



# *Like it? Pay for it*

With conventional sources of money drying up, some scientists are turning to crowd-funding.

In October 2010, Cesar Harada found himself in New Orleans with little money and a big idea. Harada, an engineer, had been working on oil-spill mitigation at the Massachusetts Institute of Technology in Cambridge. But he quit the lab in frustration at what he saw as a slow pace of work and a focus on expensive solutions. He travelled south to join the clean-up operation for the Deepwater Horizon oil spill in the Gulf of Mexico. Once there, his mind turned to a futuristic solution: a low-cost clean-up robot that local people could build and deploy themselves. Yet his two criteria for the project — a quick build and open-source intellectual property — all but ruled out academic or industrial funding.

Harada turned to Kickstarter, a website used by authors, film-makers and artists in search of project funding. He uploaded a pitch, set a goal of raising US\$27,500 and listed a series of small rewards for donors. Then he started to network furiously. Money came in from friends and engineering colleagues. A few companies

BY JIM GILES

heard about his idea; they pitched in several thousand dollars each. Word reached people he had never met, and they contributed too. When Harada's funding appeal closed in April 2011, he had raised almost \$34,000 — enough to assemble a team of engineers and build a prototype of the clean-up robot.

## **PUBLIC INTEREST**

If Harada's experience sounds like a one-off, think again. Crowd-funding — raising money for research directly from the public — looks set to become increasingly common. Established platforms such as Kickstarter are wooing scientists. And similar websites dedicated to connecting scientists with potential funders are being built, or have already launched. The public seems to be responding. Last year, for example, a group of scientists wanting to map water quality along the Mississippi River raised \$64,000 in a trial project on an online crowd-funding platform called

the Open Source Science Project (OSSP).

At a time when universities and research funding agencies are facing budget cuts, the strategy is attracting attention — as are other ways to raise philanthropic support (see page 254). "It's timely because of what's happening with traditional funding sources," says Daniel Gutierrez, co-founder of FundaGeek, a crowd-funding platform for technology projects that launched last month and is based in Yucca Valley, California.

For crowd-funding to make a real difference, advocates will have to prove that the process — which sometimes sidesteps conventional peer review — channels money to good projects, not just marketable ones. But if they succeed, there may be an unexpected bonus: it might help to forge a direct connection between researchers and lay people, boosting public engagement with science. "This is one of the most appealing aspects of crowd-funding," says Jennifer Calkins, an ecologist at Evergreen State College in Olympia, Washington, who has raised money for fieldwork on Kickstarter. "We can

involve society in the creative journey that we make as scientists.”

Online crowd-funding has already proved its worth in other fields. Kiva, a website through which individuals loan small amounts to entrepreneurs in the developing world, is one notable success: more than 600,000 lenders have channelled almost \$275 million through the site since 2005. US President Barack Obama's 2008 election campaign raised a record-breaking \$780 million, much of it from small online donations. And donors have pledged more than \$100 million to 13,000 Kickstarter projects. By drastically simplifying the process of connecting donor with cause, the Internet has unleashed a new enthusiasm for giving.

Scientists have come a little late to the crowd-funding party, because they have conventionally had other funding streams. Jai Ranganathan, an ecologist at the University of California, Santa Barbara (UCSB), is one of several researchers trying to make up for lost time. Last November, he helped to launch the #SciFund Challenge, an exercise in which close to 50 research groups had six weeks to raise money through proposals on a crowd-funding platform called RocketHub, which mostly serves artists and entrepreneurs. The challenge raised a total of \$76,000. Brian Meece, RocketHub's chief executive, based in New York, says that research projects are a “new and exciting” use for his platform, and that he will retain the science section now that the challenge is over.

### CASH FOR QUESTIONS

Other crowd-funding enthusiasts are developing donor sites dedicated exclusively to research projects. Sixteen projects are currently vying for funds on SciFlies, a site launched last November by David Fries, a marine engineer at the University of South Florida in St Petersburg. This year, the OSSP hopes to follow up on its success with the Mississippi study by launching a fund-raising appeal for around ten research proposals, says Priyan Weerappuli, a neuroscientist at the University of Michigan in Ann Arbor and the founder of the project.

Each site operates in a slightly different way, but there are common themes. Researchers start by describing and pricing a project, which they submit to the site for approval. If accepted, the pitch is placed online and donors have a few weeks or months to read the proposal and make a donation. Some sites operate on a non-profit basis and channel all proceeds to researchers; others are commercial concerns and take a cut of the money raised.

But although cash-starved scientists are lining up to list their projects, some are also expressing concerns. Take the issue of peer review. SciFlies and the OSSP post projects only after passing them through an expert review process, but Kickstarter's only requirement is that

projects have “a creative purpose” — as defined by the site's owners. Projects in the #SciFund Challenge did not undergo formal peer review: Ranganathan and co-founder Jarrett Byrnes, a fellow UCSB ecologist, checked only for obvious fraud. “I don't care if people have badly thought-out projects,” says Ranganathan.

That may sound like a recipe for shoddy science, but crowd-funding advocates say that the process has an inbuilt peer-review system, driven by the donors. Most donors will hear of a project through their social networks. They might be former colleagues of the project owner, or members of the public interested in an ecological study site. So project owners put their reputation among their peers and supporters on the line every time they post a proposal.

“There's a strong incentive to be honest,” says Kickstarter co-founder Yancey Strickler. “Social forces carry a lot of weight.” The sys-

## MASS APPEAL

### How to woo the crowd

The owners of crowd-funding sites give their tips on pitching winning scientific proposals.

- Create a compelling story about your research. Who will it benefit? And how? Then tell that story to camera — many sites allow project owners to upload short videos as part of the pitch.
- Devise clever rewards for donors. Think about giving away T-shirts decorated with project logos or, for big donors, a chance to visit your lab. Most sites require project owners to offer some reward, but bear in mind the time and expense required to produce and distribute whatever you offer.
- Use your social network, online and offline. Tell friends about the project, and ask them to tell their friends. Tweet it, blog it, publicize it on Facebook.
- Study previous successful pitches. Talk to the researchers behind them. Learn what works and incorporate it into your pitch. **J.G.**

tem also puts a premium on inventive, well-thought-out proposals. A poorly conceived pitch that attracts no funds will do nothing for a scientist's career; nor will one that never delivers on its promises. “It may not be formal peer review, but crowd-funding has validation based on common trust,” says Meece. “It's a pretty heavy filter.” Even Sally Rockey, deputy director for extramural research at the US National Institutes of Health in Bethesda, Maryland, sees benefits in an alternative evaluation system if it helps organizations to achieve their research goals. Peer review “is not the only model”, she says.

Some sites are trying to enhance this informal review process. FundaGeek has a discussion forum, the ‘Geek Lounge’, where potential donors are encouraged to debate the merits of a proposal. Last August, the equivalent forum on Kickstarter helped to halt one questionable project. The proposal, for a product called the Tech-Sync Power System, aimed to develop a smartphone app that controls home lighting. It attracted more than \$27,000 in pledges, but Kickstarter users with electronics knowledge started to question the viability of the system. The project owner, who could not be reached for comment, eventually deleted his proposal as the criticism mounted, and none of the donors lost their money.

### THE HARD SELL

Another objection to crowd-funding may be harder to shake. To sell a project, researchers need an attention-grabbing story (see ‘How to woo the crowd’). That is easy to construct if your subject of study is, say, saving pandas or curing cancer. It is less so for researchers working on polymers. So will crowd-funding prove profitable only for ‘sexy’ science?

Fries concedes that crowd-funding inherently favours certain types of project, particularly those in applied research. He is an optimist, saying that if the approach takes off, conventional funding agencies will simply have to compensate by upping their support for basic science.

Ranganathan, an enthusiastic communicator who runs his own podcast, bristles at the suggestion that crowd-funding will create a two-tier system. “It's all about telling a compelling story about the research,” he says. “Panda researchers start ahead, but I 100% believe anyone can do it.” A polymer chemist might, for example, focus on new materials that could come out of his or her work.

The pressure to communicate the potential fruits of a research project should not be seen as a burden, adds Ranganathan. Most crowd-funding sites expect project leaders to offer donors something in exchange for their contribution, such as regular updates on the progress of the research. For those who make larger donations there might be visits to a lab or field site. In the case of the Mississippi water-quality study, donors in the region were encouraged to help with collecting water samples from the river. This process should help to forge stronger bonds between researchers and the public.

Whether all this works in wider practice remains to be seen, but many welcome the experiment. “Science thrives on diversity,” says Jack Stilgoe, who studies science and society at the University of Exeter, UK. “We shouldn't be afraid of innovations in how it is funded. We should be more afraid when research money is all getting spent in the same way on the same sorts of things.” ■ [SEE EDITORIAL P.238 AND COMMENT P.260](#)

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