

with words and phrases mined from the advert. A computer will almost certainly do the initial screen to weed out non-viable candidates and assign ratings; applicants shouldn't risk their submission being deleted just because it didn't contain the appropriate keywords. "Give them every reason to screen you in instead of screening you out," says Tringali, who adds that résumés and CVs for industry should not be overly technical.

In the interest of brevity, industrial applications should not include appendices, says Blackford. Terry Jones, senior careers consultant at the Careers Group, University of London, agrees. "Some applicants think that hiring managers will be happier with a much longer account. But people are busy," he stresses. "You need to get over some key points pretty quickly. It's about clarity, not about endless detail." Including irrelevant information about publications, grants, awards and presentations could also send the wrong message: "If industry sees someone with a huge publications appendix, they may think this person is still hanging on to academic culture," says Blackford.

Those applying to positions in Germany, Austria and parts of Switzerland need to be aware of cultural differences, says Barbara Janssens, PhD career manager for the German Cancer Research Center in Heidelberg. If an advert is in German, employers in those countries expect CVs in the same language — not in English. CVs should include a professional photograph of the applicant, she says, and must be signed and dated. They should also include personal details such as date of birth and marital status, and copies or PDFs of diplomas and certificates.

When applying for scientific positions in most other European nations, it is safe to send application materials in English, unless the advert is in another language. In that case, applicants should contact the employer to learn what language to use.

Ultimately, say careers advisers, applicants need to suss out potential employers' expectations for format, language and other uncertainties by reading the advert, checking with mentors, reaching out to contacts who work for the employer and asking the employer themselves. The most brilliant research accomplishments can't work in an applicant's favour if the CV or résumé goes unread, as Sharon Milgram, director of the Office of Intramural Training and Education at the US National Institutes of Health in Bethesda, Maryland, points out. "Don't blow your chances," she says, "by not giving me what I want." ■

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## TURNING POINT

# Brian Fisher

*Brian Fisher, an entomologist and curator at the California Academy of Sciences in San Francisco, has maintained funding from the US National Science Foundation (NSF) since 1994 to collect and study ants from around the world. He has identified more than 1,000 species and studied their evolution. After a few US politicians suggested that his grants are wasteful government spending, he started considering different ways to fund his research. This year, Fisher found some success with crowd-funding through a website called Petridish.*



### How did your research become politicized?

It started in 2010, when Senator John McCain (Republican, Arizona) listed my field work in East Africa — collecting ants and sharing their photos and information on the AntWeb website — as number six of what he considered the top 100 most wasteful projects funded by the American Recovery and Reinvestment Act of 2009. Since then, the project has been cited in at least six different Republican campaign commercials as an example of how President Barack Obama's administration wastes money. It has been interesting to get raked over the coals. But what caught me most off guard was that the critics, such as conservative radio personalities, weren't necessarily focused on funding for ants; they were questioning whether the government should fund science at all.

### Has there been any fallout for your career?

I have a big research project, with 25 people involved worldwide. I'm worried about the next NSF funding cycle, and the negative publicity doesn't help. So I've been looking at alternative sources of funding, including crowd-funding: small contributions from online donors.

### How has science funding changed since you got your PhD?

Scientists have become more like entrepreneurs, having to seek many sources of support. Ant research has always been on the fringe, getting by on crumbs of funding. But you used to be able to sustain your career on NSF funding. Now scientists need a portfolio of options.

### How did you learn to create such a portfolio?

I dropped out of my first graduate programme, in biology, because the only money available required me to work on a project that I wasn't passionate about. I spent a year incubating ideas and writing grant applications — figuring out how to raise my own money — so that I could pursue research on ant diversity. Since then, I have raised well over US\$750,000 from

unconventional sources, including private donors, corporations and foundations, to create the Madagascar Biodiversity Center in Antananarivo, which identifies land for conservation and catalogues local species. I've also been able to create Ant Course: a field course offered in different countries to teach students about ant taxonomy and field-research techniques.

### Describe your experience on Petridish.

I wanted to secure at least \$10,000 in funding to visit a remote, rugged, pristine forest in northwestern Madagascar, to collect ant species before the habitat is converted for cattle raising. My project was posted online for 45 days and I landed 94 backers — ranging from one who pledged more than \$5,000 to 48 who pledged about \$20 each. This was my first experience with crowd-funding and it was really hard, especially shooting the requisite video pitch. I'm used to investing three weeks of blood and sweat writing an NSF grant application, but speaking directly to the public was very different.

### How might crowd-funding help science?

Scientists need alternative sources of money now, but that is just one of the benefits. Crowd-sourcing helps to democratize science — the websites let amateur scientists participate. There is a public-relations aspect — you have to make clear the relevance of your research. I think every graduate student should try to get funding in this way, because the emphasis is on communication. They would need to focus their questions and make a pitch, but a few thousand dollars could be enough to support them. Graduate students need to learn how to advocate for their field — you can't just hide inside the ivory tower. The walls are gone. ■

INTERVIEW BY VIRGINIA GEWIN