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## Electron Yield Measurements of Multilayer Conductive Materials

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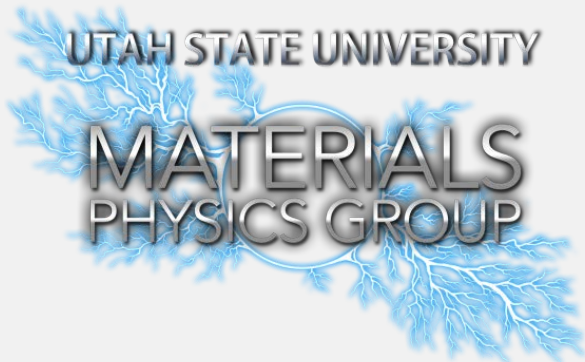
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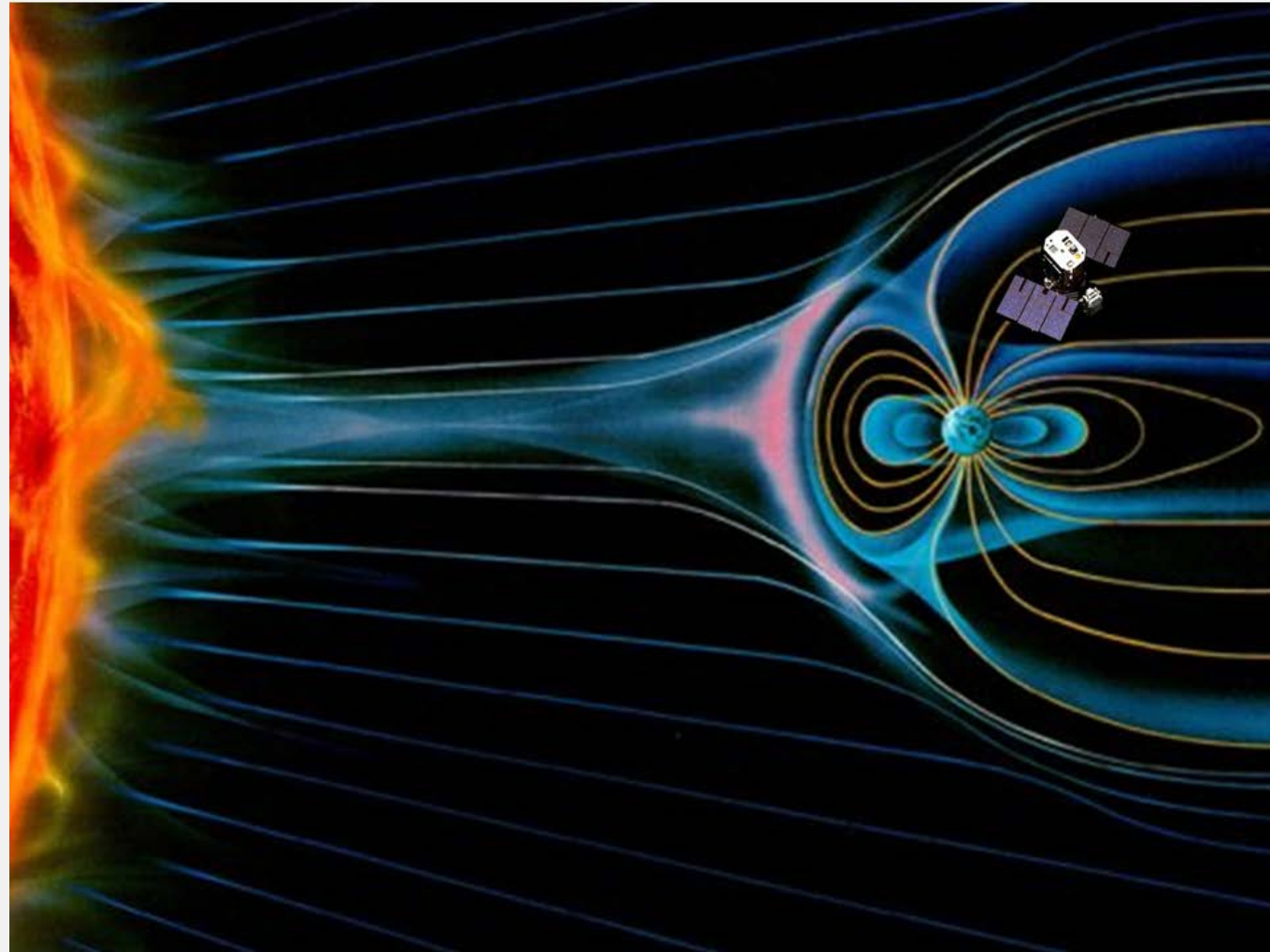


# Hemispherical Grid Retarding Field Analyzer Redesign for Secondary Electron Emission Studies

Gregory Wilson



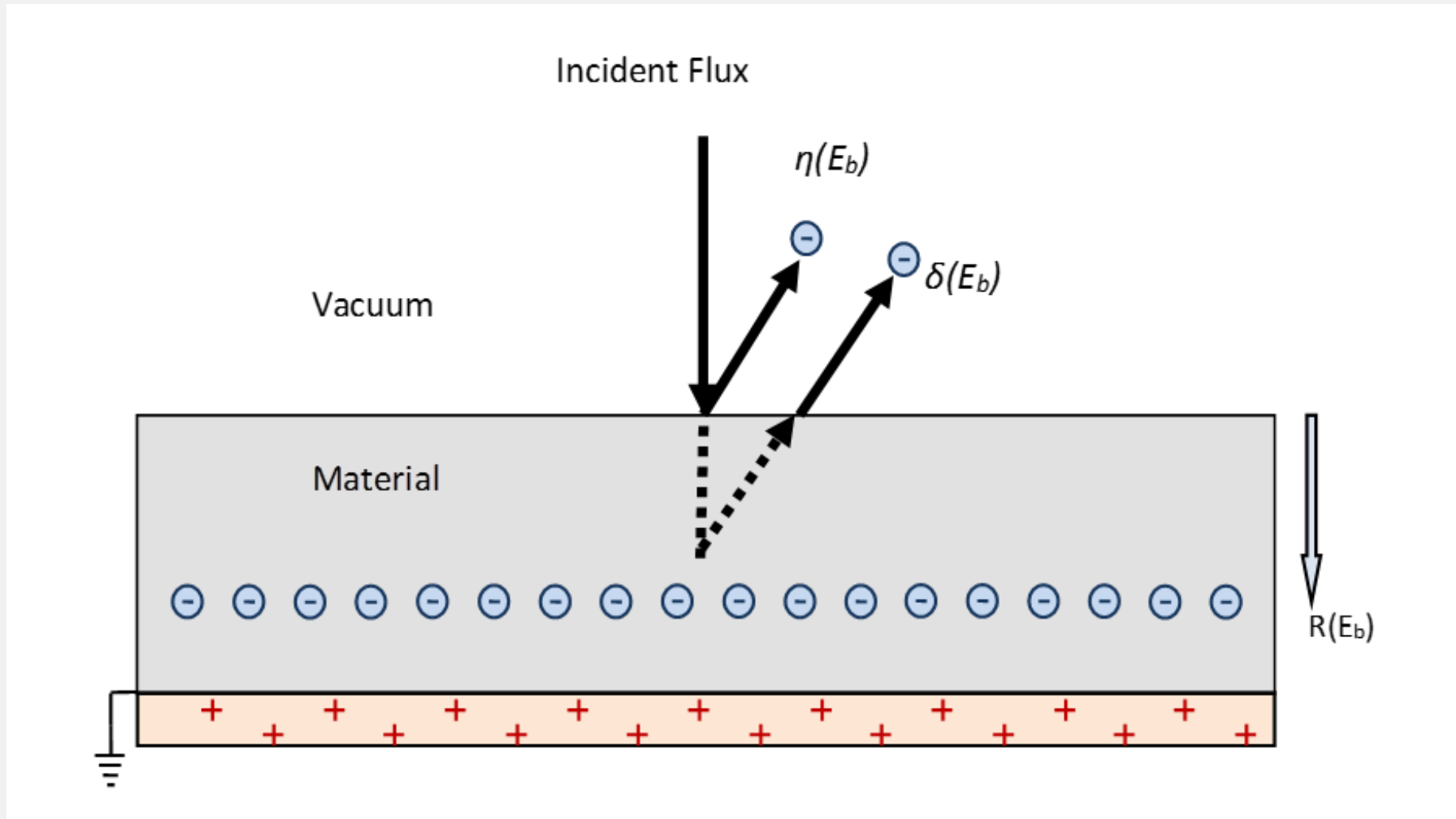
# Introduction



# Introduction

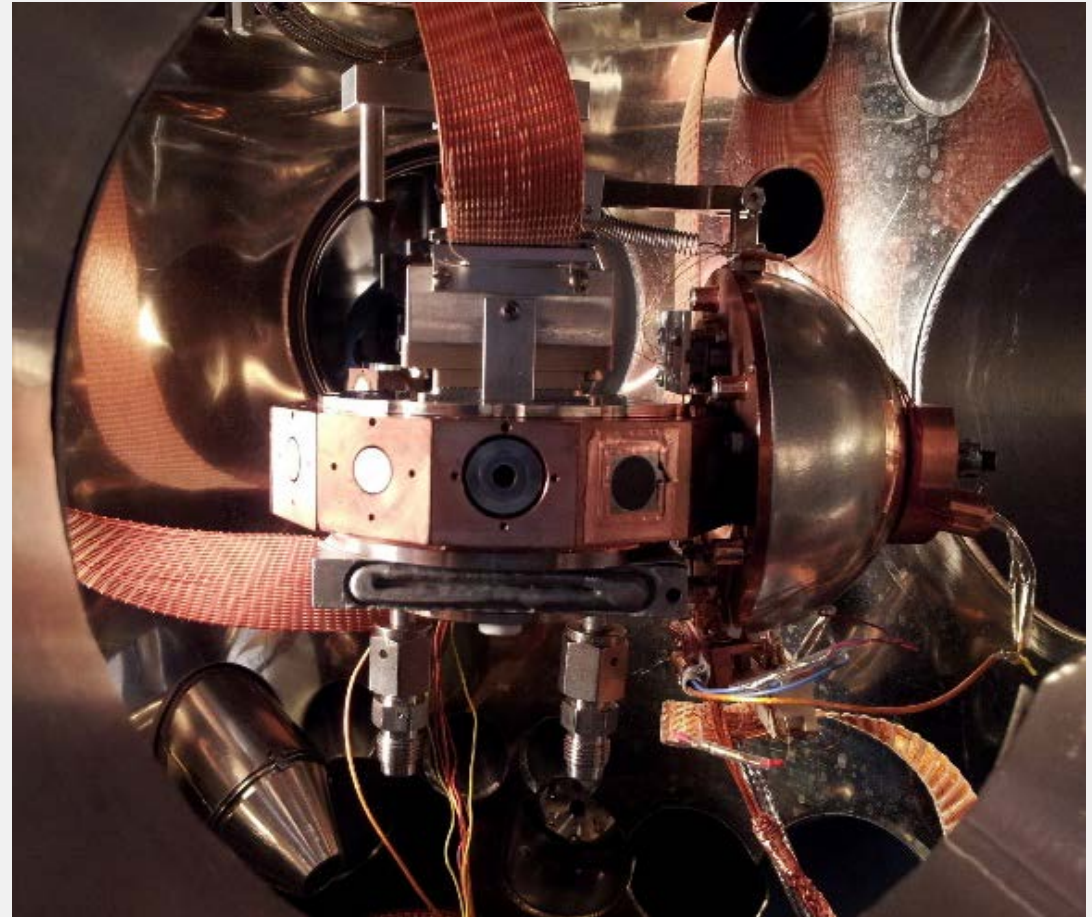
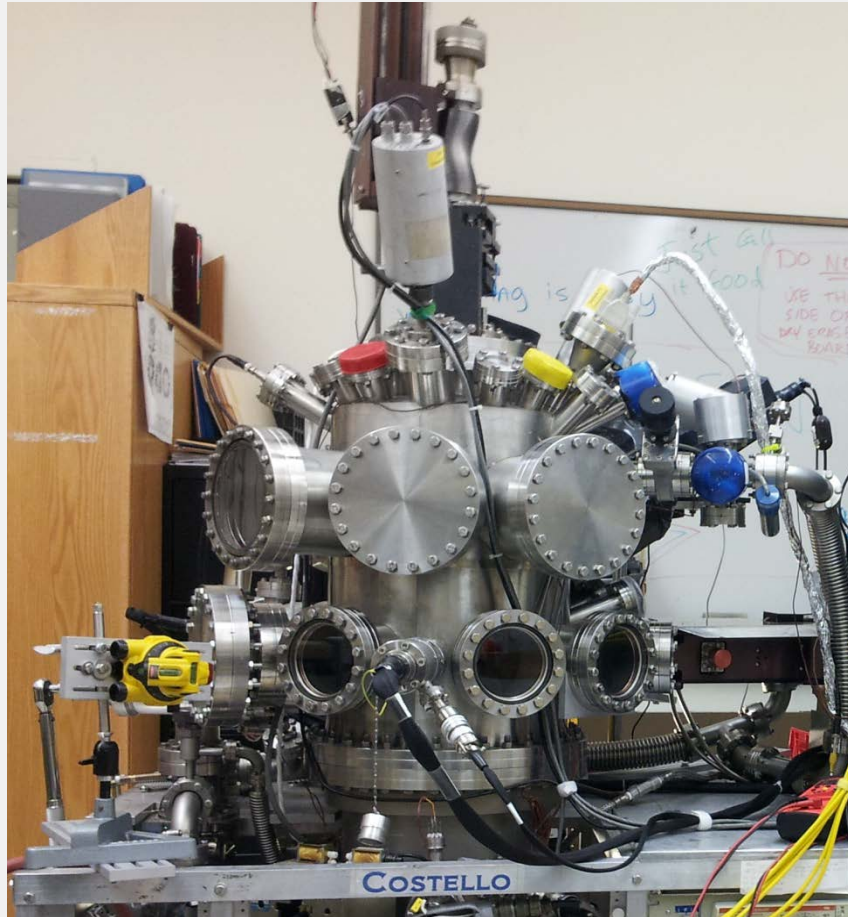


# Theoretical Background

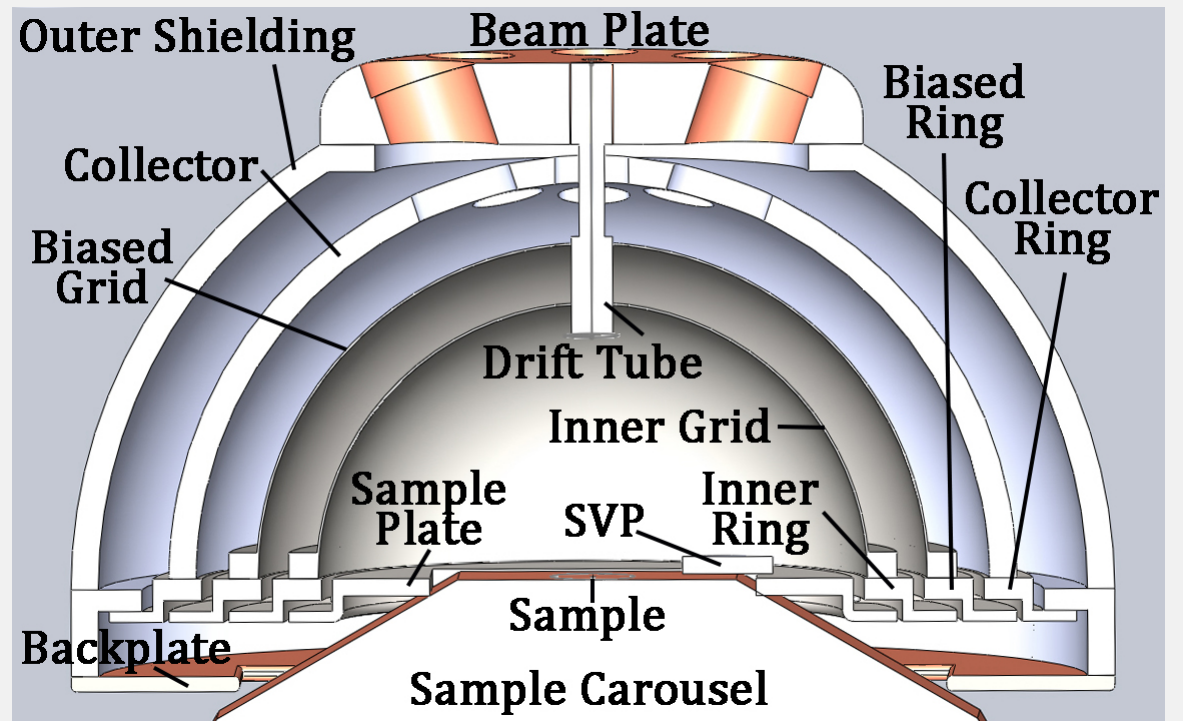
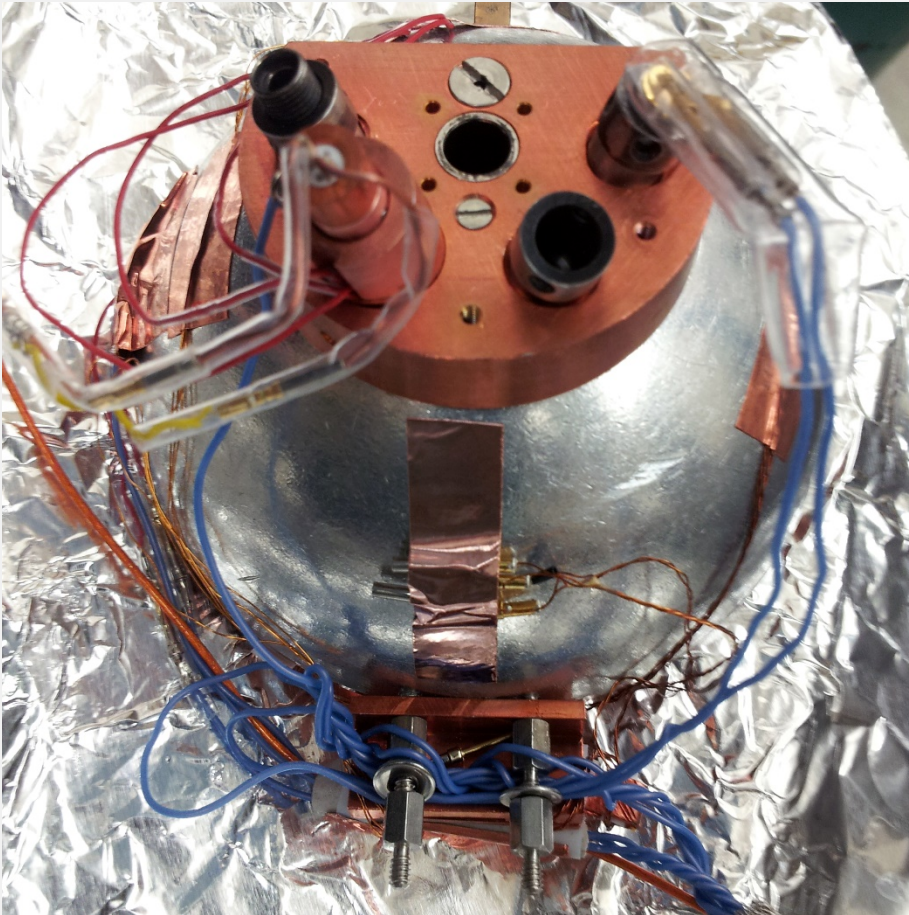




# Spacecraft Charging Studies

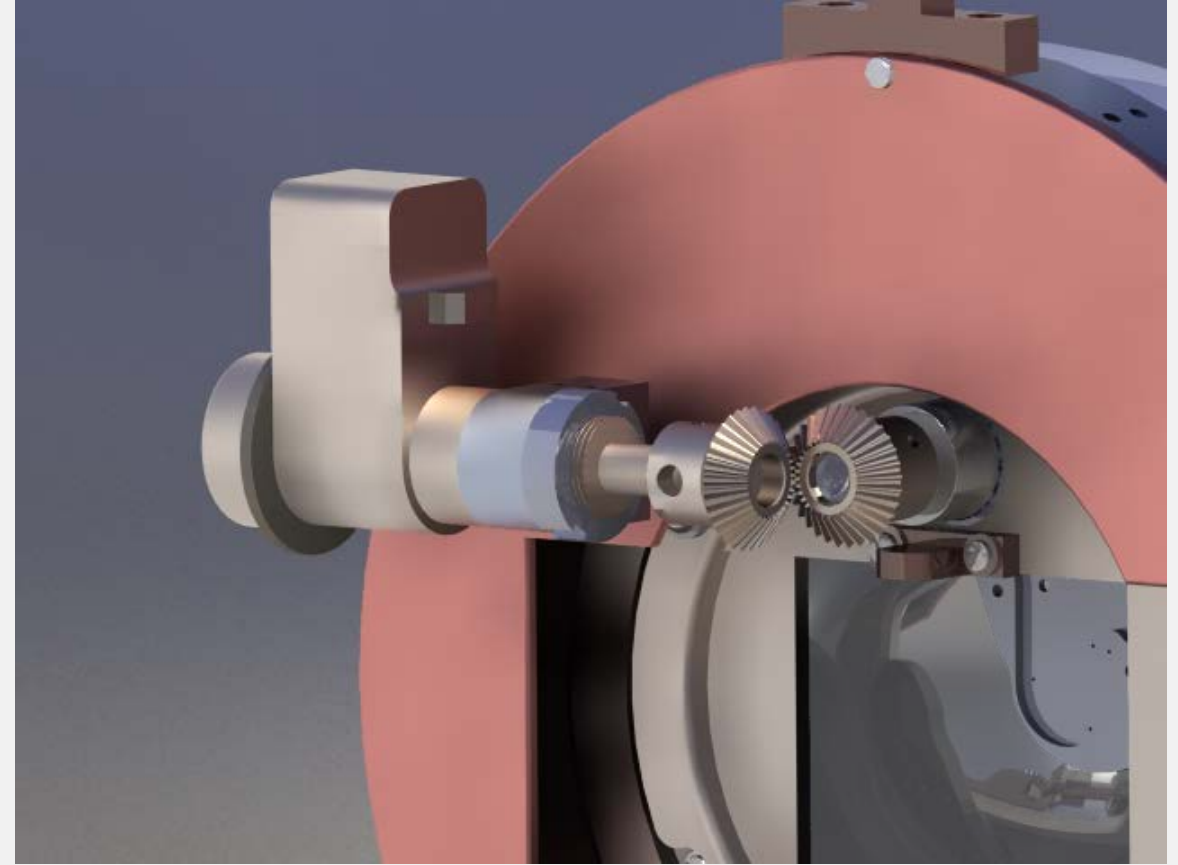
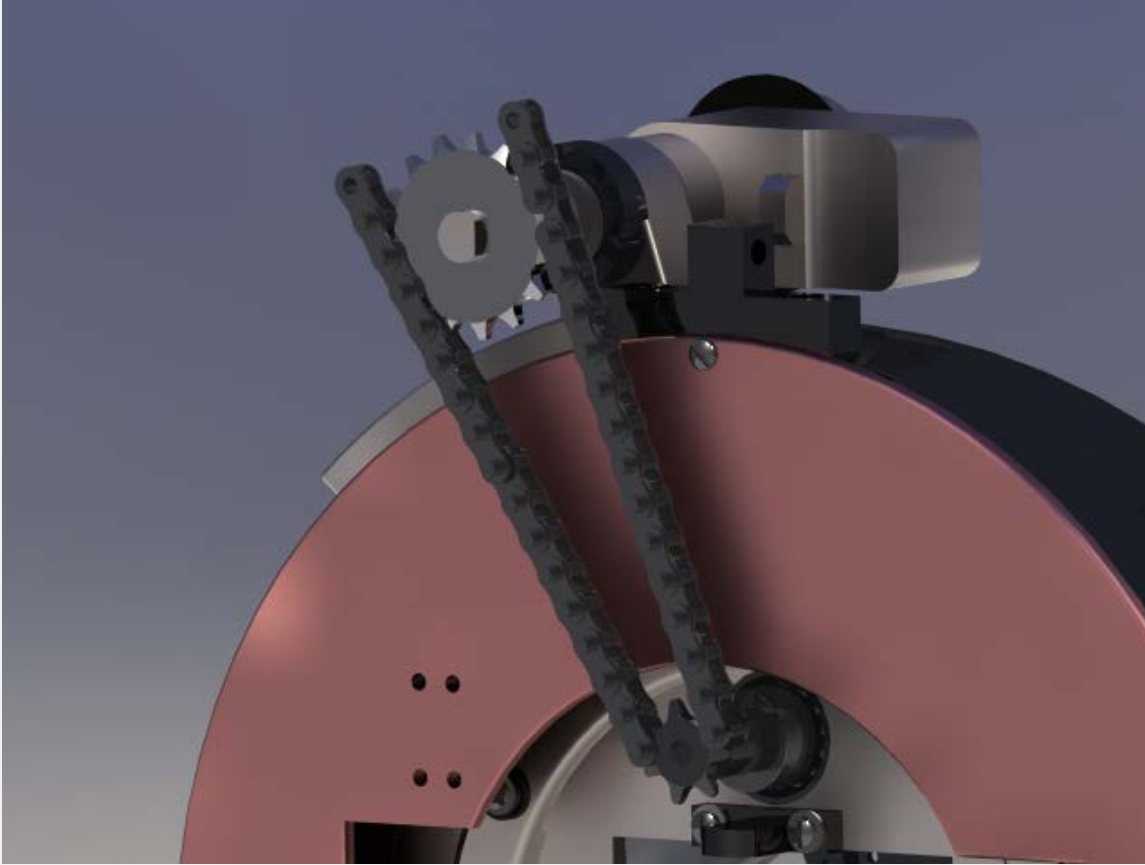


# Hemispherical Grid Retarding Field Analyzer



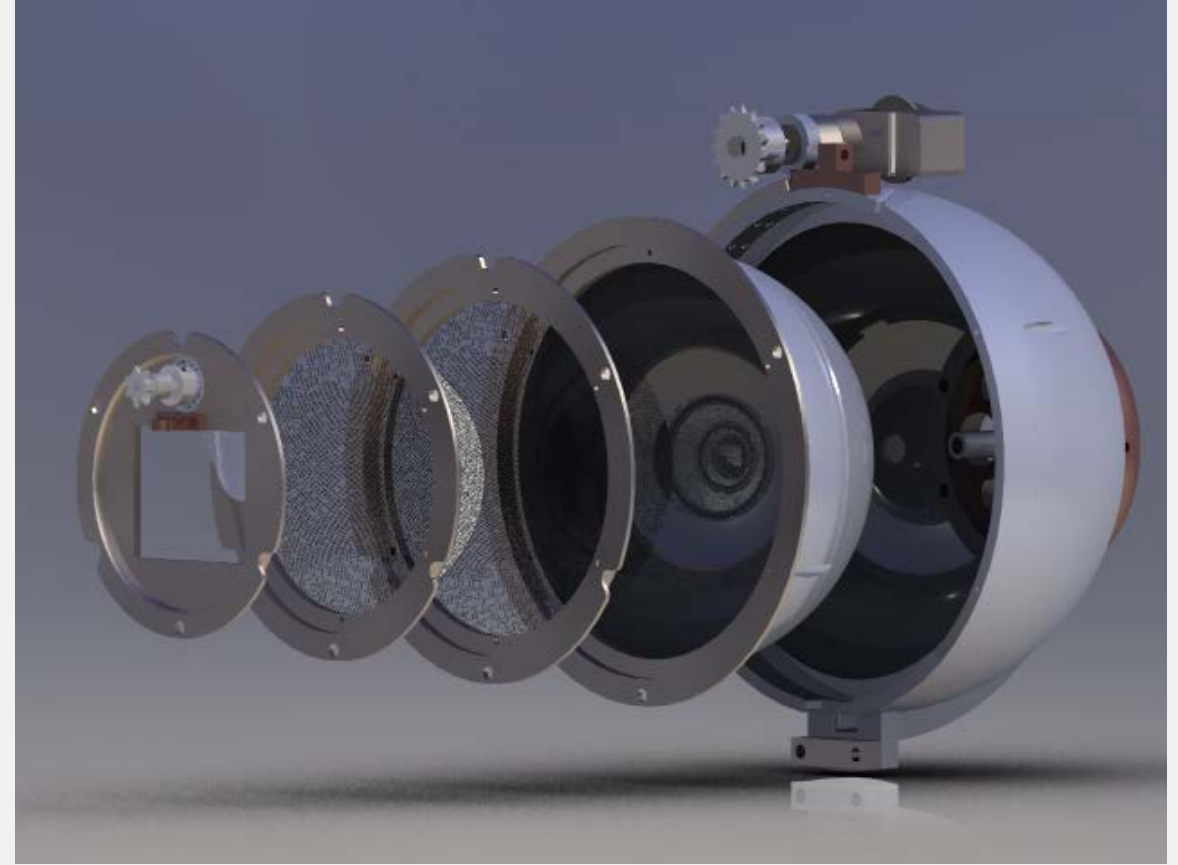


# Improvements – Surface Voltage Probe

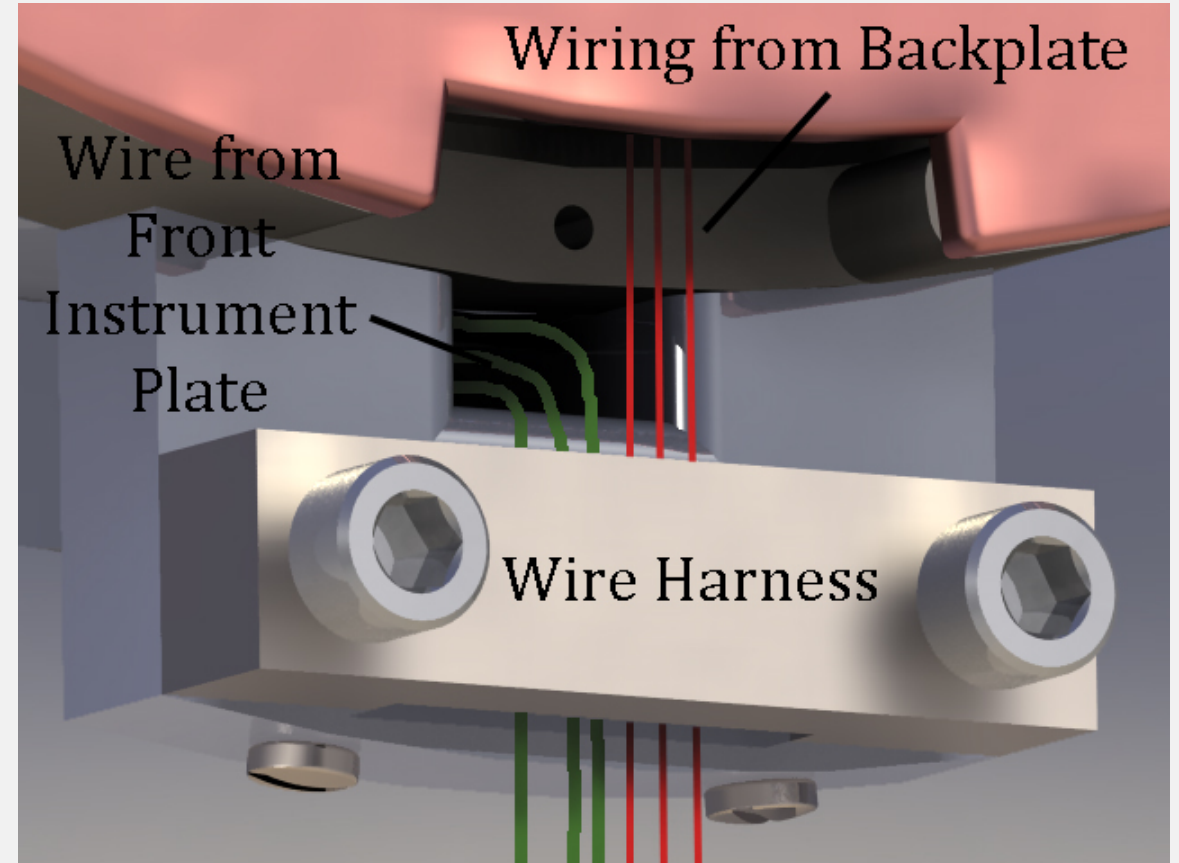
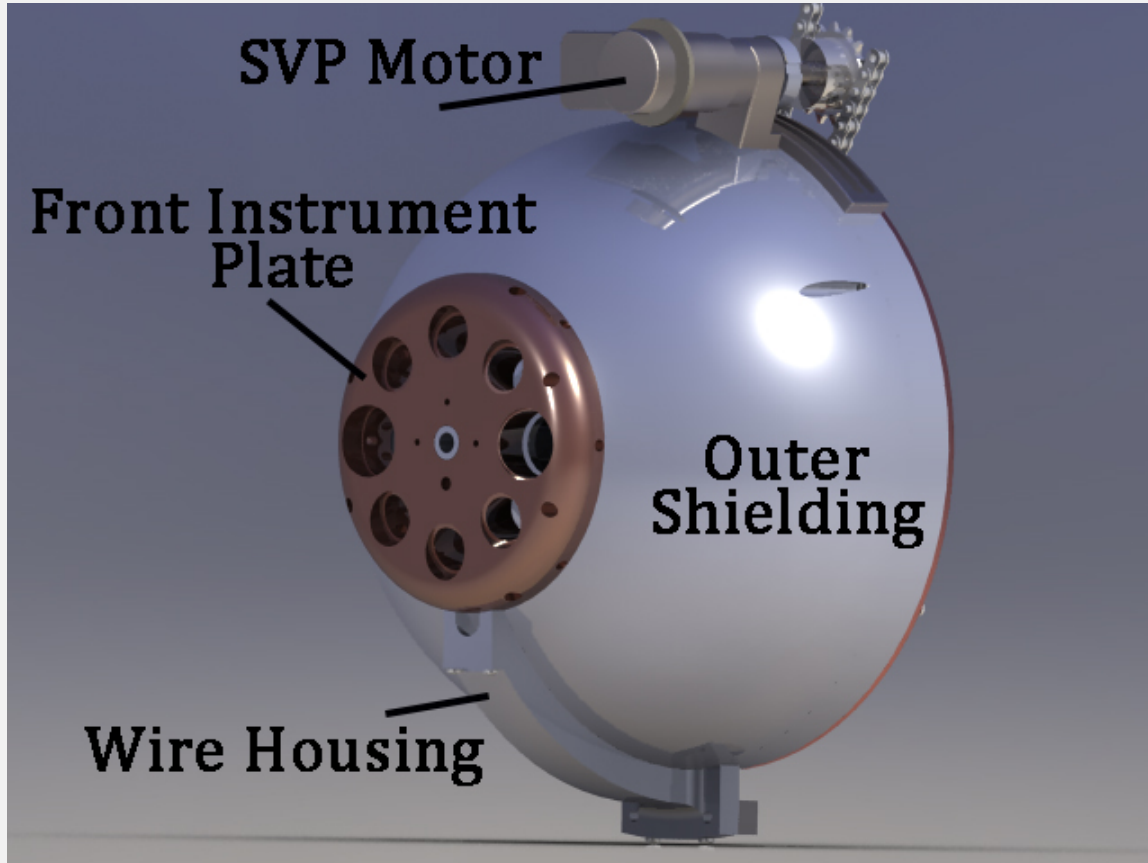




# Improvements – Electrically Isolated Rings, Hemispheres



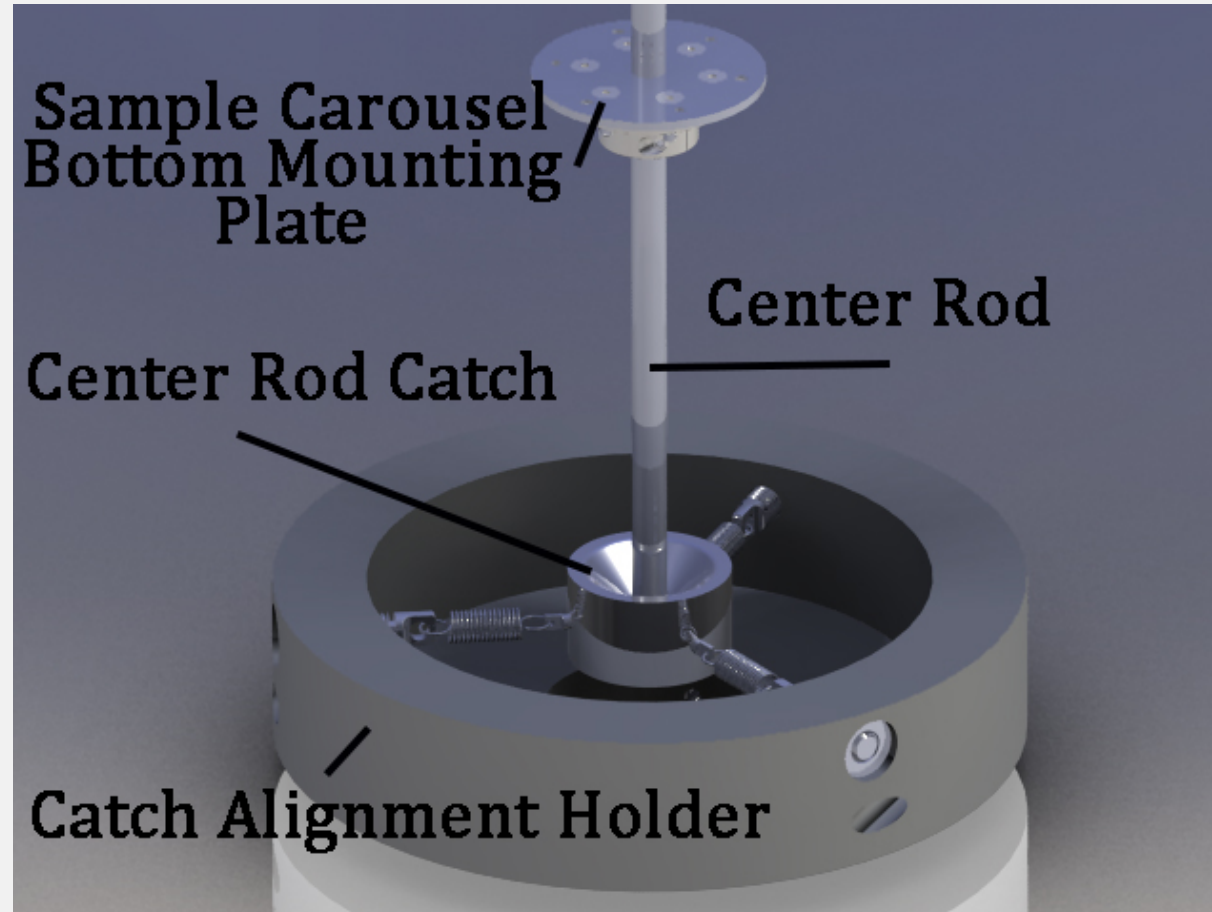
# Improvements – Front Instrument Plate and Wiring



# Conclusion

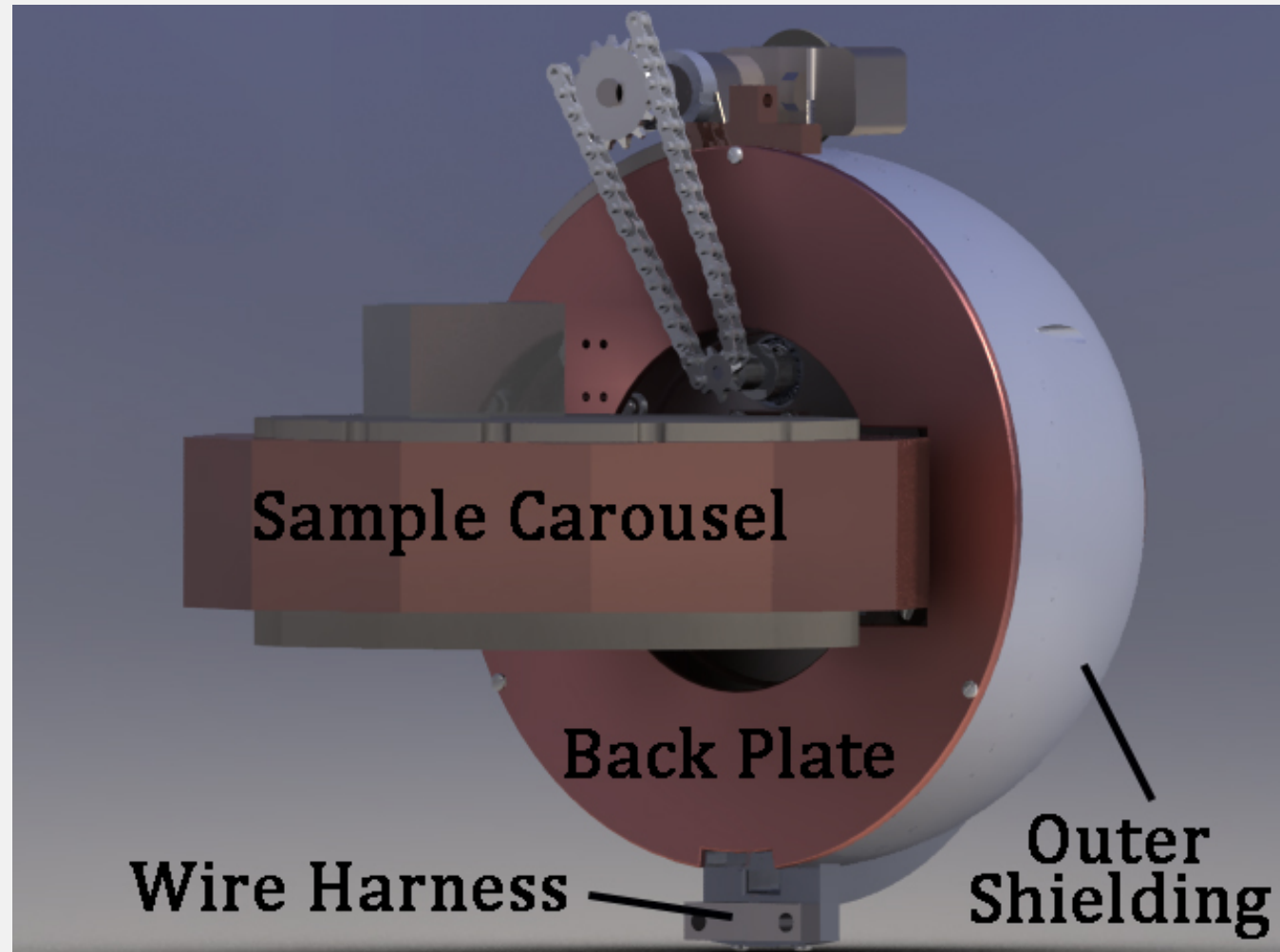
- It is vital that we understand and quantify electron yield, range and charge transport to mitigate spacecraft charging.
- USU Materials Physics Group has developed instrumentation to test space craft materials.
- By improving the current instrumentation we can extend our capabilities to include multilayer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

# Improvements – Center Rod Alignment

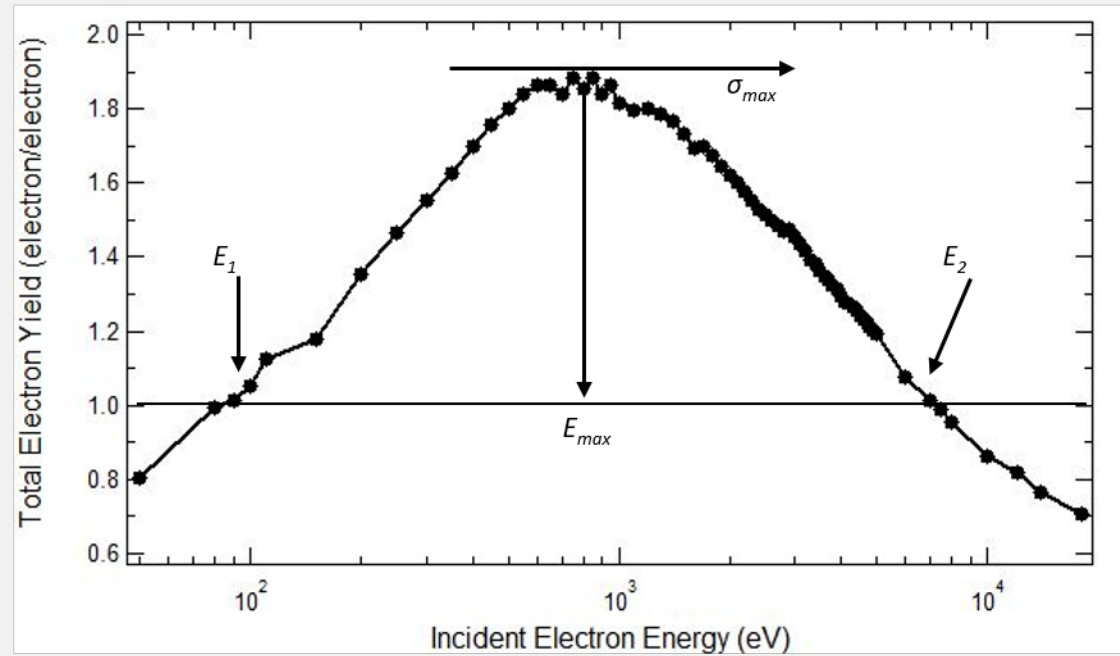




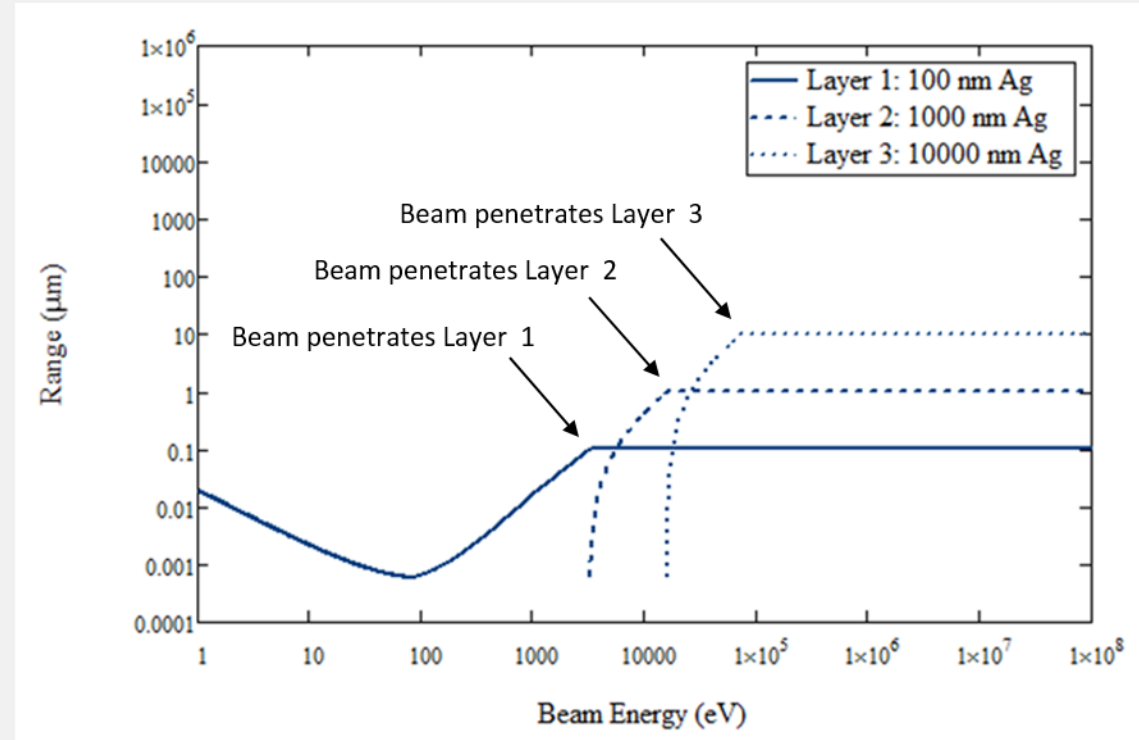
# HGRFA Back



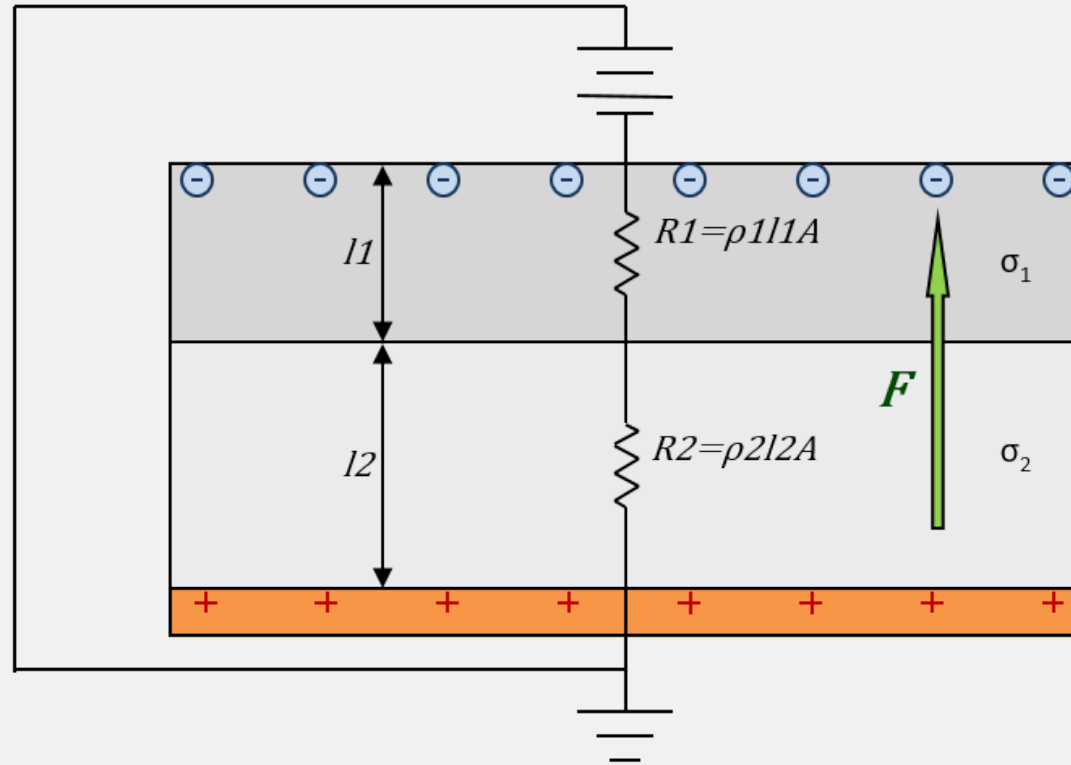
# Secondary Yield Graph



# Multilayer Range



# Multilayer Conductivity





# Current HGRFA

