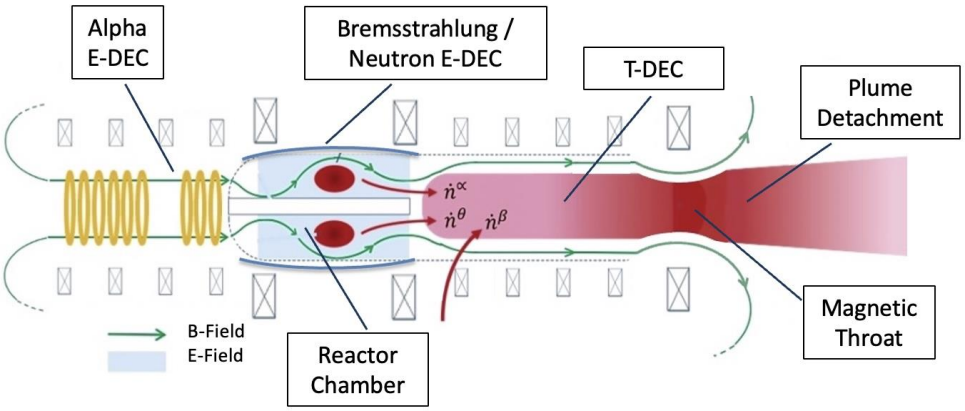
Title: ***Advanced Fusion Power and Thrust Generation with Centrifugally Confined Plasmas***

- **PI:** *Prof. Ray Sedwick*
  - University of Maryland, Aerospace Engineering, Space Power and Propulsion Lab (UMD SPPL)
- **Consultant:** *Dr. Ian Abel*
  - University of Maryland, Institute for Research in Electronics and Applied Physics (IREAP)

Research Objectives

- *Modeling / Simulation of Critical DEC Technologies*
  - Standing/Traveling Wave E-DECs
  - Inverse Bremsstrahlung Thermionic E-DEC
  - Integrated neutron shielding / power generation / propellant pre-heating E-DEC / T-DEC
  - Bypass propellant flow T-DEC
- *Evaluation of System-level specific mass / power scaling*



Centrifugally Confined Fusion Plasma with E-DEC and T-DEC Technologies

Approach

- Modeling and simulation of coupled Multiphysics using a combination of licensed, open-source and in-house s/w
  - MatLab, MCTrans, MCNP, UMHD, SWDEC, BOUT++
- Leveraging an existing team representing a diverse set of backgrounds and experience levels
  - 1 Postdoc, 5 PhD cands, 2 MS cands, 12 BS cands
- Collaboration with ARPA-E funded Centrifugal Mirror Fusion Experiment group (UMD IREAP / UMBC)

Potential Impact

- Target 10-fold reduction in specific mass as compared to JIMO
- Power conversion across all possible modalities supports both hydrogenic and advanced fuels while avoiding large low-temperature radiators
- Bypass propellant (H2O) is abundant throughout the solar system and doubles as neutron shielding
- Centrifugal confinement has applicability to terrestrial power generation
- DEC concepts explored have applicability to other fusion confinement approaches