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Princeton minds join NASA study team

Thursday, September 26, 2002

By **KAREN GREEN ALEXANDER**

PRINCETON BOROUGH - Princeton University scientists will be part of a group that will work on key problems identified by NASA.

The group, University Research, Engineering and Technology Institutes on Biologically Inspired Materials (URETI), was launched yesterday to do scientific research and develop technology that promises a range of military and consumer applications, NASA officials and researchers said at a briefing yesterday.

The hope is to increase fundamental understanding of certain scientific phenomena and use that understanding to develop technology to solve problems, scientists said.

Personal airplanes controlled by ground computers for individuals to lease for business or pleasure trips and quieter planes that do not emit unwanted substances into the environment are among the applications hoped for out of the work of the new group of scientists and engineers.

NASA is also looking to develop systems that will allow aircraft to sense and fix cracks in their bodies or sense what would be the plane's best shape to meet aerodynamic needs and then morph into that shape.

Princeton University will work to develop a strong, light-weight material that could be used to build planes, said Ilhan A. Aksay, professor of chemical engineering at the university and member of the new group.

Georgia Institute of Technology will study aeropropulsion and power; the University of Florida and the University of Maryland, reusable launch vehicles; University of California, information technology fusion; and Purdue University, nanoelectronics and computing, according to the university's statement.

Darrel R. Tenney, director of aerospace vehicle systems technology for NASA, said the institute is a "dawning of a new era" where scientists and engineers from different disciplines work together long-term.

"There is a real payoff" if the science can be translated into real engineered products, he said.

There will be applications discovered "along the way," but the institute is to make "major advancements," Tenney said.

To develop the smart personal airplane is not a major computer problem. But every cube of airspace would have to digitized, he said.

"The future lies in bringing together nontraditional disciplines to make new technology and applications," he said.

Among those, NASA hopes to move from hard-structured aircraft to material that will be able to alter aerodynamics "precisely in real time, depending on its mission," Tenney said.

"Birds can control their individual feathers," he said.

"We have very high expectations of what can be achieved from this partnership," said Michael Reischman, director of university programs for NASA.

An important aspect of the institute is that it will maintain an environment that will stimulate professional development of faculty, staff, senior students and NASA staff and maintain a high-tech work force, Reischman said.

Aksay said Princeton will look at biological structures for possibilities to mimic what they do.

The university's work also will involve using piezoelectric material, which can change shape when electricity is pumped into it, he said.

Aksay said creating the new material for aircraft is a "big challenge to face" and will take more than 10 years.

NASA has pledged an initial \$17 million with possible funding exceeding \$30 million over 10 years, the university said in a written release.

URETI will complement a number of grants already in place, Tenney said.

Rodney S. Ruoff, a mechanical engineering professor at Northwestern University and a member of URETI, said he envisions the team of scientists and engineers "making a start with fundamentals," and then "market forces will come into play."

The idea of universities providing research and development for business is "radically new," he said.

Twenty years ago there were big research and development operations at companies such as Bell Telephone Laboratories, but that changed, he said.

Factors included stockholders who wanted quick returns on their money rather than long-term investments, Ruoff said.

"Hopefully this is an intelligent way," Ruoff said.

This is "exactly how the frontiers of knowledge should be explored," said Princeton University President Shirley M. Tilghman of the URETI approach.

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