



THE LOVE BUZZ
How mating mosquitoes
harmonize their wing-beats.
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J. GATHANY/CDC

nature, explains team member Ian Seiple. This includes using cascade reactions that can form many new chemical bonds in a single step, and avoiding the use of protecting groups to shield fragile parts of a molecule during synthesis because they increase the cost and complexity of the process.

Although none of the guidelines is new, applying them all within the same synthesis has become a hallmark of Baran's work. His goal is to prove that new drugs do not have to be built from the relatively limited pool of molecular motifs used by pharmaceutical companies.

The efforts to synthesize palau'amine have forced chemists to develop new reactions and techniques for assembling complicated molecules. Part of Baran's synthesis relies on a silver-based reagent, for example, that his lab invented to gently oxidize the half-built palau'amine molecule without disrupting its nitrogen atoms. That reagent is already being used by a pharmaceutical company to make a range of drug candidates, says Baran.

In the near future, he hopes to make grams of the compound instead of the few milligrams he has so far achieved, and to tweak his synthesis so that just one of the two possible mirror-image forms of the compound is produced. His team already has a working route that cuts ten steps from the beginning of the process. "For us, the story has just begun," Baran says. ■

Mark Peplow

1. Seiple, I. B. *et al.* *Angew. Chem. Int. Edn* doi:10.1002/anie.200907112 (2009).
2. Kinnel, R. B., Gehrken, H. P. & Scheuer, P. J. *J. Am. Chem. Soc.* **115**, 3376–3377 (1993).
3. Baran, P. S., Maimone, T. J. & Richter, J. M. *Nature* **446**, 404–408 (2007).

country's science minister, for torpedoing the legislation. "The officials in his ministry warned him that his small ministry would have trouble justifying its existence if it lost authority over the council," says Dayan.

Hershkowitz rejects that charge and says he supports independent status for the council. "The law that was submitted wasn't appropriate, however," he told *Nature*. "My goal is that the research council operates with independence, but there needs to be oversight to ensure proper management."

He declined to comment on how he would react to a full council resignation.

Hershkowitz says that he plans to draft legislation in line with his goals of continued ministry oversight. Sheerit has already reintroduced his own bill, and plans to continue to push for its passage. ■

Haim Watzman

Kepler finds its first planets

WASHINGTON DC

Stars hum and throb, and the vibrations of this cosmic music could aid the NASA satellite Kepler in its goal of finding an Earth-like extrasolar planet.

On 4 January at a meeting of the American Astronomical Society in Washington DC, the Kepler team announced that it had identified five new planets. These are the first to be found by the 1-metre telescope, which stares continuously at one swathe of sky and looks for the dimming as a planet crosses a star and blocks some of its light. Hundreds more planet candidates await confirmation as the telescope gathers more data. These include some that orbit stars bright enough for their characteristic 'asteroseismology' vibrations to be detected, says Ronald Gilliland, a Kepler team member at the Space Telescope Science Institute in Baltimore, Maryland.

A precise understanding of these vibrations could allow astronomers to separate Earth-sized planets into two groups: those that are rocky and those that are watery, says Dimitar Sasselov, a co-investigator on the Kepler science team and an astronomer at Harvard University in Cambridge, Massachusetts. "It makes all the difference."

Because the core of an older star vibrates differently from that of a younger one, asteroseismology measurements can allow a precise determination of the age of the star system (and thus the planet). The data can also lead to a better estimate of the star's size — which in turn leads to more precision in the planet size. Gilliland says

the extra precision could, when combined with ground-based measurements, help to determine the density of exoplanets as much as 50% better than before. Sasselov says that will be just enough of an improvement to discern the difference between a rocky planet like Earth, which is 0.06% water, and a water world like the recently discovered GJ 1214b, which is probably at least 50% water (D. Charbonneau *et al.* *Nature* **462**, 891–894; 2009).

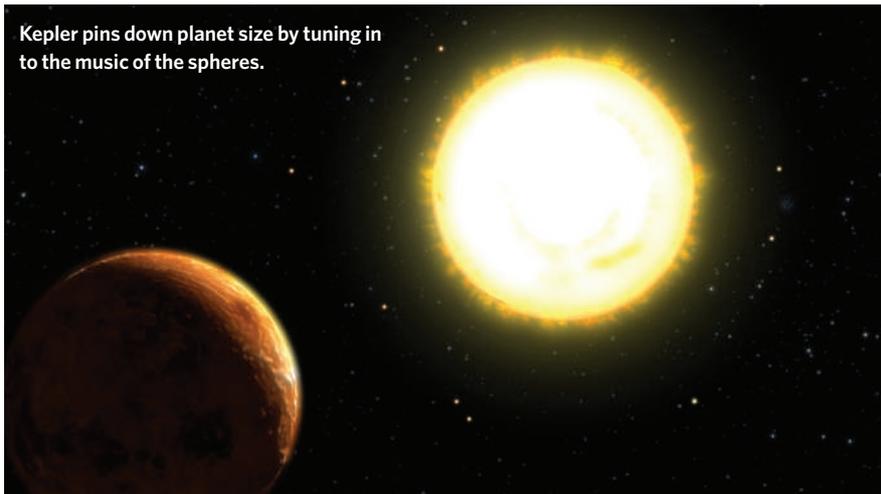
It is still early days for Kepler, which launched on 6 March 2009 from Cape Canaveral, Florida. The first five planets were discovered with just the first six weeks' science data, and they cross their parent stars repeatedly in short period orbits of a few days. Four are bigger than Jupiter — the largest planet in our Solar System — and one is about the size of Neptune.

Orbs more like Earth will be seen as the team shifts its attention to smaller planets in longer period orbits.

But Kepler only measures size. To understand density the team needs to measure mass as well, which comes from follow-up observations by ground-based astronomers. Sasselov says that even the giant 10-metre Keck telescopes in Hawaii lack an instrument sensitive enough to confirm an Earth-like planet if Kepler saw it. He is building a new instrument that he hopes to have installed on the 4.2-metre William Herschel Telescope in the Canary Islands by 2011 or 2012 — about the time when Kepler should have Earth-analogue candidates to check. ■

Eric Hand

Kepler pins down planet size by tuning in to the music of the spheres.



NASA/JPL-CALTECH