

# CAREERS

**STAND UP** Nations join together in marching for facts **p.261**

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Scientists rallied in Boston, Massachusetts, to 'stand up for science' in the face of presidential actions.

## POLITICS

# Candidate science

*President Donald Trump's rise to power has been prompting scientists to explore possibilities for political action.*

BY VIRGINIA GEWIN

Physicist Andrew Zwicker was the underdog in a New Jersey state-assembly race in late 2015. But the head of science education at the Princeton Plasma Physics Laboratory took a step familiar to scientists — he used data to inform his strategy.

Zwicker's campaign team mapped the registered voters in the district and created a model to identify those who would be most likely to respond to his message of 'evidence-based decision-making'. His team carefully crafted every piece of communication to draw that group to the polls to vote for him. Meanwhile, political pundits sneered. "The party insiders ignored me; the pollsters said I had no chance," he says.

Yet he was elected — with a margin of just 78 votes — to represent one of the state's legislative districts. The first physicist in the history of the state's legislature now straddles two worlds: half-time assemblyman, half-time academic.

It wasn't Zwicker's first election: in 2014, he ran in a primary race for a Democratic congressional seat in New Jersey. He believed that policymaking could benefit from more-analytical thinking to combat the increase in the use of 'alternative facts' — purposeful confusion tactics — along with attacks on science.

In the wake of the election of a US president who has questioned whether climate change is real and backed the debunked notion that vaccines cause autism, US scientists are increasingly exploring ways to get politically involved.

On 22 April, at least 428 cities in 44 countries will host a March for Science (see page 261). High-profile scientists such as Jon Foley, executive director of the California Academy of Sciences in San Francisco, are calling on researchers to forego their long-standing reluctance to engage in political discussions and to stand up for facts.

More than 3,000 scientists have now expressed interest in exploring the world of politics — and 150 of them will attend a training event this month on the basics of running for office. The event, which will be posted online later as a webinar, is organized by 314 Action, a non-profit political action committee that formed in Washington DC last year to encourage scientists to run for office at state and national levels, and to support them in their endeavours. At least three scientists are intending to announce this month that they will be running for congressional office in 2018.

## RISKY DECISION

Candidates have a lot to consider before mounting a political campaign. It's a risky endeavour from a financial standpoint, and high salaries and career flexibility might explain why lawyers have tended to dominate US congressional positions. But the tide is slowly turning: in 2015, lawyers made up around one-third of the US Congress, down from 80% in 1850. Educators hold 12% of the posts and medical professionals and agriculturalists collectively hold 10%.

Scientists have long shied away from politics. Many fear that they will lose their credibility if they defend science that has become politicized, observed Harvard University science historian Naomi Oreskes in her plenary talk at the annual meeting of the American Association for the Advancement of Science (AAAS) in February. Foley argues that a 'war on science' is under way, and that scientists are the ones best placed to fight this war, by demonstrating how science affects daily life and by questioning sceptics' motivations.

But, he cautions, there is a stark difference between engaging in political discourse and becoming a partisan candidate. "If scientists want to run for office, they had better be prepared to leave their scientific careers behind," he says. And leaving the bench has clear knock-on effects for the numerous students and staff researchers the labs support, so it helps to prepare for that eventuality. If that's too big a step, however, there may be more ▶

► leeway for balancing political and scientific careers at the state and local level.

Even if scientists end up deciding that running for a political position isn't an option, they can still influence politics by forging relationships as trusted advisers to politicians, for example, or working for a non-governmental organization (NGO).

### PART-TIME BEGINNINGS

Many would-be politicians get their feet wet at the local level — often in part-time posts such as on a city council or a school board. It's a way to keep a day job while building up name recognition in political circles.

But a national run can be tempting for those who want to add their scientific voice to issues of national importance — such as energy or public health. Nuclear engineer Brian Johnson contacted 314 Action, keen to have a voice on issues that could be tackled only at the congressional level, such as climate change and net neutrality, the principle that Internet service providers and governments all regulate online data in the same way.

But he realized that he would probably need to give up his job as head of risk assessment at TerraPower, a nuclear-reactor design company in Bellevue, Washington, to put together a solid candidacy. He asked himself a series of questions (see 'Political checklist') to assess his readiness for a campaign and whether it would be worth the risk to his career, which required a narrowly defined skill set in a nascent sector. Ultimately, he decided against it.

He's not alone. Leaving behind a scientific career is a significant concern for many of the scientists who have contacted 314 Action. One of the first questions that people ask is, "Can I work full-time and run?," says executive director Josh Morrow. The answer, he says, is no — at least not in election year.

And in the run-up to election year, potential candidates should determine whether selling themselves as a scientist would be a net positive. "We polled that question carefully," says Bill Foster (Democrat, Illinois), the only PhD physicist in Congress, "because I was worried that 'scientist' would give an elitist impression among the electorate."

That wasn't the case for him, but it's a region-specific question that potential candidates should explore. "Scientists need to realize that science doesn't dictate all policy and it never will," says Jane Lubchenco, a marine biologist who has served as president of the AAAS and was administrator of the National Oceanic and Atmospheric Administration (NOAA) under former president Barack Obama. "But," she adds, "we're all better off if it's at the table."

Academics such as palaeoecologist Jacquelyn Gill at the University of Maine in Orono find that timing is a hurdle. Gill considered running for office, but decided to shelve those pursuits for now. She may reconsider once she has progressed beyond processing grants and

mentoring graduate students. "For most of us on the tenure track, it is not a very flexible timeline," she says. The typical model for getting into politics looked like this, she says: do good science, become a strong communicator, get tapped to serve as a US National Science Foundation (NSF) officer. There's just one problem with that model, she adds: "When there is an explicitly anti-science administration, you won't get tapped."

Morrow points out that entering politics can open career doors through the expansion of networks. 314 Action, for example, has tens of thousands of scientists in its network, including Nobel prizewinners. "Scientists will form relationships that might further their career, even if they are not successful in a run for office," he says. 314 Action has established more than 50 campus chapters and 25 state coordinators to help organize people to advocate on science-specific issues.

For would-be candidates who are eager to get their scientific message out, it is crucial to listen, says Foster. "Spend a while listening to people in your district to make sure you understand how they are served well in government," he says, "and how they could be served better."

### DOUBLE AGENT

Zwicker is a good example of someone who is successfully managing to combine scientific and political careers. He still has a lab, although he is rarely there and he stopped doing straight research in 2003. His half-time split means that he can continue in science education, but it's not an easy transition. Politics is "the hardest thing" he's ever done, he says. "Instead of teaching around 100 people, I represent around 155,000 people," he says. He's



Physicist Andrew Zwicker (left) is a New Jersey assemblyman.

## POLITICAL CHECKLIST

### Preparatory questions

- Do I have the right temperament?
- Can I take criticism?
- Am I good at negotiating?
- Am I willing to ask people for money?
- Can I connect with the public — speaking in plain English, without jargon?
- Am I comfortable selling myself?
- Am I ready to be a public person and all that comes with that (such as digging into my past or my family's past)? **V.G.**

sponsored or co-sponsored more than 100 bills in his first year, but fundraising is different and needs strong communication skills. Scientists, he says, typically stick to facts and figures — a strategy that failed to resonate with constituents early in his political career.

Perhaps the biggest difference between science and politics, says Lubchenco, is that data and facts aren't the only factors in political decision-making. The most effective individuals have relationships across the political spectrum, not just with obvious allies. "Developing and cultivating those relationships is much of the way politics happens," she notes.

There are, of course, other ways to be politically active that don't involve running for office. Natalia Sanchez, who immigrated to the United States from Colombia when she was 14, has forged that path herself. She arrived in the United States with one goal: to become a rocket scientist. Since 2008, she has worked at NASA's Jet Propulsion Lab (JPL) in Pasadena, California, where she has served on teams that sent spacecraft to both Mars and Jupiter and has been involved in planetary-science research on Earth.

After last year's presidential election, she felt that the stakes were high enough to alter her career path. She contemplated running for a school-board position in California, but ended up becoming a field director for Tracy Van Houten, a fellow JPL rocket scientist who is one of 23 candidates running to represent California's 34th congressional district. Sanchez helps Van Houten to engage her voters and to shape her platform on immigration. "Whether or not I eventually run, I've made the switch to politics," she says. "I can help solve problems."

Scientists can also offer advice to established politicians. Having led three different scientific societies, Lubchenco knew more than 30 members of Congress quite well and had testified in Congress multiple times before she led NOAA. She encourages scientists to offer their expertise to US representatives and senators. For example, when the gene-editing tool CRISPR-Cas9 became a scientific reality a few years ago, Foster started

receiving urgent requests for meetings from high-profile scientists who wanted Congress to begin grappling with the societal impacts of human genetic engineering — such as the ethical considerations of designer babies.

The best way to offer advice, Foster says, is to set up an in-person meeting in your home state. “You will not be mistaken for a random lobbyist, you will be a constituent,” he points out. And a home meeting precludes the possibility that any group of scientists coming to speak to Congress would be seen as just another special-interest group, he adds.

Lubchenco says that scientists can also consider doing sabbaticals in which they work with members of Congress, federal agencies or the White House. And another option is serving on an advisory committee or board of directors for a foundation or NGO. “Many NGOs are politically very savvy,” she says, but “they often need help with the science”.

Foster notes that scientists should consider serving in the government’s scientific management operations, such as the NSF, US Department of Energy or in oversight of military research. Key

budget decisions are often made in private meetings, and it’s essential to have the best scientific expertise there, he says.

Scientists may find they already have skills they didn’t realize would be applicable to politics. “When I went to NOAA, I would joke with students that I was ready for the political fray because I already knew how to swim with sharks,” Lubchenco says. They laughed, she adds, but there was truth to that — animal behavioural science is about reading body language accurately so that you can tell whether a shark is going to pass by or is about to eat you. “The same,” she says, “is true in politics.” ■

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#### CORRECTION

The Turning Point ‘Whale watcher’ (*Nature* **543**, 579; 2017) included several errors: the subspecies name should have been *indica*, not *brevicauda*; the population off Sri Lanka might not be sizeable; and Oceanswell’s remit covers all marine research, not just that for whales.

# TURNING POINT

## Marching for facts

*Valorie Aquino is one of three lead organizers of the first annual worldwide March for Science on Earth Day, 22 April. Born in the Philippines, she immigrated to the United States as a child and is a PhD candidate at the University of New Mexico in Albuquerque. Aquino combines archaeological excavations of ancient Mayan sites with palaeoclimate reconstructions to understand how humans and the environment interact over time. She discusses why it’s time to stand up for science.*



#### What spawned the idea of the March for Science?

It sprang up after the huge success of the Women’s March, held around the world the day after President Trump’s inauguration. Two people took a lead. Jonathan Berman, a post-doc in physiology at the University of Texas in San Antonio, bought the Marchforscience.com URL. Caroline Weinberg, a science writer based in New York City, used Twitter to connect everyone who was talking about this. A Facebook group was born and within 12 hours it had 55,000 members. Across all social-media platforms we have over 1.6 million followers.

#### How did you get involved?

I was one of the volunteers that Caroline and Jon brought in to oversee the Facebook public page. They invited me to be a third organizer and to help craft our mission, identity, principles and goal statements. I took a lead on partnering with scientific organizations and helping to plan events at the march in collaboration with the Earth Day Network.

#### Some say we should address policy on racial diversity, gender equality or immigration.

Inclusion and diversity in science are core to our principles. People with diverse backgrounds, perspectives and abilities are integrated at all levels of leadership in the March for Science national committees. Discrimination holds back scientific advances, and we’re committed to talking to our peers about these topics, even when it’s uncomfortable.

#### Others fear the march will politicize science.

We’ve heard that the march could harm the science community more than help it. But science is not divorced from politics. Scientists are human beings. We’ve made sure to include a diversity of people and opinions, and synthesized those opinions into a clear message — specifically, the need to defend scientific integrity and protect the scientific enterprise — on our web page and

social-media outlets. We’ve secured support from more than 160 scholarly scientific and academic organizations.

#### How do you think joining this group will affect your career?

Scientists typically don’t stick their necks out politically, for fear of losing research funding or being branded in a certain way, so I had to weigh professional risks against my ethical concerns. And that was something I sat on — but not for very long. It’s so important right now to speak out.

#### Has the march affected your PhD timeline?

My PhD programme might be a little delayed. But it’s worth it. It’s crucial to make this cause as successful as it can be. I barely have time to sleep and eat. But I don’t mind. It’s galvanizing.

#### Will this experience take you on a new career path?

Absolutely. Before this, I was on a path to become an academic at a leading university, managing my own research projects. Now, I’ve pivoted 180 degrees. I feel that I can connect different communities and improve science-communication efforts. The march itself is an isolated event, but we have a long-term vision and are planning post-march actions. Mainly, we’ll focus on scientific education and cultivating scientific curiosity and enquiry.

#### What would make a successful march for you?

I hope we see a huge turnout around the world and that non-violent marchers prove inspiring. So far, more than 470 cities worldwide have organized satellite marches. I also want us to influence policymaking. This is a marathon and a relay race all in one. ■

#### INTERVIEW BY VIRGINIA GEWIN

This interview has been edited for length and clarity.

**CORRECTION**

The Careers Feature 'Candidate science' (*Nature* **544**, 259–261; 2017) erroneously referred to Bob Foster (Republican, Illinois). In fact it should have referred to Bill Foster (Democrat, Illinois).