

# Michael Griffin takes the helm

by Kendra Phipps



*Despite his six postgraduate degrees, new NASA Administrator Michael Griffin wants employees to know that he considers himself a regular guy.*

“Please just call me ‘Mike,’” he said with a smile in his first address to Agency employees. “I’m not ‘sir’ or ‘Dr. Griffin.’ The NASA administrator is not royalty, and I’m certainly not.”

Griffin reported to work April 14 as NASA’s 11th administrator after having been confirmed a day before by the U.S. Senate.

In his employee address, Griffin said that he is “intensely proud” to be leading the Agency.

“Of all the federal agencies in this country, NASA is the one whose reach is the boldest and which has the longest effect on what we do as a nation,” he said.

He said he sees himself as part of a team, and he plans to rely on input from employees Agencywide as NASA turns the Vision for Space Exploration into reality.

“The Agency is in transition; we are on a new path. There are going to be some difficult decisions to make and I won’t tell you otherwise,” he said to the NASA workforce. “But I promise you that I will make those choices as fairly, impartially, openly

and humanely as I can, with guidance from you and with every effort to hear what you have to say.”

Griffin told employees that public support for the Vision for Space Exploration is high.

“People want a space program that goes somewhere and does something, for the same reason that, a hundred years ago, the media covered expeditions to the South Pole,” he said. “In the human spirit lives an incredibly strong desire to learn what we don’t know, and that is the very basic element of which exploration consists.”

During the question-and-answer segment of his workforce address, Griffin fielded employees’ concerns that the Vision for Space Exploration would squeeze out other NASA interests, such as scientific research and aeronautics.

Griffin said that limited resources do force NASA to prioritize, but not at the complete expense of any of its objectives. He called NASA’s science program one of the Agency’s “crown jewels” and cited his own extensive work experience in the

sciences. While he admitted to being less immersed in the aeronautics world, he pledged to learn as much as possible and to sustain NASA’s excellence in that area as well.

While the Vision for Space Exploration is the current top priority, that does not mean the Agency will abandon all other efforts, he said.

“We will do what we need to do and make the necessary decisions to shape NASA along the lines of the president’s space policy,” he said. “The only promise or pledge I can bring to you is to surround myself with people who are at least as capable as I am. They say that a good manager wants to be the dumbest person on his team; that’s my goal, and some people have assured me that it should not be hard to achieve.”

Griffin’s self-deprecating remarks drew laughs from the audience at NASA Headquarters. The new administrator holds five master’s degrees and a doctorate, is a registered professional engineer and is a certified flight instructor with instrument and multiengine ratings. He is a recipient of the NASA Exceptional Achievement Medal and the Department of Defense Distinguished Public Service Medal, the highest award given to a nongovernment employee.

Griffin was serving as the Space Department head at Johns Hopkins University’s Applied

Physics Laboratory in Baltimore when he was nominated for the role by President George W. Bush. Earlier in his career, Griffin served as NASA’s chief engineer and as deputy for technology at the Strategic Defense Initiative Organization. He has served as an adjunct professor at three universities, where he taught courses in spacecraft design, applied mathematics, guidance and navigation, spacecraft attitude control, astrodynamics and more. Griffin has authored more than two dozen technical papers and a textbook.

This breadth of experience should serve him well in his new role, he said. Griffin indicated that he looks forward to working with, and learning from, the many talented people within the Agency.

“I’ve worked at NASA on several occasions. I’ve been a customer of NASA and I’ve been a partner of NASA; I know the Agency fairly well,” he said. “I’ve worked real programs with real people that are among the most talented I’ve ever known. I know the kind of talent we have in this Agency and I know what we can do when we set our minds to it.”

Griffin will be focusing on Return to Flight efforts for the time being, after which he plans to visit the NASA centers.



**During his April 12 confirmation hearing before the U.S. Senate, the Administrator stated that his priorities, consistent with the Vision for Space Exploration, will be to:**

- Fly the Space Shuttle as safely as possible until its retirement, not later than 2010
- Bring a new Crew Exploration Vehicle into service as soon as possible after the Space Shuttle is retired
- Develop a balanced overall program of science, exploration and aeronautics at NASA, consistent with the redirection of the human spaceflight program to focus on exploration
- Complete the International Space Station in a manner consistent with our International Partner commitments and the needs of human exploration
- Encourage the pursuit of appropriate partnerships with the emerging commercial space sector
- Establish a lunar return program that has the maximum possible utility for later missions to Mars and other destinations

*With his wife and daughter by his side, Griffin took the oath of office as NASA’s 11th Administrator on April 14.*

# A new spin on *artificial* gravity

by Bill Jeffs

**Keeping crewmembers in good health** on long-duration missions to Mars and beyond may require that they bring artificial gravity with them to counter the ill effects of weightlessness on the human body.

The body responds to loss of gravity by adapting itself for optimal efficiency in the weightless environment of space. This includes losing bone and muscle that are no longer needed and changing the way the cardiovascular and motor coordination systems function. By bringing along artificial gravity, in the form of centrifugal force, these normal changes could be prevented and the health and safety of long-duration crewmembers could be protected.

For more than a century, people have speculated that gravity could be created in space by rotating a spacecraft, giving space travelers a one-gravity condition like here on Earth. The idea long postulated is to rotate the vehicle and so, at least on the transit between Earth and Mars and back, people would be able to live in a one-gravity environment. Or perhaps a centrifuge could be installed in the spacecraft. Crewmembers could spin around in it for a prescribed amount of time and increase the gravitational loading so that their body responds and maintains a certain level of physiological fitness.

Cost and design issues have plagued the rotating environment idea. For the latter scenario, that of installing a centrifuge onboard a spacecraft, many questions have been raised

including how often people need to spin around and how much artificial gravity they need to stay fit.

But with the national impetus to return humans to the Moon and travel to Mars and beyond, new artificial gravity studies are about to begin to find answers to these questions.

The new research will begin this summer at the University of Texas Medical Branch (UTMB) at Galveston, overseen by Johnson Space Center. A NASA-provided Short-Radius Centrifuge (SRC) will be used to attempt to protect normal human test subjects from deconditioning when confined to strict bed rest. Bed rest can closely imitate some of the detrimental effects of weightlessness on the body. For the first time, researchers will study how artificial gravity may serve as a countermeasure for the body as a whole to prolonged simulated weightlessness.

"The Vision for Space Exploration includes destinations beyond the Moon," said Dr. Jeffrey Davis, director of JSC's Space Life Sciences Directorate. "This artificial gravity research is an important step in determining if spacecraft design options should include artificial gravity. The collaboration between NASA, UTMB and Wyle Laboratories demonstrates the synergy of government, academic and industry partnerships."

The NASA-sponsored research is divided into two phases. The first phase will use the SRC to support NASA's Artificial Gravity



**Back row, left to right:** Hamid Tabibian, Stewart Robinson, Elisa Allen, David Compton, Freddie Ferrara, Maneesh Arya, Gina Pariani, Jon-Michael Tucker, Lisa Gustafson, Joe Sinka, Dr. Bill Paloski, Eric Warren  
**Front row, left to right:** Jan Bergeron, Larry Meeker, Keena Acock



**Clockwise from left:** Test dummy lying in centrifuge with view screen visible above its head.

Control room during testing with the Human Centrifuge.

Human Centrifuge at UTMB Galveston Clinical Research Center.

Pilot Study. A second phase will include enhancements to the centrifuge design, including addition of resistive and aerobic exercise stations, to provide support for a multinational artificial gravity project that would involve Germany and Russia.

For the initial study this summer, 32 test subjects will be placed in a six-degree, head-down, bed-rest position for 21 days to simulate the effects of microgravity on the body. Half that group will spin once a day on the centrifuge to determine how much protection it provides from bed-rest deconditioning. The "treatment" subjects will be positioned in the centrifuge and spun up to a force equal to 2.5 times Earth's gravity at their feet for an hour and then go back to bed.

"The studies may help us to develop appropriate prescriptions for using a centrifuge to protect crews and to understand the side effects of artificial gravity on people," said Dr. Bill Paloski, NASA principal scientist in JSC's Human Adaptation and Countermeasures Office and principal investigator for the project. "In the past, we have only been able to examine bits and pieces. We've looked at how artificial gravity might be used as a countermeasure for, say, cardiovascular changes or balance disorders. This will allow us to look at the effect of artificial gravity as a countermeasure for the entire body."

To do this, Paloski and his co-principal investigator, Professor Laurence R. Young of Massachusetts Institute of Technology, have assembled a group of 24 scientists from leading universities and research centers around the United States to participate in the study. Under the guidance of Paloski and

Young, this unprecedented, multidisciplinary research team will collect, analyze and interpret all of the data necessary to determine how artificial gravity affects the various systems of the body. The tests are expected to end in the fall of 2006.

The research will take place in UTMB's National Institutes of Health-sponsored General Clinical Research Center. The study supports NASA's Artificial Gravity Biomedical Research Project.

The centrifuge was built to NASA specifications by Wyle Laboratories in El Segundo, Calif. It was delivered to UTMB in August 2004 and will complete design verification testing, validation of operational procedures and verification of science data this spring. The centrifuge has two arms with a radius of 10 feet (three meters) each. The centrifuge can accommodate one subject on each arm.

"The design rigor and processes used to develop this hardware, its built-in automatic safety shutdown features and the medical monitoring and control devices incorporated make this centrifuge a very safe system," said Hamid Tabibian, NASA centrifuge engineering manager, JSC Engineering Directorate.

The NASA Exploration Systems Mission Directorate, Headquarters, Washington, D.C., is supporting this research.