

## **Dr. Thomas Cawley**

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### **Education**

Ph.D. Mechanical Engineering, Penn State University, 1999.

M.S. Mechanical Engineering, Magna cum Laude, Lehigh University, 1987.

B.S. Mechanical Engineering, Electrical Engineering Minor, Magna cum Laude, Lehigh University, 1986.

### **Experience**

*The Pennsylvania State University, Applied Research Laboratory, University Park, PA*  
Energy Science and Power Systems, Research Associate, Principal Investigator, 1990 – present  
Research Activity: Development and modeling of power and energy systems for underwater use

*General Electric Aerospace, Re-Entry Systems Division, Philadelphia, PA*  
**Aero-Thermodynamics Engineer**, 1989-1990

Research Activity: Conducted computational aerodynamic studies of axis-symmetric and three-dimensional atmospheric re-entry vehicles. Analysis focused on issues of stability, shock interaction, detection and telemetry.

*The Naval Air Engineering Center, Lakehurst, NJ*

**Project Engineer**, 1987-1989

Research Activity: Developed out-of-airframe test systems for turboshaft engines.

### **Current Research Activities:**

*Air-Independent Combustion Power System for Unmanned Undersea Systems* – Combustion systems based on powdered metal fuel and steam oxidation – Powdered fuel feed systems designed to deliver to pressurized combustion systems – High-temperature, high-pressure ash handling systems -- Rankine conversion systems with high-speed turbine in Brayton-like direct-fired arrangement with combustor and particle capture system

*Hydrogen and Oxygen Generation, Storage and Conversion* – Thermochemical hydrogen generation for fuel cell utilization -- Thermochemical oxygen generation for fuel cell utilization in undersea applications -- Chemical looping combustion – Combustion synthesis of hydrogen storage materials

*Power generation from seafloor hydrothermal vent systems* – Heat pipe coupling of resource to Stirling engine – Solid state electric generation – Organic Rankine system design development with fouling resistant boiler heat exchanger