NATURE|Vol 447|14 June 2007

MOVERS

John Mather, chief scientist, Science Mission Directorate, NASA, Washington DC

1995–present: Study scientist and senior project scientist, James Webb Space Telescope
1993–present: Senior astrophysicist and Goddard fellow, NASA Goddard Space Flight Center, Greenbelt, Maryland
1990–93: Head, infrared astrophysics branch, NASA Goddard Space Flight Center, Greenbelt, Maryland

NASA, beset with morale problems and criticized by some in the research community for its focus on human spaceflight over scientific research, has made a significant gesture by appointing John Mather as its chief scientist. "Elevating John to this position makes clear that NASA highly values science," says Michael Hauser, deputy director at the Space Telescope Science Institute in Baltimore, Maryland. "His impact in astrophysics has been profound."

Mather came to astronomy by accident early in his career. It was elementary particle physics that excited him as a graduate student. But then he came across a dissertation project to experimentally validate the Big Bang theory. A 1974 NASA funding opportunity for explorer satellites provided the opportunity to test it in space. Still a postdoc, Mather assembled a team and wrote a winning proposal.

Mather hadn't expected to embark on a 33-year career at NASA — he had imagined becoming a professor — but that was before the space programme had a higher profile and funding boom. At NASA, he has had the same responsibility all his career: leading science projects.

At Goddard Space Flight Center he oversaw the Cosmic Background Explorer (COBE) satellite, designed to measure the diffuse infrared and microwave radiation from the early Universe. "We were in the technological Dark Ages," he says. There was no precedent for the project. "Pocket calculators were brand new."

At the January 1990 American Astronomical Society meeting Mather showed that the COBE observations agreed exquisitely with the Big Bang theory — which allowed physicists to better understand how galaxies formed in the Universe. His former NASA colleague, retired astronomer Nancy Boggess, remembers the standing ovation that followed. The work won Mather the Nobel Prize in Physics last year.

After the success of COBE, Mather went on to help design and implement the James Webb Space Telescope, which is set to launch in 2013. It will unfold in space and orbit more than a million kilometres from Earth.

Overcoming the immense technological hurdles involved in building the biggest-ever space telescope sparked his interest in other NASA projects — an asset in his new role as NASA's chief scientist.

"NASA hasn't had, in my estimation, a good chief scientist since the 1990s," says Boggess. "John will be the kind of anchor that NASA administrators will listen to." ■

Virginia Gewin

BRICKS & MORTAR

Southern light

Australian science will get a major boost with the opening of the country's first synchrotron in July. The Australian Synchrotron, a Aus$207-million (US$169-million) platform that accelerates electrons to nearly the speed of light, will be in Clayton, Victoria, home to Monash University.

It's a third-generation, 3-giga-electronvolt (medium energy) light source, the largest in the Southern Hemisphere. "A technologically healthy country without a synchrotron to train its young researchers and to provide state-of-the-art facilities for its forefront industries will unavoidably fall behind," says Daniel Häusermann, a Swiss physicist who was recruited to design one of the beamlines.

"Some of the animal models for lung-disease studies are genetically modified organisms, and it is extremely difficult if not impossible to carry out this work overseas," says Karen Siu, a lecturer at Monash University who studies lung diseases, including cystic fibrosis. She will use the synchrotron to develop phase-contrast X-ray imaging to diagnose disease and reveal the efficacy of gene therapy for cystic fibrosis.

The Australian Synchrotron has the capacity for more than 30 beamlines. Nine have been proposed, and five have already been installed, including ones for high-throughput protein crystallography, powder defraction, X-ray absorption spectroscopy, soft X-ray spectroscopy and infrared spectroscopy. Forensic sciences, drug design, radiation therapy and studies of oocyte maturation for *in vitro* fertilization are among scientists' applications for the light source.

A 150-metre-long medical imaging beamline will be used for imaging studies and therapy. It will deliver more precise and effective radiation therapies and detect cancers near the single-cell stage. "If you have a better understanding of how the tumour develops, you can understand the mechanisms and develop better drugs," says Häusermann. A new biomedical imaging development centre will be located nearby.

Scientists from around the world have been recruited, including Mark Tobin, from Britain's Synchrotron Radiation Source at Daresbury.

The platform has been funded by universities, research bodies, five Australian states and the government of New Zealand. The Australian government has promised Aus$50 million over the facility's first five years of operation. ■

Hannah Hoag

POSTDOC JOURNAL

What kind of difference?

A few weeks ago, I was fortunate to attend a guest lecture given by the world-renowned physician and anthropologist Paul Farmer, someone who has improved the lives of multitudes in underdeveloped regions through clinical, academic, advocacy and charitable activities.

Hearing from someone who is changing the lives of those with whom they live and work is inspiring. Many of the questions and comments from the audience after the lecture made it abundantly clear that he has numerous admirers.

Having written of the allure of making a difference in my first journal entry, the lecture led me to ponder the nature of the difference I hope to make. Is the abstract awareness that I've contributed to the sum total of human knowledge going to be enough? Or is there something about improving the lot of a fellow human being directly — through medicine, counselling or other activities of the 'helping professions' — that promises an unmatched level of satisfaction?

Scientific knowledge and understanding help us to help others. Indeed, Farmer urged us to continue the research that has underscored so many of the improvements in public health seen around the world. However, the absence of a human face can disconnect us from the reality of those who endure the diseases we study. Awakening to this reality may well change our lives. ■

Peter Jordan is a visiting fellow at the National Institute of Diabetes and Digestive and Kidney Diseases in Bethesda, Maryland.