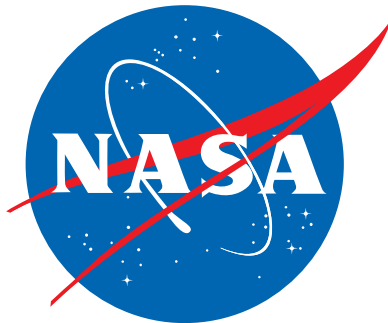


# EUNIS Microchannel Plate Quantum Efficiency Measurement

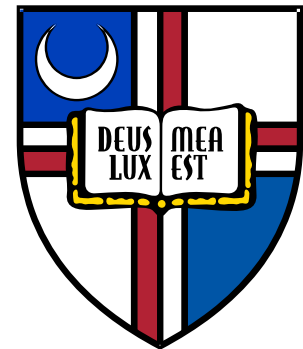
John O'Neill

**Mentors:**

**Adrian Daw  
Doug Rabin**

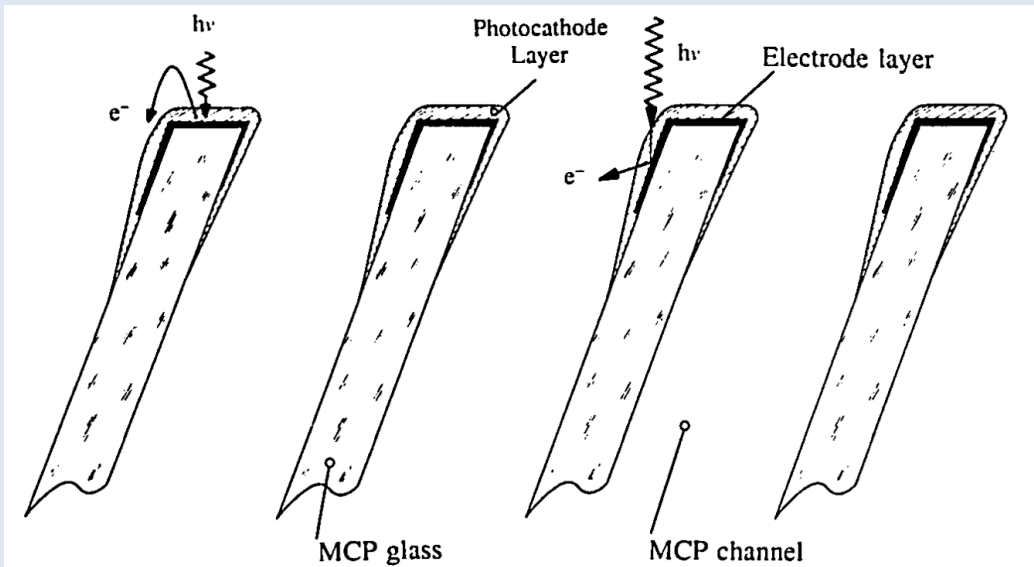


**7/27/2011**



# EUNIS Microchannel Plates

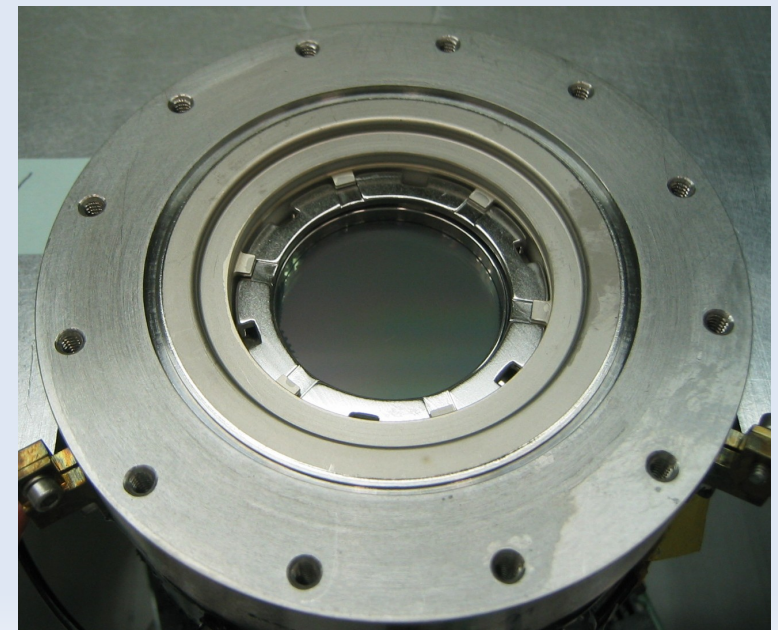
- Specifications:
  - 25mm diameter
  - 6 $\mu$ m pore diameter
  - >39% QE at 30nm (KBr)



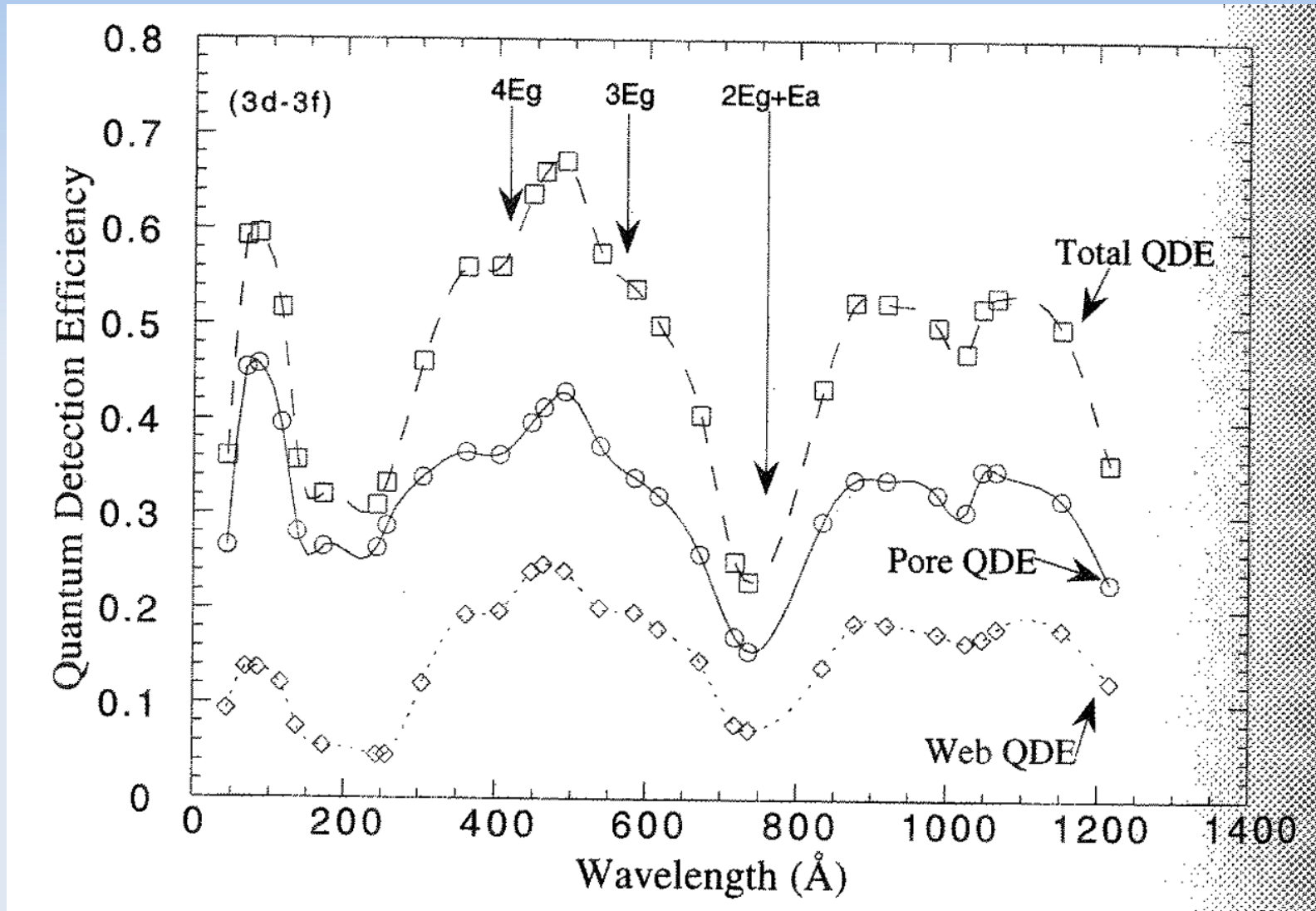
From Siegmund, Vallerger, Sokolowski, and Lampton (Applied Optics, 1987)

# Testing MCP Quantum Efficiency

- Procedure:
  - Uninstall old MCP
  - Install new MCP
  - Attach detector to monochromator, 125nm
  - Measure current from CsTe PMT, known QE
  - Measure EUNIS MCP
  - Obtain relative QE, approximately 13%



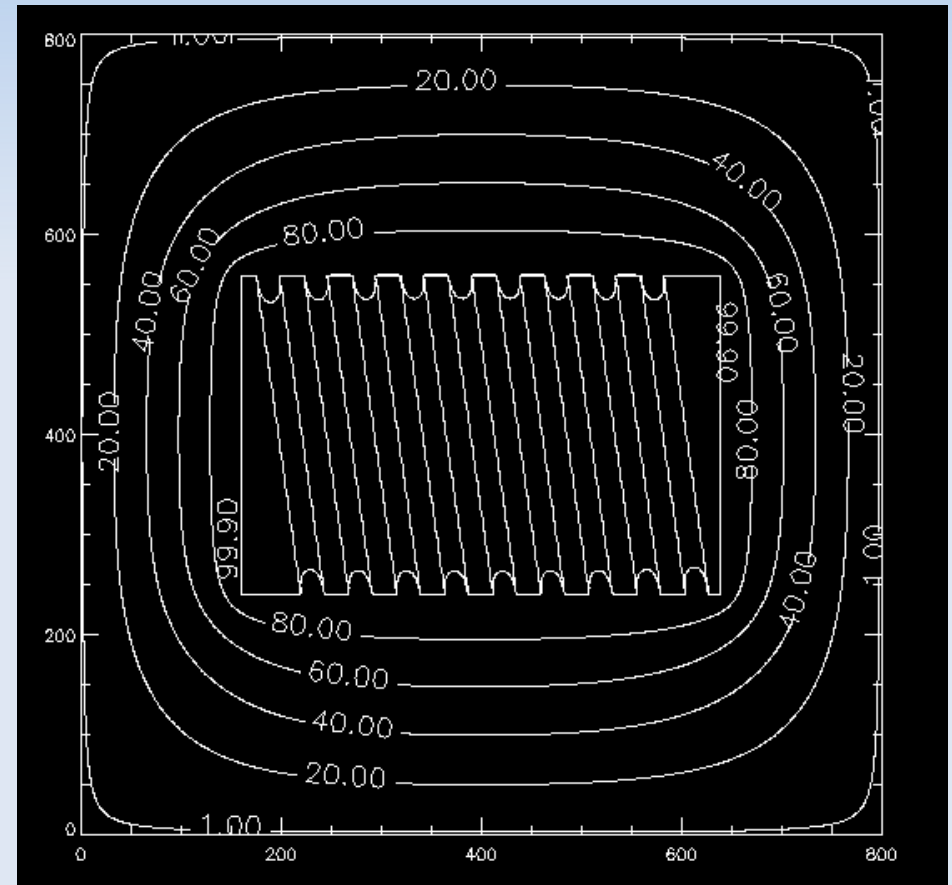
# KBr Quantum Efficiency



From Siegmund and Gaines (Proc. SPIE, 1990)

# Simulating the MCP in IDL

- Start in 2D then build full 3D model
- Looking for how much the field extends into the MCP pores
- Contour plot of 2D cross section MCP shows minimal field in the pores



Equipotential lines in volts, axis are in pixels

# Conclusion

- We are confident the reported QE from our testing was from the web only.
- The MCP QE x gain will be measured relative to a photodiode in the EUNIS lab, providing another diagnostic to confirm the total QE.
- The entire optical system will be calibrated end to end at Rutherford Appleton Lab after flight.

# Thanks

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D. Linard, T. Plummer, D. Rabin, D. Varney**
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