Multifunctional Materials
University of Dayton, Ohio (url: http://www.udayton.edu/index.php)

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09.15.2010 | Research, President  The University of Dayton Research Institute has been awarded a six-year, $44.5 million-ceiling contract from the Air Force Research Laboratory. The grant will fund research, development and technical transition on advanced composite, hybrid and thermally engineered materials and organic and organic-hybrid materials systems and devices for future Air Force systems.

Work performed by the Research Institute will support the in-house research effort at the Nonmetallic Materials Division of the Air Force Research Laboratory at Wright-Patterson Air Force Base.

Research will focus on composites, hybrid and thermally engineered materials for extreme environments, said principal investigator Tom Whitney, group leader for advanced composites at the University of Dayton Research Institute.

"We'll be performing exploration and development on a wide variety of materials in an effort to improve their properties and make them multifunctional, in other words, tailor them to serve more than one purpose. In some cases we'll be working with disparate materials and combining them to achieve this; those will be hybrid materials," Whitney said.

Whitney said improved materials for extreme environments are needed for a number of Air Force applications, including advanced thermal protection systems and advanced engines.

Under the same contract, the Research Institute also will perform research, development and technical transition of thermal management materials in support of AFRL's Thermal Materials and Sciences Branch. Work will include the design, synthesis, fabrication, modeling, simulation and characterization of condensed phase materials for a variety of Air Force thermal management applications.

"We will develop an understanding of the physical and chemical processes that govern thermal materials functionality, allowing for the development of improved thermal materials," said co-principal investigator Steve Patton, group leader for fluids, lubricants and coatings at the Research Institute. "We will also develop and evaluate new and modified thermal materials and systems and develop new modeling and laboratory procedures and techniques to evaluate materials performance."

Patton said the work will provide advanced thermal management materials for Air Force systems such as satellites and aircraft systems.

The University of Dayton Research Institute has been awarded $8,336,270 under the program.

For more information, contact Pamela Gregg at 937-229-3268.