TURNING POINT
Olivier Guyon

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Optical physicist and astronomer Olivier Guyon splits his time between the University of Arizona in Tucson and the Subaru Telescope at the National Observatory of Japan in Hawaii. In October he won a John D. and Catherine T. MacArthur Foundation 'genius grant' of US$500,000.

What launched your interest in telescopes?
I grew up in the French countryside, where there was no light pollution, and became interested in astronomy at an early age. I got a small telescope as a teenager but ran out of things to look at in the sky because of the instrument's limitations. So I joined astronomy clubs and began building my own telescopes because I wanted one that was larger than what I could afford. That gave me a strong taste for instrumentation and fuelled my interests in optics.

How did you first make a name for yourself?
I started graduate school soon after two radio astronomers discovered the first Earth-like planets outside the Solar System in 1992. Funding was starting to flow and the environment was ripe for suggesting ideas and developing new techniques. My PhD was very heavy on instrumentation and focused on adaptive optics — combining sensors and mirrors to remove the effects of atmospheric distortion that prevent the detection of planets around stars. Astronomers needed a way to overcome this distortion, and adoptive optics help to recover a sharp image. My success was really due to having the right skills at the time the topic was becoming high profile.

What was your most important turning point before winning the MacArthur award?
When I came up with what I consider my biggest contribution to the field — designing a better method to block out the direct light from a star in order to detect very faint objects, like exoplanets, next to them. I created a way to alter the telescope beam to physically remove the starlight. The technique halves the costs of deploying a planet-locating telescope in space. That led to other work and projects on the ground as well as to my involvement in future space missions.

Is that how you came to split your time between two institutions?
Yes. My first position after my PhD was at the Subaru Telescope, where I developed ground-based techniques. When things ramped up on the space side, I took another position at the University of Arizona, where I was working on NASA future missions. Both institutions agreed to my schedule. I tend to spend more time in Arizona in the spring, when I'm teaching an annual course, and more time in the autumn at Subaru.

What's it like to get a MacArthur prize?
It's a very strange phone call. They ask two questions when you answer the phone: 'Are you alone?' and 'Are you sitting down?' I knew this was not the type of call I usually receive. My first reactions were a mix of being thrilled and extremely grateful — in part to the unnamed colleagues who told the committee I was worthy of this prize.

What will the funding allow you to do?
It is well suited to a project my colleague and I started two years ago. We want to prove that you don't have to be at a research institution to discover exoplanets. All that the public, schools or amateurs need is an understanding of how to detect when exoplanets are passing in front of a star, and commercial hardware to build an instrument.

We've built a prototype — a low-cost, lightweight telescope for amateurs that has now demonstrated that it can measure stars' brightness accurately enough to hunt for exoplanets. The funding will help to refine and perfect the prototype. I would like to see it take off and prompt more people to participate in the search for exoplanets. The ultimate goal is to encourage schools and amateurs to build robotic small units that will help them to join our process of discovery. Hopefully, the MacArthur prize and the visibility it generates will build interest and prompt the formation of partnerships to push this further. ■

INTERVIEW BY VIRGINIA GEWIN

RECRUITMENT

Federal talent drive

The US Department of Defense needs an overhaul if it is to successfully recruit and retain leading global talent in science, technology, engineering and maths, according to the report *Assuring the U.S. Department of Defense a Strong Science, Technology, Engineering, and Mathematics (STEM) Workforce.* Released on 25 October by the US National Academies in Washington DC, the report finds that STEM professionals view the federal agency as an undesirable workplace because of red tape, a lack of civilian training opportunities, burdensome security-clearance requirements and below-average facilities and equipment. In the near- to mid-term, the agency will probably need to recruit researchers and engineers with expertise in cybersecurity, intelligence, biosecurity and nanotechnology, among other areas, the report notes. To maximize recruitment potential, the agency should relax or expedite some of its security-clearance requirements, the report recommends. It also proposes that the US federal government modify its work-visa and green-card systems to help non-US researchers work and stay in the country.

TRANSLATIONAL RESEARCH

Entrepreneurial boost

Universities should provide scientists with mentorship, business-support services and private-sector connections to help them exploit the commercial potential of their research discoveries, says a study published on 24 October (K. D. Harrison *et al. Sci. Transl. Med.* **4,** 157fs37; 2012). The study cites the 'Garage Network' at the California Institute for Quantitative Biosciences (QB3) as an example of success. The QB3 network is a business incubator that supports entrepreneurs at the University of California's San Francisco, Berkeley and Santa Cruz campuses. By providing inexpensive space on campus and easing access to financing, it has helped to launch some 60 businesses, mainly in therapeutics and medical devices, and has generated around 280 jobs since 2006. "Universities have an obligation to ensure that their basic research leads to treatments for diseases and supports a growing economy," says study co-author and QB3 associate director Douglas Crawford. He says that universities should offer space for working on business plans and investor pitches, and should help with company launches and small-business grants.