

Ames Research Center (ARC)

Highlights*:

- Exploration Scouts: New Program Office as part of Exploration's Precursor Robotic Missions effort to manage approximately \$20 million in FY 2011 and \$400 million over five years allocated to scout locations for eventual human visits with a focus on small, competed robotic missions.
- Small Satellite Subsystem Technology: New Program Office to manage \$6 million in FY 2011 and \$126 million over five years in research and development in this important technology area.
- Edison Small Satellite Demonstrations: New Program Office to manage \$10 million in FY 2011 and \$90 million over five years to demonstrate key small satellite capabilities.
- Aeronautics Research: The FY 2011 funding augmentation will be used to increase research activities into green aviation and Next Generation Air Transportation System (NextGen) capabilities.

* Proposals regarding Program Office assignments will be implemented following Congressional approval of the FY 2011 budget; and funding amounts include the cost of civil service labor.

Center Assets: Located in the Moffett Field, CA, ARC employs over 1,200 civil servants, consisting mainly of professional engineers and scientists in aeronautics and aerospace systems, biotechnology, information technology research, nanotechnology, fundamental space biology, earth and space sciences, and human factors research. Center capabilities that will be tapped in the President's new program include their expertise in aeronautics and aerospace systems, information and nanotechnology research, and biotechnology. Specific new activities include the following.

Exploration Scouts, Program Office: This new program will support small, competed robotic precursor missions to the Moon, Mars and its moons, Lagrange points, and nearby asteroids to scout targets for future human activities, and identify the hazards and resources that will determine the future course of the expansion of human civilization into space. This Program will focus on rapid, small, innovative satellite approaches to these destinations. As the Program Office, ARC will coordinate and manage these projects with other NASA Centers, academia, and private-sector partnerships and activities.

Small Satellite Subsystem Technology (SSST), Program Office: Technologies that enable small satellites to provide game-changing capabilities for the government and commercial sectors will be supported in this program. These "push" technologies may include formation flying, long life power systems, miniaturized remote sensors, deployable apertures, autonomous swarm

operations, and other technology enablers. Architectures, proximity operations, robotics, space-to-space power transmission and other system interoperability such as that being developed for standardization in small spacecraft will also be advanced.

Edison Small Satellite Demonstrations, Program Office: This program will develop and operate a series of NASA-focused small satellite demonstration missions. Science objectives for these missions will focus on the life and physical sciences, including fundamental biology as well as other NASA needs. Technology objectives could include formation flying, autonomous operations, collaborative observations, and approaches enabling payload recovery. NASA will pursue these missions in collaboration with academia and small business in close coordination with other relevant government programs. Through collaborative efforts, university students will gain hands-on experience within project activities. In addition, this program seeks to serve the small satellite community by improving the affordability of small payload launch through secondary payload process improvements and other development efforts.

Aeronautics Research Augmentation:

ARC will support the Aviation Safety Program in the verification and validation of flight critical systems that will be required in order to successfully realize NextGen. This support will include the development of improved verification and validation tools to ensure that new NextGen concepts satisfy flight critical safety requirements, especially needed considering the trend for increasingly software-intense automation, and the complex interactions between humans and automation.

ARC will support the Integrated Systems Research Program, addressing operational and safety issues related to the integration of unmanned aircraft systems (UAS) into the national airspace by providing expertise in air traffic management concepts and algorithms for automated separation assurance and conflict detection and resolution, NextGen modeling and simulation of airspace operations, and intelligent contingency management planning.

ARC, along with the other NASA research centers, will support the augmented research and development efforts, including grants and cooperative agreements, to support NASA's environmentally responsible aviation project. These research plans, which are currently being developed, will include design and feasibility studies, high-fidelity simulations, flight demonstrations, design competitions and prize challenges.