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Career Advice

Asking the Public for Money

Postdoctoral research fellow David Kipping has often seen other astronomers don smart jackets when attending meetings or giving presentations, especially when they knew that funding powers-that-be would also be there. So before heading to one of his science presentations last year, Kipping pulled on a smart jacket. His next moves, however, were less conventional. He climbed the stairs to the roof of the Perkins building at the **Harvard-Smithsonian Center for Astrophysics (http://www.cfa.harvard.edu/)** , pointed his laptop's video camera at himself and, with the center's 9-inch Clark telescope dome in the background, made a science sales pitch directly to the public. The **video (http://www.petridish.org/projects/help-us-find-the-first-exomoon)** , which appears on YouTube and on the science crowd-funding Web site **Petridish.org (http://www.petridish.org/)** , raised $12,247. The pitch was to buy and install a small supercomputer, which he would name for the biggest donor, to speed up data processing on a search for moons in other solar systems.

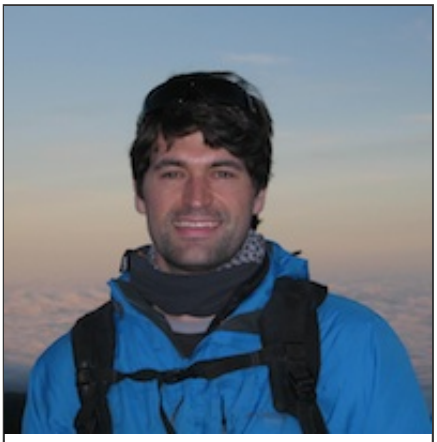
"Because [crowd-funding] is funding small projects, it's got its own niche." —David Kipping

Direct public funding of science in return for recognition is nothing new: A century ago Antarctic explorer Ernest Shackleton named dogs on one of his expeditions for the British schools that helped pay for it. He also named a lifeboat for his biggest donor. Today's online platforms like Petridish.org, however, may be more efficient than Shackleton's fundraising, which took him 2 years. Kipping secured his funding during a 30-day campaign and got the check within weeks of completion. For now, the amounts of cash raised this way remain small—Kipping's funding is typical for online science-funding campaigns. But it is extra money for scientists strapped for funds, provided they know how to navigate the opportunities and pitfalls.

What is crowd-funding?

Scientists using crowd-funding sites put together an online profile describing their project, their target amount, and the rewards they are willing to offer to donors. Some sites allow anyone to initiate campaigns, but others sift through scientific proposals and try to screen out those which do not have academic affiliations or are obvious quackery. Some offer advice and promotion.

Then the countdown, often from 30 to 90 days, begins. If, during that time, donors pledge to meet the target amount, the site charges the pledgers and passes along the money, minus an 8% to 10% commission, to the proposer, who then begins making good on the rewards and research. In order to encourage accurate goal-setting, some sites also allow researchers to collect donations that fall short of their target, but at a higher commission.



CREDIT: David Kipping

David Kipping

"It's outside the standard procedure of funding that we learn as graduate students," Kipping says. He did not have to go through a traditional funding body, such as **NASA (http://www.nasa.gov/)** , which funds his salary and an annual research supplement, nor did his proposal encounter expert peer review. But he did engage in a monthlong, online question-and-answer process with potential public funders. Kipping says they asked "really smart questions, ... particularly on the computing side," challenging, for example, his plan to use clusters rather than distributed computing. While he did not change his supercomputer's design as a result of those questions, he says he could imagine doing so given a good idea.

Current success rates are hard to estimate. Petridish.org co-founder Matt Salzberg claims that about 80% of the campaigns the company has selected and promoted since its launch in March have met their funding goals. **RocketHub (http://www.rockethub.com/)** and **Kickstarter (http://www.kickstarter.com/)** report rates in the 30% to 40% range, depending on the category. But in all cases in science, "We're talking about a tiny amount of money," says astronomer Giovanna Tinetti, who co-supervised Kipping's Ph.D. research at **University College London (http://www.ucl.ac.uk/)** . For now, Petridish.org

advises scientists to aim for $10,000 to $50,000.

An emerging platform

CREDIT: Timothy Dooley

Alton Dooley

Online crowd-funding is still in its infancy, especially in science. Some researchers are concerned that the crowd-funding process could allow weaker proposals to win funding because it bypasses peer review. In a **blog post (http://lab.hirschey.org/files/crowdfunding_science.html)** last year, biomedical researcher Matthew Hirschey of **Duke University (http://www.duke.edu/)** in Durham, North Carolina, also questioned whether crowd-funding was an efficient use of a scientist's fundraising time and whether it was a sustainable funding mechanism.

But users say crowd-funding is earning a place in the current funding landscape. The money Kipping obtained through crowd-funding allows him to speed up an ongoing project for which he already had funding from NASA. Crowd-funding can also allow researchers to meet needs unmet by conventional funding sources. Researchers sometimes need only small amounts of money, but today's funding structure is such that "it's paradoxically sometimes harder to get smaller amounts of funding" than it is to obtain the funds to run an entire laboratory, paleontologist Alton Dooley says. Dooley, a curator at the **Virginia Museum of Natural History (http://www.vmnh.net/)** in Martinsville, was able to raise $4000 through Petridish.org for **fieldwork (http://www.petridish.org/projects/saving-fossil-whales-in-virginia)** to save fossil whales in Virginia. Kipping says that crowd-funding can also be a way to pilot ideas that might later be developed into full-fledged grant proposals to more traditional funders. "Because [crowd-funding] is funding small projects, it's got its own niche," he says.

Winning over the crowd

What you first need for successful crowd-funding is a clearly defined project, says ornithologist Thomas Hart of the **University of Oxford (http://www.ox.ac.uk/)** in the United Kingdom. When using RocketHub to fund a prototype penguin-monitoring **Web cam (http://www.rockethub.com/projects/7548-a-satellite-webcam-for-penguins)** , Hart found that the public likes it when "you have a clear, defined" goal, he says. The ability to communicate your project in a clear, concise, and compelling way is also paramount. And not only in the written form: Kickstarter, for example, **tells (http://www.kickstarter.com/help/school/making_your_video)** campaigners that projects with videos succeed about 50% of the time while those without only achieve 30% success.

Credit: Lucas McNelly

Lucas McNelly and a microphone.

Perks count, too. Filmmaker Lucas McNelly, who keeps **statistics (http://www.lucasmcnelly.com/p/crowdfunding-stats.html)** and sometimes consults on crowd-funding campaigns, found that filmmakers tend to get the most donations in exchange for a DVD of their film, regardless of where it is on the donation scale. Scientists need to think of what perks will have a similar, irresistible appeal, he says. In addition to naming the computer for the biggest donor, Kipping will also sign artists' renditions of exomoons or name donors in the acknowledgement section of future papers. Dooley promised his Petridish.org donors casts of fossil bones from the excavation.

Whatever perks campaigners decide to offer, they should understand that crowd-funding efforts are not strict market transactions but rather are based on personal relationships. The first donors are often members of the scientist's network, with unknown members of the public joining in when the project gains momentum. As a potential funder, McNelly says, "I'd want to get to know the people doing this work so that I could root for them to accomplish whatever it is they're trying to accomplish." Kipping says that responding to the public's queries during the campaign took about the same amount of time he spends checking his e-mail every morning. Donors often expect the relationship to keep going during and after the project. Dooley will use his existing **blog (http://www.paleolab.org/)** to keep in touch with donors during the fieldwork and afterward when he's analyzing his data.

Navigating the pitfalls

If cultivating relationships with donors is novel to many scientists, so is releasing their research ideas to the public before peer-reviewed publication—and formal acknowledgement of who came first. Those with patentable ideas may also wonder how much they can give away without losing control of their intellectual property (IP). "There is actually historical precedent to warrant such caution," Kipping says. The dangers are not the same for all scientists, however. "In our case, the idea of looking for an exomoon is something many groups are trying to accomplish and it is widely known we are one of the teams leading this effort, so I had no concerns about discussing this plan with the public, too," Kipping adds. Being scooped is also "perhaps of less

concern in a field such as paleontology, where the results are often tied to particular specimens or locations," Dooley adds.

Picking a platform

Science and technology crowd-funders

Petridish.org (http://www.petridish.org/)

TechMoola.com (http://www.techmoola.com/)

Sciflies.org (http://sciflies.org/)

Open Genius (http://www.opengenius.org/)

The **The Open Source Science Project (http://www.theopensourcescienceproject.com/)**

#SciFund Challenge (http://scifundchallenge.org/)

Anything-goes crowd-funders

Kickstarter (http://www.kickstarter.com/)

RocketHub (http://www.rockethub.com/)

Indiegogo (http://www.indiegogo.com/)

Peerbackers (http://peerbackers.com/)

Another crowd-funding platform, **FundaGeek (http://www.fundageek.com/)** , offers campaigners the ability to restrict the visibility of their campaign to registered potential donors who have agreed to a non-disclosure statement. They also offer **an IP guide (http://www.fundageek.com/NonDisclosure)** . Researchers considering weighing how much to share ahead of publication can also look to the **Open Science movement (http://sciencecareers.sciencemag.org/career_magazine/previous_issues/articles/2010_04_09/caredit.a1000036)** for useful discussions and guidance.

Researchers can also seek legal and logistical help from their institutions. Universities and museums, for instance, have a long tradition of raising money from crowds, even if their platforms predate the Internet. Dooley says he consulted his museum's marketing department, which promoted his project via its Twitter and Facebook accounts. Other universities have **promoted campaigns (http://researchmatters.asu.edu/stories/scientists-use-crowd-funding-support-research-2247)** by their researchers to attract press attention and online donors. Harvard University helped Kipping administer his crowd-sourced funding as a gift rather than a grant so he would not have to pay high overhead fees.

But crowd-funding is so new that some universities and institutions may be less prepared to support their researchers in getting crowd-funding. They may be unsure how to handle money generated through crowd-funding, or worry that crowd-funding might interfere with their own fundraising campaigns, wrote ecologist Jai Ranganathan of the **University of California, Santa Barbara (http://www.ucsb.edu/)** , in a **post (http://scifundchallenge.org/blog/2012/03/12/university-objections-to-scifund-how-do-you-counter-them/)** . In 2011, Ranganathan co-founded the **#SciFund Challenge (http://scifundchallenge.org/)** using the general-purpose crowd-funding site RocketHub as an experiment to test whether scientists can use crowd-funding to support their research. Ranganathan advises scientists to contact their university administrators early on to smooth the way.

Because crowd-funding bypasses some of the traditional gatekeepers and shrinks the distance between researchers and the public, it warrants care. But the users *Science* Careers reached report no criticism from their institutions or peers. Kipping's colleagues encouraged him to pursue the campaign when he discussed it with them, and Dooley's institution adopted a "let us know how it goes" attitude, he says. After trying it, the crowd-funded scientists found no downsides, and they praised the easy application process, short turnaround time, and extra money. "If the science is good then it's always good when it's funded," Tinetti says.

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