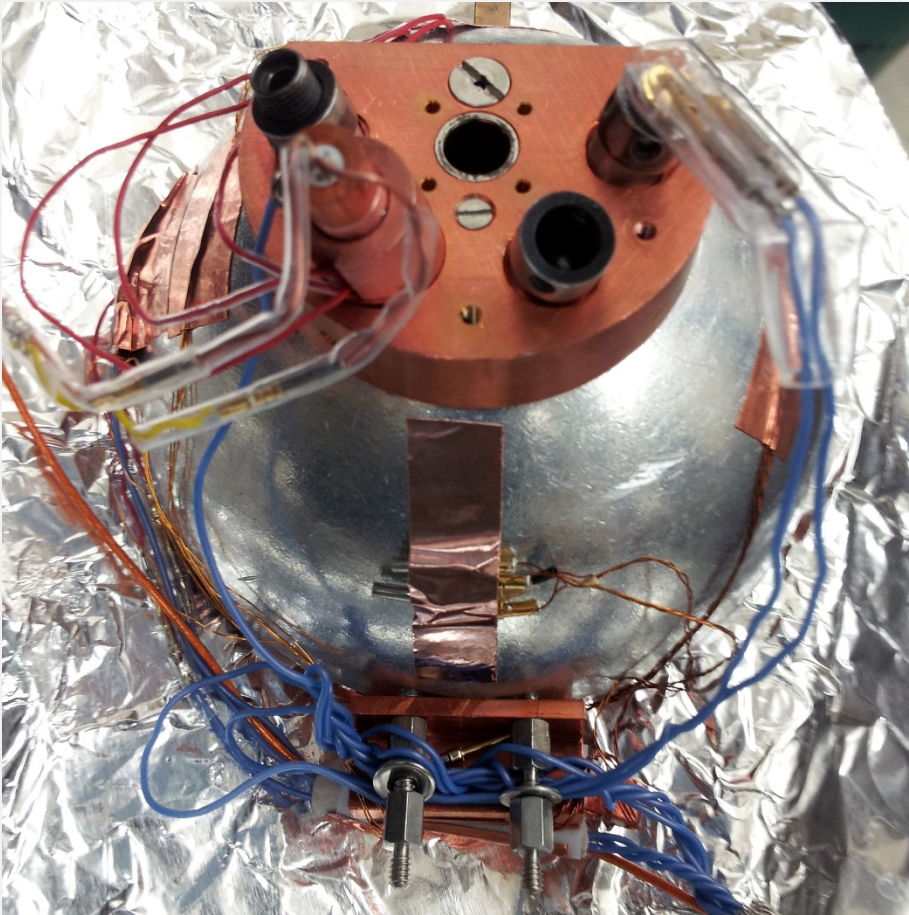
Theoretical Background



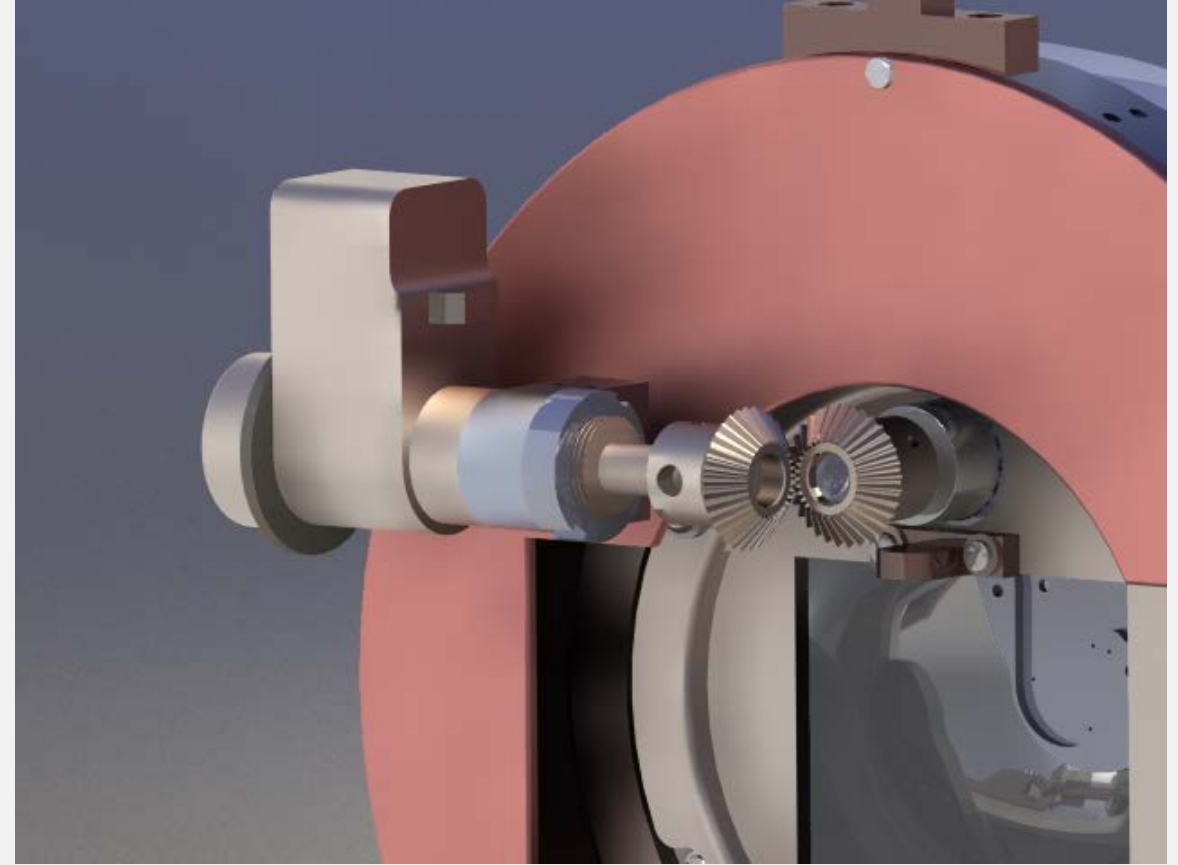
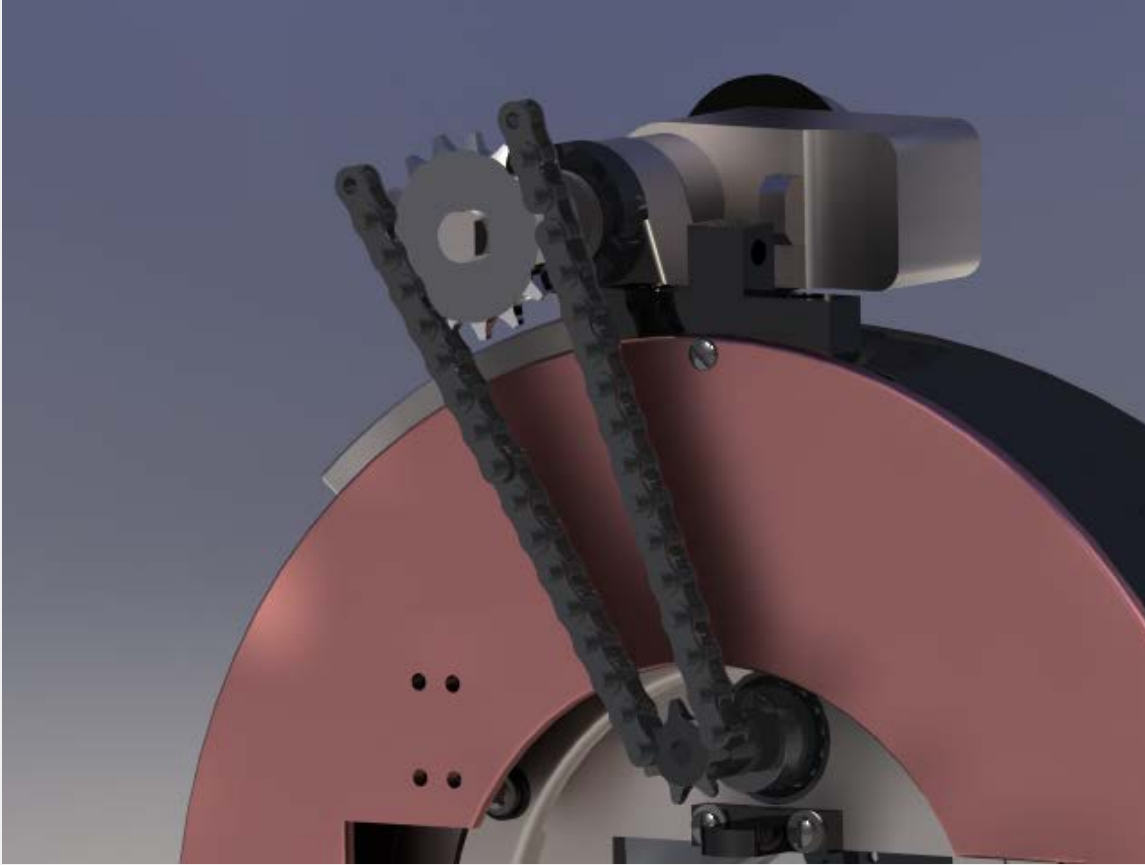
Spacecraft Charging Studies



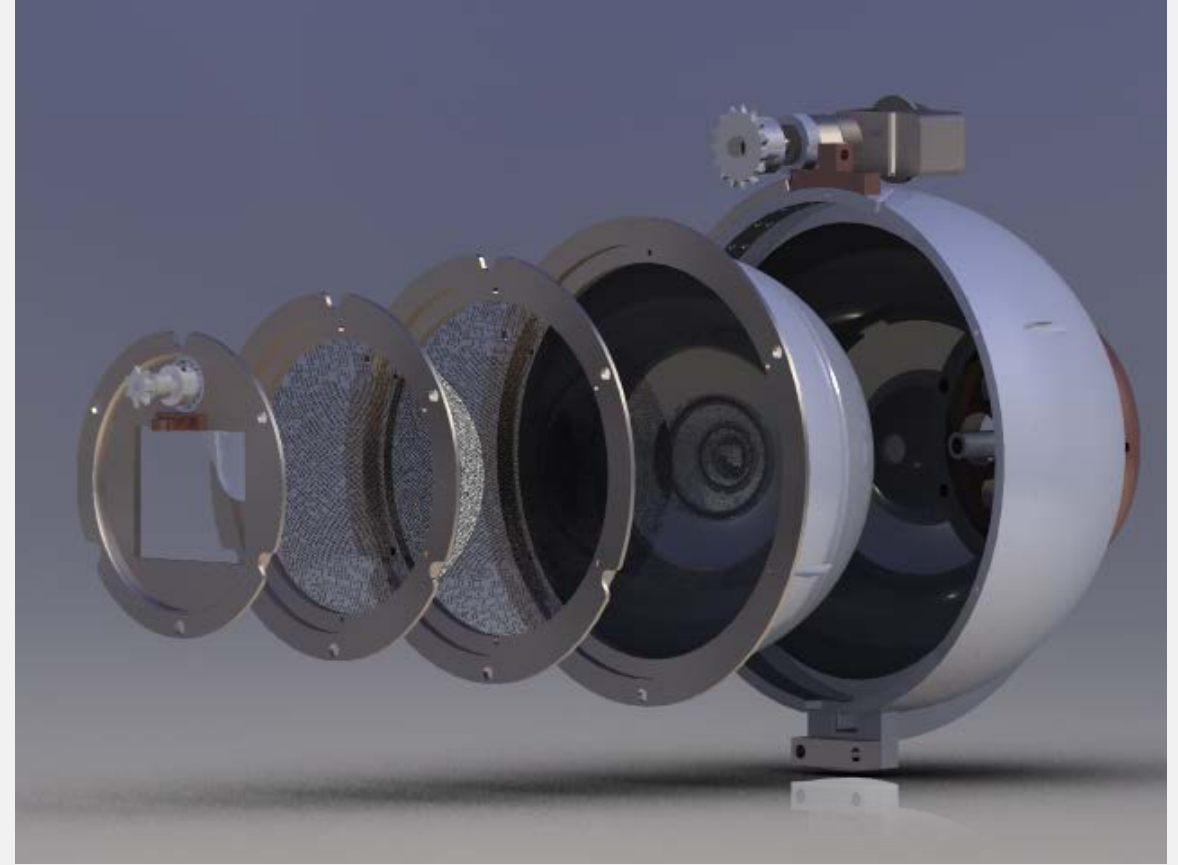
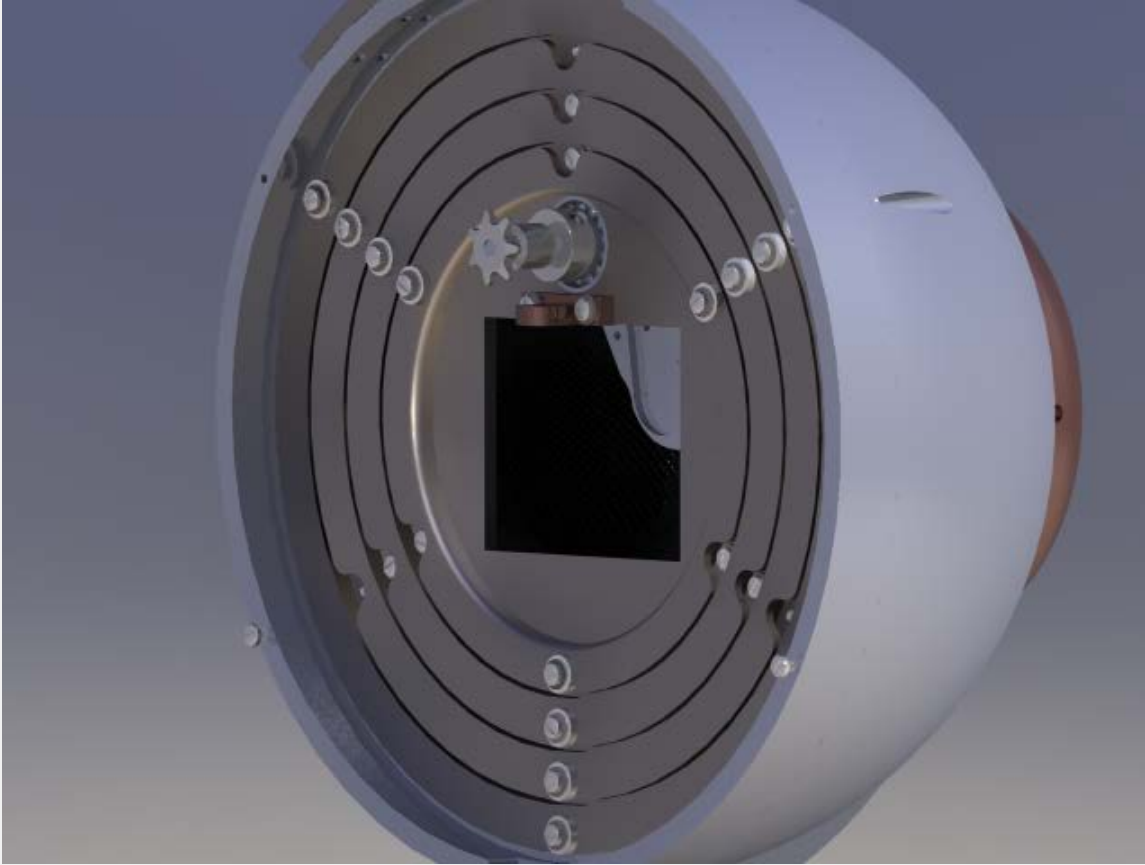
Hemispherical Grid Retarding Field Analyzer



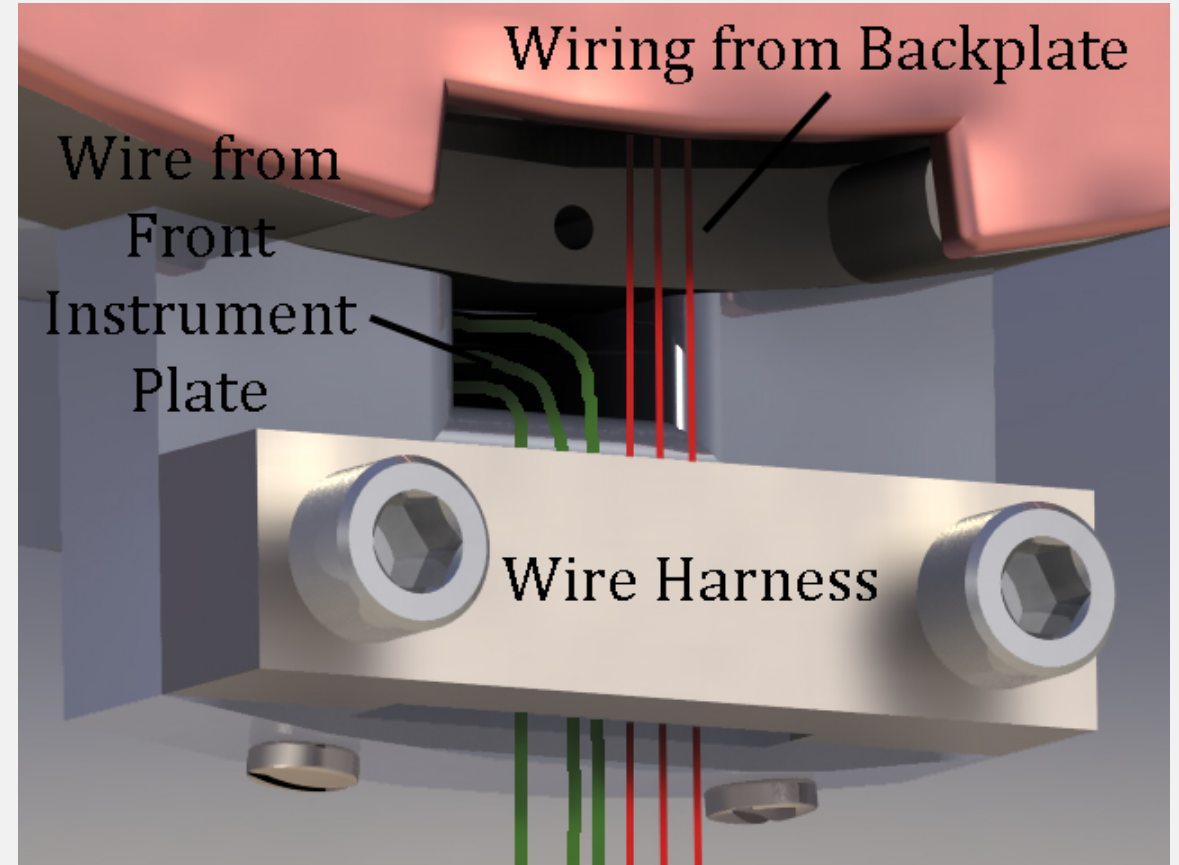
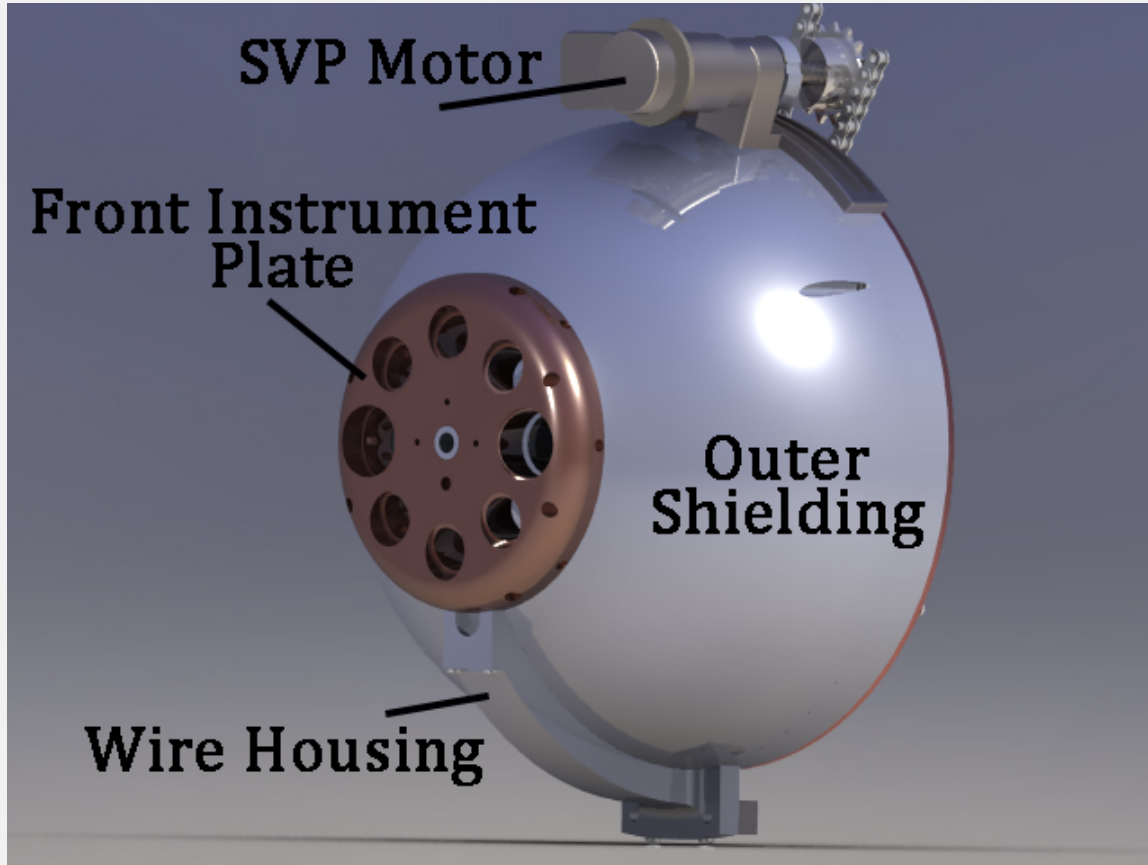
Improvements – Surface Voltage Probe



Improvements – Electrically Isolated Rings, Hemispheres



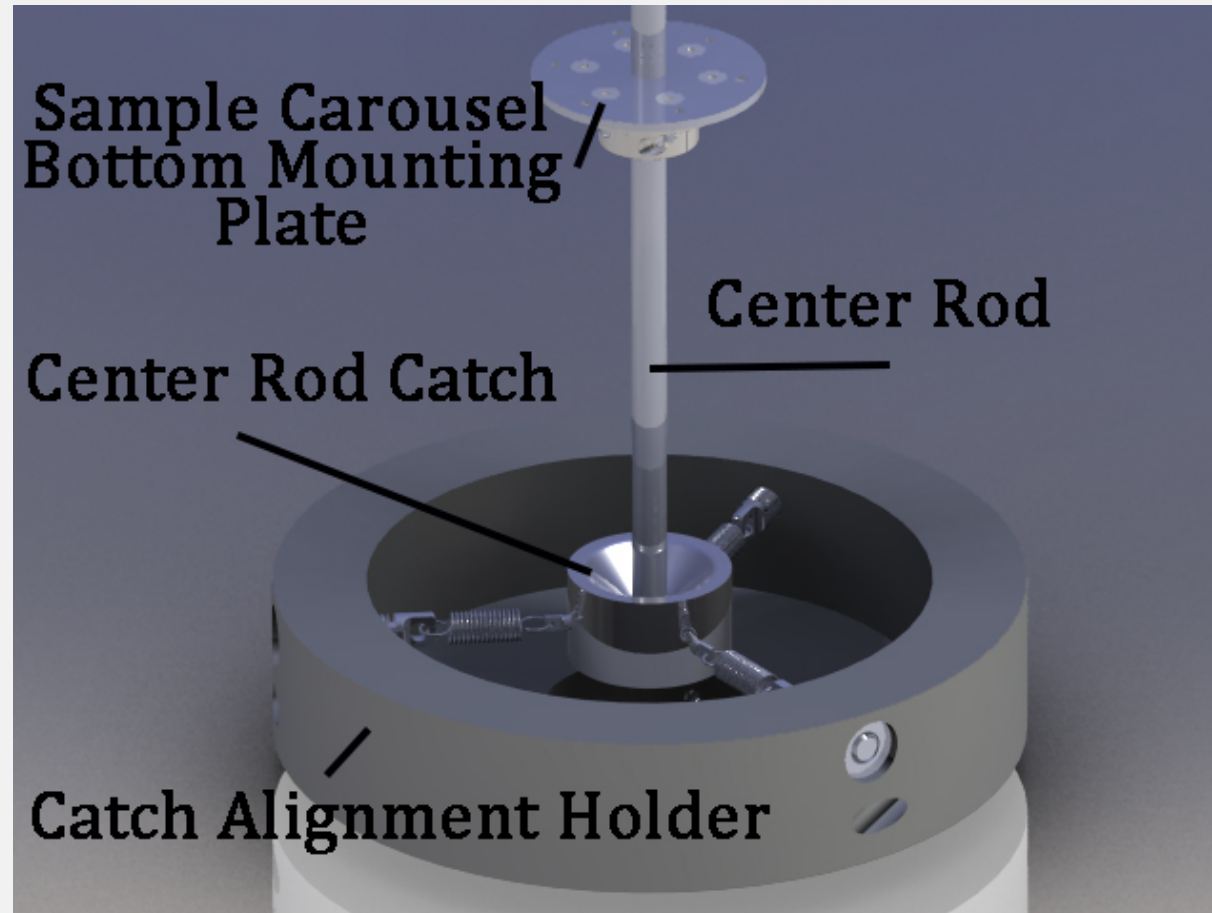
Improvements – Front Instrument Plate and Wiring



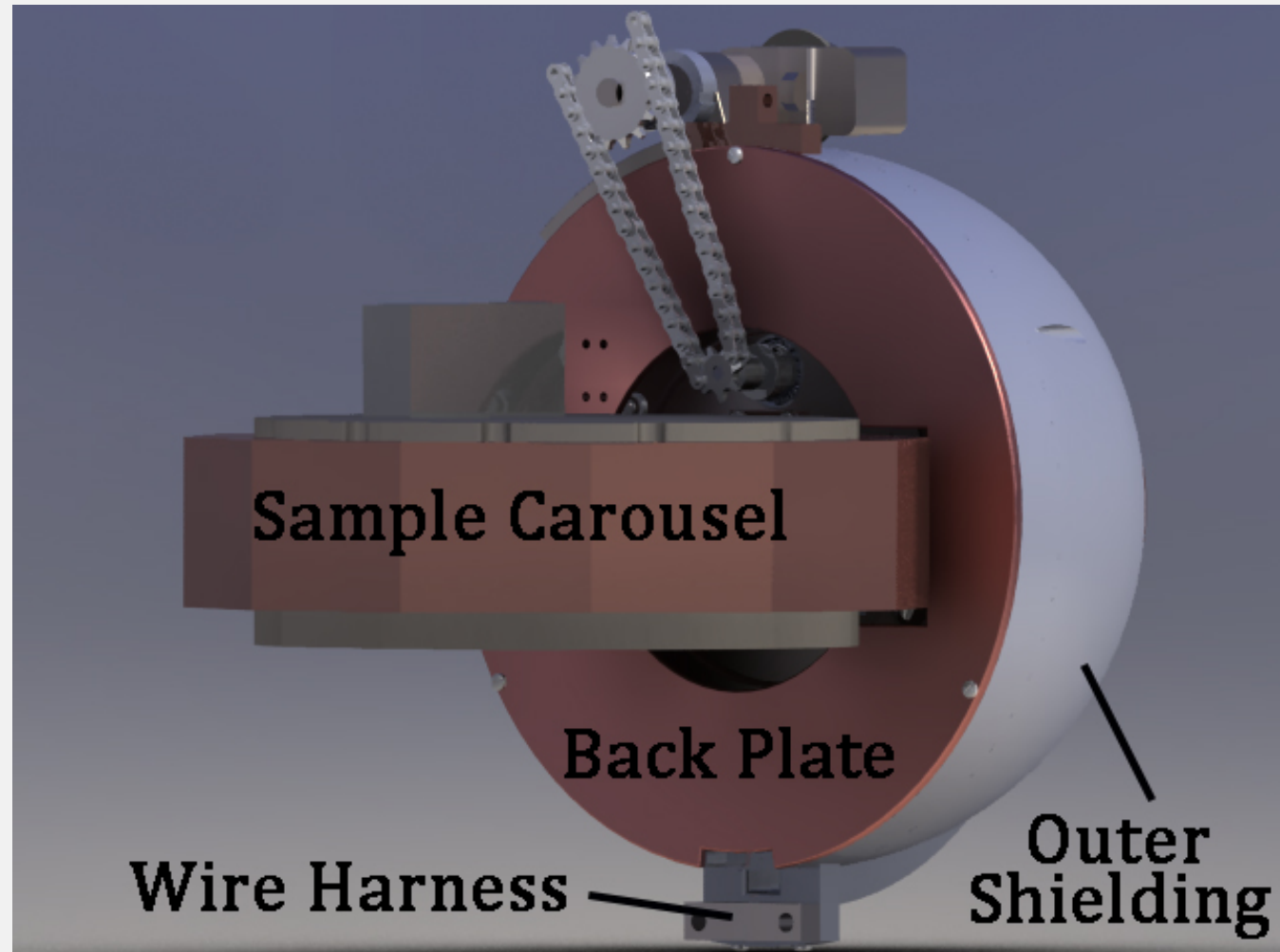
Conclusion

- It is vital that we understand and quantify electron yield, range and charge transport to mitigate spacecraft charging.
- USU Materials Physics Group has developed instrumentation to test space craft materials.
- By improving the current instrumentation we can extend our capabilities to include multilayer materials and temperature dependent measurements, reduce noise and increase sensitivity, and allow future modifications as needs arise.

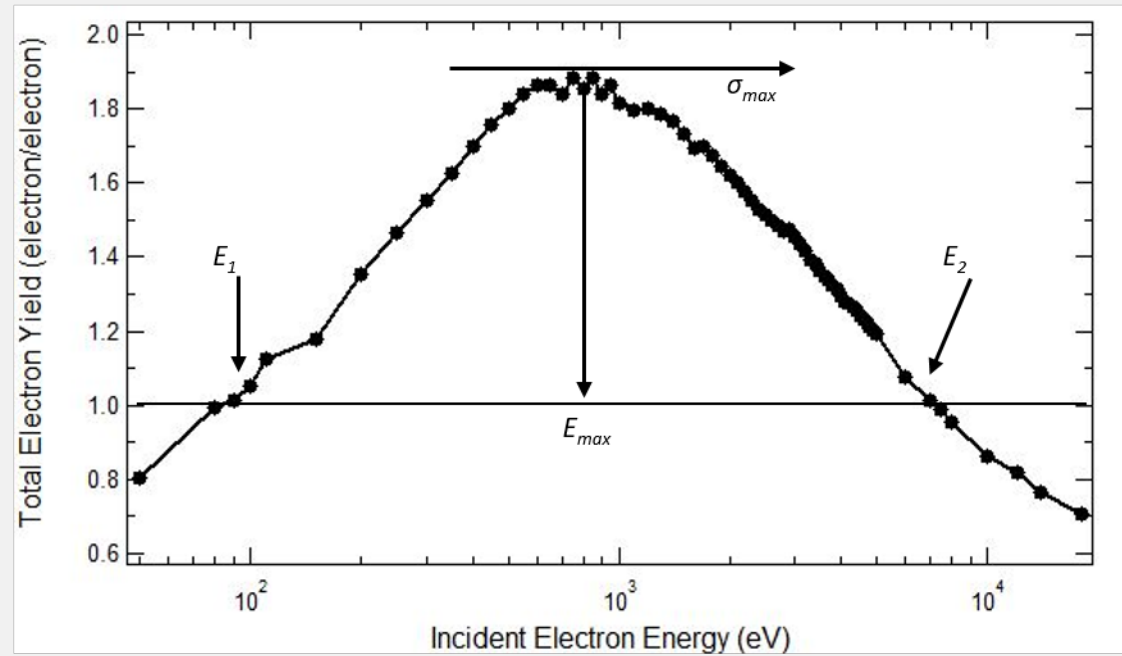
Improvements – Center Rod Alignment



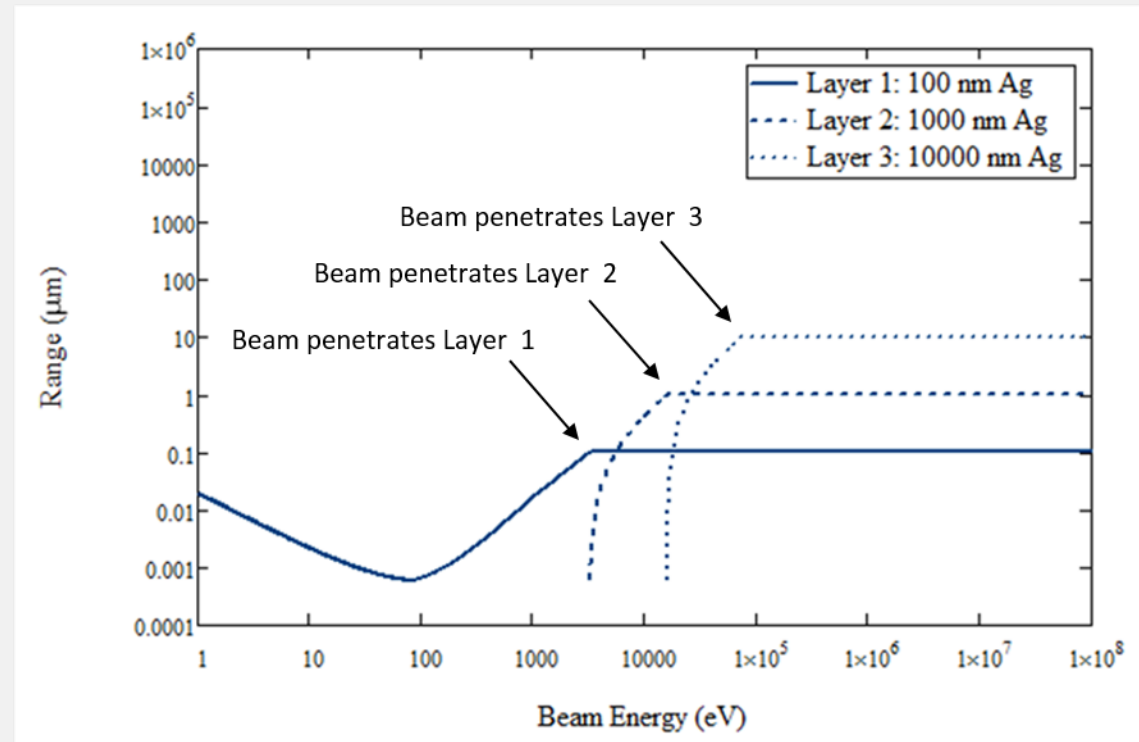
HGRFA Back



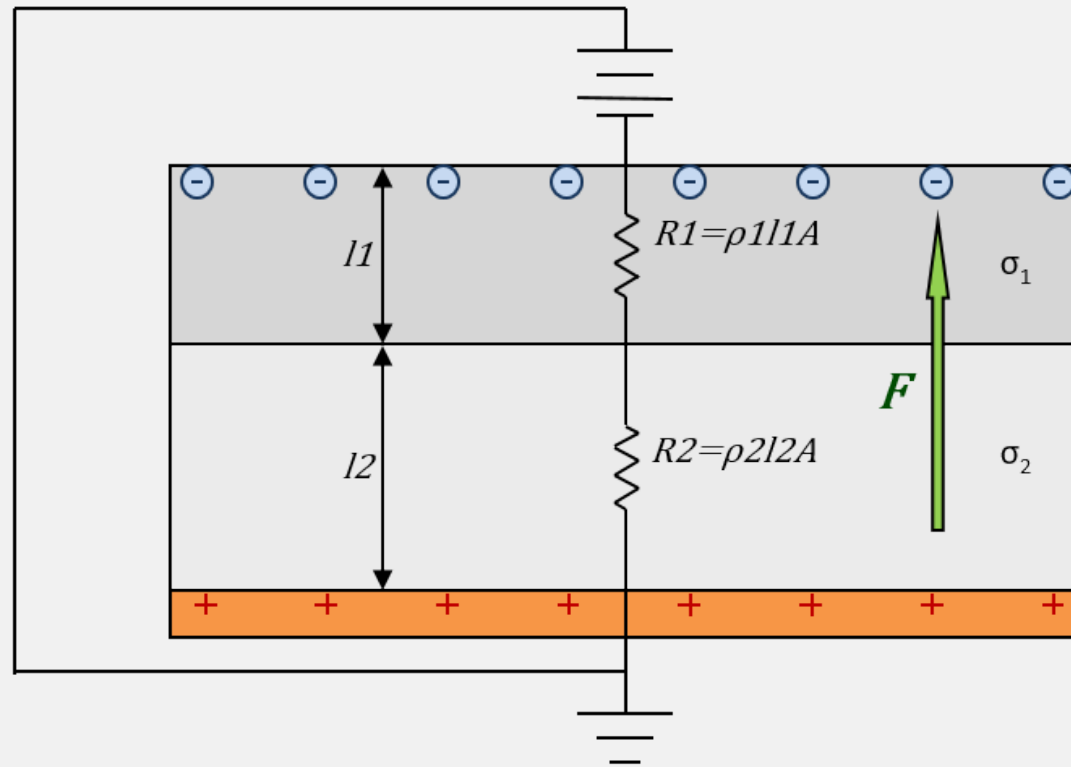
Secondary Yield Graph



Multilayer Range



Multilayer Conductivity



Current HGRFA

