

postdocs

Both Alaluf and Brubert recommend projects like Dance Your Ph.D. as an exercise in effective science communication. Alaluf says it made her see her work differently and prompted her to think of new ways to explain it. “It’s hard to compress your Ph.D. into a few minutes,” Brubert says. “So it’s a good lesson in picking out what’s important to communicate.” Plus, he says, “Now I have a fun way to finish presentations about my work.”



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– Lise Johnson

Exploring career paths

For **Lise Johnson**, outside projects are a way to hone communication skills, have fun, and explore career options. Johnson is a research scientist studying sleep, memory, and learning, and is the education manager for internships at the Center for Sensorimotor Neural Engineering, based at the University of Washington in Seattle.

In 2014, Johnson participated in “Thought Experiments on the Question of Being Human,” an annual festival of short plays about science, technology, and humanity, organized by the city’s Infinity Box Theatre Project. Johnson was one of five scientists who talked with local playwrights about neural engineering. The playwrights turned

the conversations into plays that were performed as staged readings. Johnson did the project for fun, without expectations. “It was an interesting intersection of different fields,” she says, “And I got to practice something I do a lot—talk about science to people without a science background.” She is also coauthoring popular science books with her research center’s executive director. Their first is *Brain Bytes: Quick Answers to Quirky Questions About the Brain*.

Johnson says projects that use scientific knowledge in nontraditional ways can be a way to consider career paths. “I’m still considering a research career, but working in education, industry, or science communication is also a possibility, so I do these types of projects to get experience,” she explains.

The secret to juggling diverse obligations like research, book projects, teaching, and family life with two young children, observes Johnson, is being organized and transitioning quickly from one type of work to another. “Scheduling is a big issue,” she says, “I used to rely on my memory, but now I write everything down.”

Keeping options open

Early career scientists may particularly benefit from experiences outside the lab. **Sam Wang**, a professor of molecular biology at Princeton University, who directs a lab at the Princeton Neuroscience Institute, says the main responsibility of his students and postdocs is their research—but they should also be thinking about their career path, he adds. In addition to academic and research positions, he has had advisees take jobs at a pharmaceutical company, a science journal, and a hedge fund. “As

scientists, we always have to think about the next thing,” he says, “but when you’re a student, it’s especially important. And there’s so much you can do with science training.”

Wang speaks from experience. Throughout his career, he has applied his scientific skills to a personal interest in politics and policy. During his postdoctoral fellowship, he took a year to do a AAAS Science & Technology Policy Fellowship, assisting Sen. Ted Kennedy with science and education policy. “The work I did used my verbal and math science skills,” he says. “I did statistical analysis, designed charts, and provided information for speeches and documents.” Wang considered continuing in government, but stuck with his original plan to go back to neuroscience. One reason was that an academic position doesn’t preclude working in policy in the future. “I knew the policy work would still be there, and it still is,” he says.

Early in his academic career, Wang launched his nationally known Princeton Election Consortium blog, which analyzes U.S. elections. He also coauthored the popular science book *Welcome to Your Brain: Why You Lose Your Car Keys but Never Forget How to Drive and Other Puzzles of Everyday Life*. Wang’s attitude was that the pretense period is high pressure, but also gives you several years of job security, which allows you to pursue other interests. Sometimes, though, your job and your outside interests will simultaneously impose demands, he says, and then “you just have to make all the deadlines.”

Launching a new field

Merging disciplines can be a career in itself. Arielle Johnson has been interested in science and culinary arts since the early 2000s, when molecular gastronomy was in the news and a new edition of Harold McGee’s classic book, *On Food and Cooking: The Science and Lore of the Kitchen*, was released. While studying at New York University, she heard that chemistry professor Kent Kirshenbaum was planning a seminar series on science and food. “I talked my way into the first meeting and refused to leave,” she says. That opportunity introduced her to culinary leaders and led to an undergraduate project on how polymers change the texture of ice cream.

Finding a graduate program took some effort, since Johnson’s interests didn’t match the curricula of typical food science departments. The perfect fit was the University of California, Davis, which houses the Robert Mondavi Institute for Wine and Food Science. The executive board includes McGee, who has since become Johnson’s friend and mentor. When she explained that she wanted to work with chefs on experimental food techniques, Johnson says, “They got it.”

In graduate school, Johnson networked her way to a summer position at Noma in Copenhagen, Denmark, which led *Restaurant* magazine’s “World’s 50 Best Restaurants” list. At first, the chefs weren’t sure what to do with the American scientist in their kitchen. “They were skeptical,” Johnson says. But the restaurant was experimenting with adding insects to their recipes and one day, she saw Chef Lars Williams reading a research paper on insect pheromones. When Johnson pointed to the chemical diagrams and said, “Those are flavor molecules,” the chefs realized what she could contribute.

In addition to scientific expertise, Johnson attributes her success in a high-pressure restaurant environment **cont.>**

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Dr. Wang, far right, with his lab group.

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Featured participants

Center for Sensorimotor Neural Engineering, University of Washington
www.csne-erc.org

Free University of Brussels
www.vub.ac.be/en

MIT Media Lab, Massachusetts Institute of Technology
www.media.mit.edu

Princeton Neuroscience Institute
pni.princeton.edu

Robert Mondavi Institute for Food and Wine Science
robertmondaviinstitute.ucdavis.edu

University of Cambridge
www.cam.ac.uk

Brain Bytes: Quick Answers to Quirky Questions About the Brain
www.goodreads.com/book/show/30231747-brain-bytes

Dance Your Ph.D. Contest
www.sciencemag.org/projects/dance-your-phd

Meeting Global Challenges
www.sciencemag.org/content/343/6171/579.summary

Princeton Election Consortium
election.princeton.edu

Welcome to Your Brain: Why You Lose Your Car Keys but Never Forget How to Drive and Other Puzzles of Everyday Life
www.bloomsbury.com/us/welcome-to-your-brain-9781596915237

Additional resources

AAAS Science & Technology Policy Fellowships
www.aaas.org/program/science-technology-policy-fellowships

to her “willingness to lift a shovel when necessary.” When she finished her Ph.D., Noma hired her to work with Williams to create a lab out of shipping containers, for experiments on fermented foods such as pickles, miso, and kombucha. To prepare, Johnson says, “I spent my last months at UC Davis hanging around the plant labs studying heating and humidifying systems.” In addition to the engineering experience, Johnson’s unusual postdoc gave her knowledge of the chemistry, biochemistry, and microbiology of fermented foods.

Johnson is now at the MIT Media Lab at the Massachusetts Institute of Technology in Cambridge, where all projects are interdisciplinary. As a director’s fellow on the Open Phenome Project, she works with engineers, biologists, and architects, studying how environmental conditions such as temperature affect the production of plant flavor molecules.

Like Alaluf and Brubert, Johnson finds that working with people who share her interests yet have different backgrounds improves her science communication skills. At Noma, she says, “I had to explain what I was thinking about in simple English, all the time.” Working with chefs, fermentation experts, and engineers pushes her to be a better scientist, she adds. “I get knowledge that I can’t get academically.”

Think, ask, then “give it a go”

Based on their experience with unusual collaborations, the scientists have some advice. Think about your goals for the project you’re working on, Arielle Johnson says. “You’ll have a happier time if you figure out what you want from it first.” Try blogging or other writing to explore and reflect on a new field and establish your presence there, she suggests.

If the project requires time away from the lab, consider the financial aspects. Johnson had an NSF graduate fellowship, which gave her the freedom to go to Noma for several months. “Having money that you control is extremely liberating,” she says. Wang says the AAAS fellowship let him immerse himself in the government for a year, so he could fully experience that work. “The time away from my research clarified what I wanted,” he says. “In the end, it was to come back to neuroscience, but the year away sharpened my ambition in the field.”

Regardless of the time involved, consult your advisors. Both Alaluf and Brubert talked with their advisors in advance and didn’t let video production interfere with their research. Wang says he applied for the policy fellowship with the support of his postdoctoral advisor, who told him he could return to the lab afterward.

While academic advisors can give some important guidance, external networking is also critical. Reach out via social media or in person, and at talks or conferences, to people who inspire you and are working in the area that interests you, as Arielle Johnson did with McGee. “Scientists might not be the most sociable people, but everyone enjoys talking about shared interests,” she says. Consult a lot of people for guidance, she advises, and be respectful of the time they take to mentor you.

Wang recommends talking to those who made the same decision you are considering. People are usually very generous about sharing their experiences, he says. “Get advice from people who’ve been at the same career crossroad, but are now 5 or 10 years further along.”

Once you decide to collaborate on a nontraditional project, whether you are contributing your scientific expertise or just showing up and dancing, put your heart into it. “Give it a go,” says Brubert. “People who are enthusiastic make everything easier and fun.”

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