Construction and Characterization of a Farnsworth-Hirsch Fusor

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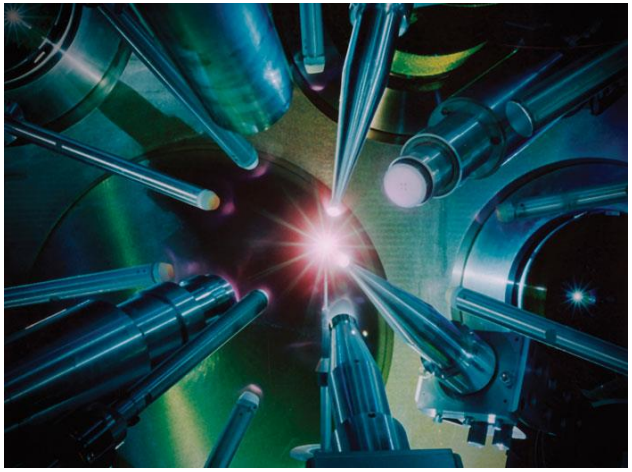
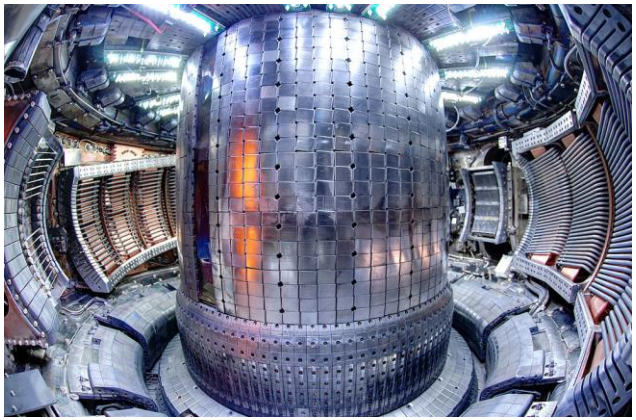
Why Fusion?





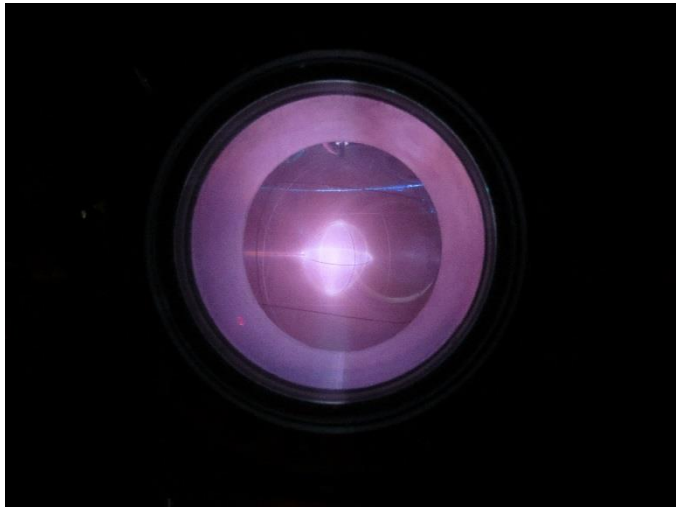
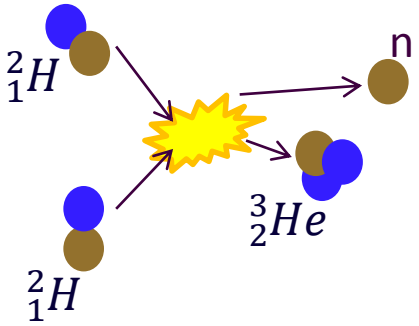


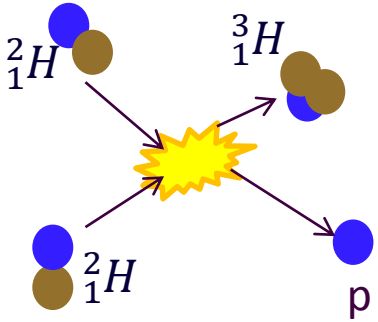
Photo Credit: LLNL and Robert Mumgaard

D-D Fusion

$$^{2}_{1}H + ^{2}_{1}H \rightarrow ^{3}_{2}He + ^{1}_{0}n + 3.27MeV$$



$$^{2}_{1}H + ^{2}_{1}H \rightarrow ^{3}_{1}H + ^{1}_{1}H + 4.03MeV$$



D(d,n) Cross Section

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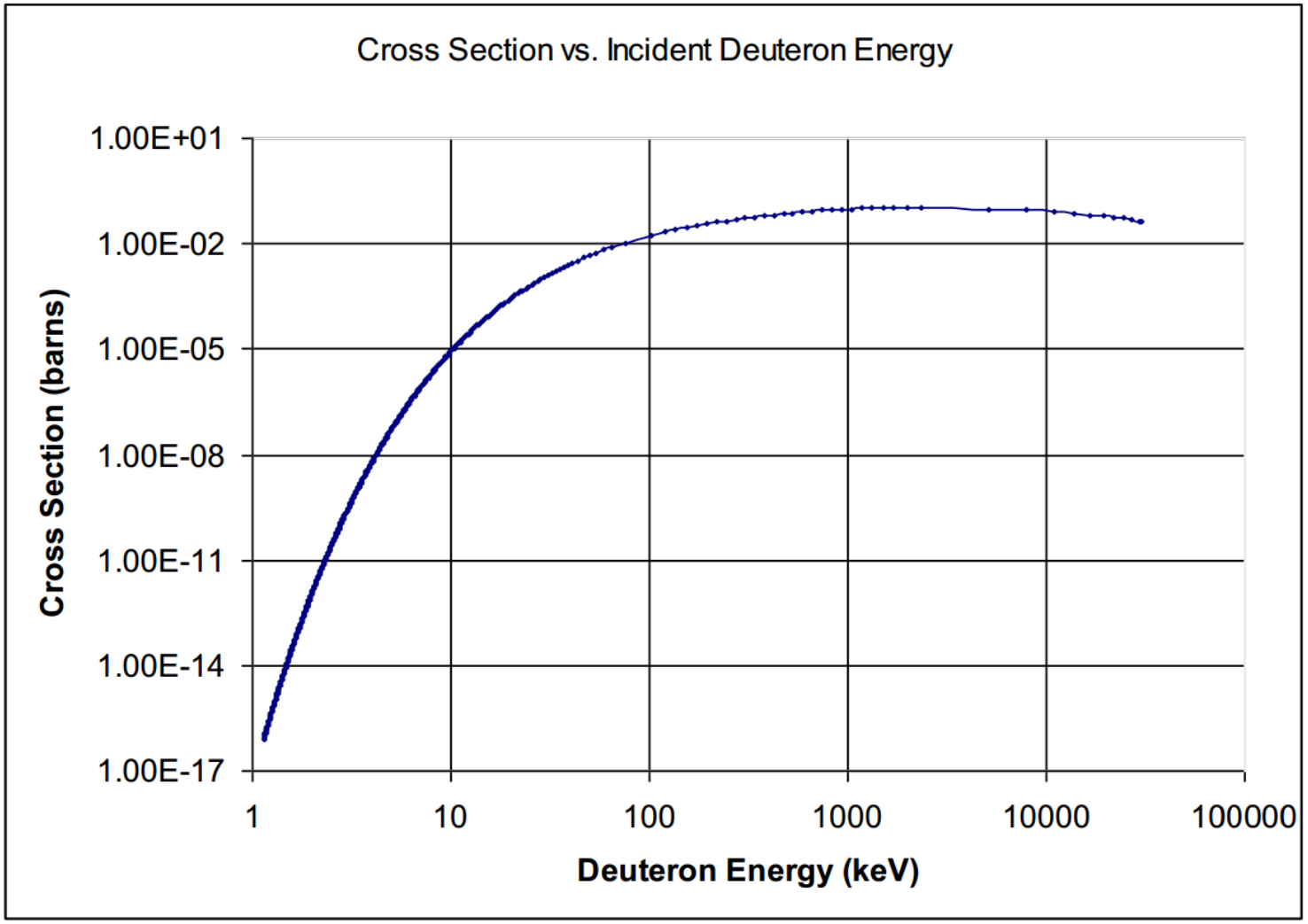


P.T. Farnsworth

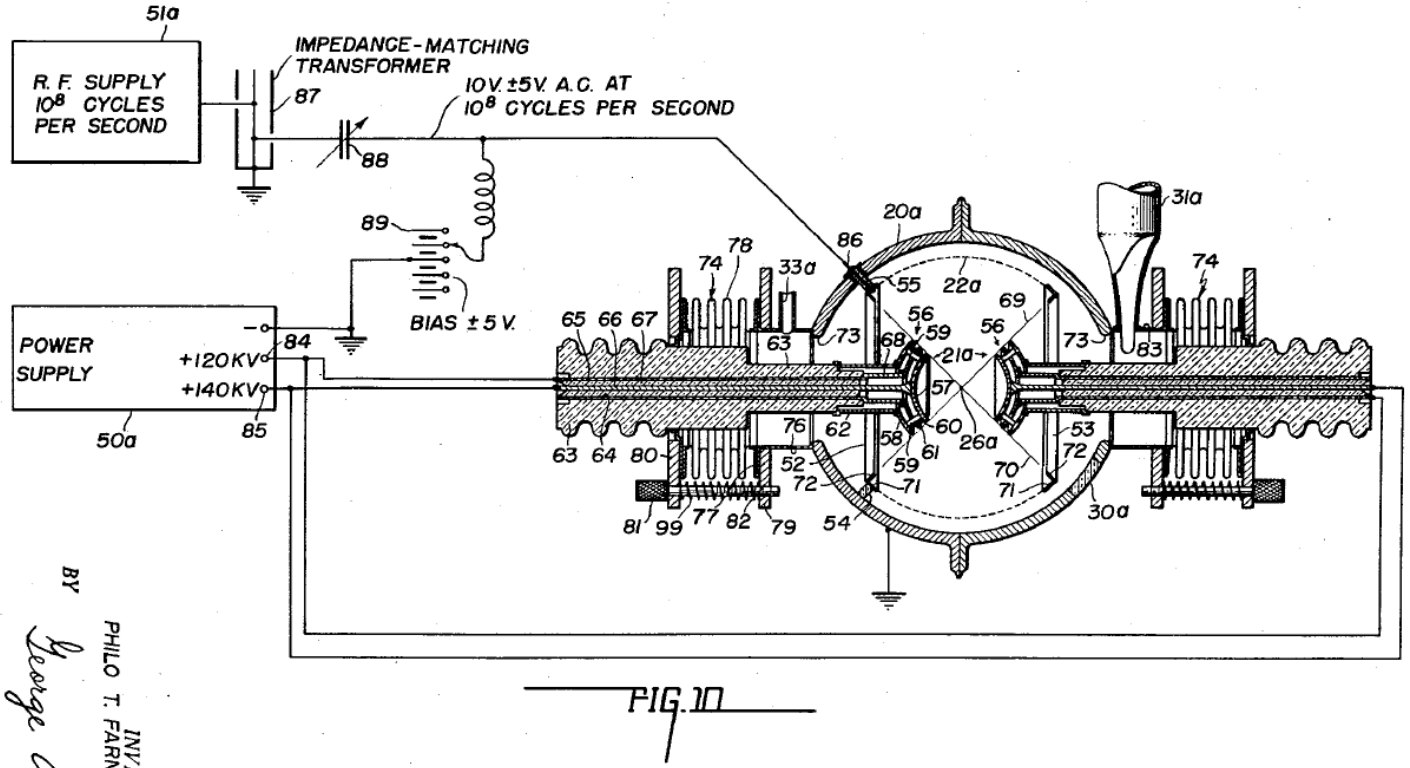


FIG. 10

INVENTOR.
PHILO T. FARNSWORTH
BY
George A. Gust
ATTORNEY

Diagram Credit: [7] Farnsworth

R.L. Hirsch

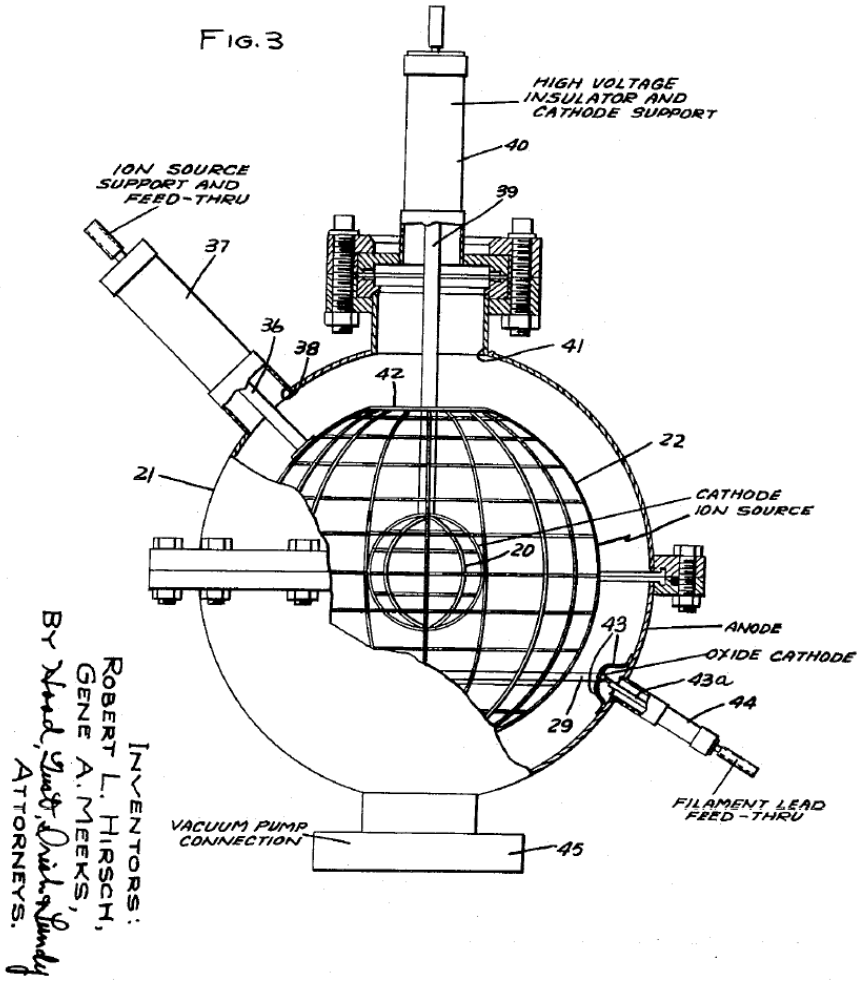
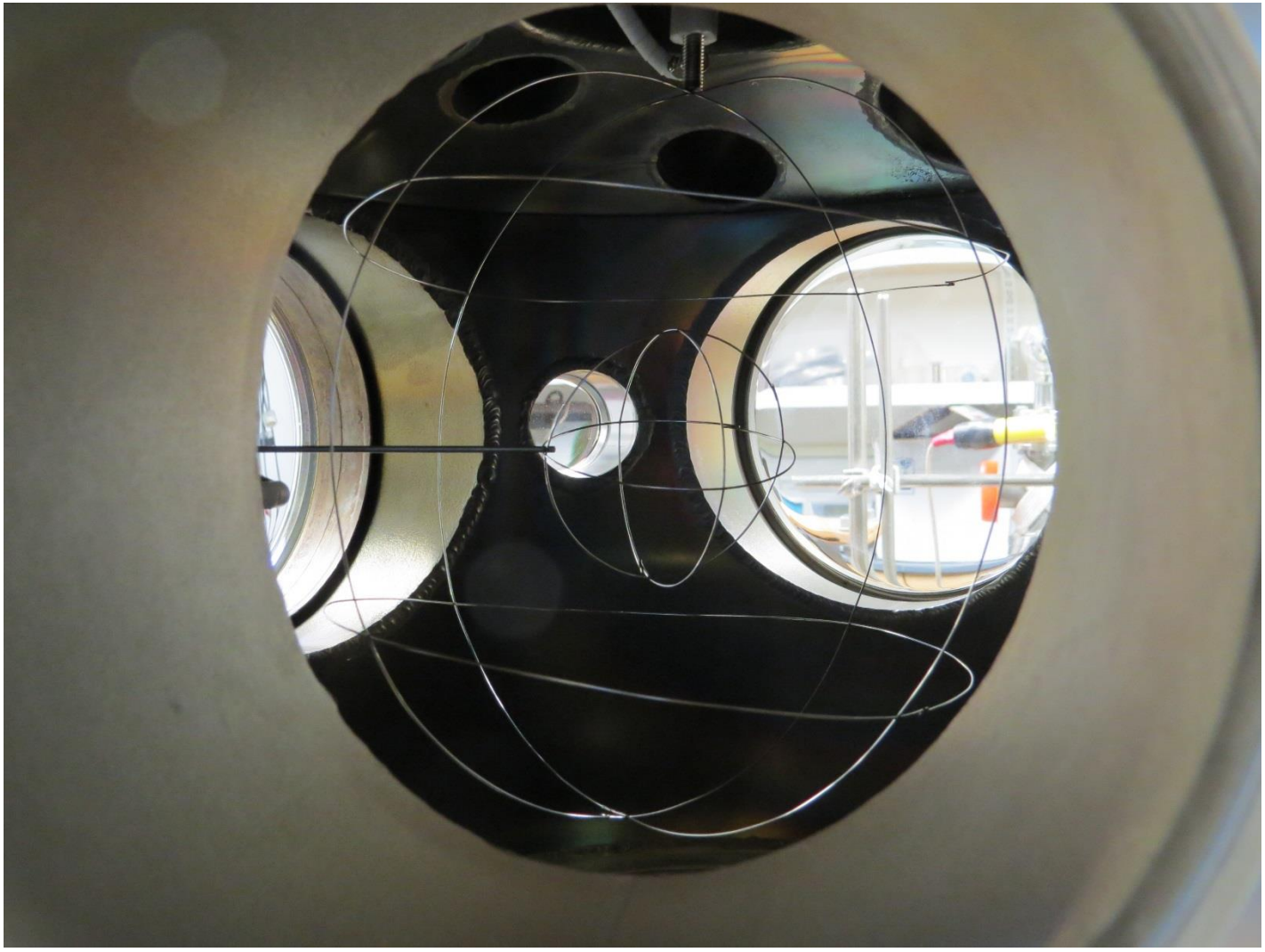


Diagram Credit: [8]Hirsch

Farnsworth Fusor

Farnsworth Fusor



Farnsworth Fusor

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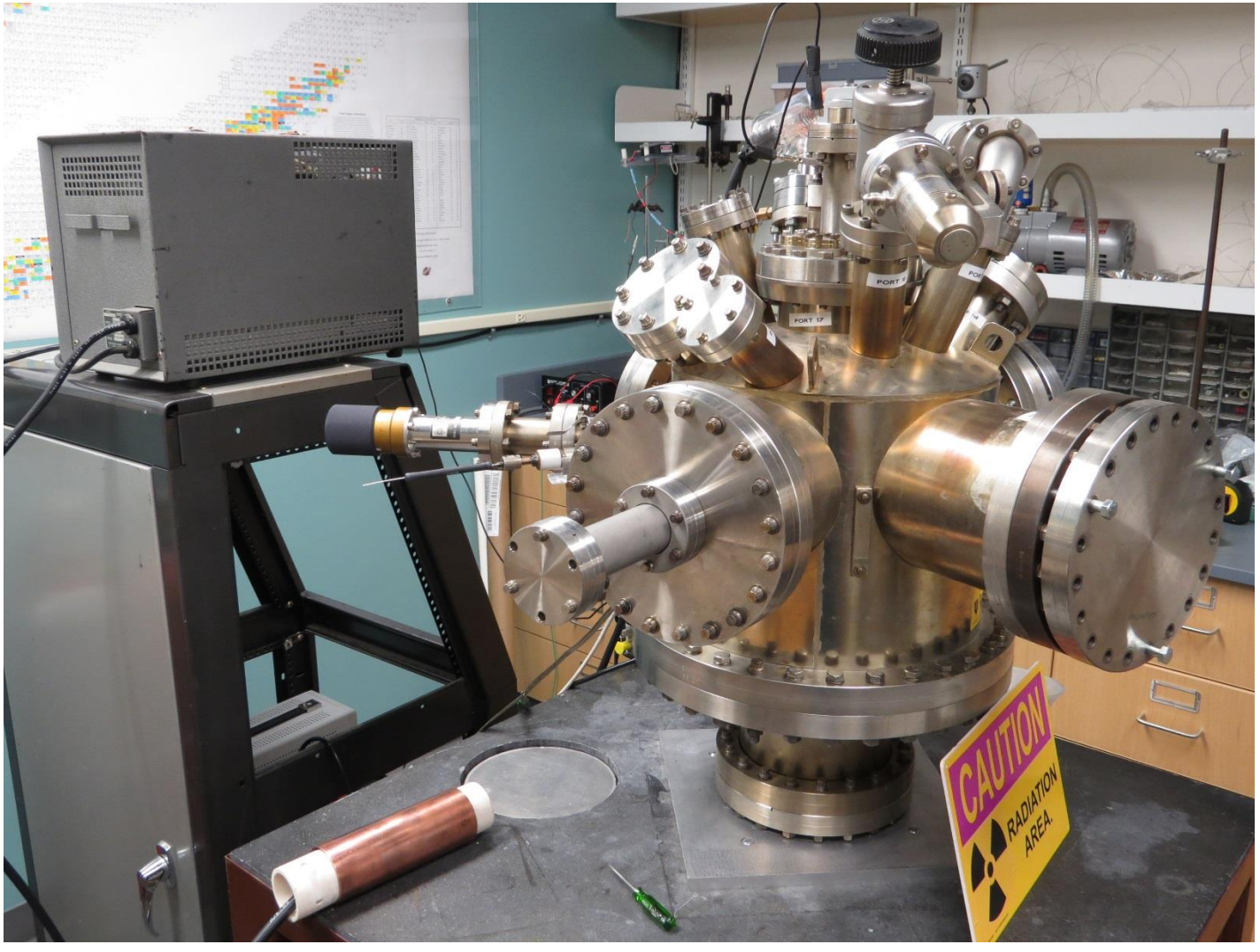
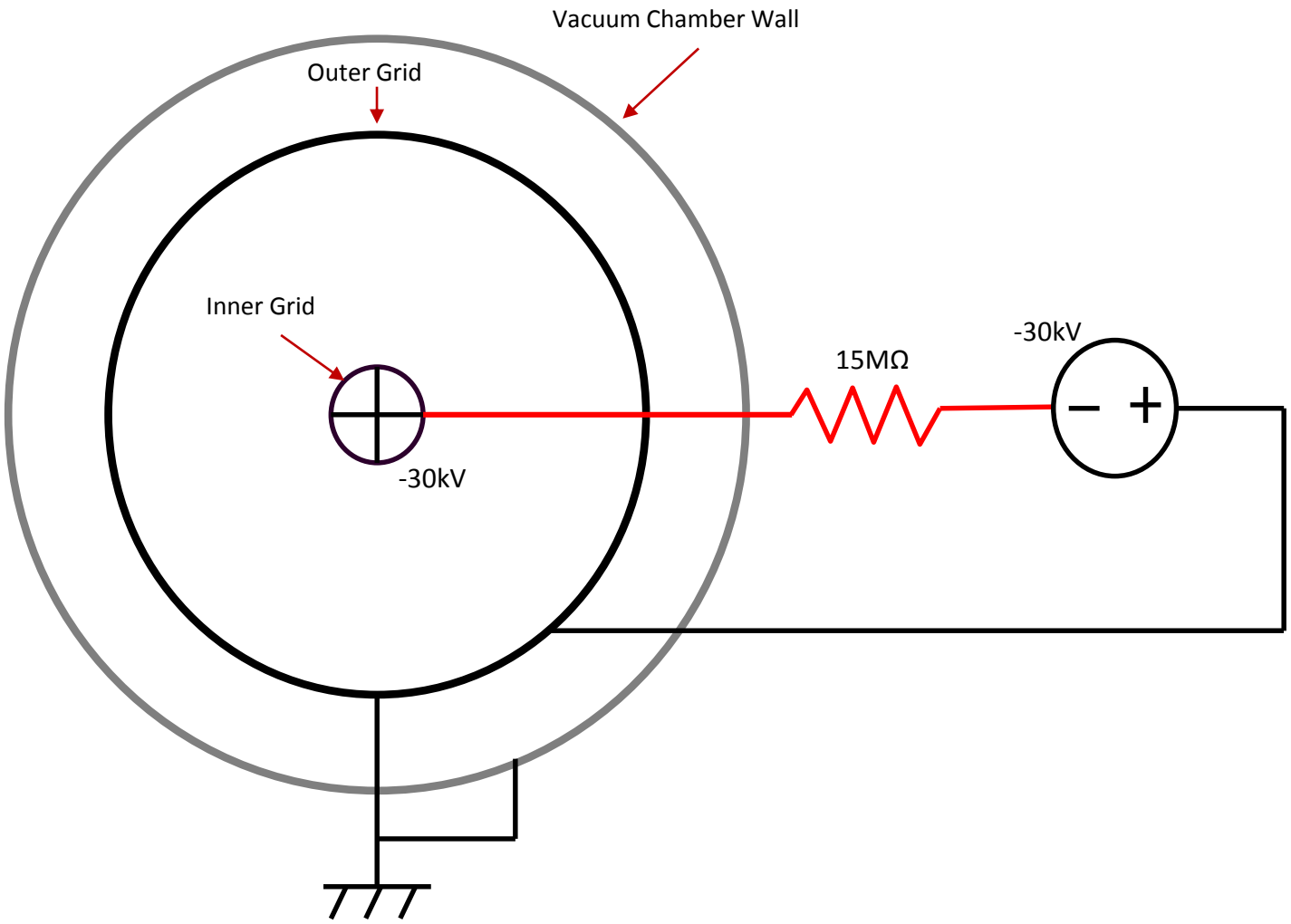


Electrical Diagram



Fusor Operation

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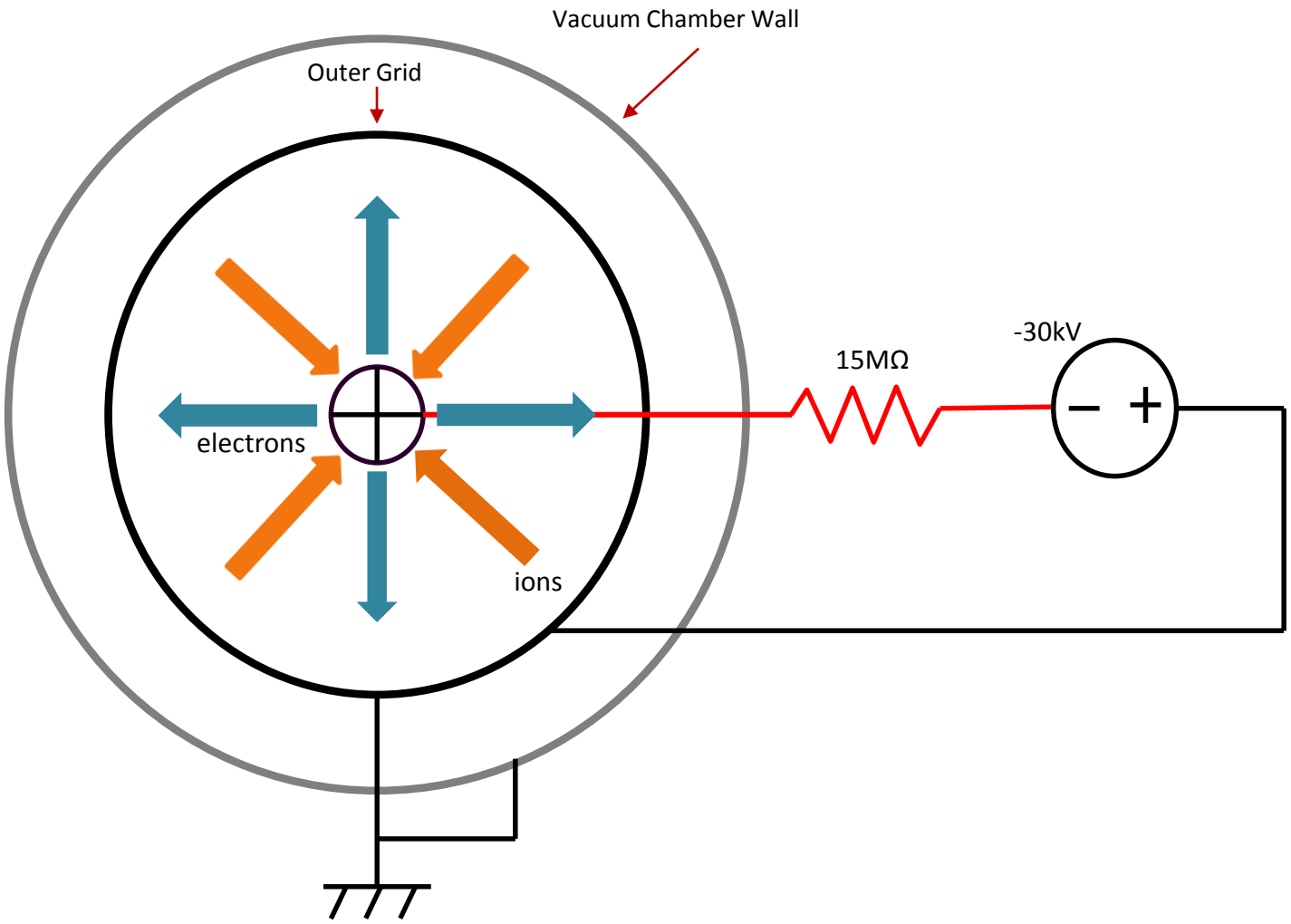
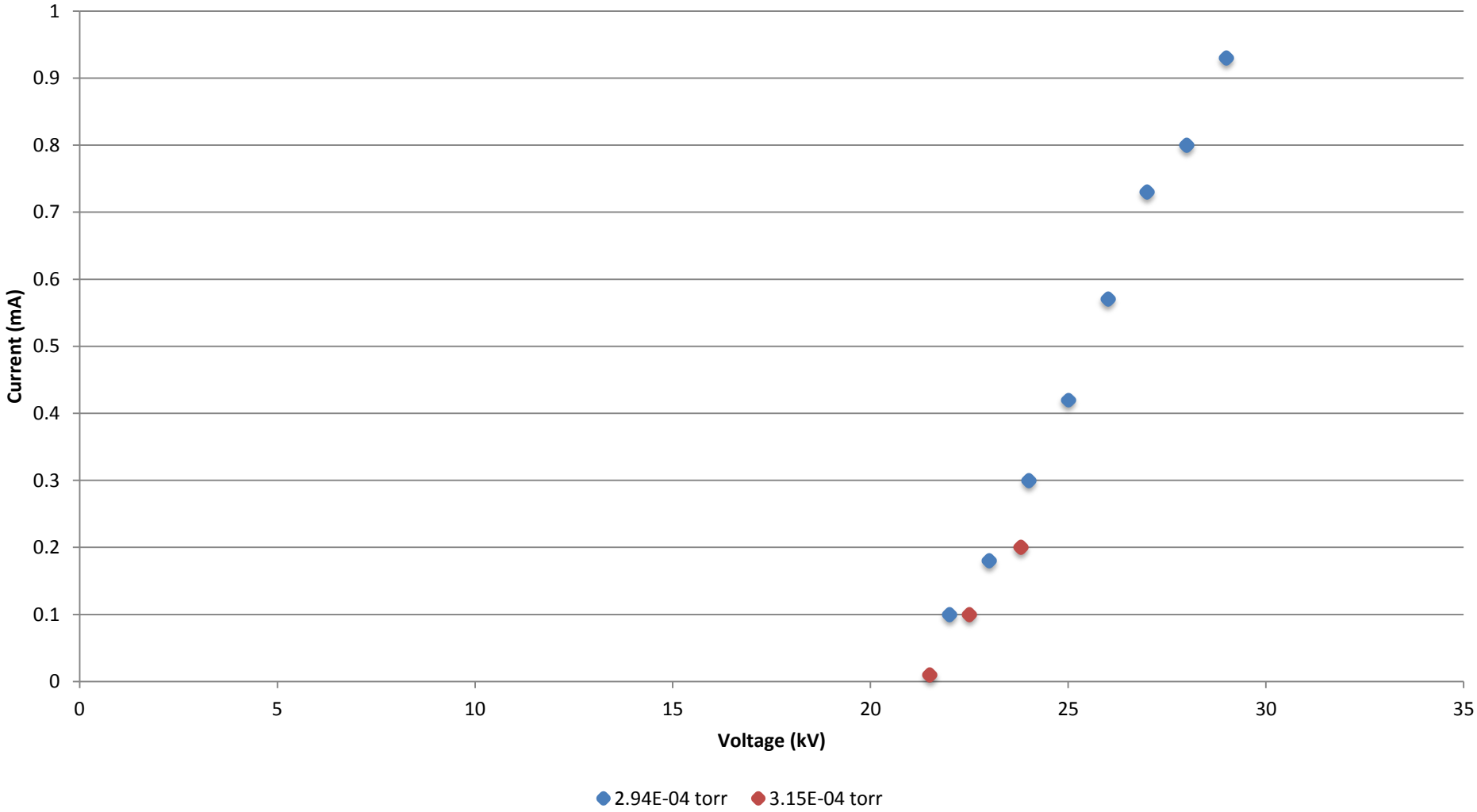


Pressure-Current-Voltage



Plasma at 10^{-3} torr

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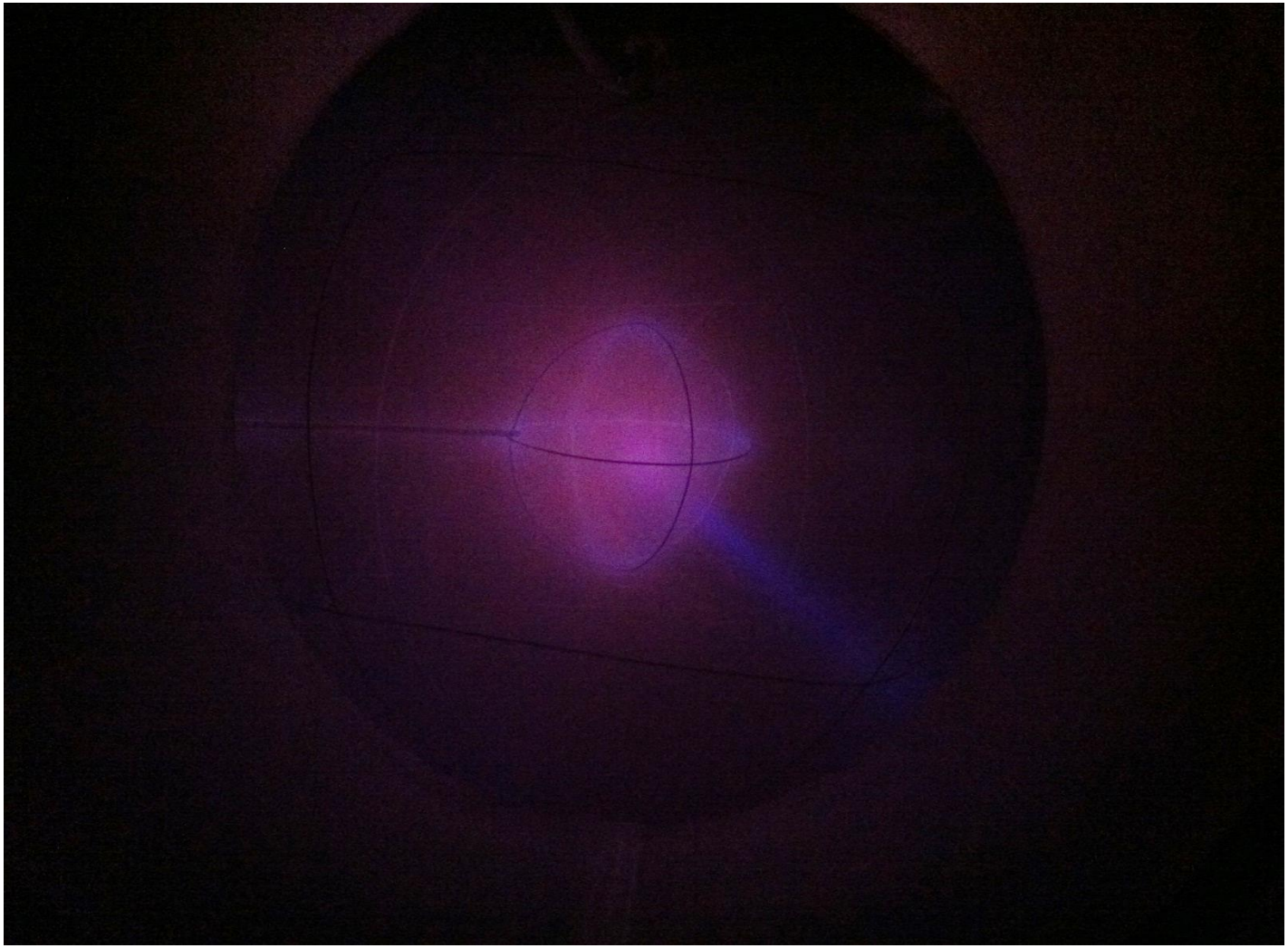

Plasma at 10^{-4} torr

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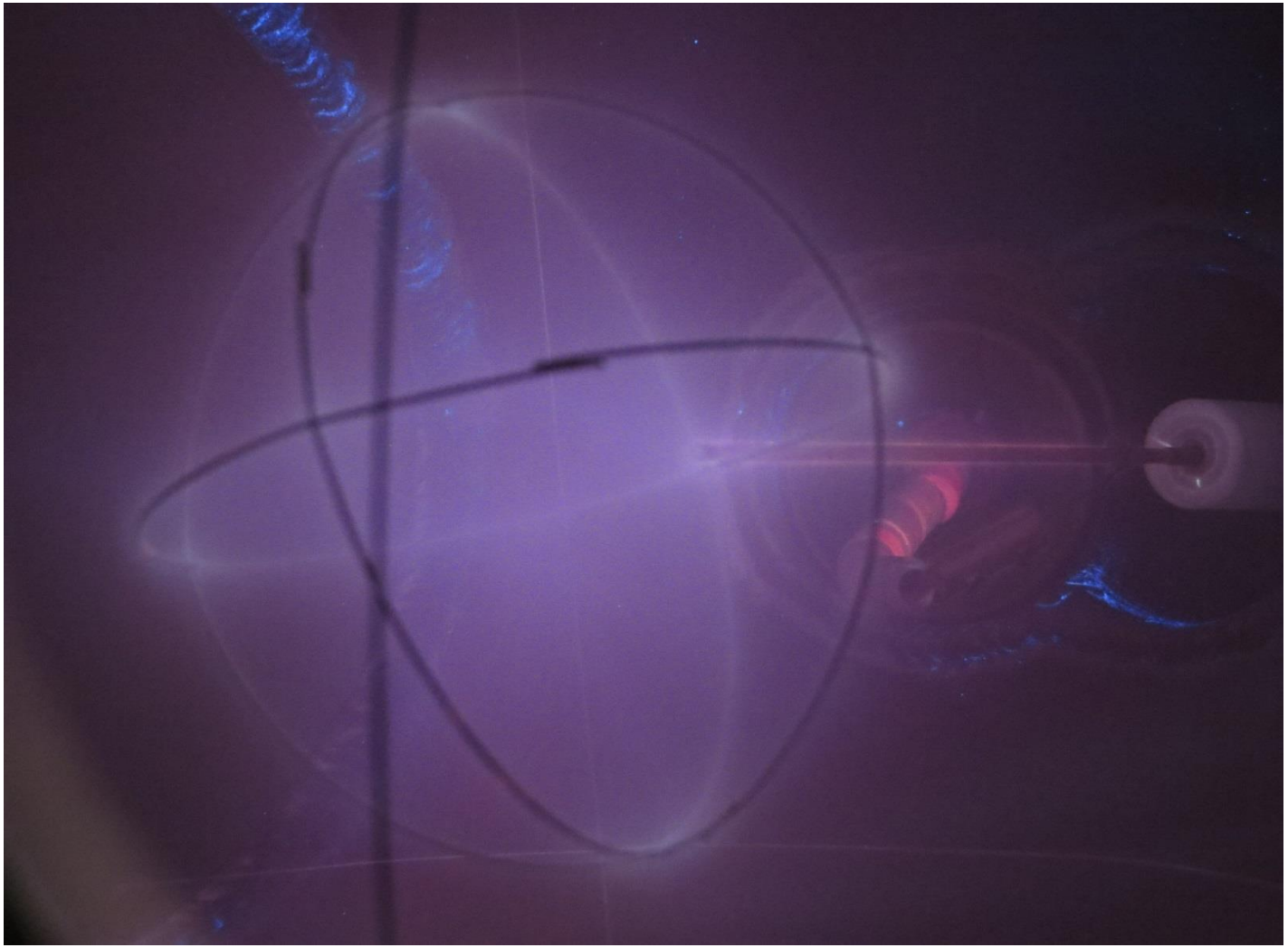
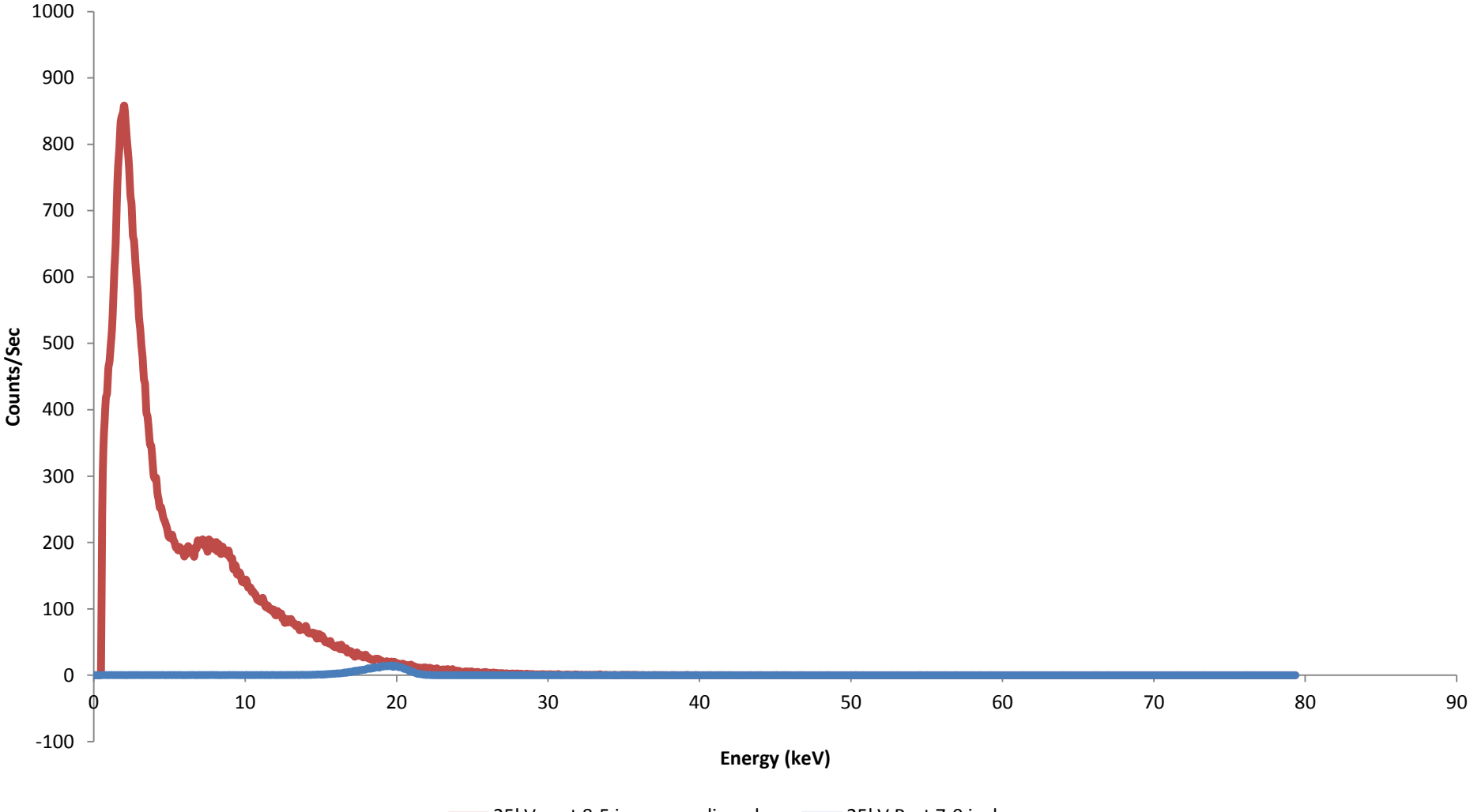
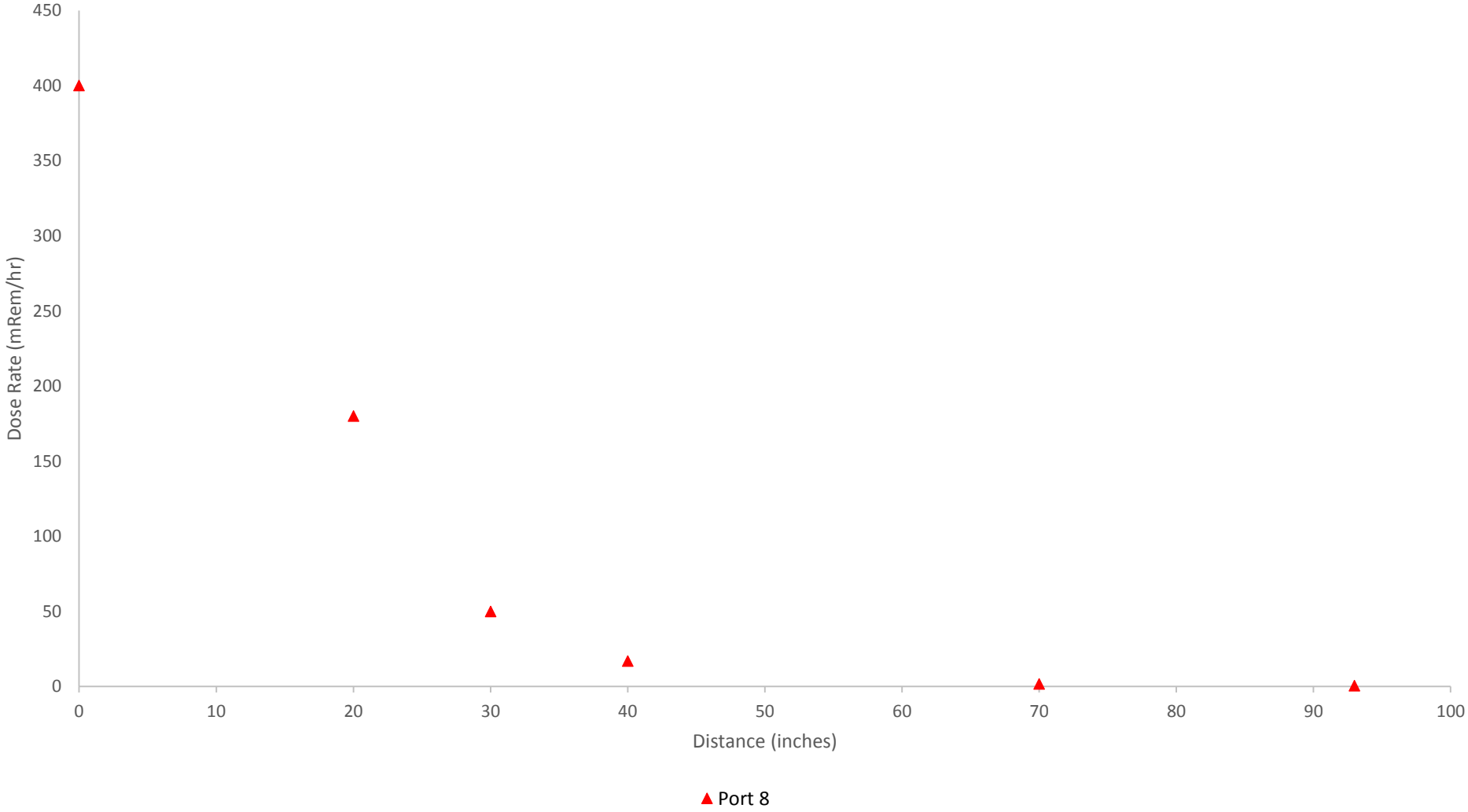


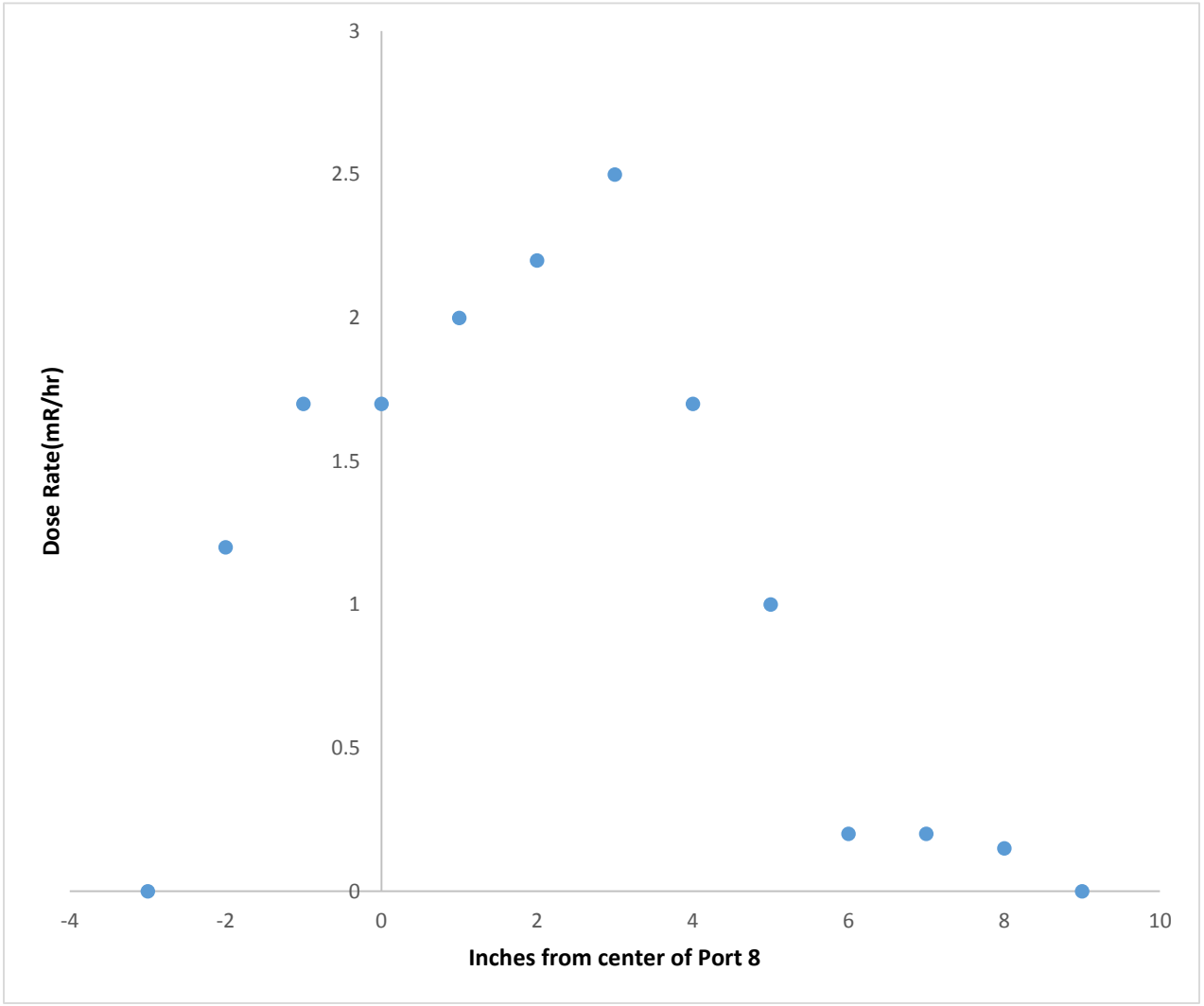
X-ray Spectrum

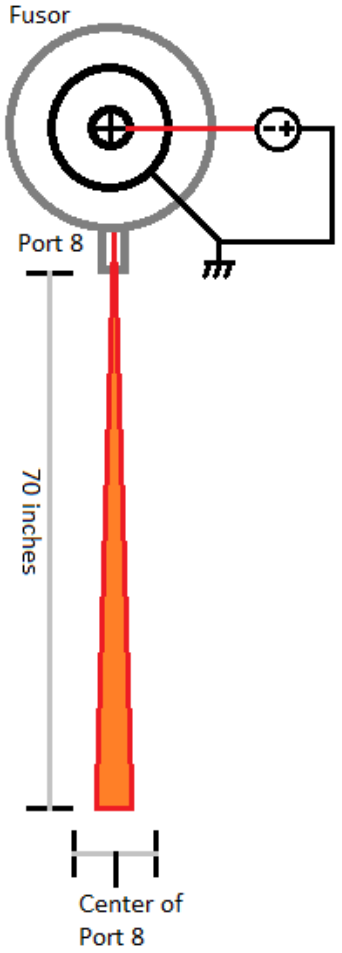


Radiation Dose Rate



Radiation Dose Rate





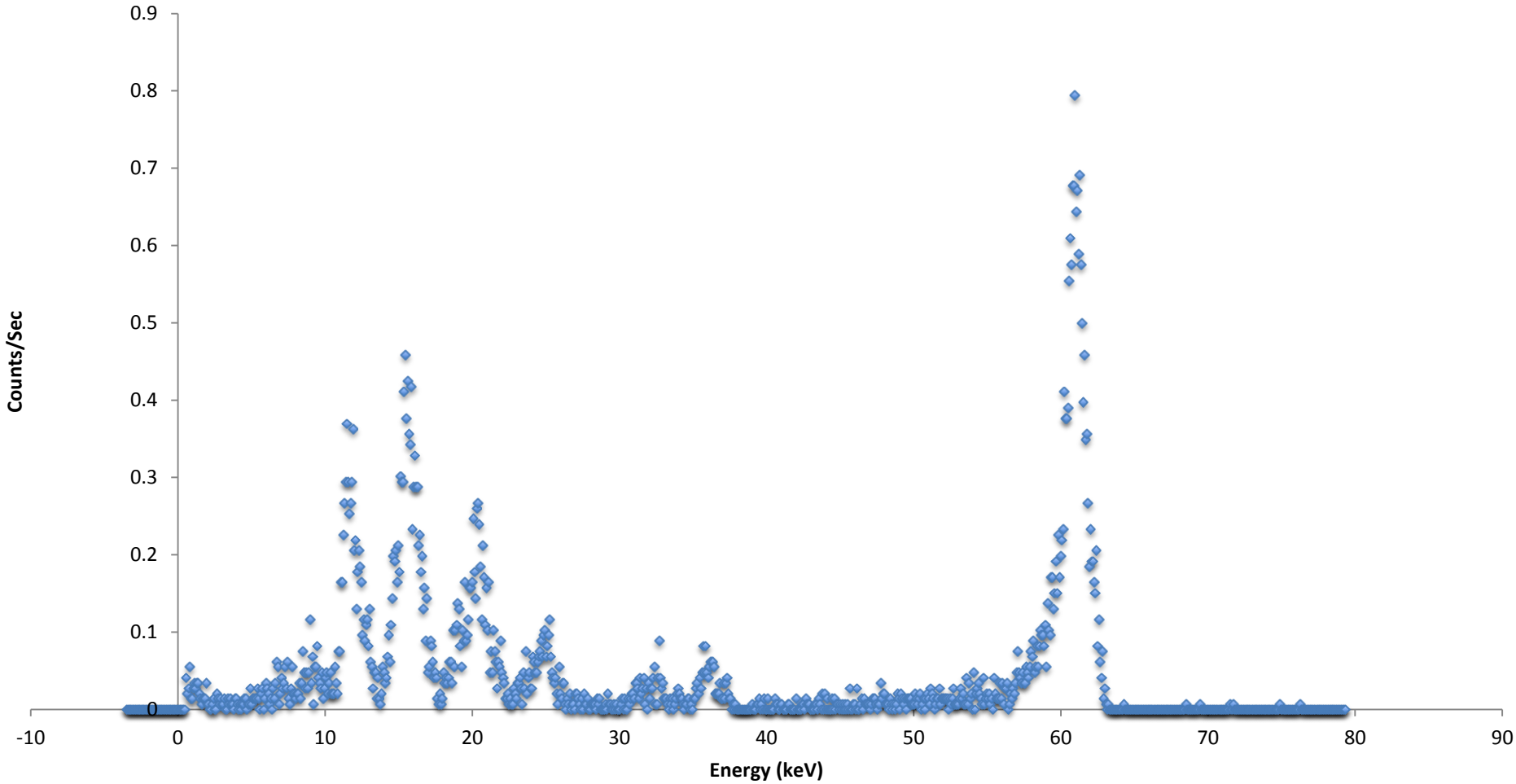
Future Plans and Current Goals

- Enable remote operation
  - Remote system control and data collection
  - Utilize door interlock system
- Register fusor with NYS Department of Health
- Fusion experimentation

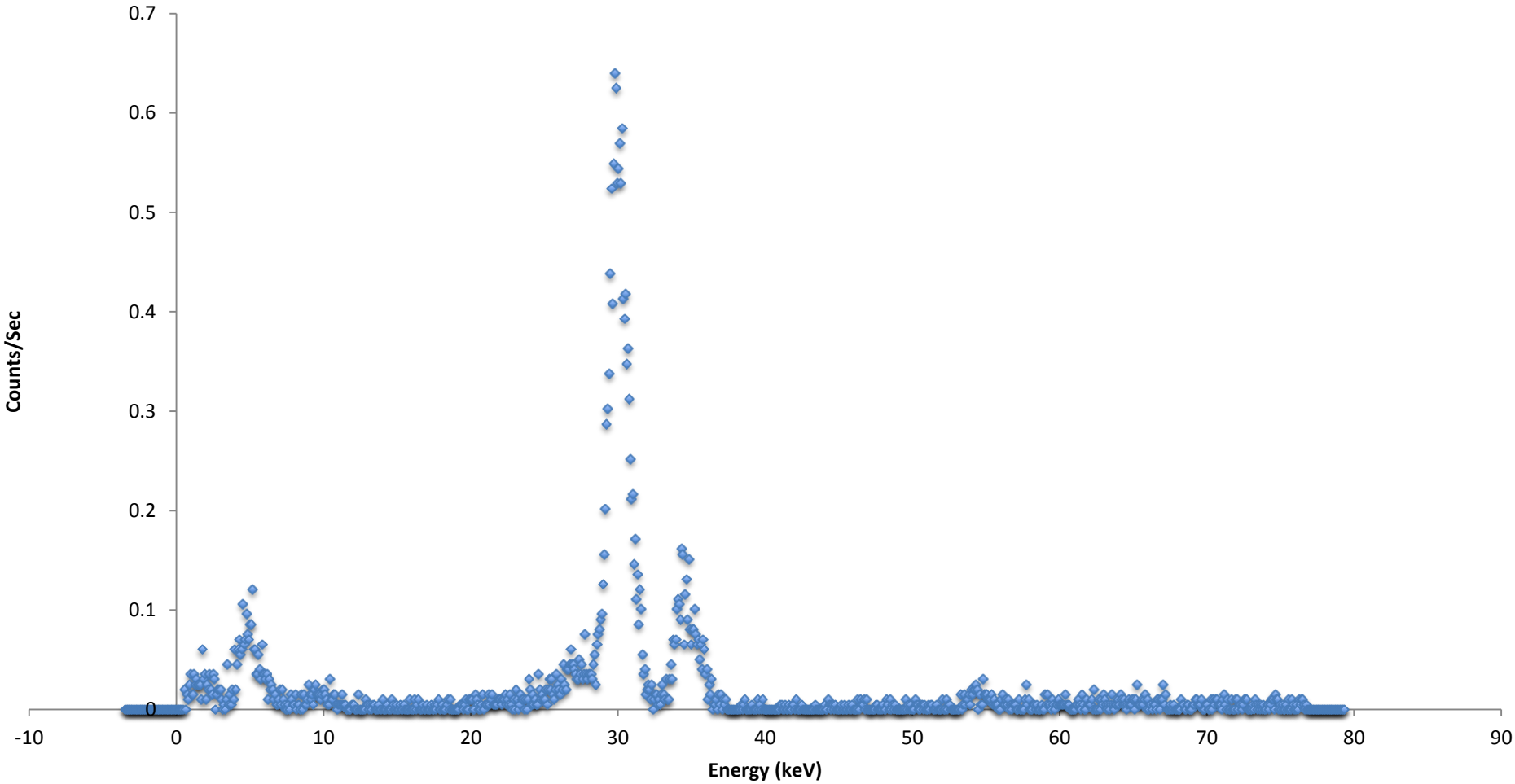
Resources

- [1] S. Pfalzner, *An Introduction to Inertial Confinement Fusion* (Taylor & Francis, New York, 2006), p. 2-3, 9-11, 14-15
- [2] N. D. Cook, *Models of the Atomic Nucleus* (Springer-Verlag, Berlin, 2006), p. 55-57
- [3] J. Lindi, Phys. Plasmas **2** 11 3933-4024 (1994)
- [4] G.H. Miley and S. K. Murali, *Inertial Electrostatic Confinement Fusion: Fundamentals and Applications* (Springer, New York, 2014), p. 3-4.
- [5] L. Spitzer, *Princeton U. Obs. "Equations of Motion for an Ideal Plasma" (1952)*
- [6] W.C. Elmore, J.L. Tuck, and K.M. Watson, Phys. of Fluids **2** 3 239-246 (1959)
- [7] P.T. Farnsworth, *'Electric Discharge Device…'* (US Patent #3258402). (1966)
- [8] R.L. Hirsch et al, 'Apparatus for Generating Fusion Reactions' (US Patent #3530497). (1968)

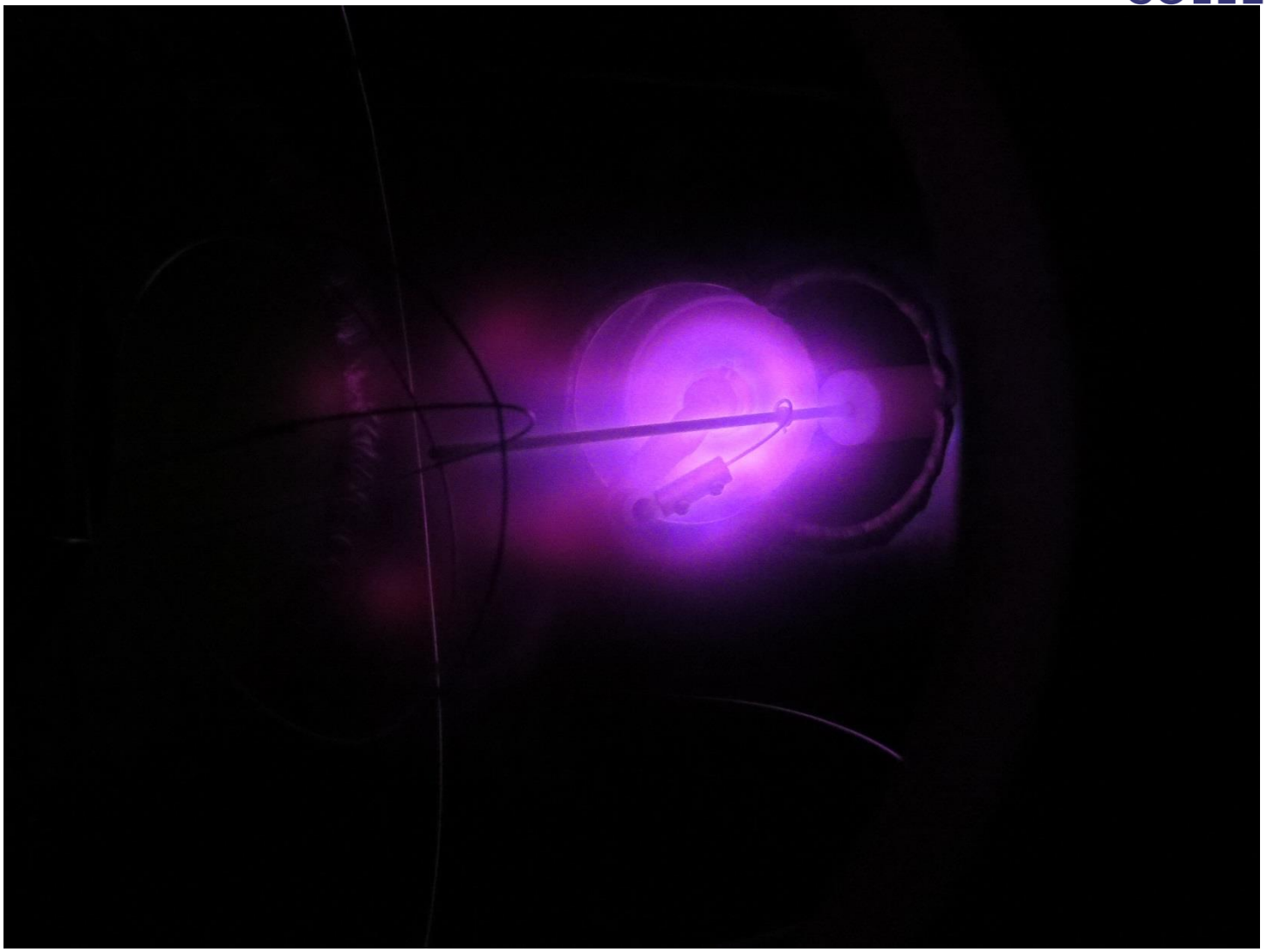
X-ray Spectrum Calibration



X-ray Spectrum Calibration



Additional Pictures



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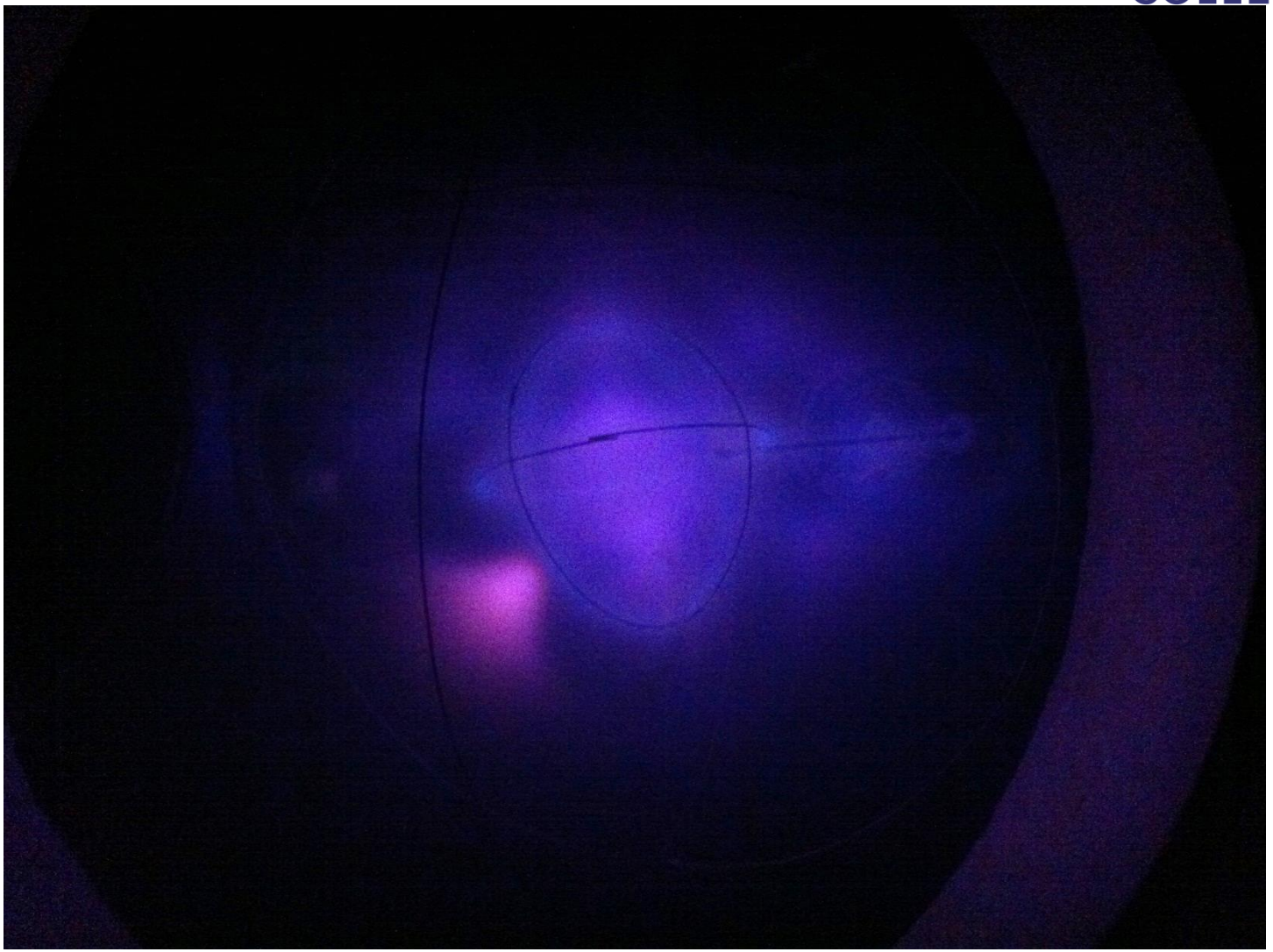

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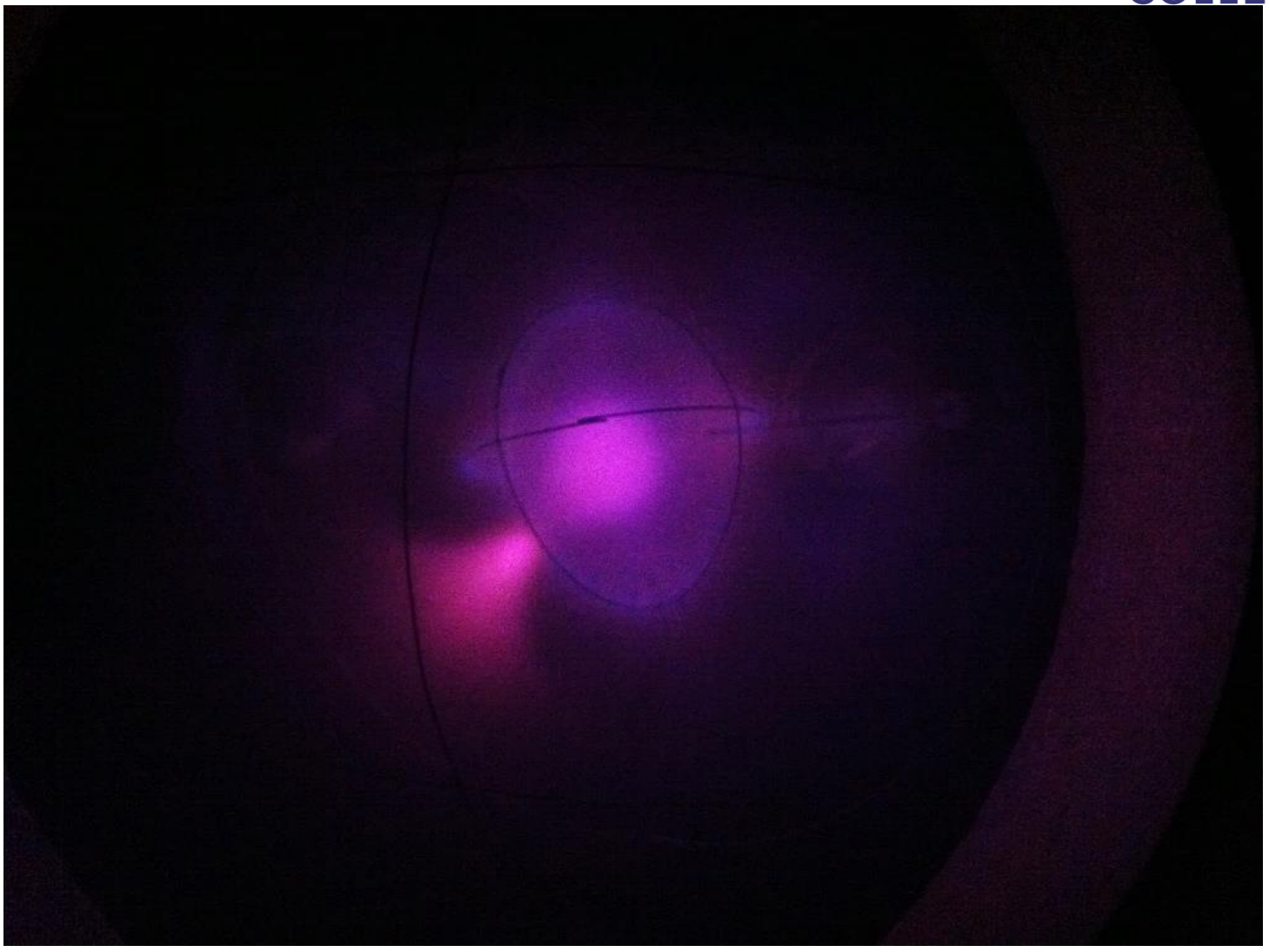

Additional Pictures

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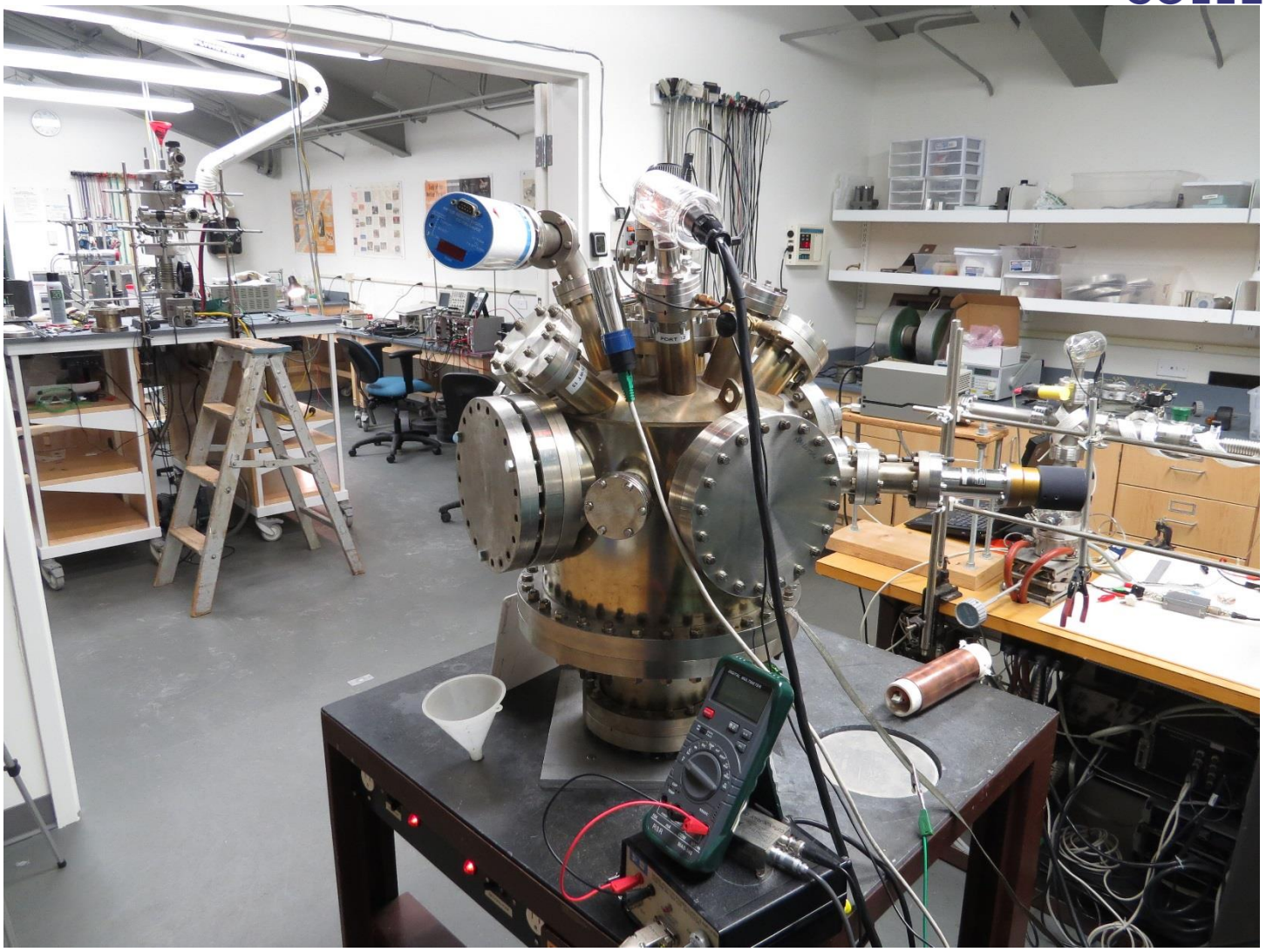

Additional Pictures

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