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With Funding Tight, Researchers Tap the Public

NANCY AVERETT

When Yiwei Wang and Rachel Wheat wanted to study the impact of Pacific salmon on the southeastern Alaskan ecosystem, they might have applied to the National Science Foundation (NSF) for funding. But with no track record, no preliminary data, and institutional funding low—fewer than 25 percent of NSF grant applicants receive funding—the two University of California, Santa Cruz, graduate students knew their chances were slim.

So, like a growing number of scientists, they turned to crowdfunding, an Internet-based mechanism through which individuals solicit small amounts from many donors instead of a single large sum from an institution. In June 2012, they worked through one such Web site, Kickstarter, to set up a campaign to raise $10,000. "We were both familiar with crowdfunding," Wheat said, "so we decided to give it a go."

Most Kickstarter ventures are focused on creative fields, rather than science, and donors receive a piece of the work once it has been funded: a DVD, a framed print, theater tickets. Researchers rarely have such swag, which is one reason why a handful of science sites—Microryza, Petridish.org, #SciFund Challenge, and FundaGeek—have popped up. "The natural output of the scientific process is just kind of more science," said Denny Luan, who cofounded Microryza in 2012. "You can't give people a trinket or a mug or a T-shirt." Instead, Luan said, investigators can share with donors the thrill of scientific discovery.

In an article on crowdfunding in the December 2012 issue of *Trends in Ecology and Evolution* (doi:10.1016/j.tree.2012.11.001), Wang and Wheat note that ecologists and evolutionary biologists are at the forefront of science crowdfunding, perhaps because it "is an extension of crowdsourcing, a concept familiar to many ecologists who have used citizen science data for their research." They also point out that most requests are for less than $10,000, making crowdfunding better suited for graduate student summer research than for a huge multiyear study. Still, doctoral students aren't the only ones using it. Ken Hotopp, who owns an environmental consulting company, recently raised $2725 on Microryza to study a freshwater snail in Maine. "It was hard to get government funding," Hotopp said, "because it's not a charismatic megafauna."

Even researchers with high-profile reputations have turned to crowdfunding. Dan Jaffe, an atmospheric chemist at the University of Washington, has garnered nearly $5 million in grants from the NSF and other federal agencies. Yet, when he recently decided to take on an urgent and politically dicey air-quality project, he found no local, state, or federal support. Jaffe was concerned that crowdfunding might take too much time. "But," he said, "it was this approach or no study." He turned to Microryza this spring and raised his goal—$18,000—in 1 week. "I was surprised [at] how quickly the money came through," Jaffe said. "This clearly reflects the high-profile nature of this project and the need [of] the public for legitimate and trustworthy scientific information."

Both Microryza and Kickstarter require that project proposers reach their goal within a set time period in order to use the funds; otherwise, all money must be returned to the donors. Jaffe was aided when a Seattle National Public Radio station interviewed him on his research, which was related to a controversial plan to transport millions of tons of coal by rail from Wyoming to ports in the Pacific Northwest. But Hotopp ended up contributing $1000 of his own money. "We got money from the [Maine] State Department of Inland Fisheries and Wildlife, a good chunk from Colby College, and my brother-in-law kicked in some, so I decided to pitch in the rest of the money," he said. "I wanted to take advantage of the money we got, because I knew we probably wouldn't get it again."

Wheat and Wang agree that it's difficult to get the public's attention. "We basically had to work every day to think of ways to drive people to our site," Wang said. They e-mailed friends and family, used Facebook and Twitter, made cold calls to nonprofits, gave public lectures, and made frequent updates to their Web site and blog. In the end, they succeeded, raising $10,124.

This year, Wheat used her preliminary research to win an NSF Graduate Research Fellowship that will pay for the next 3 years of the project. "I showed them [that] I'd already begun the work and that my methods were feasible and already generating a lot of really intriguing information," she said. Still, both she and Wang agree that the public outreach was the best part of the experience. Luan said that this reaction is typical, citing a tenured professor at the University of Alabama who struggled at first with reaching out to potential donors through a Mircroryza campaign but quickly came to enjoy it. "She told us it was the coolest thing she had ever done in her career," he said. "She realized people out there really cared about her research."

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