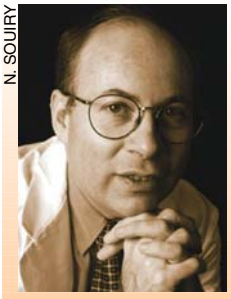
to help unravel disorders affecting white matter—the fibers that connect different regions of the brain—such as dyslexia, multiple sclerosis, and schizophrenia.

Another approach, MRI and spectroscopy of heavier nuclei such as sodium, phosphorus, carbon, or oxygen—instead of hydrogen, the MRI workhorse—opens the way for broader study of brain metabolism, neurotransmission, and disease. "We use carbon-13 and oxygen-17," says Le Bihan. "The abundance of those nuclei is very low, hence the need for very high fields."


N. SQUIRY

Le Bihan

"I think [NeuroSpin] is a wonderful facility," says Kamil Ugurbil, director of the Center for Magnetic Resonance Research at the University of Minnesota. "They are trying to combine and facilitate interactions between many different types of scientists. Such efforts go on already, but it's based on individual efforts. By consciously planning this, both in terms of building design and in terms of organization, they may be able to achieve much better results."

Toni Feder

Visas Extended for Students, Scientists

After months of trying to strike a balance between openness and security, State Department officials have changed immigration rules to allow foreign researchers and students in science and technology fields classified as "sensitive" to maintain their US visa clearances for up to four years.

"This change will ensure that the US continues to have access to the world's best and brightest scientists, and that's good for science and for security," said Representative Sherwood Boehlert (R-NY), chairman of the House Committee on Science.

The Visas Mantis program was established in 1998 to prevent scientists from transferring protected technology out of the US. In the wake of the September 11th attacks, the program was tightened, and foreign scientists and many students were required to undergo complete security reviews every time they left the US and wanted to return. The reviews were cumbersome and often took months. As a result, many of the students and scientists found it risky to leave the US for any reason.

In 2003 a one-year clearance period was implemented, but that was of little help to foreign students, researchers, and scholars involved in multiyear programs. The new policy grants clearances of two years to researchers and scholars, and four years to students. The extended clearances apply only to those returning to the same program or activity for which the visa was originally granted.

The relaxation of standards came after George Atkinson, science adviser to the secretary of state, joined the consular affairs and nonproliferation bureaus to negotiate for the change with

Statue Hid Hipparchus Star Catalog

Since Alexandria's great library was ransacked 1600 years ago, astronomers have searched in vain for a copy of the Hipparchus star catalog, the earliest sky map known to have used a coordinate system. Now, an astrophysicist vacationing in Naples, Italy, believes he has found a copy sitting in plain view on a statue of Atlas, the Greek god sentenced to bear the weight of the heavens.

The two-meter-tall statue, called the Farnese Atlas, was unearthed in the 1400s and is in the National Archaeological Museum in Naples. It is believed to be a second-century-AD Roman copy of an earlier Greek original. For years historians had speculated that the globe on the giant's shoulders, which is marked with 41 Greek constellations and with lines indicating the celestial equator, tropics, and ecliptic, contained an accurate sky map.

But no one with technical training had published anything about the Farnese Atlas until Bradley Schaefer of Louisiana State University, Baton Rouge, came along last year. "I have a nice fun result simply because I am the first astrophysicist to run an analysis," he says. His research will appear in the *Journal for the History of Astronomy* next month. The sky map Schaefer identified will help astronomers and historians determine how much of Hipparchus's work was used in later star catalogs. In addition to creating the sky map, the second-century-BC astronomer discovered the wobble of Earth's axis, recorded the first observations of a nova, calculated the length of the year to within six minutes, and is said to have devised the magnitude scale for star brightness still used by astronomers today.

Schaefer dated the statue's sky map by taking advantage of one of Hipparchus's observations: Stars and constellations move slowly over time with respect to the celestial equator, tropics, and meridian lines. By digitizing high-precision photographs of the globe, Schaefer was able to mathematically match locations of constellations to a date. According to his calculations, the map rendered on the globe was created in 125 BC, give or take 55 years. The positions of the constellations on the globe are too accurate to be an artistic interpretation, says Schaefer. The date, plus the shapes of the constellations, clinch the mapmaker as Hipparchus, and rule out other potential sources, such as verbal descriptions of the night sky by Aratus (275 BC), Eudoxus (366 BC), or the Assyrian observer (1130 BC), and Ptolemy's later catalog from about AD 128.

"Schaefer's given a pretty convincing argument, and the real ingenuity here is working out the star positions just from the pictures," says Owen Gingerich, a Harvard University astronomy historian. "Perhaps the most fascinating part of this discovery," Schaefer says, "is simply that we have recovered one of the most famous known examples of 'lost ancient wisdom.' "

Paul Guinnessy


GERRY PICUS/GRIFFITH OBSERVATORY

The Farnese Atlas (above). Compensating for the slow movement of stars across the sky was the key in dating the constellations on the globe (right) to 125 BC.