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Day in the life of an 11-grant grandee

John Reed's workday begins when he wakes up at 3 a.m. to write grants and papers. At 6 or 6:30, he goes for a long run, swim or bicycle ride. By his own count, he has run 20 half-marathons and 10 marathons. Now aged 49, he's into half-triathlons — but only because full triathlons take too much training time.

By 7:30, Reed is at work at the Burnham Institute for Medical Research in La Jolla, California, juggling roles as its president and director of a 35-person lab that specializes in cell death. If his researchers need him urgently, they e-mail a secret address that goes directly to him. They each have weekly goals that must be met, and progress is measured with project-management software. "It's a no-nonsense, get-the-job-done, focused environment," Reed says.

On many evenings he has business dinners and meetings to attend. Every other evening, he goes home to spend time with his family. At weekends, he sleeps in — until 4:30 a.m.

Kenneth Yip, a 28-year-old postdoctoral researcher from Canada, joined the lab two years ago knowing that working with Reed would help him to build an attractive CV. "I don't know many principal investigators at that level who have washboard abs," Yip says. "He does everything 100% — which is 200% for the rest of us."

Reed's results speak for themselves. Between 1995 and 2005, he was the most highly cited author in all of cell biology, with 23,729 citations, according to Thomson's ESI ranking. His lab has averaged one paper per person per year.

His productivity has been rewarded with support from the US National Institutes of Health (NIH). In 2007, he received 11 NIH grants worth almost \$11 million. He says he deserves them all. And he doesn't support a cap to the number of grants permitted per researcher. "The evidence is that some labs and some people can handle a larger portfolio," Reed says. "I don't think we should apply a one-size-fits-all mentality." **E.H.**

The Solar System's first breath

HOUSTON, TEXAS

Scientists have made the crucial measurement of oxygen composition at the birth of the Solar System. The discovery fulfills the top science priority of the NASA Genesis probe, which slammed into the Utah desert in 2004 on its return to Earth when its parachute failed to open.

"Despite crashing, all the major science objectives of Genesis will be met," says Kevin McKeegan, a cosmochemist at the University of California, Los Angeles. He announced the finding on 10 March at the Lunar and Planetary Science Conference in Houston, Texas.

The finding that the Sun is relatively richer than Earth in oxygen-16, the most common oxygen isotope, contradicts the conventional wisdom that Earth has the same oxygen isotope composition as the Sun. The discovery also gives researchers a reference point for the oxygen composition at the origin of the Solar System. Genesis trapped the stream of ionized particles known as the solar wind — which, because it emanates from the relatively unchanged outer layers of the Sun, is thought to carry primordial oxygen among its elements.

Oxygen-16, with eight protons and eight neutrons, comprises 99.8% of the oxygen on Earth. There are smaller amounts of oxygen-17 and oxygen-18, whose proportions vary throughout the Solar System. Scientists have measured slightly different proportions on Earth, Mars, the Moon and in meteorites, as if each place has its own oxygen fingerprint. "We had a map for oxygen isotopes," says McKeegan. "But we didn't know which way was up."

Researchers have gone to great lengths

to try to discover the original proportion of oxygen isotopes in the Sun. Two rival groups published contradictory results from analyses of lunar soils, which are thought to contain embedded solar oxygen as the Moon lacks an atmospheric shield against the solar wind (see *Nature* 440, 751–752; 2006). One of those researchers, Marc Chaussidon, is pleased that the new findings could settle the debate.

"There has been this question for years," says Chaussidon, a cosmochemist at the Research Centre for Petrochemistry and Geochemistry in Nancy, France. "Everybody would have bet that the Sun had the same composition as Earth and the meteorites. In fact, Earth is not like the Sun."

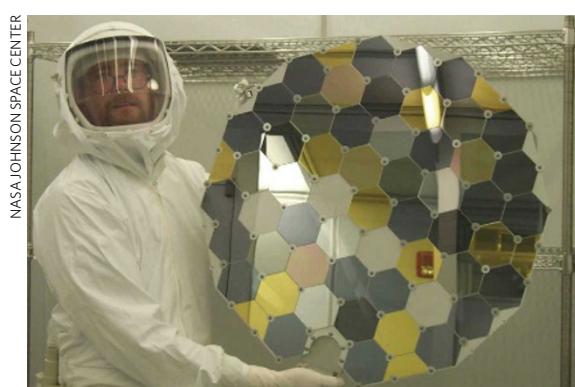
The result represents a triumph for the Genesis scientists, who have salvaged what they could from the wreck, including isotopic analyses of noble gases (A. Meshik *et al. Science* 318, 433–435; 2007). But oxygen is tougher to measure, as it is so plentiful and reactive. McKeegan and his group used a mass spectrometer on a 3-millimetre-square section of a silicon wafer containing oxygen from the solar wind.

Using a beam of caesium ions, the researchers eroded the top 20 nanometres of the sample to remove any contamination by Earth-based oxygen. Then, in a vacuum, they measured the isotopic composition of the Sun's oxygen, using the ion beam to knock the atoms loose from the silicon trap, and found a greater proportion of oxygen-16 than on Earth.

The result raises more questions, says Chaussidon. Now, scientists need to understand why Earth's oxygen composition is different from the Sun's, and what chemical processes caused the change. Whatever the process, it would have sucked out oxygen-16 while the gas of the proto-Solar System condensed into solid grains that coalesced into the planets.

It would also have been one of the very first things to happen in the 4.5685-billion-year-old Solar System. Chaussidon says the mystery process would have stripped away the oxygen-16 within the system's first few million years of existence.

Eric Hand



Genesis' collectors trapped atoms in the solar wind.