

University Propulsion Programs at the University of Alabama in Huntsville

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Abstract

The Propulsion Research Center at the University of Alabama in Huntsville (UAH) came into being on February 1, 1991. This paper chronicles the growth of the Center, its contribution to the propulsion community and its impact on propulsion education at UAH. The Center mission was formulated with an eye toward educating students in the research process with an emphasis on problems associated with the propulsion community. The unique structure of UAH with separate and distinct research and academic functions posed an interesting set of challenges that had to be met in order to implement a program that bridged the gap between the two. Whereas most university research centers have been organizationally located in a given college, school or department, the UAH Propulsion Research Center is located within the research side of the University and provides an “umbrella” organization under which faculty from various colleges and departments can function. As such, the Center has affiliations with a number of academic departments and centers within UAH. Both graduate and undergraduate academic programs in propulsion were instituted within the Department of Mechanical and Aerospace Engineering concurrently with the establishment of the research program to achieve the mission goal. This paper explores the functioning of the UAH Propulsion Research Center and highlights some of the current research efforts.

I. Background

- A. Purpose:** The UAH Propulsion Research Center was originally created to serve the needs of both Alabama students interested in propulsion and the local propulsion community. That local community consisted primarily of the NASA Marshall Space Flight Center (MSFC) and the U. S. Army Aviation and Missile Command (AMCOM) and supporting industry. That role has been expanded in the 13 years of our existence to embrace students from across the United States and provide service to the propulsion community as a whole.
- B. Goals:** The goals of the Center are captured in the Mission Statement that has provided the guiding principles since its inception in 1991.
- Educate Students in the research process
 - Provide new knowledge/leading edge research in propulsion & related topics
 - Serve as a prime propulsion engineering resource for Alabama, the southeastern U.S. and as a leading resource for the nation.

Over the first 13 years of operation, the faculty and students of the Propulsion Research Center have uncovered new ideas in their research and continued to contribute to the propulsion community. A short resume of the PRC achievements is now presented in terms of research achievements and ongoing contributions of our graduates.

- C. Expenditures:** The primary support for the PRC efforts comes from external grants and contracts. Figure 1 shows the expenditures per year of the PRC from its inception in 1991. The PRC started with investment from state of Alabama, through the UAH Office of the Vice President, Research. The Center achieved the one million dollar per year mark in the first 7 years and will surpass the two million dollar per year mark at 14 years. Total income (including state support) to date is \$16,000,000 with \$11,200,000 of expenditures through FY03. Figure 2 shows the types of agencies that provided the funds. The state of Alabama has provided 21% of the funds expended to date. This money supports the administration of the PRC through partial support of the Director and a staff assistant. NASA support comprises 34% of the expenditures with major programs in chemical and advanced propulsion. Some of the NASA money is “passed through” to

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