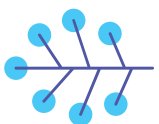




Civic Science Career Roadmap



Civic Science Fellows

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NAVIGATING THE FUTURE



Civic Science Fellows and partners gathered in 2023 at the National Academy of Sciences Building in Washington, D.C. (Photo: Sameer Khan)

Dear Colleagues,

Working across new and deepening connections, we are hearing compelling shared aspirations and resonance for a future where science is a vibrant part of community life and democratic deliberation. A future where all people can find belonging and fulfillment in the practice of science. A future where discovery makes lives better, communities stronger.

As new generations prepare to lead the way into this future, with much not yet known, what guidance and support can we offer? Remarkable scientific discovery, emerging issues, and rapidly changing ecosystems are accelerating the need for boundary-spanning, bridge-building, inclusive problem solvers.

The Civic Science Career Roadmap grows out of a collaborative endeavor to support these leaders and community: the Civic Science Fellows program. Together, [philanthropic and organizational partners](#) are working to share growing bodies of evidence-informed practice and practice-informed research. Together, we are providing “R & D” space for early-career leaders to pilot innovative

experiential work along with a deeply supportive community to scaffold and amplify learning and successes.

This Roadmap reflects the diverse voices of the Civic Science Fellows network, with special appreciation to our colleagues at the California Council on Science and Technology, who shared their model of a career roadmap, [Science Policy: A Guide to Policy Careers for Scientists](#). With a remarkable set of insights to draw on, a team of Fellows, contributors, and advisors have drafted this Roadmap as a starting point for reflection, orientation, and action. (Please see Acknowledgments.) We share this resource with an invitation to view this Roadmap as an evolving resource for pioneering leaders and organizations.

As resource partner Alondra Nelson, Harold F. Linder Professor of Social Science at the Institute for Advanced Study, told the Civic Science Fellows, “It is harder work to want to build these bridges, but it is deeply gratifying—and really important.” Funding partner Sam Gill, President of the Doris Duke Foundation, emphasized with Fellows, “The time is now. Science in society *is* science. Be bold and take risks; you’re never going to have a more willing set of collaborators.”

With appreciation for the generosity of many to invest in talent, partnership, and our shared future,

A handwritten signature in black ink that reads "Elizabeth". The script is fluid and cursive, with the 'E' starting with a large loop and the 'z' having a long tail that loops back under the 'n'.

Elizabeth Good Christopherson
President and Chief Executive Officer, Rita Allen Foundation
Chair, Science in Society Funder Collaborative

INTRODUCTION

What is civic science?

Persistent health disparities; a warming planet in crisis; the emergence of increasingly complex artificial intelligence; and technology that allows for precise gene editing—these are a few of the urgent areas where science holds profound promise for solutions and profound dangers. Unlocking the promise, mitigating threats, and navigating the complex societal implications of emerging science and technology requires broader engagement and deliberation about research priorities and practices, and how to manage its findings. Beyond immediate applications, a thriving ecosystem of discovery science also depends on strengthening bonds between science and technology, diverse communities, and democratic systems to create the seeds of new knowledge.

Civic science is a growing field of study and area of practice committed to ensuring that all people shape and benefit from science, technology, and innovation. As emerging science and technology advance rapidly, they raise questions that are not just technical but require tapping into a full array of tools—including tools from ethics, communication, community engagement, social science, and policy—as well as proximity to the people most affected to help frame problems and solutions. The civic science community is coming together to meet the need for new language, approaches, relationships, knowledge, and action.

Current ideas around civic science trace to the mid-1990s, when as Director of the National Science Foundation, Neal Lane [urged scientists](#) to take a new role in society as “civic scientists,” to “step beyond their campuses, laboratories, ministries, and institutes and into the center of their communities to engage in active dialogue with their fellow citizens.”

Since then, through use by several organizations, researchers, and practitioners, the aperture of civic science has broadened to encompass the roles of many in addition to scientists, as well as to delve into a complex web of considerations for scientists and scientific institutions. Throughout, there is an emphasis on collaboration across a wide range of sectors, geographies, belief systems, cultures, ways of developing knowledge, experiences, and goals.

Development of civic science approaches, knowledge, and networks has also been shaped by urgent considerations of our time—including rapidly changing information environments, the COVID-19 pandemic, acute polarization, climate emergency, and persistent inequality.

A pair of articles in the *Stanford Social Innovation Review* address this context and explore how civic science can respond, beginning with “The Civic Science Imperative,” by Elizabeth Christopherson, Dietram Scheufele, and Brooke Smith, published in 2018.

“To find productive societal responses to emerging science, we need to escape these cycles of polarization, and for that we need more than scientific information,” the authors write. “We need to engage in and support the messy, complex work of civic discourse and negotiation.”

In 2021's "How Science Philanthropy Can Build Equity," Christopherson and Scheufele, along with Emily Howell, Kasisomayajula Viswanath, and Norris West, explored "diversity, equity, and inclusion as core responsibilities and strengths of civic science"—key to the "how and why" of civic science approaches. With equity at the center, the authors conclude, civic science approaches can create the "foundations for future generations to reach their highest aspirations and for science to reach its highest potential to benefit humanity."

Civic science offers connections that can help support efforts in several fields to address gaps and opportunities identified in recent years. Foundational landscape research from organizations including the National Academies of Sciences, Engineering, and Medicine; the American Academy of Arts and Sciences; the Open Research Funders Group; and others have pointed to a need to think beyond traditional boundaries of sector and discipline to address underlying challenges in [science communication](#), [public engagement with science](#), [dismantling racism in STEMM organizations](#), and [supporting open science](#), to name just a few. Across these areas, there is a need to develop boundary-spanning capacity, including supporting new generations of early-career, diverse leaders across many types of institutions.

A feature of civic science efforts is that the work transcends traditional field boundaries. Civic science brings together diverse perspectives to ensure the rigor, representation, innovation, and effectiveness of resulting research and decision-making. Civic science professionals build bridges between different cultures, sectors, disciplines, and ways of building knowledge about the world. They are creative, innovative, entrepreneurial changemakers growing teams and coalitions. They are dedicated to listening and co-creating, grounded in a commitment to broadening who informs research, who participates in research, who decides about its use and applications, and who benefits from its power and promise.

The political philosopher Peter Levine has described the "civic" as asking the question, "What should we do?" A career in civic science leans into each part of this question. Together, we are working to expand the *we*, making connections across diverse publics to enable collective decision-making. Our work is centrally about engaging with questions of ethics—finding a *should* that advances democratic institutions and values. And civic science careers seek to build engagement, evidence, and transformation through what we *do* together—moving to action. Yet within the *we*, and with many intersecting areas of work, each of us has many decisions to make about our own most effective and rewarding roles as contributors. At multiple points in the path, we each ask the question, "What should *I* do?"

Examples of civic science work

Civic science principles and approaches can be reflected in a wide range of initiatives. Because civic science has a multifaceted orientation—a constellation of connected North Stars—civic science professionals work in a range of sectors, in diverse roles, and on varied topics. Scientific institutions, governments, funders, nonprofit organizations, industry, professional associations, community organizations, and media all have roles in fostering a culture of civic science. Civic science professionals work in research labs, state capitals, businesses, neighborhood parks, town halls, museums, and newsrooms (to name just a few). For example, the White House Office of Science and Technology Policy developed the [Blueprint for an AI Bill of Rights](#) through a year of engagement with stakeholders in the private sector, academia, and civil society

across fields, as well as impacted communities, with open opportunities for public input. More locally, a collaboration between the Oregon Museum of Science and Industry (OMSI), local, Tribal and regional government entities, nonprofits, and businesses resulted in the [design of a neighborhood](#) intended as an inclusive community destination with innovation, culture, arts, and science learning at its heart—with components such as a Center for Tribal Nations and a waterfront education park.

As the examples above illustrate, civic science work takes place in many different fields of practice that may be described with different names. As a broad umbrella designed for connection, civic science emphasizes that each of these fields—and others—are connected and benefit from a team approach to share learning, collaborate on impact, and strengthen each facet.

Below are examples of civic science work in particular areas, including keywords that can be used for searching, and examples of projects. Note that all have overlap and connections across areas.

- **Science policy, systems, and practice**

e.g., science funding; federal, state, or local policy on scientific topics; open science; participatory science; STEM equity; antiracism in scientific organizations; incentive structures; institutional and systems change

Example project question: How can science funders build equity-centered practices and accountability into their funding priorities and processes?

They are dedicated to listening and co-creating, grounded in a commitment to broadening who informs research, who participates in research, who decides about its use and applications, and who benefits from its power and promise.

- **Ethics**

e.g., ethical and societal implications of scientific discovery and emerging technologies; responsible conduct in research; ethics of applications of scientific research; implications of emerging science in the law and justice system; responsible research and innovation; scientific integrity

Example project question: How can developers of AI and diverse communities partner to have a wide range of ethical considerations and user priorities inform AI research and development?

- **Democratic trust and deliberation**

e.g., addressing misinformation and disinformation; depolarization; public deliberation; science of collaboration; evidence-informed policymaking; dialogue across difference; integrity; accountability

Example project question: What communication approaches and spaces enable people to learn from and connect with people from diverse viewpoints on science-related topics,

especially when they disagree? What steps can facilitate this kind of communication space?

- **Equity, justice, and opportunities for all**

e.g., environmental justice; just tech; health equity and health disparities; valuing Indigenous knowledge and other ways of knowing; systemic approaches to increasing community power and equity related to science and science decision-making

Example project question: How can technology developers, researchers, policymakers, and diverse publics engage with each other to ensure we don't create or apply technologies in ways that reproduce or reinforce existing systemic inequalities in race, class, gender, etc.?

- **Communication and public understanding of science**

e.g., science communication; inclusive scicomm; science in art and film; scientific visualization; science journalism; informal science learning; science education

Example project question: How do people in a particular city want to learn about science, and how can artists, filmmakers, museums, etc. collaborate with them to facilitate those learning spaces?

As a broad umbrella designed for connection, civic science emphasizes that each of these fields—and others—are connected and benefit from a team approach to share learning, collaborate on impact, and strengthen each facet.

- **Community engagement**

e.g., community science; patient community engagement; public engagement with science; local climate action; community-based participatory research; citizen science

Example project question: What tools and policies make it so that community members can collect, access, and use environmental data to advocate for environmental health policies in their communities?

While the areas and projects described above are diverse, they all entail exchanges and learning that transcend traditional disciplinary boundaries. In each, diverse stakeholders come together to determine answers to questions such as: What should we be studying? How should we study it? Who should be involved? And how should we apply what we are learning to real-world challenges?

“

Science cannot provide all the answers. Other disciplines, such as history, political theory, and moral philosophy, can inform how to interpret data and what to do with it.

But to encourage effective cross-disciplinary engagement, we need to train scientists in intellectual humility. Science is a communal practice. If you are going to work effectively with others in the communal practice of science you need to be willing to listen to others, to inspire their participation, and to take their advice.

I hope people come together not just to communicate to their own disciplines, but to communicate across disciplines, build on those relationships, and work together, so cross-disciplinary engagement becomes endemic.

While it will take many of us from different sectors working together to make change across the ecosystem, I believe there is a thirst and a hunger for this kind of conversation.”

— Heather Templeton Dill, President, John Templeton Foundation



Civic science careers: Context for this roadmap

Because of the diversity of civic science careers, this roadmap is intended to serve as a curated compilation of resources to support career-related decision-making for those with civic science backgrounds or inclinations. It is a resource to help those building their own maps. It is designed for people interested in, for example:

- Finding a position that aligns with the goals and approaches of civic science—or that can be shaped to align with them—in any of a number of sectors and fields;
- Creating a new position or role as the basis of a ground-up civic science career path that doesn't quite exist yet;
- Changing a current career, or incorporating a new civic science lens to an existing role or area of work—for example, an academic researcher who wants to build community engagement into their research;
- Taking a well-known path and considering its relationship to civic science (e.g., career civil servant, science journalist);
- Creating and finding support for new partnerships and projects to align with your civic science priorities, whether as a primary occupation, a side project (which may become primary), or part of an existing role;
- Exploring more broadly to co-create pioneering career paths to meet needs for leadership with new approaches and skills.

While this roadmap will occasionally mention specific backgrounds (e.g., scientific training), it was written to be inclusive of perspectives and experiences. With its origins in the United States, it is most comprehensive on U.S. opportunities and resources, though applicable to other national contexts as well. We look forward to adding more resources in future editions.

“

The problems that we have in the world don't respect academic borders. Our solutions don't as well.”

— *Alondra Nelson, Harold F. Linder Professor of Social Science, Institute for Advanced Study*



An emerging community and an evolving resource

In the subsequent chapters, you will find resources that support different stages and approaches to civic science career development. These include career design, thriving in your role, and an introduction to professional development activities, educational opportunities, and fellowships, all of which can serve as fruitful components of a civic science career. While we hope that some recommendations and resources will be exactly what our readers are looking for at the particular moment in which they read this roadmap, each reader will find some points that resonate more than others—with others that may gain relevance at a future stage.

Whenever possible, we prioritized resources that are publicly available. Other books and magazines cited can be accessed through a local library.

This roadmap is intended to be a living document that will grow and be refined with future learning through the Civic Science Fellows program and network. Additional resources are available through the Civic Science Toolkit. Please see the [Civic Science Fellows website](#) for these and other resources.

Resources

General

- [“The Civic Science Imperative,”](#) by Elizabeth Good Christopherson, Dietram Scheufele, and Brooke Smith, an articulation of a culture of “civic science”: one in which scientists take active roles as citizens, and citizens from all walks of life engage with scientific research and its social and ethical implications
- [“How Science Philanthropy Can Build Equity,”](#) by Elizabeth Good Christopherson, Emily Howell, Dietram Scheufele, Kasisomayajula Viswanath, and Norris West, a call to action for science philanthropy and science communication to support partnerships with communities of color. Includes examples and description of the importance of supporting boundary spanners.

- [What Should We Do? A Theory of Civic Life](#), by Peter Levine, as well as his blog post “[What Is Civic Science?](#),” which reflects on the concept of “civic science” and its relation to other fields
- [The Public Face of Science](#), a project of the American Academy of Arts and Sciences, which produced three publications that collectively explore how to improve the connection between science and society in America
- [Civic Science Fellows program](#), including a description of Fellows’ backgrounds and projects and a collection of resources that can serve as a starting point for learning more about civic science in research and practice

Topic-Specific Resources

- [A Crack in Creation](#), by Jennifer Doudna and Samuel Sternberg, describes the discovery of the powerful gene-editing tool CRISPR alongside its ethical implications
- [Advancing Antiracism, Diversity, Equity, and Inclusion in STEMM Organizations](#), a consensus report of the National Academies of Sciences, Engineering, and Medicine examining the results of systemic racism in the United States on STEMM organizations, and providing recommendations for fostering a climate genuinely accessible and supportive to all
- [Braiding Sweetgrass](#), by Robin Wall Kimmerer, a botanist and member of the Citizen Potawatomi Nation, who reflects on the ecological world through the lenses of science and traditional knowledge
- [Communicating Science Effectively](#), a consensus report of the National Academies of Sciences, Engineering, and Medicine surveying findings from existing research on how to communicate effectively about science and proposing a research agenda to fill gaps in knowledge
- [Community Science Resource Hub](#), from the Association of Science and Technology Centers, provides an overview of the attributes, outcomes, and approaches to community science, as well as examples, resources, and tools to support community science efforts
- [Open and Equitable Model Funding Program](#), from the Open Research Funders Group, collects and tests interventions to make the process and results of funding research more transparent, equitable, and inclusive
- [The Oxford Handbook of the Science of Science Communication](#), edited by Kathleen Hall Jamieson, Dan Kahan, and Dietram A. Scheufele, combining theory and case studies across a number of topics connected to understanding and advancing evidence-based science communication
- [The Received Wisdom](#), a podcast hosted by Shobita Parthasarathy and Jack Stilgoe about how to realize the potential of science and technology throughout its development and governance, through conversations with researchers and practitioners from around the world
- [Technoscience and Environmental Justice: Expert Cultures in a Grassroots Movement](#), edited by Gwen Ottinger and Benjamin R. Cohen, explores case studies of how experts’ encounters with the environmental justice movement are changing scientific practice
- [Thinking in Systems](#), by Donella Meadows, provides an overview of how to apply systems thinking to the problem we face, from the personal to the global

SPOTLIGHT: A COMMITMENT TO CIVIC SCIENCE

I am a neuroscientist by training who made the leap into science policy in 2006. Early on, as I began my work in the science diplomacy space for the government, I realized I was wearing several hats. I was working in international science cooperation but I was also working to advance the place of women and girls in STEM. I think I got as many calls about foreign policy back then as I did about mentoring the next generation of problem solvers at home. I have always done my work as a scientist involved in my many communities. I am a very active member of the Hispanic community, a woman scientist who cares about holding the door open for others, and I am also deeply involved in issues impacting my home in South Florida and the place where I was born, Puerto Rico. All of these things come together for me in my work. At the core, I have brought to the table a set of values that I view as civic science as I have used my science background to effect change on all these fronts.



Frances Colón

In 2017, I made a decision to go local—using my skill set to help groups in Miami address a looming challenge: climate change. During those years in Florida, one of the things I did was learn “community organizing” so we could impact the policy process together. That experience imparted on me some of the best lessons I can think of for civic science.

SCIENCE MUST MEET PEOPLE WHERE THEY ARE

As scientists, we should be there all the time, not just in crisis. We need to incorporate respect for people's concerns and fears, answering questions in partnership with them—not through policy that descends from above, but right there in the community from the beginning. This builds trust over time and for the long term.

SCIENCE NEEDS COALITIONS

We need to work with people who believe in what we do, and people who are harder to convince. We need coalitions of students, policymakers, journalists, faith-based organizations, educators, workers—integrated across perspectives, class, and culture. Many ask me how we make sure that science doesn't become political in this process, but there's a well-defined line between partisan and political. Science is political but it should never be partisan.

TELL THE SCIENCE STORY

We need to be able to proudly stand by the story of the achievements of science. Science is about the betterment of people's lives—discovery that cures, innovation that saves you money. People need to know that we're fighting for them, that science is fighting for them. "Why is my street flooded on a sunny day?" Science should show people the why of their lived experiences, and how it can offer solutions.

I challenge everyone to use at least 10 percent of their time on civic science. Everyone can ask themselves—how can I support others in doing this work, create space, fund the work, get involved in the ways in which folks are seeking to change systems?

It's about sparking a change. Change in structures, change in culture, change in norms at the local and international level. It is the right of every person in every community across this country to enjoy the benefits of the progress of science and its applications.

***Frances Colón** is a member of the Civic Science Advisory Committee and Senior Director for International Climate Policy at the Center for American Progress. She is a member of the President's Council of Advisors on Science and Technology and former Deputy Science and Technology Adviser to the U.S. Secretary of State. This spotlight is drawn from her remarks for a Civic Science Fellows Lab and the 2022 William D. Carey Award Lecture for the American Association for the Advancement of Science. Read more about Dr. Colón's career trajectory in the California Council on Science and Technology's [Guide to Policy Careers for Scientists](#).*

DESIGNING A CIVIC SCIENCE CAREER

Priorities, possibilities, and action

If you're reading this guide, you may already be taking an intentional, civic science–driven approach to your career. You're most likely asking high-level questions like: “Given my current circumstances and my goals for my future, what professional opportunities *should* I pursue? And how?” Being strategic about your career means taking action to align your various priorities with real possibilities that exist in the world to move in the direction of your goals. Being strategic about a civic science career adds an extra level of challenge—recognizing that you are among the people shaping new, more inclusive, and collaborative possibilities for how we work.

Career guidance is often designed to help people find specific opportunities that match the skills and experiences they have. While this is inevitably a critical component of finding a role that is a good fit, this chapter supports broader thinking about career possibilities—using your values, priorities, and goals as the starting place, instead of existing job titles, descriptions, or openings. In this chapter, you will find suggestions and an annotated list of resources for two foundational stages of career exploration, which can apply to people considering ways to adapt an existing role to increase its civic science orientation, or to those looking to make a larger shift, such as to a new role or field:

- Identifying priorities (“looking inward”) and possibilities (“looking outward”)
- Taking action to align priorities with possibilities

The University of California San Francisco Office of Career and Professional Development has created an [interactive road map](#) that demonstrates the sequenced and cyclical nature of career exploration and planning through the following phases: self-assess, investigate, reflect, synthesize, re-assess, plan, and implement. Although these stages may take place in the sequence listed, they are not necessarily linear, or one-time processes. Over time, as your priorities, experiences, and skills evolve, you may want to revisit the exploration stages introduced in this chapter.

Ideal opportunities are those that align with our priorities, strengths, and goals. When opportunities arise (e.g., a job posting, an invitation to collaborate, or a grant opportunity), it is easier to assess whether it may be a good next step for you at this moment if you have already considered and articulated your career parameters. Articulating these parameters—the features that work must or must not have—also serves as a guide for navigating the opportunity space, resulting in a more efficient and effective opportunity search process. This process is especially important for designing civic science careers, as civic science work looks vastly different from one context to another, and there are few prescribed paths to follow. The challenge and the opportunity for civic science professionals is identifying their own distinctive paths—what kinds of work are in that path, and what kinds are too far afield and should be left for others.

One way of thinking about the components of exploration is in terms of desires and reality. Your ideal options sit at the intersection of your desires and the reality—the set of careers that are

both aspirational and realistic for you to potentially achieve. The next section (“looking inward”) focuses on identifying your desires, which includes considering your priorities, strengths, skills, goals, and identity. The subsequent section (“looking outward”) provides guidance on clarifying the reality, including the networks, organizations, and roles that exist or could exist in the world. The final section in this chapter (“taking action”) builds on these concepts to help you identify and pursue real-world opportunities that align with what you are seeking in a role.

Looking inward

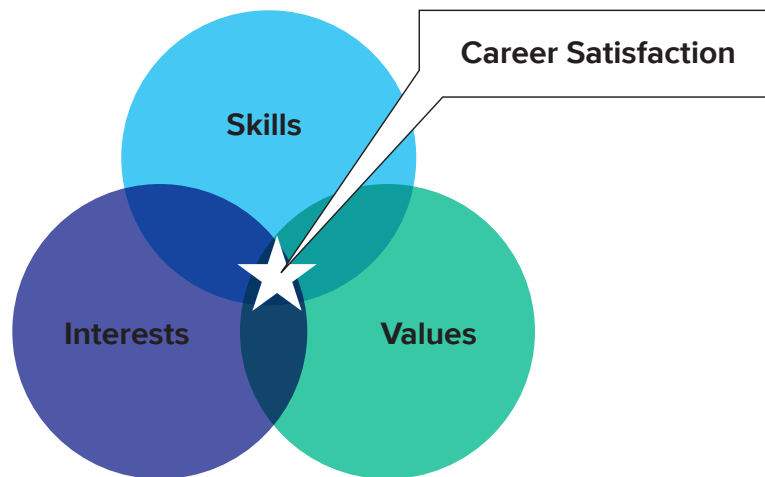
Identifying your own priorities, strengths, and goals

Investing in the introspective work of identifying your priorities, strengths, and goals helps to surface your implicit thoughts about the role you want work to play in your life, what it should (and shouldn’t) look like for you, and what you hope to achieve through paid work. For example, you might articulate your level of comfort with uncertainty or risk, which might influence the kinds of work you should consider. Similarly, you might reflect on the importance of prestige, compensation, flexibility, and organizational mission for you. As you surface these ideas and put them into words, certain roles, sectors, employers, and models are likely to become more attractive to you, while others may become less attractive.

This section introduces a few different frameworks for career introspection, with others included in the resources list at the end of the chapter.

Skills, Interests, and Values

One way of thinking about the kind of work that will result in greatest satisfaction is in terms of three intersecting circles: your skills, interests, and values.



Graphic adapted from UCSF Office of Career and Professional Development

Ideal roles—and careers more generally—will align with your *interests* in ways that keep your attention, will leverage your *skills* in ways that enable you to be effective while still growing, and will be consistent with your *values*, providing a sense of purpose and motivation to increase your effectiveness and impact over time.

Interests are the tasks and subject areas you enjoy. They might include activities that give you energy and that you can easily get immersed in (i.e., enter a [state of flow](#)), those that give you a sense of meaning or purpose, and those that offer the right level of challenge and fun. On the flip side, you also likely have specific tasks and topics that you dislike, whether because you find them stressful, boring, or unpleasant.

Skills include those that have been developed through explicit training, as well as those honed through experience. Skills refer to tasks you are good at or would like to be good at doing. For example, skills may include data analysis or copyediting, facilitating group discussions or managing complex projects. The descriptions of civic science work in the previous chapter provide terms and concepts that may help you recognize skills you currently have or want to develop.

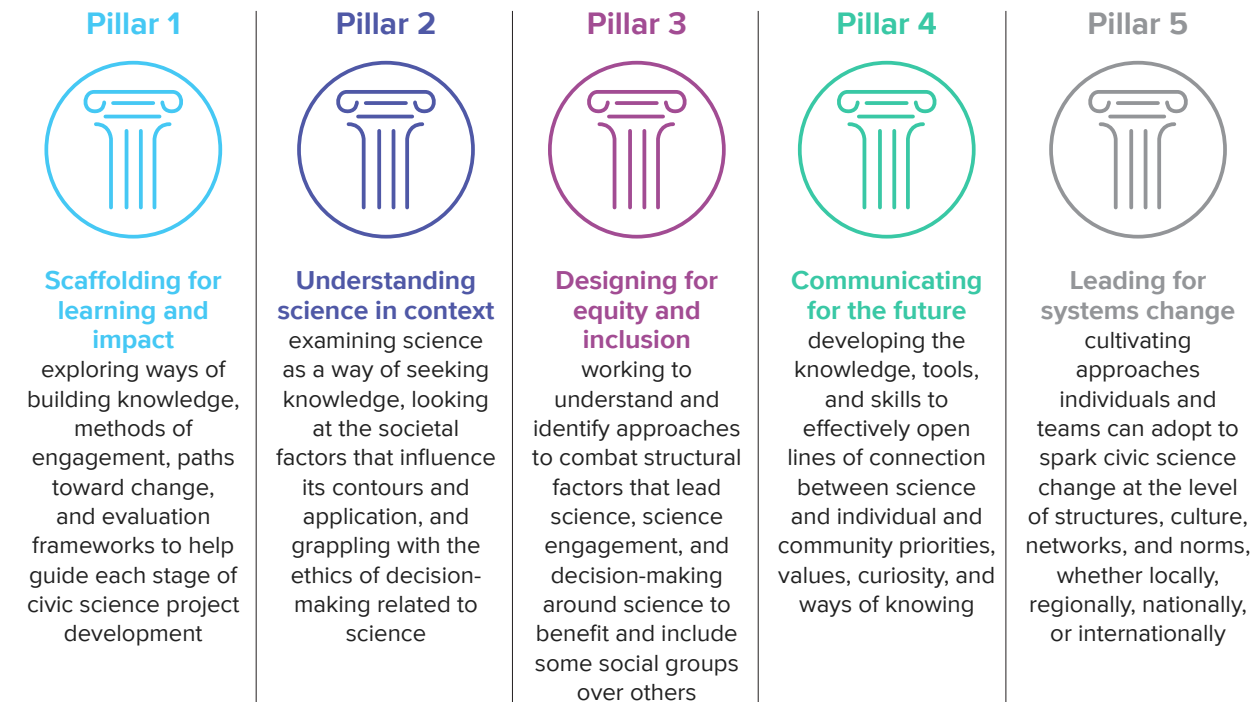
Values can encompass a wide range of concepts, including priorities, worldviews, beliefs, and aspirations. Tim Urban writes about five high-level “yearnings” that collectively define your wants, or your priorities in relation to your career (see [How to Pick a Career](#)). These include:

- Personal: our personality and values, including our own idea of fulfillment
- Social: our perception of what others think of us and feelings of acceptance and inclusion
- Lifestyle: being able to do what we want, when, how, and with whom we want
- Moral: the difference you want to make in the world
- Practical: being able to meet our basic needs and the needs of our families

Each “yearning” is composed of a number of more specific aspects, with different levels of priority for each of us that we may not consciously recognize without substantial reflection and testing. For example, our general social yearning includes desires for things like power and inclusion. These are not necessarily equally important to everyone, and even for a single individual, one of these may be more important than the other in different times or contexts. There may be circumstances in which we yearn for both of these things, but recognize that they are in tension with each other and one must take precedence. When we recognize the many yearnings operating simultaneously, and their relative importance to us, we can account for them more effectively in our decision-making.

The Pillars of Civic Science

While civic science professionals bring a wide range of interests, skills, and values to their work, there are a number of areas of practice and emphasis that are relevant across the civic science landscape. The five pillars of civic science learning, developed by the Practice and Science of Civic Science Advisory Committee with the Civic Science Fellows network, provide an orientation point for thinking about your current strengths, priorities, and areas of opportunity as they relate to a civic science framework. Each of these pillars might inform the roles and further development activities you pursue.



Social Identity

Another aspect of looking inward involves acknowledging the many facets of your social identity (e.g., your race, ethnicity, gender, sexual orientation, disability, class, etc.), and the ways in which your identities influence your privilege and challenges and how you experience different career spaces. An identity wheel, such as [this resource by the LSA Inclusive Teaching Initiative](#) at the University of Michigan, can help you think about a range of facets of your social identity, including which might be most important and salient for you.

Understanding the components of identity may be valuable for helping articulate the kinds of work environments that are most desirable for you. Insights about your identities can help inform your exploration strategy, identify allies, pinpoint priorities for inclusion and belonging, and overcome potential barriers related to your identity.

Personal Theory of Practice and Mission

Another concept that supports reflection on career direction is the personal professional mission statement, which expresses two things: An effective mission statement will be general enough to encompass a range of roles or projects you may take on, while simultaneously providing specificity that helps you assess whether various opportunities or directions are aligned with your skills and ultimate goals.



An in-depth framework for developing a sense of personal mission is the [personal theory of practice](#), developed by the Massachusetts Institute of Technology’s Community Innovators Lab program (CoLab). A personal theory of practice integrates:

- Insights on the personal values that guide your work,
- Reflections on your professional experiences, and
- Ongoing insights on your field.

Brought together and articulated through a set of activities and discussion prompts, each of these elements can help guide future professional practice. Although initially developed in the context of urban planning, [Dayna Cunningham](#), who founded the MIT CoLab and is now Dean of the Tisch College of Civic Life at Tufts University, offers the personal theory of practice framework to those interested in pursuing careers across civic science.

Another way to think of a personal theory of practice or mission statement is as the throughline that connects your work experiences or choices so far and that may continue to shape your choices in the future—creating a sense of coherence across careers that may seem different on the surface. This is particularly relevant for civic science professionals, who are especially likely to have worked in roles, on projects, or with stakeholders who are diverse in many ways. However, upon deeper investigation, there are often underlying orientations driving them and their work, such as a commitment to building understanding across difference, advancing equity in science settings, or increasing the ability of policymakers and communities to use science to address complex problems.

For example, Cunningham started her career as a civil rights lawyer and has also worked in philanthropy. She explains that she has a “personal North Star” that organizes the many different chapters of her career—put together through a mixture of new opportunities that arose. In making each decision, she has been consistently oriented by the goals of “voice and justice,” she says. The work that has spoken to her has been centered around figuring out how marginalized people can step into leadership roles and find their voice, combined with a commitment to—and aptitude for—fighting for justice.

Several in the Civic Science Fellows network have found inspiration in the Japanese concept of [ikigai](#)—a passion that gives meaning to a person’s life—whether through paid or unpaid work, a profession, or social connections.

Several in the Civic Science Fellows network have found inspiration in the Japanese concept of ikigai—a passion that gives meaning to a person’s life.

Going through the process of developing a personal theory of practice, mission statement, or sense of ikigai can be helpful for understanding why particular opportunities seem more valuable to you, for strategizing where you might like to move to next in your career, and for communicating the story of your career choices to others—including prospective funders, employers, and collaborators.

Looking outward: Uncovering the possibility space

While looking inward supports the development of *theoretical* parameters and images of the work you may want to do, looking outward enables you to collect information about *actual* possibilities that exist. While this can include increasing your understanding of the roles, fields, organizations, or funding models that exist, “looking outward” can also involve brainstorming opportunities to modify a current role or portfolio to increase its alignment with your goals and ideals. In either case, while you may not be able to immediately discern the extent to which the possibilities you’re uncovering fit within your parameters, the purpose of outward exploration is to better understand the landscape of opportunities—including those for which you may be immediately eligible and those that may require additional skills, knowledge, relationships, or experience to obtain. Notably, exploring the landscape of opportunities can also help you refine your thinking about your own interests, skills, values, mission, and theory of practice. In this way, inward and outward exploration are mutually reinforcing.

There are several ways to learn more about the possibility space:

- For civic science careers, this roadmap provides examples of organizations, professional development activities, educational opportunities, and fellowships, which may serve as starting points as you begin to chart the landscape of opportunities within your parameters—including existing positions as well as potential resources and demand that could support shaping new roles. Learning more about the range of opportunities allows you to expand your understanding of the landscape. The [Civic Science Fellows website](#) includes additional resources.
- LinkedIn allows you to search for people working in particular fields, organizations, or job titles and explore their backgrounds. For instance, if you discover someone whose work is of interest to you, you might ask: What roles have they previously held? Where have they worked? Ideally, you’ll collect multiple examples of people whose work is of interest, which will allow you to identify consistent trends while also noting variability in backgrounds and experiences. For example, you may notice that one person whose career is of interest pursued a particular advanced degree, but others in similar positions did not, implying that the degree *could* help you attain a similar position, but is not a prerequisite. This may be an especially fruitful strategy for discovering models of nontraditional careers—for example, people who have created their own organizations, or who have expanded existing roles to encompass civic science approaches. Many civic science network organizations (see Acknowledgments below) also share updates and opportunities through LinkedIn—including the Civic Science Fellows program announcements shared through the [Rita Allen Foundation](#).
- Informational interviews are informal conversations you initiate with individuals who work in an area of interest to you. While these are also useful for ultimately landing a position of interest or obtaining funding for a new venture, at this stage, the purpose of informational interviews is to gain insights that help you flesh out your understanding of the possibility space. For instance, you may ask someone to speak with you if they work for an organization that you’re interested in, have created their own unconventional career opportunities that you would like to learn more about, or have past experience that seems aligned with your parameters. You can ask questions about their experiences, including how they made the career decisions they’ve made; what has been particularly rewarding and challenging; and

what their own career goals are. It is particularly valuable to ask the person you're speaking to *who else* they might recommend you speak to, so you can continue to expand your knowledge of the possibility space.

- » The organization 80,000 Hours provides some [sample scripts and considerations](#) for setting up and conducting informational interviews.
- » In a 3-minute [video](#), the Stanford Life Design Lab shares an overview of what informational interviews are and how to execute effective interviews.

Building your networks for exploration and support

Other people can provide invaluable insights to support your career landscape exploration. Beyond informational interviews, investing in the development of professional networks will have wide-ranging benefits.

Networking can feel transactional—like you're reaching out to people simply to get something from them—but it does not need to be this way. In a short [video](#), the Stanford Life Design Lab suggests reframing networking as “asking for directions.” They note that people *like* to give directions. It makes us feel good to do something small to help others. Many people are willing—even eager—to have short conversations about their professional experiences and insights or make an introduction to another colleague.

For civic science work, intentionally building networks is especially important for understanding and navigating career paths, and these personal networks also form the basis for growing the connections and learning at the heart of civic science—a collaborative impact network. Impact networks are living things, David Ehrlichman, author of [Impact Networks](#), noted in a Civic Science Fellows Lab, and they require cultivation by many to thrive.

Depending on your existing networks and priorities, you might consider developing relationships with the following types of people (adapted from Herminia Ibarra's book [Working Identity](#)).

- New peer groups that include people working in spaces, sectors, or for organizations you're interested in; who have skills, backgrounds, and roles you're exploring; and who likely face similar challenges as you.
- Guiding figures, including advisors, mentors, sponsors, and friends who provide models of ways of living and working that you're curious about or pursuing.

“

Community is a verb.”

— *Raj Pandya, Vice President of Community Science, American Geophysical Union, citing many community leaders and social scientists*

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- Communities of practice, or other existing communities with a common theme or focus that can steep you in a professional culture and context and provide a sense of belonging as you enter a new professional community.

While a professional in any field might benefit from each of these types of relationships, they are particularly important for civic science professionals, who are often in boundary-spanning roles and doing work that incorporates insights, methods, and partners from diverse areas. Civic science professionals may not have as many built-in relationships that have developed over the course of their past experiences, since they may be doing or hoping to do work that is distinct from that of past mentors, teachers, supervisors, and peers. At the same time, many budding civic science professionals are likely to find themselves interacting with folks who are not necessarily all interested (at least initially) in what they are doing, precisely because it is striking out in a new direction and may be more difficult for people to immediately connect with, given its novelty. Moreover, some professional relationships are likely to fade away as one's professional work shifts in a new direction. This is a typical experience for professionals in many fields but may be especially common for people working in civic science areas, due to the dynamic nature of this work.

Many civic science professionals will need to dedicate time and energy to developing the relationships that will help them thrive, not only early in their career but throughout. This can ultimately be an asset, as it often results in meaningful relationships that have been intentionally cultivated.

These challenges mean that many civic science professionals will need to dedicate time and energy to developing the relationships that will help them thrive, not only early in their career but throughout. This can ultimately be an asset, as it often results in meaningful relationships that have been intentionally cultivated.

Within each category, members of the Civic Science Fellows network have highlighted resources of particular interest to civic science boundary-spanners.

Peer Groups

Peer coaches are people who are at a similar stage in their career to you and can help you work through career challenges and decisions by asking questions about your thoughts and experiences, and serving as a sounding board. These relationships are often reciprocal. While many of us have informal peer coaches, Joyce Yen and colleagues at the University of Washington's ADVANCE Center for Institutional Change have developed [approaches](#) to support the development of more formal peer coaching circles—forums where peers support one another in finding their own workable solutions and also build their coaching and listening skills. The structured, regular sessions also provide accountability for following up on commitments to address challenges.

For people working in civic science, this model is especially powerful. It is not only an effective approach to navigating through emergent, complex issues—it also is a chance to practice new ways of working, where people are empowered to explore solutions to their own problems, rather than applying outside prescriptions that don't fit their circumstances.

SPOTLIGHT: PEER COACHING CIRCLES

By Joyce Yen, Director, ADVANCE Center for Institutional Change, University of Washington, and M. Claire Horner-Devine, Founder, Counterspace Consulting

No matter how an individual comes to a career in civic science, or indeed to any career, they will likely find themselves navigating relationships, organizations, and challenges. One important strategy for thriving in a new role is to build systems of support. Support can come in many forms, ranging from formal mentors and advisors to friends and family to bosses and coworkers. Peer Coaching Circles complement existing systems of support and provide a structured framework for achieving goals, creating connection, and building skills.

Peer Coaching Circles (PCC) offer a regularly occurring opportunity for structured self-reflection, career development, and mutual support. Through a PCC, an individual belongs to a supportive community as they explore a range of career development topics such as understanding organizational culture, building relationships, creating opportunities, and tackling challenges. Since 2008, we have been refining and implementing this PCC model through our faculty development work nationally as well as at the University of Washington and through our consulting and coaching work. Our PCC model was originally inspired by the peer model in *Every Other Thursday: Stories and Strategies from Successful Women Scientists* and then adapted to leverage coaching.

We have introduced PCCs to a variety of participants at a range of different career stages in academia, industry, philanthropy, and other fields. The Civic Science Fellows community has also used PCCs with great success. We love the power of this model and its adaptability. It works as an ongoing support structure and can even be impactful as a one-time problem-solving and feedback activity in workshops or other gatherings. It builds agency, skills, and community. We have yet to find a situation or community for which it does not bring value.

Peer Coaching Circles have a multidimensional purpose. First, PCC participants engage in intentional self-reflection and gain perspective and awareness on a dilemma, opportunity, or challenge they are facing (see Peer Coaching Circle Inquiry Model image). No issue is too small or too large for this model. Others in their circle serve as peer coaches and support them in generating ideas for helpful action toward achieving their goal (see image - Step 2). Second, the PCC format and regular meeting cadence for ongoing PCCs builds trust among group members and fosters a sense of community. Being authentically and regularly engaged in supporting one another's success strengthens the bonds between



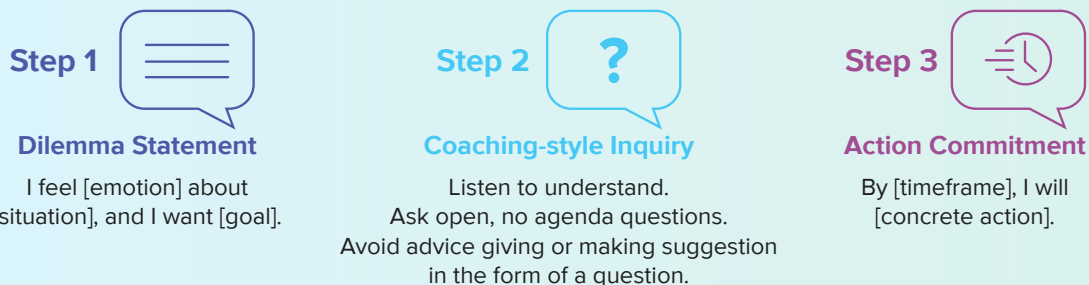
group members. Third, participants develop impactful coaching skills as they practice listening and inquiry skills as peer coaches. These listening and question-asking skills are valuable beyond PCCs and can support individuals' civic science success as they and their work span boundaries, fields, and communities.

Importantly, PCCs reframe problem-solving from a focus on the problem to a focus on success and the future. This reframe has served us well over our 20+ years working to advance diversity, equity, and inclusion in science, pursue culture change, and support professional and career development of academics, scientists, and others. It allows us to effectively and efficiently support people's agency, self-directed learning, and efficacy in obtaining their goals. Specifically, rather than offering advice or suggestions when presented with a problem, we emphasize listening to understand and empowering individuals to self-define what success looks like for them and how they want to move forward. Listening to understand occurs by asking coaching-style questions, which have no agenda and help individuals better understand or see their issue at hand. Contrast that type of question with a problem-solving focused question that seeks to either discover additional details that could inform a solution suggestion (e.g., "How does work?") or suggest a strategy but phrases the suggestion in the form of a question (e.g., "Have you ..."). This nuanced distinction is the heart of the PCC inquiry model (see image). Coaching-style inquiry can be a challenging skill to develop because many of us have been socialized to listen to give advice or offer solutions when faced with a problem. The PCC inquiry model invites participants to refrain from problem-solving and instead be in a community of peers who are listening deeply and supporting each other's ability to tap into their own knowledge, power, and resources. In doing so, we become better sources of support for each other and ourselves.

Additional details about the PCC model and how to implement it can be found via

- a [two-page overview](#) of Chapter 32: "Peer Coaching Circles for Ongoing Faculty Development" in the *Handbook of STEM Faculty Development*
- a [PCC basics handout](#) with key concepts and instructions for running a PCC meeting

Ultimately, individuals flourish in their careers when they have access to professional development and support, can build connections and community, and can address the challenges they face. PCCs are one strategy to build support systems and thrive in civic science careers.



Guiding Figures

Naledi Saul, Director of University of California San Francisco Office of Career and Professional Development, names ten things a guiding figure, or mentor, *could* offer:



Naledi Saul, Director, Office of Career and Professional Development, UCSF

- Time and attention
- Advice and direction
- Emotional support
- Knowledge and skill development
- Role modeling and inspiration
- Access to resources
- Access to opportunities
- Access to a community or network
- References or letters of recommendation
- Protection

Successful mentoring relationships, she says, are built on clarity and alignment about *which* of the above benefits a mentee is seeking and which ones a mentor feels they are ready, willing, and able to offer. The potential benefits give rise to six archetypes of mentors:

- **The field support:** people who are content experts and can help you learn the knowledge and skills required to develop in your discipline;
- **The career support:** People who offer guidance on how to position yourself to pursue and succeed in a particular career path;
- **The guide:** People who show you the ropes in any new, complex, or fraught setting or situation;
- **The inspiration:** People who have a specific skill or quality you wish to develop in yourself;
- **The friend, family, and/or therapist:** People who know and appreciate you, your strengths and weaknesses, and always see the best in you. You can always be fully yourself around them;
- **The sponsor:** People who are specifically dedicated to your advancement. They advocate for you, make introductions, and advise you on how to position yourself for the next position.

As boundary spanners, people working in civic science may have several mentors over time fulfilling different roles, and they will also themselves serve as mentors. In some of these relationships, the word “mentor” may never come up.

Saul notes that each mentoring relationship follows a five-stage life cycle, beginning with 1) identifying your goals and potential mentors, 2) connecting with someone and requesting that they serve in a mentor role, and 3) establishing a relationship in line with your goals and both of your needs and preferences. 4) Maintaining the relationship then requires giving and receiving feedback and recognizing progress. And finally, 5) the end of a mentor relationship calls for a celebration of achievements, an expression of gratitude, and saying goodbye. It is useful to take a few moments to reflect on how prepared you feel to navigate each stage, and what information, resources, and support you might need. For example, perhaps you don’t fully feel comfortable with stage 2 (connecting)—specifically the etiquette of connecting with someone—and might want to read more about informational interviewing. Or you might wonder about strategies around step 4 (maintaining), as you might have grown out of touch with your mentor and want strategies to reach out and reconnect.

Communities of Practice

Communities of practice include established networks, associations, and other groups that exist to support people working in a particular area. In addition to offering diverse relationship types, such groups often have mechanisms for circulating job opportunities, professional development opportunities, and events, as well as channels for meeting new people, problem-solving, and sharing information and ideas. People who identify as boundary spanners or civic science professionals need to be more intentional about seeking out communities of practice, since their work often does not overlap perfectly with existing communities. For this reason, many civic science professionals find value in belonging to multiple communities of practice, each of which can provide different ideas, resources, and relationships that collectively meet one's needs.

The civic science network, growing from the Civic Science Fellows program, is also an example of an emerging community of practice, where people across sectors and career stages can build new relationships, resources, and learning opportunities that will be mutually supportive.

Civic Science Fellows have also engaged in building and strengthening a number of communities of practice as part of their fellowship projects and beyond—including with the American Association for the Advancement of Science, the American Geophysical Union, the American Society for Cell Biology, the Association of Science and Technology Centers, the Association of Public and Land-grant Universities, Ciencia Puerto Rico, the Environmental Data and Governance Initiative, the National Informal STEM Education Network, the Open Environmental Data Project, the Open Research Funders Group, Research!America, the Science Philanthropy Alliance, the Science in Society Funder Collaborative, and Sigma Xi.

Taking action: Aligning priorities with possibilities

While reflecting, gathering information, and network building are essential and often rewarding, they will not often result in career opportunities without further action. It can be helpful to toggle between “conceptualizing” (what are you looking for in theory?) to “operationalizing” (what does that look like in practice—in terms of specific opportunities, skills, organizations, etc.?).

In [How to Pick a Career](#), Tim Urban describes a continuous feedback cycle of reflecting and articulating your assumptions and career exploration strategy; acting to test them out; receiving results, feedback, and additional information; and adjusting your assumptions and strategy accordingly.

For these reasons, it may be useful to put parameters on your exploration. For example, you may say, I'll explore looking inward and outward for one month, or I'll continue to explore until I've conducted 10 informational interviews. After that, you may assign yourself some action that helps you gain answers to questions that emerged as you've collected information—for example, volunteering in a field where you think you may like to work, testing a type of task as a consultant, applying for a seed grant for a project that may ultimately become a larger organization, or applying for specific position openings.

In short, reflection and action rely on each other—you must act to gather information you can reflect on, and you must reflect on information to determine the next steps. Having someone in your support network who can recognize any tendencies you may have to get stuck in reflection

or action can be helpful, as well—as can a peer coaching circle focused on career development (see spotlight, page 21).

Narrowing the possibility space: Comparing options to priorities

The goal of acting on the insights you’ve gathered from inward and outward exploration is to further define your opportunity space—the pool of options that are within reach for you and potentially align with your priorities. At first glance, it may not be clear whether many of the possible roles or paths you’ve unearthed align with your interests, values, and so on. It often takes a more targeted approach to assess the extent to which various opportunities fit within your articulated parameters, for example through additional informational interviews or becoming involved in an organization in a small capacity.

While winnowing is important, it is also important not to be so selective early on that you inadvertently exclude opportunities that might be a good fit. The Stanford Life Design Lab offers guidance to “look for offers, rather than jobs” (for example, in this short [video](#)). In other words, although applying for opportunities does have a cost (time, and sometimes money), to do so you don’t need to be confident that a specific opportunity *will* be a good next step; you only need to have a sense that it *might* be, which you’ll be better suited to determine through the application and interview process. This same idea can be applied to the pursuit of opportunities beyond pre-existing positions. For example, if you are exploring the possibility of starting a new organization, network, or consulting practice, you may take the first steps toward pursuing funding, collaborators, or clients as a way of getting feedback on your ideas and testing their viability. You do not need to be 100 percent committed to an idea or line of work to do this, and in many cases, you may be better served by not yet being fully committed, as you’re likely to be more adaptable and open to alternatives.

Many of the frameworks identified in the “looking inward” section of this chapter may be valuable to revisit in the context of specific possibilities. For example, you may use the skills-interests-values Venn diagram to assess the extent to which the primary tasks for a role you’re considering fit within your articulated skills, interests, and values or the likelihood that a particular collaboration or side project will align with and build on your personal theory of practice.

An [Opportunity Comparison Matrix](#) was developed by the UCSF Office of Career and Professional Development to provide a basis for assessing how specific opportunities compare on dimensions that matter to you—weighted for their relative importance to you. This tool can be used to facilitate reflection on specific opportunities (e.g., a job posting or notice of funding) or on broader paths (e.g., creating a new organization or making a pitch for a new direction within an existing role).

The organization 80,000 Hours offers a number of [dimensions](#) for assessing which possibility might make a most promising *next step* for you, including considering how many different options will give you an opportunity to learn about yourself, the world, and your longer-term options.

You might also decide to consider possibilities in terms of how they might relate to your current ability and enjoyment, as articulated in the table below, informed by several existing matrices that compare competence or confidence to passion or interest. In many cases, a role or type of work won’t fall squarely in one box. Instead, different components of the work might be situated

in different boxes. You may be content to have a few tasks in less desirable boxes (e.g., low enjoyment) if they are outweighed by more tasks in more desirable boxes.

<p>High enjoyment, Low current ability</p> <p>Tasks in this box present opportunities to learn and grow while doing something you enjoy. However, if too many components of a role are in this box, it might be difficult to land the job or opportunity and meet expectations.</p>	<p>High enjoyment, High current ability</p> <p>Most people will derive satisfaction from spending most of their work time doing tasks in this box. However, you may want to be mindful about seeking out opportunities to grow, which may not emerge organically if you are already highly skilled at the tasks you're doing.</p>
<p>Low enjoyment, Low current ability</p> <p>You'll want to minimize the number of tasks that you do in this box. A potential role with many tasks in this box should be considered a last resort.</p>	<p>Low enjoyment, High current ability</p> <p>This is a “danger zone” because you're highly competent and may be rewarded for your skill, but you're ultimately not enjoying the work. It's best to avoid a role with many tasks in this box because it can be challenging to pivot once you find yourself here. If you find yourself in a position with many tasks here, activities in the “looking inward” section may help you determine whether you can pivot within your existing role or whether you're best served by seeking out a new opportunity.</p>

Once you've narrowed the possibility space to identify a handful of most promising opportunities, there is the challenge of getting the job, securing the funding, or convincing an organization to let you try something new. The next chapter includes tactical ideas to help you turn possibilities into reality.

Resources

Priorities: Skills, Interests, Values

- [How to Pick a Career \(That Actually Fits You\)](#), essay, resources, and activities on identifying priorities, by Tim Urban
- [Ikigai: The Japanese Secret to a Joyful Life](#), introducing a concept that has long been part of Japanese culture and has more recently been explored in the context of careers
- [What Are Your Personal Values?](#), by Jennifer Nash. This article outlines two activities—The Wheel of Life and Life Journey Map—for taking stock of how well your current use of time aligns (or not) with your priorities, for making sense of your journey so far, and understanding what that means for where you want to go next.
- [Designing Your Life: How to Build a Well-Lived, Joyful Life](#), by Bill Burnett and Dave Evans, on using design thinking ([empathize](#), [design](#), [ideate](#), [prototype](#), [test](#)) to create career pathways that are meaningful and enjoyable
- [Flow: The Psychology of Optimal Experience](#), by Mihaly Csikszentmihalyi, on the conditions that allow people to feel engaged through their skills meeting a challenge ([Ted Talk version](#))
- [Start With Why](#), by Simon Sinek, David Mead, and Peter Docker, the first in a three-book

series guide to identifying your purpose and applying it for personal, team, and organizational success. (also a Ted Talk version: [How to discover your “why” in difficult times](#))

- [Personal Theory of Practice Curriculum](#), from MIT CoLab, including guiding questions and activities for self-reflection and group discussions to identify your personal priorities, tendencies, and goals

Identity and Building Networks

- [Social Identity Wheel](#) by the University of Michigan College of Literature, Science, and the Arts Inclusive Teaching Initiative can help you think about a range of facets of your social identity, including which might be most important and salient for you
- [Working Identity: Nine Unconventional Strategies for Reinventing Your Career](#), by Herminia Ibarra, for strategies on how to help you move constructively between reflection and action
 - » Also see the [book summary](#) by Sajith Pai. This synopsis describes the concept of a working identity, its connection to career changes, and provides guidance for leveraging an evolving understanding of your working identity to make career decisions.
- [Impact Networks: Create Connection, Spark Collaboration, and Catalyze Systemic Change](#), by David Ehrlichman, examining approaches for building relationships and collaboration across boundaries using a living-systems approach
- [Tools for building your own Peer Coaching Circles](#), from Joyce Yen at the ADVANCE Center for Institutional Change of the University of Washington

General Tools

- [Interactive road map](#) by the UCSF Office of Career and Professional Development provides key questions and resources for each phase of career exploration
- [A \(Free\) Weekly Career Planning Course for Positive Impact](#), from 80,000 Hours, a nonprofit organization focused on helping students and recent graduates learn how to build impactful and personally fulfilling careers
 - » Also check out: [The Career Plan Template](#), from 80,000 Hours, with self-guided questions for reflection and strategy development
- [Life Design Lab Resources](#), from the Stanford Life Design Lab. Includes short videos and trainings. For personal priorities exploration in particular, check out:
 - The [Online Module: Designing Your Career](#)
 - The Odyssey Planning [videos](#)
 - [Videos from the Stanford Life Design Lab](#) on networking, finding opportunities, and seeking offers
- [Individual Development Plan](#) from Science Careers. This web-based career-planning tool is tailored to the needs of Ph.D. students and postdocs in the sciences. It includes exercises to help you examine your skills, interests, and values; a list of 20 scientific career paths with a prediction of which ones best fit your skills and interests; a tool for setting strategic goals for the coming year, with optional reminders to keep you on track; and articles and resources to guide you through the process.
- [Imagine PhD](#), a career exploration and planning tool for Ph.D. students and postdocs in the humanities and social sciences
- [Opportunity Comparison Matrix](#), by the UCSF Office of Career and Professional development, allows you to articulate and weight your criteria, which can be used as a basis for comparing different specific opportunities

General Guidance

- [Ascend](#) newsletter and magazine for early-career skill and leadership development, from *Harvard Business Review* (magazine, behind paywall after two free articles per month; newsletter is free)
- [Elastic: Unlocking Your Brain's Ability to Embrace Change](#), by Leonard Mlodinow, on building skills in navigating uncertainty
- [Range: Why Generalists Triumph in a Specialized World](#), by David Epstein, on the value of exploring and creating your path through generalizing, even if it means the path is non-linear.
- [The Startup of You](#), by Reid Hoffman and Ben Casnocha, which provides career planning recommendations framed around the idea that your career is analogous to a startup that requires you to think like an entrepreneur.
 - » Also see associated [resources](#), including executive summaries and tips for using LinkedIn

SPOTLIGHT: CAREERS IN NEUROSCIENCE AND SOCIETY

By Ishan Dasgupta, Program Officer, Dana NextGen Program; Khara Ramos, Vice President of Neuroscience & Society; and Caroline Montojo, President and Chief Executive Officer, Dana Foundation

What prompted Dana to develop its civic science work?

The Dana Foundation is leading efforts to build the emerging and critical field of neuroscience and society, a field that aims to foster meaningful connections between scientists and engineers working in neuroscience and the people whose lives could be impacted by it. As part of this field-building, we believe it is critical to educate, train, and equip the next generation of interdisciplinary experts and practitioners to shepherd neuroscience for a better world. However, without defined pathways to a diversity of employment opportunities, individuals may disengage from neuroscience and society work as they encounter limited career options. In addition, at present, the students, practitioners, and scholars who engage in neuroscience and society work are not representative of American society along multiple demographic and cultural dimensions.



The inspiration for this work draws on our individual experiences as trainees, as well as the countless stories we hear from trainees who are interested in advancing neuroscience for societal impact. We come from backgrounds in neuroscience, law, public health, and philosophy, seeking to work at the intersection of neuroscience and society, yet in our early careers, we needed to navigate our way without defined guideposts or a community of like-minded people.



Taking neuroscience as an example: many people pursue neuroscience driven by a passion to have a positive impact in society, but neuroscience training currently does not equip neuroscientists to conduct research in a societally embedded manner, leveraging methodologies and skills from other fields such as ethics, law, humanities, and community engagement. We imagine a paradigm shift in training neuroscience and society scholars and practitioners, which will incorporate critical scientific expertise but also broaden the knowledge, practical skills, and networks of expertise that these trainees gain during their training.

Dana’s career development work—what does it entail and for whom?

One way the Dana Foundation is building infrastructure for neuroscience and society careers is through the Dana NextGen program. The NextGen program emphasizes/ supports experiential learning for trainees to take their traditional classroom pedagogy and apply it to societal concerns. We aim to broaden not only trainees’ skills, but also the disciplines they are exposed to. For example, if you are a neuroscience trainee, one way to gain experiential learning may be to work with an ethicist and a community engagement expert on a shared research project. This form of interdisciplinary, consistent collaboration fosters interactions between academia and spaces that go beyond those walls. It allows trainees to directly interface with members of the community, entrepreneurs working in industry, or judges in the criminal justice system, for example.

One central example of our funding for career development is the Dana Foundation Career Network in Neuroscience & Society. Led by Dr. Francis Shen, JD, PhD, the goal of the network is to expand and diversify the next generation of neuroscience and society students, practitioners, and scholars.

The career network has three core components. First, it will recruit new people, especially from institutions and geographies underrepresented in neuroscience, to engage in neuroscience and society work. Pilot efforts will create virtual and in-person programming for undergraduate and graduate students to generate excitement about pursuing a career in neuroscience and society, and to connect them to individuals and institutions that can further support their exploration of these careers.

Second, it will create and communicate new opportunities for fostering and sustaining work in neuroscience and society. This will include engaging with private industry, nonprofit, government, and higher education sectors to promote the expansion of existing programs (i.e., postdoctoral fellowships in neuroethics, civic science fellowships for neuroscientists) and create new opportunities, and regular emails to communicate opportunities to job seekers.

Third, it will connect people and opportunities to build new careers. The Career Network in Neuroscience & Society website (neuroxcareers.org) consolidates existing career-related information, and it provides new career pathways content and resources for aspiring practitioners, scholars, and students at the intersection of neuroscience and society.

In addition to the Dana Foundation's support for the Career Network, we have career development opportunities through the Dana Centers for Neuroscience & Society, trainee-focused sessions at conferences, and professional development awards.

Each of the institutions that are part of our Dana Centers Initiative will host a variety of neuroscience and society trainees at different career stages, starting from high school students up through postdoctoral and early-career scholars. These Dana "fellows" will come from different backgrounds and disciplines, including trainees from the community who will bring their lived experience to inform the practice of neuroscience.

At science conferences, the Foundation holds trainee-focused events designed to understand the needs of trainees and explore ways to build tools to assist them in their development. We hosted a trainee-focused social at the 2022 Society for Neuroscience (SfN) conference and will be expanding our efforts by hosting an exhibit at the National Diversity in STEM conference hosted by the Society for Advancement of Chicanos/Hispanics and Native Americans in Science. In June, we hosted a trainee-focused workshop at the 2023 US BRAIN Initiative meeting on approaches to multidirectional public engagement and provided attendees with a call-to-action guide on how to incorporate new approaches into their local universities and communities.

This fall, we will also launch our first-ever open call for trainee-focused funding, in the form of professional development awards. These awards will allow students to explore interdisciplinary opportunities beyond their home discipline by giving small grants to facilitate attending a neuroscience and society-related conference or fostering a collaborative research project that may not otherwise be possible.

Any early insights?

One insight that emerged early on through our various programs is how deep the need for more career development opportunities is in neuroscience and society. We have

consistently found a high demand for alternate career paths for neuroscience trainees, whether through attendance at our 2022 SfN reception or through personal interactions with students who have reached out seeking guidance. A consistent theme across many of these conversations is the need for more employment opportunities; access to funding for interdisciplinary, collaborative work; outlets to publish work that doesn't neatly fit within existing publications; and a deep desire to better engage with the communities in which their academic institutions reside.

SPOTLIGHT: CAREERS IN ART AND SCIENCE

*By Louis J. Muglia, President and Chief Executive Officer,
Burroughs Wellcome Fund*

ARTIST-SCIENTISTS – RENAISSANCE PIONEERS OF THE SCIENTIFIC LANDSCAPE?

I have long been interested in the intersection of science and the arts. How creativity, inspiration, and passion can co-inform both scientific and artistic endeavors is something I wanted to explore when I became the president and CEO of the Burroughs Wellcome Fund in January 2020. I believe that fostering the interaction of science and the arts encourages unique perspectives on the challenges and questions that surround us as human beings. Having better understanding of complex societal issues promotes critical and creative thinking, and allows for a well-rounded problem-solving skill set.

I was with Burroughs Wellcome Fund for less than two weeks before I attended the National Geographic Storytellers Summit. There, I met Elizabeth Christopherson for the first time and many of the inaugural cohort of the Civic Science Fellows. Sometimes it takes just one day for serendipitous pieces to come together. The presentations introduced me to several creative works—among them, the photographic work of Anand Varma.

Varma, a biologist and a photographer, takes a unique approach to photographing what seems like an impossibility. He has worked with hummingbirds, jellyfish, parasites that take control of their hosts, capturing microscopic and easily missed details. His [studio](#) is part laboratory, part makerspace, and part classroom.



**BURROUGHS
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FUND** 

Varma is the perfect example of a scientist–artist. He’s led by an unquenchable curiosity that propels him to solve problems and answer questions. The arts contribute a unique dimension to civics discussions by inspiring empathy, encouraging creative thinking, and fostering cultural understanding.

Also during the Storytelling Summit, I met Álvaro Laiz, who was a National Geographic Explorer. Laiz is an expert at capturing the essence of diverse cultures and environments through his photography. Laiz is an artist taking on scientific questions. His unique approach to storytelling, combined with his deep respect for indigenous communities, led the Fund to contribute to his work as a 2021 Civic Science Fellow.

While these projects and others are inspiring, they beg the question of what’s next in terms of career path? There seems to be limited avenues to pursue a career along these endeavors. The Burroughs Wellcome Fund has long been committed to fostering careers of early-career biomedical investigators. We see these boundary-spanning individuals like Varma and Laiz as a new model for early-stage investigators along a nontraditional academic track.

Our work in Science + Arts does not stray from our professional development mission. Recently, the Fund partnered with the National Geographic Society to support Varma’s current project, the WonderLab. It combines the structured observation of a research lab with the design thinking of an engineering workshop and the creative expression of an art studio. The overall mission of the lab is to develop and share new pathways for using visual media to inspire a scientific mindset among a wide range of audiences and create a society that is more curious about, and connected to, the natural world.

In the introduction to a paper that I co-wrote with artist-scientist Callie Chappell, [we wrote](#), “Scientists and artists are both driven by curiosity and creativity. Curiosity causes both scientists and artists to try and understand and represent the world around them. To answer questions such as ‘what do we not understand?’ we need creativity. And what we create can help us to better see the world around us.”

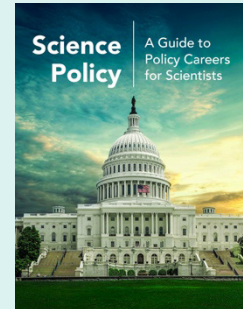
We, as scientists, artists, administrators, etc., are tasked with addressing the most pressing challenges in society, so we need to foster a scientific community that centers diverse perspectives and ways of knowing. By amplifying creativity, play, and transdisciplinary work across all areas, we can establish the connections, create the conversations, and collaborate on solutions to take meaningful action.

Science provides the evidence-based foundation for decision-making, while arts contribute emotional intelligence, cultural awareness, and creative problem-solving. A society that values both disciplines can make more holistic and effective choices, leading to positive societal progress.

SPOTLIGHT: CAREERS IN SCIENCE POLICY

By the California Council on Science and Technology Team

[CCST's Science Policy Career Guide](#) began as a labor of love among Alumni of the CCST Science & Technology Policy Fellows program, when Julianne McCall (Class of 2017) organized a career workshop event aimed at providing an overview of career pathways and resources available to scientists interested in pursuing careers in civic service. She recognized that recent graduates and early-career scientists, even when receiving support from their academic advisors and institutions, often lacked the professional development resources, networking opportunities, or training needed to navigate an unfamiliar career landscape. While many fellowship programs existed to support individuals making this career transition—with more being created every year—the number of highly qualified applicants far exceeded the number of fellowship slots available.



As a supplement for the workshop, Julianne partnered with Sydney Chamberlin (Class of 2019) and John Thompson (Class of 2016) to prepare a manual that scientists could use to inform and inspire their own career paths. The guide includes:

- an introduction to science policy and the settings in which it can be practiced;
- narratives from individuals with successful career paths in science policy;
- a list of organizations, academic programs, and fellowship opportunities to support individuals embarking on their own career journeys.

Since its initial publication in 2020, we remain humbled by the reception it has received throughout the science policy community and are honored to have played a part in inspiring this Career Roadmap.

CCST Science and Technology Policy Fellows' career development work starts with Policy Boot Camp, where the fellows learn professional skills as well as the history and politics of California, how a bill becomes a law, legislative and executive branch policies and procedures, and the culture of Sacramento. For the remainder of the fellowship, they attend weekly professional development seminars that include deep dives into topics such as stakeholder engagement, or fundraising; career conversations with appointed and elected California leaders; and collaborative check-ins to learn from each other as they navigate the policy arena. Halfway through the program, CCST Science Fellows attend a three-day career development retreat, with workshops, small groups, and 1:1 sessions covering topics including job searching, resumes, networking, interviewing, and

negotiation. CCST also conducts training for the Fellows mentors and leads conference workshops for scientists interested in interdisciplinary, boundary-spanning type of work.

In addition to the professional development opportunities offered to the CCST Science and Technology Policy Fellows, CCST hosts a Science Translators Showcase as part of CCST's Science & Technology Week. The Science Translators Showcase offers professional development to California early-career scientists who desire experience and training in translating their science for a policymaker audience. Participants learn and gain experience on how to communicate their research effectively to a policy audience through a series of training webinars, homework, and by engaging directly to Legislators and staff in Sacramento.

As the CCST Science and Technology Policy Fellows program enters its 15th year, here are a few insights we can offer:

1. **Professional development isn't just for early-career scientists.** It can be useful for people at any stage in their career, including those who have been in civic service a long time.
2. **Lean into existing skills.** Many Ph.D.s already possess many of the skills needed to find success in the world of science policy (completing a doctoral program necessitates honing problem-solving and analytical skills), but they worry they don't have the depth of subject matter expertise compared to their dissertation field to transition into a policy position. Learning to communicate and emphasize these skills is vital.
3. **It all comes back to communication.** Strong, clear communication is how policy gets done, and scientists in all career paths—not just civic service—can benefit from continuing to develop their oral and written communication skills.
4. **Practice is key!** Stepping into the unknown policy world takes courage, and developing new skills and expertise takes time—so be patient with the process and take advantage of opportunities to practice and build community.

If you are interested in learning more, please visit our website at ccst.us or email ryan.bixenmann@ccst.us.

LANDING OPPORTUNITIES

Once you've explored your possibility space and identified specific opportunities you would like to pursue, the next challenge is to “land the opportunities.” This will look different for different types of career steps and at different career stages. It might be receiving a job offer, getting a fellowship, securing funding, or formalizing a partnership.

While different scenarios, fields, organizations, and roles have different norms, at some point securing most opportunities requires you to articulate who you are as a professional, what work you do, and why you are a good fit for a particular opportunity. We make a pitch for ourselves and our work through our resumes and cover letters, in conversations and interviews, emails proposing partnerships, and in requests for funding. This is true whether we're applying for an educational opportunity, a posted job, a fellowship, a grant, a contract, or making the case for a new organization or position that doesn't yet exist. If your pitch is received favorably and you receive an offer, you may have an opportunity to negotiate the terms of that offer. This section addresses elements across each of those steps.

Making a successful pitch is not only about our competence or credibility as an individual; it also requires making connections between your experiences, skills, and perspectives and a particular opportunity and area of work. For civic science opportunities and for people with interdisciplinary backgrounds, there may not be an obvious one-to-one correspondence between your background and the opportunity at hand. So, these steps will require special attention and preparation.

Many resources on the tactical components of applying for jobs and funding can be found online, as well as through career development offices at universities, which often include resources for alumni. Rather than aiming to be comprehensive on these dimensions, this roadmap prioritizes and focuses on content that is particularly pertinent to civic science professionals and opportunities.

Making a pitch for yourself and your work

In order to land opportunities, you need to be able to make the case for why you're well-positioned for success in a particular role. This includes articulating the values, skills, experiences, and understandings that you bring to your work, your professional goals, and your vision of impact in a particular field. The frameworks and resources discussed in the previous chapter lay the groundwork for articulating these ideas. When connecting with potential employers, funders, or partners, the insights that emerged through exploratory work must be woven together into a narrative persuasive to people with power to help you take the next steps in your career.

Crafting and translating your resume and cover letter

Most formal opportunities, such as posted positions and grant opportunities, require a document that lists credentials relevant to the opportunity—a resume or CV—as well as a cover letter that makes the “pitch,” explaining how your background makes you a good fit for a particular opportunity. Both of these pieces must be tailored to individual opportunities, to strategically

communicate directly translatable civic science skills and experiences, personal narrative, interest, and aptitude for the role, funding, client, or partnership in question.

For both your resume and cover letter, determining what to include and how to frame important points can be particularly challenging for boundary spanners and other individuals who need to translate their resume across different sectors or professional contexts. Doing so requires an understanding of your audience, including their familiarity with different areas of work and concepts, as well as their values and priorities (e.g., if you were the screener for this job, grant, etc., what would you want to see in the ideal cover letter and resume? What terms will help them see your background and skills in terms of the particular opportunity they are screening for?). Leveraging insights from the informational interviews, support networks, and research you've done so far will be especially valuable for providing an understanding of how you might tailor your resume and cover letter for the different fields, sectors, funding, partners, and clients that you're exploring.

Interviewing

Being able to connect the dots for an interviewer or other conversation partner (e.g., prospective funder, partner, or client) in clear and compelling ways is an essential competency for civic science professionals. This is where the personal mission statement, goals, values, and skills you unearthed and clarified in the inward exploration stage are especially valuable, as well as recognizing how they align with the opportunity you're pursuing. Interviews and similar conversations provide an opportunity for a potential employer, partner, funder, or client to gain a richer understanding of your background and perspectives and how you engage with others.

Although interviews are often thought of in a unidirectional way—an employer, funder, or client assessing a candidate—it also allows you, the candidate, to assess a potential employer, funder, or client as well, including how they work and engage with others, their values and priorities, and their vision for the opportunity you're exploring.

The UCSF Office of Career and Professional Development offers a number of [resources](#) for those preparing for interviews (also relevant for conversations that serve similar functions). Here, we include guidance to help connect more general interviewing guidance to specific civic science opportunities:

- In response to general questions like “tell me about yourself,” talk about your training, background, and skills, being sure to point out how civic science attributes serve as throughlines in your work—such as boundary-spanning experience connecting diverse stakeholders and designing for equity and inclusion.
- If asked questions about where you want to be in 5–10 years, focus on characteristics of your ideal work, including the values and outcomes that are important to you—not on a job title. The exercises and frameworks provided in the previous chapter can provide a foundation for articulating this vision.
- Enter into a conversation with a strong sense of your personal narrative (or mission, or personal theory of practice), including formative experiences, challenges you overcame, and lessons learned, and be prepared to tell these stories in response to a range of behavioral questions (which typically start with something like “tell me about a time when...”). These

provide additional opportunities to demonstrate, through story, how you work and think. They are especially good opportunities to show that you think in terms of systems (rather than single-order causes and effects, you recognize a wide range of interdependencies, second-order effects, and complexities), and that you prioritize designing for equity and inclusion.

While these recommendations are likely to be helpful in any area of work, they may be especially crucial for civic science professionals because they often have diverse backgrounds and areas of expertise that weave together disparate fields, skill sets, and experiences. While this kind of background can make you well positioned for creative and impactful work, it can make it challenging for a prospective employer, funder, partner, or client to immediately see why you're the right person for a role.

Throughout an interview or similar conversation, it is important to remember that not only are you being assessed for a particular opportunity—you are also assessing the person with whom you're speaking through discussion, with an opportunity to determine your compatibility.

Naledi Saul, Director of the Office of Career and Professional Development at UCSF, advised Civic Science Fellows to consider different kinds of organizations that can be detected and avoided through the interview process. Some organizations are toxic for everyone—the organizational culture, the people, or something about executing the actual work causes people such distress that it negatively affects morale, productivity, or other areas of life. In other cases, an organization may not necessarily be toxic, but it may be a bad fit for you. For example, if your values aren't shared, your work style or approach isn't appreciated, your needs aren't recognized, or your goals aren't aligned or supported, you will likely not be happy.

An interview or other conversation is a key tool for assessing whether a potential employer, partner, funder, or client is either toxic or a bad fit for you. Saul encourages a data-driven approach, with candidates asking multiple people the same or similar questions and assessing if their responses are 1) similar, 2) detailed, 3) credible, 4) appealing. For example, if assessing a potential future boss, you can ask both them and others they supervise about how they set expectations, give feedback, or offer protection, and look for consistently corroborating answers. Answers that do not meet these four benchmarks could be considered signs that the boss might not be as skillful as they think they are. You can also learn by paying attention to what people don't say. For example, if someone pauses for a long time and seems to choose their words carefully, it could be a sign that they need to reflect (which is good) or a sign that this is a tension point or something they don't feel comfortable sharing (which is not good). So note if the person interviewing you hesitates on all responses, or only some.

Negotiating

Negotiating is a critical step between receiving an opportunity and deciding whether to accept it. It can affect your experience in a role, influencing things like how valued you feel in your work, whether you have the resources you need to thrive outside work, and how long you stay.

Expectations around negotiation vary from one context to the next. For example, for many funding opportunities, grant amounts are published in advance; however, depending on the type of funding organization, there may be room for further conversations about what additional

resources, financial or otherwise, it will take for the work to be successful. For many posted positions, negotiation (whether on salary or something else) is expected. To better understand the norms and possibilities for a particular opportunity, you can lean on the networks you've developed throughout your career and exploration process. Perhaps peers have recently received similar opportunities and can share insights about what they did (or wish they did), or you may have mentors who are more familiar with a particular landscape and can share guidance.

It is particularly valuable for civic science professionals to consider a negotiation strategy because they are often creating new roles or organizations, bringing novel background experiences or skills to an existing role, or charting some other novel path. With this novelty, there is more ambiguity around things such as compensation that require intentional, clear communication, and advocacy rooted in a distinctive, forward-looking value proposition.

Pursuing funding

It is critical to have a coherent and compelling narrative of your background and vision for the future when pursuing funding, whether this is to create a new role, start a new project, or even to start a new organization. While the specifics vary significantly across different contexts, the following resources and spotlight provide a starting point for many areas of civic science work.

First, recognize that different donors or funders are [motivated by different things](#). If you can understand the driving force behind why a particular funder invests in the things they do, you can both determine whether your work might be aligned with their motivation, and, if so, frame your work in ways that make the alignment salient.

Many of the resources described in the previous chapter can also be considered through the lens of pursuing funding. For example, you may need to intentionally build your network to find a source of funding that is a good fit for your goals and to build a relationship that will make the funding possible. Relationships are key for 1) learning how funding works in your particular fields and across different types of funding sources, and 2) developing the language and connections that will convey the credibility and relevance of your work to those potential funders. Your mentoring and support networks can help you gain the “behind-the-scenes” information you need to determine whether you should find collaborators (e.g., someone with complementary expertise or access to particular resources or funders). It's particularly important to leverage all the resources at your disposal when applying for funding, since funding sources are typically very competitive. This also means that rejection is common. Rather than seeing this as a failure, you might try to view this as an opportunity to further refine your ideas, practice communicating about them, and gain feedback from the process.

Resources

Tactical resources and how-tos:

- [The Elevator Conversation](#), a short video from the Stanford Life Design Lab that suggests reframing the high-pressure concept of an “elevator pitch” to a more organic, lower-pressure “elevator conversation” that conveys the narrative of your work
- [All the best advice we could find on how to get a job](#) from 80,000 Hours (a component of their broader career planning course referenced in the previous chapter, focused on the

tactical elements described in this section)

- [UCSF Office of Career and Professional Development resources on interviewing](#), including ways to prepare for different types of interviews, engage during the conversation, and follow up
- “[15 Rules for Negotiating a Job Offer](#),” by Deepak Malhotra for *Harvard Business Review*, includes advice pertaining to a wide range of opportunities
- “[Seven Donor Types](#),” by Susan Howlett, which provides an overview of different values and orientations you might observe from different funders

Context-specific resources

- [Fast Forward](#), an organization that bridges the tech and nonprofit sectors to build capacity for tech nonprofits, so they can scale solutions to urgent societal problems. The website contains a number of resources applicable to nonprofit start-ups of any kind, as well as a job board for those interested in tech nonprofit work.
 - » See especially the [Tech Nonprofit Playbook](#), which distills advice from leaders whose work has transformed the social impact space

SPOTLIGHT: PARTNERING WITH PHILANTHROPY

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Philanthropy’s role is to provide formative capital for democratic institutions. Philanthropy helped to shape the character and contours of the American scientific enterprise. Today what we’re calling civic science targets perhaps the greatest crisis for that enterprise in recent memory—the crisis of objectivity. Philanthropy needs to step up by continuing to grow its commitments to civic science, bridging gaps in representation, understanding, and participation.



“What can you do as civic scientists to accelerate these trends? Give us some new ideas. We need more and bigger ideas from all of you. We need you to help us find new talent, new ideas, new networks to apply our funds. And foundations are often guilty of tackling the same problem in isolation to each other. We need you to help us transcend these boundaries.

“Like any investor, we need our grantees as much as you need us. We need you and are counting on you.”

— *Samsher (Sam) Singh Gill, President and CEO, Doris Duke Foundation*

“

Being part of this community is so critical. That's where the best kinds of work can come—where we listen from each other, we learn from each other. It's not you telling me what to do, it's not me telling you what to do. That idea of engagement that's so central to civic science is actually a characteristic that I think is really important in the philanthropic relationship to our own grantees—about respect, listening, inclusion. That helps make the work we fund better and more reflective of the communities we serve.”

— *Brooke Smith, Director, Science and Society, The Kavli Foundation*



“

It's important to realize who isn't in the room. And how can we make sure that we're not only listening to but actively seeking perspectives and ideas as well as leadership. We need to be much bigger than our own perspectives and our own networks.”

— *Janet Coffey, Program Director, Science, Gordon and Betty Moore Foundation*



THRIVING

While we often think of career design in terms of decisions that take place before setting off on a path—accepting a position, beginning a fellowship, starting an organization—there are many important elements of thriving in a career that come after a direction has been initiated and can increase your effectiveness, satisfaction, and resiliency, as well as readiness for next steps.

While the recommendations and resources in this section pertain to work across a wide range of sectors and roles, they are especially pertinent to civic science work. As boundary spanners, civic science professionals engage with the distinctive challenges of developing and nurturing collaborations, often with collaborators who are diverse on several dimensions and bring different norms, expectations, and skills to their shared work. Boundary spanners who are people of color or have other marginalized social identities face particular pressures, which may include disproportionate [institutional demands](#). Similarly, people working in mission-driven organizations, which encompasses many civic science professionals, have a particular set of opportunities and challenges when it comes to thriving at work—with factors like personal investment in work contributing to both a sense of meaning and high rates of burnout. The considerations below are not “extras,” therefore, but core to being able to stay in a fulfilling career path and meet your goals and values.

People working in mission-driven organizations, which encompasses many civic science professionals, have a particular set of opportunities and challenges when it comes to thriving at work—with factors like personal investment in work contributing to both a sense of meaning and high rates of burnout. The considerations below are not “extras,” therefore, but core to being able to stay in a fulfilling career path and meet your goals and values.

Personal wellbeing

Civic science efforts strive to bring about conditions that enable human flourishing, and they emphasize attention to *how* results are achieved. Many in the community have pointed to an important corollary: it’s essential for the people doing the work to also have opportunities to flourish—to be well in all ways. It can be helpful to periodically take stock of your sleep, nutrition, exercise, and relationships, to assess the extent to which they’re each promoting or hindering your physical and mental health.

Beyond being important in their own right, physical and emotional wellbeing are prerequisites for doing meaningful work effectively. If you’re not operating at your physical or emotional best, your impact will be limited. In a [review of diverse sources of evidence related to career success](#), the organization 80,000 Hours identified these two items as most important: “Don’t forget to take care of yourself” and “If necessary, make mental health your top priority.” Resources for assessing and fostering personal wellbeing are included at the end of this chapter.

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Our complex world absolutely needs more people who can build connective tissue between science and the rest of society. Of course, you'll need courage to chart your path as a boundary spanner—the very reasons that we need you are the same that make it hard to be you. But that's why the runway lights of the Civic Science Fellows Program network and resources are so essential.”

— *Angela Bednarek, Project Director, Evidence Project
The Pew Charitable Trusts*



Pew

Managing self

Although much of our experience of work is influenced by other people, we each have the power to be deliberate about various approaches we take in doing our work. In most roles, we have some power over the structure of our days (and weeks, months, and years), though the external constraints on these rhythms will vary significantly depending on your field, organization, role, and personal life.

A number of researchers and leaders have been advocating for a reframe for “time management,” from managing your time to managing your attention or energy. The following resources provide language and strategies for those interested in shifting focus toward attention and energy.

- [Productivity Isn't About Time Management. It's About Attention Management](#), an article in *The New York Times* by Adam Grant, who argues that a focus on time management makes us more aware of how much time we waste. Instead, a focus on what consumes our attention, including the people and projects that matter, reduces the pressure placed on the amount of time that things take and increases your intrinsic motivation for your important work.
- [Manage Your Energy, Not Your Time](#), a *Harvard Business Review* article by Tony Schwartz and Catherine McCarthy, describes and provides real-world examples of “renewal rituals,” which are intentional practices that increase one’s physical, emotional, or spiritual energy throughout the day to increase alignment, satisfaction, and well-being, and in turn lead to better and more sustainable performance.

A focus on attention and energy can give rise to a number of strategies, such as deliberately blocking out days or portions of days to dive deeply into a project without interruption, setting boundaries about when you check things like email or social media, prioritizing the most important or challenging tasks at the time of day that you are sharpest, or carving out time for breaks that restore your energy.

It also can be a helpful reframe to recognize that it is most likely not possible to do everything that you care about in the world or feel that you should do. This can sound depressing at first,

but it also means that you don't need to hold yourself to the standard of: "If I just optimize my day right, I can do it all!" Instead, it can help to pick—out of all the things you care about—what are the (few) truly top priorities. Then build your day around those. If you're interested in more time management reframes, the book [Time Management for Mortals](#), by Oliver Burkeman, has many ideas and approaches you can try.

Managing others

Another component of thriving professionally is how you engage with people who are part of your team—either at the same organization or on a collaborative project with different organizations and people working together. The Management Center, which provides a number of resources for mission-driven teams, notes that supportive [relationships](#), built on trust and a sense of shared purpose, are the core of effective management. They also note that building connection and community in teams is a key way to avoid [burnout](#).

Often, and especially early in a career, these relationships are with people you don't formally manage, and who may have some form of power, such as decision-making authority or responsibility over your work. Traditionally, the phrase "managing up" has referred to strategies and considerations that support a mutually beneficial relationship with a boss or supervisor. Civic science professionals may have other relationships where there is an imbalance of power and these strategies can also be effective, including relationships with funders, nonprofit board members, elected officials and their offices, leaders of advocacy coalitions or membership organizations, or media outlets.

Karina Davidson, Dean of Academic Affairs and Director and Professor in the Institute of Health System Science at the Feinstein Institutes for Medical Research in New York, shared the following recommendations for managing up:

- **Learn to “read your boss’s mind”** — in other words, learn about their priorities and values and their working style, so you can develop a stronger understanding of their expectations and anticipate their reactions to various situations. (The Management Center calls this [perspective-taking](#).)
-
- **Practice saying no graciously.** While you cannot always say no to something that someone asks, especially in the case of a power imbalance, there are many times when it's acceptable but challenging to do so. Learning to say no involves knowing yourself—under what circumstances should you say no, and what ways of doing so are authentic to you—and knowing those to whom you report, such as how they respond to different forms or styles of communication.

Additional resources on this topic are included at the end of the chapter.

Leadership and organizational change

An understanding of strategies for leadership and organizational change are especially critical for people in formal leadership roles, those starting a new organization or other entity, and those advocating for change within an organization or professional community. However, leadership

does not need to be codified in your position for you to lead—in many contexts, informal leaders can have substantial influence over norms, values, and the work of a team or organization.

2020–21 Civic Science Fellow Shannon Dosemagen, Director of the Open Environmental Data Project, describes ways that the concept of a “theory of change” can be applied for both the design of an organizational trajectory as well as a personal career. A theory of change (many templates for which can be found online) lives alongside an organizational or personal mission, vision, and values, and explains how you (or your organization) will make an impact. Closely related to the personal theory of practice described above, it lays out how the big “why” or “so what” connects to the specific “hows” that your organization or you carry out. It’s helpful both for explaining your work, as it encapsulates what you do and why, and helps you make decisions about where to invest energy and resources. For example, it can serve as a basis for saying “no” to opportunities that don’t serve your ultimate goals. Although theories of change are employed in a wide range of work, they may be especially helpful in the context of civic science work and careers because many boundary spanners and other civic science professionals are forging new paths, tackling specific, evolving, or emergent problems, and taking new approaches.

Your theory of change will also likely have elements that need further investigation, and will evolve over time. Dosemagen noted that it’s valuable to consider whether a deliberate or emergent strategy is more appropriate for your context and goals. When operating with a *deliberate* strategy, the past is a good predictor of the future, and there is precedent for the goals and approach being undertaken. Deliberate strategies aim to bring about predictability, efficiency, and reliability, and are typically led by experts who define a problem and outline a plan. *Emergent* strategy, by contrast, respond to conditions of change and uncertainty by focusing on uncovering needs and prototyping solutions. Rather than rely on precedent, teams develop an agile plan over time as intentions accommodate a changing reality.

While both approaches have value, they are effective for different kinds of challenges. For example, Dosemagen notes, work on solar energy required an emergent strategy at the outset, when there were questions about how it would work, pay for itself, and be used. Today, there’s a significantly greater understanding of all of these questions, so in many cases work on the development and deployment of solar energy is deliberate, though there are new questions on how to encourage people to embrace and use it that have surfaced and benefit from emergent strategy. Because civic science work frequently involves questions and approaches without precedent, yet can often take place within institutions and communities that have specific norms, expertise, and ways of operating, many civic science professionals will toggle between these two types of strategies in their work.

Building inclusivity into your day-to-day

A pillar of civic science work is designing for equity and inclusion (see page 15). This is true of both the outcomes of civic science efforts and the day-to-day processes, structures, and norms that define the work.

Joyce Yen, Director of the ADVANCE Center for Institution Change at the University of Washington, opened a conversation with a group of Civic Science Fellows by articulating diversity as “differences that carry social and historical significance in the modern world,” a definition

adapted from organizational psychologist Kecia M. Thomas. Yen noted that challenges of building diversity, inclusion, and equity in organizations and systems that have long been exclusionary can seem insurmountable. One helpful way of thinking about diversity challenges is that they are similar to financial debt, she said. Even when we have a lot of financial debt, we generally approach it little by little. Every bit that we pay off is meaningful. Similarly, we need to do what we can to intentionally address the diversity debt, even if we aren't able to "solve" it entirely in a short amount of time.

Yen articulated a framework for approaching diversity, equity, and inclusion issues as a leader, including those in both formal and informal leadership positions:

- Identify your circle of concern (i.e., what/who you care about) (from [Loving Leadership](#) by Christopher Loving)
- Grow your circle of influence (i.e., what/who you can affect)
- Find your immediate next steps (i.e., what is possible and strategic for your goals).

You can create accountability by identifying "lead measures"—specific measurable behaviors that will help you reach your goals. Lead measures will drive the outcomes (aka "lag measures") you care about.

Yen also recommends cultivating a mindset that we all have room for growth in our ability to lead in ways that advance diversity, inclusion, and equity. When we "pat ourselves on the back" too much for all that we do, rather than focusing on ways we can still improve, we are more susceptible to perpetuating inequity.

Naledi Saul is also a Principal Investigator on a National Science Foundation grant training scientists in inclusive research mentoring and people management skills. Her work suggests that people managers can use five general inclusive pillars when implementing any work task or decision. Below are each of the pillars with examples of how various strategies could be applied for each pillar for a common work task: a meeting.

- **Add respect**
You make space for people to bring their full selves to work and value their contribution (e.g., using people's preferred name and pronouns, admitting your mistakes, signaling that you value others' values/work/contribution, etc.)
- **Add diverse voices**
You invite perspectives to the decision-making process. (e.g., ask for input in the meeting, invite participation, etc.)

One helpful way of thinking about diversity challenges is that they are similar to financial debt. Even when we have a lot of financial debt, we generally approach it little by little. Every bit that we pay off is meaningful. Similarly, we need to do what we can to intentionally address the diversity debt, even if we aren't able to "solve" it entirely in a short amount of time.

- **Add objectivity**
You add accountability or transparency to a situation (e.g., keep track and stay on top of the agenda, use meeting ground rules)
- **Level the playing field**
You do something to create a situation in which everyone has a fair and equal chance of succeeding (e.g., signal your expectations and preferences, which helps people understand how to have a successful relationship with you; automatically turn on transcription in virtual meetings, etc.)
- **Offer protection**
You do something that prevents another person from suffering harm or injury or from damaging the culture (e.g., stop people from silencing each other or taking each other's credit in the meeting, etc.)

Finally, Saul emphasized that engaging in inclusivity usually means engaging in change management. Leaders, mentors, and managers can apply change-management principles to efforts to improve inclusivity in particular areas of their work, including signaling and clarifying why a particular change is valuable, piloting the change, and holding people accountable for participation.



EDI is a journey of continuous improvement—so find good companions.”

— Percival Matthews, Associate Dean for Equity, Diversity, and Inclusion and Associate Professor, School of Education, University of Wisconsin–Madison



Initiating collaborations

Civic science work often involves building strategic collaborations, often with people and groups who have different backgrounds, expertise, circles of influence, and cultures. Adam Levine, Associate Professor at Johns Hopkins University and President and co-founder of [research4impact](#), has noted that potentially excellent collaborators are often strangers to each other. Even when they want to build new collaborations, in practice they do not know how to begin the process, have limited capacity, and/or lack opportunities to collaborate. One way to solve these problems is to reduce their uncertainty through relationality.

Relationality refers to how you relate to others and how others will relate to you. Relationality is not merely the point that “relationships matter” but that new relationships are difficult because there is uncertainty in how potential collaborators will relate to one another. Either through a

supportive third party or directly, collaborators can intentionally signal their collaborative qualities, explicitly stating what sometimes remains unsaid. For example, it can be helpful to overtly share that you value others' expertise. In initiating a collaboration, it can also be helpful to prioritize others' experience of you—for example, focusing less on your competency and more on your friendliness. For more on cultivating diverse collaborations or support finding a collaborative partner, see the [research4impact website](#).

Beyond the initiation of a new collaboration, managing collaborations requires intentionality. Building trust and relationships, honoring local voices and perspectives, building processes that allow for flexibility and iteration, and working toward mutual benefits can all pose distinctive challenges. At the same time, they are all essential ingredients in impactful civic science work—giving rise to results that cannot be achieved in the absence of effective and equitable collaboration. The National Academies of Sciences, Engineering, and Medicine's Standing Committee on Advancing Science Communication and the Civic Science Fellows program partnered to organize a series of roundtable discussions, [Collaborating with Communities about COVID-19, Climate, and Community Concerns](#), which provide an overview of promising practices and open questions around building civic science collaborations with community partners, as well as case studies of successful collaborations.

Resources

Managing self

- Resources from 80,000 Hours
 - » [All the evidence-based advice we found on how to be more successful in any job](#)
 - » [Annual Career Review](#), an activity for regularly checking in on the previous year, identifying indicators that you may want to make a career change, and making plans for the coming year
 - » [A checklist for making rational career decisions](#), intended to support assessing career decisions in the face of uncertainty
- [The Nonprofit Burnout Assessment worksheet](#) by Beth Kanter includes statements in a few categories with the instruction to rate the extent to which each describes your current situation. The worksheet also provides a key for interpreting your results and determining what you need to improve your relationship to your work.
- Computer science professor [Cal Newport's website](#), which includes links to long- and short-form writing on topics like “deep work,” digital minimalism, and finding meaning in work
- [Productivity Isn't About Time Management. It's About Attention Management](#), an article in *The New York Times* by Adam Grant, who argues that a focus on time management makes us more aware of how much time we waste. Instead, a focus on what consumes our attention, including the people and projects that matter, reduces the pressure placed on the amount of time that things take and increases your intrinsic motivation for your important work.
- [Manage Your Energy, Not Your Time](#), a *Harvard Business Review* article by Tony Schwartz and Catherine McCarthy, describes and provides real-world examples of “renewal rituals,” which are intentional practices that increase one's physical, emotional, or spiritual energy throughout the day to increase alignment, satisfaction, and well-being, and in turn lead to better and more sustainable performance

Managing others

- [Why Managing Up to Your Boss Is Not Enough](#), by career consultant Jenny Wood, on how to manage up, diagonally, and outside of immediate supervisors, to build a strong network of support. (*behind paywall after 2 articles per month*)
- [Managing Up: What is It and Why Do It?](#) By University of California Merced's Human Resources, with concrete guidance for managing relationships with supervisors
- [Resource library](#) from the Management Center, including
 - » [How to Actually Reprioritize](#), an overview of strategies around how to say no to some things to make room for others
 - » [The Four Elements of Strong Relationships](#), a guide for building management relationships based on authenticity, trust, navigation of power and difference, and a sense of shared purpose
 - » [Using Choice Points to Advance Racial Equity and Inclusion](#), a five-step process for identifying opportunities and enacting changes that advance equity and inclusion
 - » [Managing Up and Sideways](#), a collection of articles and tools to help build relationships and alignment

Inclusive Leadership

- [Art of Transformational Consulting \(ATC\)](#) serves as a repository for resources that support personal and organizational change for impact, with tools on topics including assessment, facilitation, feedback, leadership, organizational transformation, personal ecology (balance, pacing, and efficiency), personal mastery, and visioning
- [15 things we've learned in 15 years](#) by the Rockwood Leadership Institute, a group that provides capacity-building to individuals and organizations working to make a social impact. The publication articulates learnings about how to transform ourselves, our organizations, and our movements.
- [How Can We Lead Now?](#) an article by the Rockwood Leadership Institute that includes a wide-ranging set of resources on leading for justice and inclusion
- [Burnout at Work Isn't Just About Exhaustion. It's Also About Loneliness](#), by Emma Seppälä and Marissa King, which argues that leaders must build inclusive and empathetic workplaces, to avoid loneliness and the burnout that follows

Collaborations

- [Research4impact](#), organization that facilitates collaborations among diverse stakeholders to work on complex social problems
- [Collaborating with Communities about COVID-19, Climate, and Community Concerns: A Roundtable Discussion](#), organized by the National Academies of Sciences, Engineering, and Medicine's Standing Committee on Advancing Science Communication in partnership with the Civic Science Fellows program, provides a set of materials containing diverse insights into promising practices and open questions

Books

- [The Happy, Healthy Nonprofit: Strategies for Impact Without Burnout](#), by Aliza Sherman and Beth Kanter, includes resources for assessing your organization's health and practical recommendations for improving the well-being of a nonprofit
 - » Also see the authors' [website](#), which includes downloadable resources

- [*Emergent Strategy: Shaping Change, Changing Worlds*](#), by adrienne maree brown, describes approaches to leaning into change and deliberately embracing emergent strategy to make a positive impact on ourselves, society, and the planet
- [*Four Thousand Weeks: Time Management for Mortals*](#), by Oliver Burkeman, includes many time management reframes

OPPORTUNITIES: ONGOING DEVELOPMENT

There are many ways to build skills, experiences, and networks outside of formal education programs and your primary professional focus. Volunteering or participating in various groups provide opportunities to gain skills, experiences, and networks, while also providing outlets for personal enrichment, meaning, and relationship-building. There may be opportunities for impact in volunteer positions that may not be immediately available through paid work. While participation in such professional development activities is not a requirement for pursuing a civic science career, such activities can support career advancement or provide benefits that complement paid work or formal education. In some cases, volunteer efforts can become paid efforts.

This chapter describes ways to engage in community, government, and other organizations on a volunteer basis or as a nonpaid group member or participant, including examples. Because there are many potential civic science–related professional development opportunities, the list provided here is intended as a starting point that will spark ideas for other possibilities that may be even more closely aligned with your priorities and interests.

If a type of engagement interests you, a good way to start is by making a small commitment (e.g., attending one event) or by holding an informational interview with someone you know who has been involved in this area previously.

The following questions may be useful in determining whether an involvement may be ideal for you, and if so, what type of activity you might pursue:

- What do I want to gain from this experience that I may not be able to gain from a paid opportunity? New skills? Network expansion? Knowledge? Personal enrichment? A sense of meaning? Something else?
- What can I contribute through this experience that I may not be able to give through a paid opportunity?
- Given what I hope to gain from and give through the experience, is this an ideal way to achieve my goals, or might a different activity be more strategic?
- Will I enjoy spending my time and energy on this?
- Are there other reasons engaging in this activity might indirectly be beneficial to my career or personal development?

Additional questions can help you weigh the trade-offs involved in participating in any particular activity.

- How much time do I have available to spend on professional development activities? Is this particular opportunity one that will fit within the bounds of the time I have to give?
- Beyond time, what else will this activity require from me (e.g., travel funds, developing new skills)?
- How will spending time and energy on this affect other areas of my life (e.g., relationships, work, hobbies and interests, overall health and well-being)?

Sample Professional Development Opportunities

The following areas represent a range of organizations and activities that provide opportunities for civic science professional development.

Professional Societies

Most disciplines have scholarly or professional societies or associations that represent the discipline or general area of study. Involvement in such organizations—whether simply as a member or as a volunteer—may be especially beneficial for people who aim to advance a particular discipline or support the connections between that discipline and other communities (e.g., by providing technical input to policymakers or participating in community outreach events on a particular scientific topic). Professional societies and associations can provide connections to a network of scholars with a common academic or professional interest and specific channels for engaging in activities, such as community outreach events for scientists to share their work with students or Capitol Hill lobby days to meet with members of Congress.

Many disciplinary societies have committee structures including committees committed to science policy initiatives; science communication activities; diversity, equity, and inclusion efforts within the field; internal governance; and many others. These committees provide opportunities to work with the society to create programming, awards, communications, or organizational policies, all of which can advance civic science values.

Wikipedia includes [a list](#) of scientific associations and societies—though not comprehensive, it may provide a starting point to find organizations that reflect your discipline.

There are also cross-cutting associations, societies, and networks that have opportunities for researchers and practitioners from a wide range of disciplines. For example:

- [American Association for the Advancement of Science \(AAAS\)](#), world's largest multidisciplinary scientific society and a leading publisher of cutting-edge research
- [Association of Science Communicators](#) promotes responsible practices in science communication, facilitates discussion and exchange of ideas, enables networking, and fosters public engagement
- [National Science Policy Network](#), an association of civically engaged individuals and local chapters committed to strengthening the role of science in society
- [The SciCommers Network](#), a community of scientists and engineers that includes faculty, post docs, graduate students, and undergrads dedicated to engaging the public through better science communication, hosted at Boston University
- [Sigma Xi](#), The Scientific Research Honor Society, is an international honor society of science and engineering
- [Transforming Evidence Network](#), a community that shares research and expertise about how evidence is made and used, across policy and practice domains
- [Union of Concerned Scientists](#), a member-supported nonprofit that's fighting for a safer and healthier world

Governmental Opportunities

Governmental volunteer opportunities may consist of formal appointments to local, state, or

national bodies or may involve informal engagement with officials to provide expertise on a particular topic. Engagement can be a very small commitment—for example, weighing in during a public comment period—or a much larger one, such as running for office. Government structures, and therefore opportunities, vary greatly from one place to the next, so it is important to investigate the particulars of the government you are most interested in supporting.

City and county governments

In the United States, local governments are typically defined by city or municipal boundaries and/or by larger county boundaries (which are called parishes or townships in some parts of the country). These entities vary significantly between regions—for example, in some places public education is run by cities or towns, while in other cases it’s run by counties. Although the specifics vary from place to place, there are many opportunities to volunteer in these local governments.

Local governments have boards and commissions that assist the government in making decisions and often need technical expertise. Appointments to these volunteer boards are usually by application, and openings can be found on the county website. Local governments may issue specific report requests and other assessments to investigate topics such as roadways or fairground locations. For specific reports, a special task force or other group may be activated, and membership may be by application or appointment.

One distinct way to engage at the local level is with school boards. Though there is not often a technical advisory position available, board members often welcome input from relevant experts and engaged community members.

Examples of ways to learn about local government engagement opportunities:

- Attend city council, county commission, or school board meetings
- Follow government or elected official social media accounts
- Subscribe to newsletters from local elected officials and government offices, such as the sustainability office
- Introduce yourself to your local elected officials—either by email or at an in-person event—and let them know your areas of expertise and how you might want to contribute.

“

Civic science in my mind is a bedrock of our government. It is building *with* not *for* people. It is looking at both qualitative and quantitative methods to better understand. It’s easy to run fast with a small group of people. It’s much harder to engage with people experiencing the harms, or people who operate outside of your own worldview.”

— *Stephanie Nguyen, 2020–21 Consumer Reports Civic Science Fellow, Chief Technology Officer, Federal Trade Commission*



State government

Similar to both county and municipal governments, state-level governments have boards and commissions that are normally appointed by the governor of the state. These are also selected by an application process and are sometimes mediated by nonprofit organizations that assist in the applications and curation of nominees.

State government engagement can include things like testifying on legislation live at a committee hearing (usually a signup is available upon arriving at the meeting) or by responding to policy proposals during comment periods.

A professional society relevant to your field, or a university you are associated with may be able to help you get started with engaging state-level government. There are also likely smaller nonprofits that exist in your state with a mission to engage policymakers. The secretary of state's office can be a place to start finding in-state nonprofit organizations, as they reposit this information.

Federal government

A common way to engage at the national level is to testify when committees are considering legislation. Since there are many more groups from across the country trying to weigh in on such legislation, working with a group such as a disciplinary society that already has connections and experience with governmental processes can be an effective avenue to contribute. Responding to policy proposals during public comment periods is a more accessible and frequent way to engage with federal opportunities. A number of federal agencies and offices provide regular opportunities for public engagement, including the White House Office of Science and Technology Policy.

Democracy and civic engagement opportunities

Many civic science priorities require engaging with democratic processes and structures beyond formal governments, such as fostering dialogue among different communities, expanding access to evidence, and broadening representation in decision-making bodies. To gain experiences and skills in such areas, for example, you might:

- Participate in organizations that facilitate dialogues across difference
- Volunteer to register voters or encourage people to vote (i.e., “get out the vote” campaigns)
- Serve as a poll worker or election judge, opportunities you can pursue through your municipal or county office of elections or clerk's office
- Campaign for candidates or ballot initiatives that reflect civic science values
- Become involved in civic groups or mutual aid projects that seek to understand and advance community priorities

Education-focused opportunities

Education is a key component of many civic science priorities. It provides an avenue for cultivating strong relationships with science among students of all backgrounds, ultimately helping to make the scientific enterprise more representative and scientific research more equitable and useful. Education-focused activities provide a range of avenues to engage with students and teachers, which can help you build a deeper understanding of things like how

education systems work, students' experiences with and perceptions of science, and educators' challenges and goals. For example, you might:

- Volunteer for after school programs
- Judge or help to facilitate science fairs
- Participate in meet-a-scientist events (e.g., [Skype A Scientist](#))
- Contribute to curriculum development and teaching materials (e.g., through [Bitescis](#))
- Volunteer for an afterschool program

Public engagement and communication opportunities

Beyond formal education, civic science goals related to sharing science, learning about community priorities, and collaborating on societal problems with scientific components can be realized through a range of public engagement and communication activities. To strengthen communication skills, for example, you might:

- Volunteer with a museum or science center
- Participate in science events like festivals or science cafes ([Science Festival Alliance](#) may be a helpful starting point)
- Contribute to a community science project (e.g., through [Thriving Earth Exchange](#))
- Volunteer at a county or state fair through a local civic group or a university's extension office
- Write about civic science issues, for example as op-eds or articles in national or local media (see resources at the [OpEd Project](#))
- Start or contribute to YouTube channels, podcasts, blogs, and social media accounts
- Use your voice as a personal brand to highlight civic science questions and approaches

Issue advocacy opportunities

Advocacy is another channel for advancing civic science goals. This might involve contacting elected officials, organizing or participating in protests or other collective actions, and communicating your position to key audiences. While advocacy can be done independently, it is often most effective when done in concert with a group, organization, or coalition. For a smaller commitment, you may choose to become a member or participant of an advocacy group. This is often an appropriate first step as you're getting to know a group. For a larger commitment, you might become a formal or informal leader in such a group (e.g., chapter leader or board member). There are many groups, ranging from hyper-local to international, on common civic science issues, such as environmental and climate justice, health equity, artificial intelligence, and data security and privacy.

Service opportunities

While many of the opportunities described in the sections above may involve some element of service, other opportunities are entirely focused on giving time, money, or labor to a cause that is aligned with civic science goals and values. While they can be recurring engagements, many of these also allow for one-off or intermittent engagements. For example, you might:

- Volunteer for a food bank
- Participate in neighborhood or park clean-ups (e.g., removing litter or invasive species)
- Contribute to a community garden

- Volunteer or donate to nonprofit organizations that advance civic science values
- Provide pro-bono consulting to an organization that would benefit from your topical expertise

Resources

Organizations

- [The National Science Policy Network](#) is an association of civically engaged individuals and local chapters committed to strengthening the role of science in society
- [Engineers & Scientists Acting Locally \(ESAL\)](#) is a national organization dedicated to increasing local civic engagement by people with backgrounds in science, technology, engineering, and mathematics (STEM)
- [Skype a Scientist](#) has a database of thousands of scientists and helps them connect with classrooms, families, libraries, scout troops, and more around the globe
- [ComSciCon](#) is a series of workshops focused on the communication of complex and technical concepts organized by graduate students, for graduate students
- [BiteScis](#) has a dual mission to increase the interaction between the broad base of practicing researchers in science—graduate students—and the K12 classroom
- [The UCS Science Network](#) is an inclusive community of more than 23,000 scientists, engineers, economists, public health specialists, and other experts across the country working to educate the public and inform decisions critical to our health, safety, and environment
- [The OpEd Project](#)'s mission is to change who writes history through programs that elevate the ideas and knowledge of underrepresented expert voices to accelerate solutions to the world's biggest problems—problems that cannot be solved justly or sustainably without a diversity of voices, expertise, experience and identity
- [Thriving Earth Exchange Community Science Fellows](#), committed volunteers who are eager to facilitate and lead collaborative, co-developed community science projects that produce on-the-ground impact in local communities
- [The Science Festival Alliance \(SFA\)](#) fosters a professional community dedicated to cultivating a healthy relationship between science and society through festivals and other public events

SPOTLIGHT: FINDING A CIVIC PATH

When I reflect on it now, my entire life has been shaped by civic action. My parents were both refugees from Vietnam after the Vietnam War. They went on a boat in the middle of the night and left their country. They lived in refugee camps until they were sponsored into the United States, because of certain laws that existed that allowed for their sponsorship in the United States.

Fast forward some years, and both my brother and I have found our way into the public sector. My brother and I both went to Georgia Tech, and he took the route of ROTC with the Marine Corps. At the time, I took the route of the private tech sector. But I spent a lot of time outside of work, either helping the immigrant community sign up for social services; or helping with various science, technology, engineering, and math initiatives; or running the charitable campaign for a company. I didn't really know how all that would tie together in a bow as a single job or career path.

Then in 2014, I got a call from the White House to ask if I would come work on this new initiative to bring the talent of technologists into the federal government. There was this moment of all my worlds colliding—my tech side, and all the ways in which my family has been touched by civic action. After ten years of not thinking about government and civic tech being a path, I had this opportunity to bring all my skills, my lived experiences, my family history, all into the White House at the United States Digital Service.

That forever changed how I think about how technology should be built and for whom, who it should take into account, and how we should think about the communities we serve when we build technology. I met passionate public servants who have known what it's like to be on the ground in so many different aspects of society, whether it's housing insecurity, immigration services, social security, the Department of Defense, or Veterans Affairs.

My worlds collided again when I joined the Civic Science Fellows program. I got to meet people who were photographers,



In 2015, First Lady Michelle Obama and Jill Biden greeted Kathy Pham, second from left, and her brother, Captain David Pham, in the Blue Room of the White House. Kathy was invited as the First Lady's State of the Union guest. (Official White House Photo by Lawrence Jackson)

biologists, nonprofit experts, people who put justice and equity at the core of how they think. Within a year, so many people helped me further think about the topic of tech and responsibility. And I learned a lot about the power of storytelling. They don't teach storytelling at engineering school. I'm immensely grateful for spaces where we can not only hone our own expertise and craft, but also be around so many other people who have really different backgrounds to help us all think more deeply about what's civic, what's science, what's technology, and what their intersection looks like.

I'm thrilled to be able to continue doing work that I feel really matters in technology, civic tech, and civic science—bringing my expertise in products and data, government, tech, and computer science, and pairing them with my lived experiences as well.

One thing that brings me hope and excitement is groups like the Civic Science Fellows program that are very intentional about bridging so many different aspects of community, movements, technology, the civic, history, race, gender, scholarship, and so much more—bringing it all together, and enriching each other's research and lives. And then having these people go off into various leadership roles in business and government and academia and beyond, and influence how others think about and view the world and respect each other's expertise.

When we build anything, we can do it with empathy, with understanding the needs of people around us. We can lead with both strength and kindness. We can bring people with the most relevant lived experiences to any policy, product, or technology we build. And we can spread out the wealth—whether it's who's at the table, actual wealth, or reputation. We can make space for many other disciplines. We can open the door for many other people. Because what else is there in the world but to share it with each other?

Kathy Pham was the 2020 Shorenstein Center Civic Science Fellow, a member of the inaugural cohort of Civic Science Fellows. In 2023, she was appointed the inaugural Executive Director of the United States National AI Advisory Committee, tasked with advising the President and the National AI Initiative Office. Previously, she served as the Deputy Chief Technology Officer of the Federal Trade Commission. She also serves as a Senior Advisor at Mozilla and a Lecturer in Public Policy at Harvard Kennedy School, where she launched the [Product and Society](#) program.

OPPORTUNITIES: LEARNING PROGRAMS

Training and educational programs are one way to build skills and knowledge relevant to civic science issues. They can also serve as a vehicle for developing professional support networks that include peers and mentors.

This chapter provides a snapshot of some of the kinds of programs that are available for further training, professional development, or career specialization to build on your existing skills, experiences, and expertise. It is not meant as an exhaustive repository of all possible opportunities, but rather as an outline to support thinking about what may be a good fit for you. It can also help with finding names of fields that overlap with civic science.

Although many people working in civic science careers hold advanced degrees, there are also many positions that do not require advanced degrees. For many areas of civic science, forms of experience and expertise that are not developed through formal education are more significant than a particular degree or certificate. We encourage readers to think about education and training programs as means to achieve specific goals, rather than required boxes to tick on the path to a career in civic science.

The following questions may be useful in determining whether further education or training may be helpful for you, and if so, what type of program might be the best for your goals:

- What do I want to gain from this experience? (e.g., the list might include new skills, credentials, or network expansion)
- How will education or training help me advance to the next level in my career?
- Will I enjoy spending my time and energy on this?

Other questions can help to assess whether a particular program is the best option or if there are better alternatives to help you achieve your goals.

- Is this program a strategic and intentional next career step? Or do I need to return to the career exploration process (see chapter B) to gain more clarity?
- Are the expectations and requirements to complete this program successfully realistic for the time, energy, attention, and other resources that I have to dedicate to this right now?
- Is the scope of this program appropriate for my specific professional and career goals?

Additional training programs also come with time, money, and energy costs. Therefore, it is important to weigh the trade-offs involved and how they affect the entirety of your life, not just your professional career.

- How much will this cost financially? Will I pay for it with income? Savings? Loans? Scholarships?
- How will this program affect the attention and the effort I can put toward other things in my life (e.g., relationships, work, hobbies and interests, overall health and well-being)?

The rest of this chapter describes the types of learning programs that may support growth in civic science-related fields and provides examples of a range of opportunities.

Types of learning programs

General learning programs

There are many courses, workshops, and other training programs that do not result in a degree but provide opportunities for targeted learning. Such programs are typically not offered through enrollment at a university or institution of higher learning, and they offer shorter time investments, ranging from a single day to weeks or months to complete. While many programs may be free, such as Massive Open Online Courses (MOOCs) and some university extension programs, others, such as county and municipal continuing education platforms, or nonprofit and business training programs, have costs. These programs are often a good match for those who are interested in focused, skills-based learning, and they are often designed to be compatible with other full-time work. Some institutions, including employers, universities, and public libraries, cover the costs of access to learning opportunities, such as LinkedIn Learning.

Master's programs

Master's degree programs are offered through enrolling as a graduate student in a university program. There is great variety in the kinds of programs offered at different institutions, such as in-person and online degrees, part-time or full-time programs, and with a corresponding Ph.D. or undergraduate programs, faculty, and institutional support. In terms of costs, these programs require a significant financial and time investment. Typically, master's programs require around one and a half to two years of full-time enrollment, and tuition is in the range of tens of thousands of dollars. Many universities provide master's degree tuition assistance (or complete tuition coverage) to employees, so seeking employment at a university while working on a degree may be a strategic approach for some individuals. Master's programs can be well-suited for those who want to gain specific and significant training, skills, knowledge, and credentials that can be translated into a professional career in civic science.

Ph.D. programs

Like master's programs, Ph.D. programs are offered through enrolling as a graduate student in a university program. Typically, Ph.D. programs require four to six years of full-time enrollment, the first one to two of which involve more coursework while the remainder focus more on original research. In some disciplines, including many science fields, admission into a Ph.D. program in a science field frequently includes financial support, potentially with fully funded tuition costs and a living stipend. Ph.D. programs are most appropriate for those who want to develop research expertise in a highly focused area of study or wish to pursue an academic career. See Matt Might's [illustrated guide to a Ph.D.](#) for a visual depiction of the specialization and depth involved in doctoral research.

You do not need to get a Ph.D. in any particular field to get training that prepares for a career in civic science. In fact, you do not need to have a Ph.D. at all to pursue a civic science career, though there are a small number of opportunities that do require a Ph.D., such as particular research roles or science policy positions.

Certificate programs

Certificate programs are similar to full degree programs in that they are typically offered through enrolling as a student in a university program, with a variety of different experiences available. Certificate programs offer a mid-level of time investment, typically one to one-and-half years. While tuition can range from thousands to tens of thousands of dollars, they are often more cost effective than a full master's program for focusing on specific skill sets, and have some of the same benefits of access to institutional faculty and peers as a full graduate degree. Note that you can often add certificates to another degree program that you're undertaking. For example, one may pursue a certificate in science policy or community engagement alongside a degree in neurobiology.

Sample program areas and disciplines

Here, we provide a short list of program areas and disciplines that may provide skills and knowledge that will support some civic science career goals. Noting that different institutions use a range of terms to refer to similar programs, we provide this list as a starting point for search purposes. Many civic science professionals have backgrounds in disciplines that are not explicitly about a dimension of civic science, but that nevertheless provide a perspective and understanding that bears on their civic science work. For example, a neuroscientist may not have had coursework related to civic science concepts, but their first-hand experience of conducting science provides them with an understanding of the process of science and civic science issues that arise in it. The list below is a subset of disciplines that would equip someone for civic science work, intended to illustrate several angles from which one can approach civic science issues.

Relevant academic disciplines:

- Science and technology policy, including related and sub-disciplines such as public-interest technology, environmental policy, health policy, and public policy, from the local to the international level
- Science and technology studies, exploring the human and social dimensions of science and including specializations in areas like history and philosophy of science, medicine, and technology
- Communications and journalism, including related disciplines such as political, health, environmental, and science communication and specialties like science writing, data visualization, filmmaking, media studies, and marketing
- Ethics and philosophy, and their application to topics like biotechnology, artificial intelligence, and the use of data
- Sociology and related fields such as cultural studies
- Psychology, including sub-disciplines like cultural psychology, environmental psychology, health psychology, educational psychology, and social psychology
- Anthropology, including sub-disciplines such as social anthropology and cultural anthropology
- Political science, including sub-disciplines such as comparative politics, international relations, and political theory
- Education studies, including areas of focus such as educational outcomes and equity, evaluation, pedagogy, policy, and education systems
- Geography, including sub-disciplines such as integrated geography and human geography

- Public health, including areas of focus such as health disparities, environmental health, community health, mental health, health education, health and healthcare policy, and disability
- Environmental sciences, including disciplines such as ecology, atmospheric sciences, environmental sciences, geosciences, and oceanography
- Technology, including the development, application, ethics, and use of a wide range of technologies
- Computer science and data science, including the areas of big data and machine learning
- Other STEM fields, including neuroscience, genetics, medicine, engineering, physics, and mathematics, potentially paired with formal or informal work in another field represented on this list
- Business and related specialties like change management, leadership, innovation, decision making, and problem solving
- Law, including its intersections with topics such as civil rights, education, environment, health, research, and technology

Resources

- [Illustrated Guide to a PhD](#), by Matt Might, visually depicts one interpretation of the experience of doing a Ph.D.
- [Master's vs Doctorate: Which Degree is Right for You?](#) A comparison of two advanced degree types
- [What Are Certificate Programs?](#), by Coursera, offers a number of considerations for this type of program

SPOTLIGHT: RESEARCH!AMERICA

By Mary Woolley, President; Jenny Luray, Senior Vice President of Strategy and Public Engagement; Sophia Kaska, Senior Manager of Science Initiatives and Outreach; and Fanuel Muindi, Lasker/Research!America Fellow for Civic Science, Research!America

Connecting scientists to policymakers and to the public has been central to Research!America's mission since it was founded in 1989 and continues to be a vital focus for the organization today. With good communications and community engagement skills and a basic appreciation of public policy, scientists can humanize complex ideas, inspire others to pursue science, and be one of the strongest bulwarks we have to counter the spread of misinformation. Since much of academic research is funded by taxpayer dollars, there also needs to be a sense of accountability to the public. The need for scientists to receive training in science communication, science policy, and other nontraditional STEM skills that fall under the



civic science rubric is well-documented and increasingly sought after by early-career scientists.

With foundation support, Research!America is currently managing three interrelated initiatives that all tie into expanding civic science opportunities. One component is the Civic Engagement Microgrant Program, currently supported by the Rita Allen Foundation. Since 2018, the Microgrant program has funded over 80 groups of STEM graduate students and postdoctoral researchers from across the country to support civic engagement projects. The program provides training, mentoring, and hands-on experience in public policy, communications, community outreach, and program management. The microgrant program has provided Research!America with extensive feedback about different types of civic science projects, information about what training early-career scientists need to be effective in public engagement, and insights into the obstacles too often faced when pursuing this path in today's academic environment. (See the [Microgrant impact report published in 2022.](#))

In order to further improve the Microgrant program and with support from the Sloan Foundation, we held two highly informative roundtables with early-career researchers from diverse racial and ethnic backgrounds. We have begun to put the recommendations from these sessions into practice in recruiting for our sixth Microgrant cohort. For example, it's important not to assume familiarity with the term "civic science" but to highlighting concrete learning opportunities for students who participate. We also heard the need for academic programs to provide support for both the training and experiential components of public engagement.

The growth in demand for civic science training has given rise to a variety of programs and initiatives to provide opportunities for individuals trained as scientists to broaden their skills through courses, workshops, events, conferences, fellowships, and more. Scattered funding, inadequate staffing, insufficient evaluation, and most consequentially, a lack of core investment in civic science by academic institutions creates significant obstacles for the discipline. Much of the training remains at the grassroots level and is highly decentralized, thus not sustainable in the long-term.



Seeing the urgent need at this juncture for a clear understanding of the state of civic science training in the U.S. in order to build and improve upon what exists, Research!America partnered with the Lasker Foundation to develop a detailed landscape of training programs. Ready for launch in November 2023, the database is designed to help coordinate efforts, track effectiveness, increase visibility, identify synergies, support strategic investments in skill areas where there are gaps in training, and ultimately generate actionable recommendations to help accelerate future progress.

We believe this database will be an important catalyst in accelerating the growth of the civic science training ecosystem by generating new insights and findings, ultimately moving the discipline into the mainstream of graduate science training. Post-launch, we will offer opportunities for practitioners and other training stakeholders to meet on a regular basis to exchange information.

The database will be a critical tool in the third and newest piece of Research!America's civic science work (also made possible with support from the Rita Allen Foundation): convening academic leaders to discuss and prioritize the institutional changes needed to advance civic science training and to develop an accompanying strategy for getting there. This multiyear effort is intended to yield broad support for civic science training, greatly expanding access to training to many more graduate students and postdocs.

OPPORTUNITIES: FELLOWSHIPS

In addition to permanent employment, education, professional development, and volunteer opportunities, fellowships programs can provide training, networks, and professional credentials that can open doors to future professional opportunities. In many ways, they combine the strengths of different opportunity types by emphasizing skill development, mentorship, network building, and on-the-job training.

This resource grew out of a fellowship program—the [Civic Science Fellows program](#)—and in this chapter, we focus on fellowship programs as a distinctive type of opportunity in the civic science space. The term “fellowship” is used for many different kinds of opportunities and programs, varying in format, duration, requirements, and focus. In this chapter, we describe a number of different kinds of fellowships and considerations for determining whether a fellowship might be valuable for you, focusing on programs that have a fixed duration and are intended to serve as a stepping stone or catalyst for a project or career.

Former Civic Science Fellows have spoken to the benefits of the program for career development and exploration, which a number of other fellowship opportunities share, including:

- Moving from more narrowly focused training (e.g., in academia) to address new issues and use new skills
- Expanding knowledge, skills, approaches, and experiences
- Opportunities to try different types of work and interact with different kinds of professionals and organizations to help identify what kind of future paths to consider
- Exposure to different types of career paths, including nontraditional paths
- Increased confidence in new areas and types of roles, including boundary-spanning roles—with knowledge of their value
- Credentials, completed projects, publications, speaking roles, and other accomplishments that can be used to land new opportunities
- Development of networks and a supportive peer community

When considering applying to fellowship programs, the following questions may be helpful to ask to assess the alignment between a particular opportunity and your career and personal priorities.

- What do I want to gain from this experience? (e.g., the list might include new skills, credentials, or network expansion)
- How will this specific fellowship help me advance in my career? What opportunities does it open for me that I cannot directly pursue now?
- What have past fellows gone on to do after their fellowships? How do their trajectories relate to my goals and priorities?
- Will I enjoy spending my time and energy on this?
- How is this fellowship different from others that I could do? What distinct qualities, skills, or experiences will it provide me that others may not?

- Or, if multiple fellowships may give me similar value, what are the other factors that might be important for my decisions? (E.g., geography, disciplinary association, area of specialization, networks accessed, etc.)
- Am I interested in this fellowship because it is the best opportunity aligning with my career goals, or do I need to return to the career exploration process (see chapter B) to gain more clarity?

Fellowship programs can be highly competitive and sometimes have an opaque application process, so it is important to identify early on how you will select programs to apply for and how you will prepare a successful application for each specific program. Questions to ask include:

- Who is this fellowship intended for (e.g., level of education, career stage, personal identities, etc.)? How well do I fit the target audience? What can I highlight to show my alignment with the target audience?
- Who can I talk to to ask questions about the application process, and what makes for a strong application? Who can provide insight about the fellowship experience? If they are not in my network already, how will I make those initial connections?

Types of fellowship programs

Many fellowships serve as a bridge from previous education, training, or professional experience into new sectors, specialties, or areas of civic science issues. They tend to focus on developing specific career and leadership skills, new networks, or pursuing specific projects, such as those that involve innovative approaches or are experimental in nature.

Here, we describe a number of fellowship types, based on their focus areas and the kinds of networks they connect you with. As with the lists in the other chapters, the lists of fellowships included in this chapter are not exhaustive. They are intended to serve as a starting point for fellowship exploration.

Civic science fellowship

- **Civic Science Fellows Program**
While the fellowship programs below cover different areas and sets of areas within civic science, the Civic Science Fellows program, from which this roadmap emerged, emphasizes connections across each of these areas and others. Envisioned as a civic science lab, Fellows are embedded with host organizations from a variety of sectors, where they work to co-create pilots, partnerships, knowledge, models, and new ways of working that can help seed collaborations between science and society. Meanwhile, they connect with one another and with a supportive network of leaders across organizations, disciplines, and communities in this space.

Issue-focused fellowships

If your interests and goals tend to be focused on a specific issue or area of intersection between science and the broader society, exploring topic-specific fellowships may be valuable. Such fellowships can provide opportunities to deepen your knowledge and skills in a particular domain, as well as to build a network of people who work on related challenges.

Environment and climate

Examples include:

- [Open Climate Fellowship](#)
Provides opportunities for individuals with a strong interest in climate change and policy to work with organizations that are working to address the issue. Fellows work on a range of projects related to climate change, such as research, advocacy, and communication, and gain experience in policy analysis and advocacy.
- [Stanford Woods Institute for the Environment/University of Colorado, Boulder - Earth Leadership Program](#)
Designed to support leaders in the environmental field who are working to address complex environmental challenges. Fellows receive training in leadership, communication, and interdisciplinary collaboration, and work on projects related to sustainable land use, climate change, and biodiversity conservation.

Health and medicine

Examples include:

- [The Robert Wood Johnson Health Policy Fellowship](#)
Provides individuals with a strong interest in health policy the opportunity to spend a year in Washington, D.C., working on health policy issues. Fellows work in a variety of settings, including government agencies, congressional offices, and nonprofit organizations.
- [Health and Aging Policy Fellowship](#)
This fellowship program provides opportunities for healthcare professionals and researchers to work on policy issues related to aging and healthcare. Fellows work with federal agencies and nonprofit organizations to develop and implement policies related to healthcare access, health equity, and caregiving.

Civic technology and public-interest technology

Civic technology and public interest technology fellowships are focused on the civic dimensions of technologies, including their development, applications, and societal implications. These fellowships often offer opportunities to experience working in or with people in the private sector and tech industries. Examples include:

- [Public Interest Technology \(PiTech\) Fellowships and Visiting Practitioners \(ViPs\) Program—Cornell University](#)
These fellowship programs aim to bring together technologists, policy makers, and advocates to work on projects that serve the public interest. PiTech Fellows work on research projects related to technology and society, while ViPs are practitioners who work with PiTech Fellows to provide mentorship and hands-on experience.
- [Emerging Scholars and Fellows programs—Center for Information Technology Policy at Princeton University](#)
For emerging scholars and fellows who are interested in exploring the intersection of technology, policy, and society. Fellows work on research projects related to information technology policy and receive mentorship from the Center's faculty and researchers.

- [Civic Digital Fellowship and Civic Innovation Corp—Coding it Forward](#)
Provides opportunities for students and recent graduates to work on technology projects that address civic challenges. Civic Digital Fellows work with federal agencies to design and implement digital solutions, while Civic Innovation Corps members work on technology projects for local government and nonprofit organizations.
- [CivicSpark](#)
CivicSpark is an AmeriCorps program dedicated to building capacity for local governments in California, Washington, and Colorado to address emerging environmental and social equity resilience challenges such as climate change, water resource management, affordable housing, and mobility. Fellows complete research, planning, or implementation projects that provide the support public agencies need to advance their resilience initiatives.
- [Just Tech Fellowship](#)
Supports and mobilizes diverse and cross-sector cohorts of researchers and practitioners to imagine and create more just, equitable, and representative technological futures. Fellows identify and challenge injustices emerging from new technologies, and pursue solutions that advance social, political, and economic rights.
- [Open Philanthropy Technology Policy Fellowships](#)
Supports early-career professionals who are interested in working on technology policy issues. Fellows work with partner organizations to develop and advocate for policies related to AI governance, biosecurity, and other emerging technology issues.
- [Code for America’s Community Fellowship Program](#)
Provides opportunities for technologists and designers to work with local government agencies to develop and implement digital solutions that improve public services. Fellows work on projects related to health, justice, and economic opportunity, and receive mentorship and training from Code for America staff.

Science policy fellowships

Science policy fellowships provide another mechanism for applying one’s scientific, civic, policy, or technical expertise to help solve societal problems. These fellowships provide a hands-on understanding of how scientific evidence and expertise operate in a governmental context.

Science policy fellowships are disproportionately located at a national or federal governmental level, which often means that individuals must be located in the Washington, D.C., area, and in many cases are limited to U.S. citizens.

Additional resources for finding science policy fellowships:

- [List of Science Policy Fellowships](#), created by Kelley Singel, a former AAAS Science and Technology Policy Fellow and Christine Mirzayn Fellow
- [Science Policy: A Guide to Policy Careers for Scientists](#), created by alumni of the California Council on Science and Technology (CCST) Science and Technology Policy Fellowship. The guide includes a chapter on policy fellowships.

Here we discuss three broad types of policy fellowships: national, state, and professional organization fellowships.

National-level policy fellowships

National-level policy fellowship programs are highly focused on federal government and national-scale problems and projects, especially providing opportunities to work with the executive and legislative branches. These programs typically equip fellows to provide subject-matter expertise for policymakers to make informed decisions about science and technology-related issues.

Examples include:

- [National Academies Christine Mirzayan Science and Technology Policy Fellowship](#)
Program is designed to provide early-career individuals who have a strong interest in science and technology policy with the opportunity to spend 12 weeks at the National Academies of Sciences, Engineering, and Medicine in Washington, D.C. Fellows participate in a range of activities, such as briefings and discussions, and work on projects related to science and technology policy.
- [Presidential Management Fellowship](#)
A two-year fellowship designed to prepare recent graduates for leadership positions in the federal government. Fellows work in a variety of agencies and departments, gaining experience in areas such as policy development, program management, and external relations.
- [ORISE STEM Internships and Fellowships Program](#)
Provides opportunities for students and recent graduates in STEM fields to participate in internships and fellowships with government agencies and national laboratories. Fellows gain hands-on experience in STEM fields and contribute to research projects.

State-level policy fellowships

State-level policy fellowships are similar to national-level programs but focus on local and state-level issues. These programs most often place fellows in state legislatures to support state policymakers in decision-making on science and technology-related issues. They are located throughout the country, though usually in state capitols. State-level policy fellowships can provide significant personal interaction with policymakers and more direct influence on decision making than national ones. However, these programs tend to be less well-resourced than national counterparts and do not exist in every state.

Examples include:

- [CCST Science & Technology Policy Fellows](#)
Places fellows in the California state legislature, where they work on science and technology policy issues. Fellows have the opportunity to gain experience in policy analysis, communication, and advocacy, and to interact with a broad range of stakeholders in the policy process.
- [MOST Policy Initiative](#)
MOST Legislative Policy Fellows offer scientific policy research to the Missouri General Assembly members. They also offer research resources throughout the year, host educational workshops, engage in policy discussions, and link researchers with topics related to their specialization to encourage the adoption of evidence-based policies in the state.

[North Carolina Sea Grant STEM Policy Fellowship](#)

Provides graduate students from North Carolina colleges and universities with opportunities to serve full-time for a year in high-level state government offices, focusing on policy topics related to science, technology, engineering, and mathematics.

Professional organization fellowships

Professional society fellowships frequently provide discipline-specific opportunities to work in a federal policy role. They provide opportunities for fellows to strengthen their networks, with connections to both policy and disciplinary experts.

Examples include:

- [American Chemical Society Public Policy Fellowship Program](#)
Provides early-career chemists with the opportunity to spend a year in Washington, D.C., working on public policy issues related to chemistry. Fellows work with congressional offices or government agencies and gain experience in policy analysis and advocacy.
- [AAAS Science and Technology Policy Fellowship](#)
Provides opportunities for Ph.D. scientists and engineers to participate in policy development at the federal level. Fellows work in congressional offices or federal agencies, contributing to policy development and implementation in a range of areas, such as energy, environment, and national security.

Science communication fellowships

Science communication fellowships tend to be shorter, usually lasting less than 12 months. They provide opportunities to develop concrete skills such as science writing, media production, or public speaking, usually through hands-on experience.

Examples include:

- [Science Communication Network Science Communication Fellowship](#)
Focused on training scientists and researchers to communicate their work effectively to the general public and media. The Science Communication Network provides training, mentorship, and resources to improve science communication skills and foster engagement with audiences outside of academia.
- [International Institute for Applied Systems Analysis Science Communication Fellowship](#)
Designed to train early-career researchers in science communication and to help them bridge the gap between science and policy. Fellows work with IIASA's communication team to develop and implement science communication strategies, create multimedia content, and engage with policymakers and stakeholders.
- [The Geological Society of America Science Communication Fellowship](#)
Provides opportunities for geoscientists to communicate their research to broader audiences, including policymakers, educators, and the general public. Fellows receive training in science communication, engage in outreach activities, and participate in GSA's Annual Meeting.
- [David Suzuki Fellowships](#)
For journalists, communicators, and storytellers who are passionate about communicating about complex environmental problems. Fellows work with the David Suzuki Foundation's

communication team to create multimedia content, engage with audiences, and develop effective communication strategies.

- [AAAS Mass Media Science and Engineering Fellows Program](#)
Organized by the American Association for the Advancement of Science, the program offers opportunities for graduate students in science, engineering, and related fields to gain experience in science communication. Fellows are placed in media outlets across the country, where they work as science reporters, writers, and producers.
- [National Cancer Institute Communications Fellowship](#)
Provides training and experience in science communication for cancer researchers and scientists. Fellows work with NCI's communication team to develop and implement communication strategies, create multimedia content, and engage with audiences through various channels.
- [Massachusetts Institute of Technology Knight Science Journalism Fellowship Program](#)
For journalists and media professionals who are interested in covering science, technology, and the environment. Fellows receive training, mentorship, and funding to pursue independent research projects and improve their science communication skills.
- [Katherine W. Fanning Residency in Journalism and Democracy](#)
Provides opportunities for journalists to explore the intersection of journalism and democracy. Fellows receive training, mentorship, and funding to pursue independent research projects that investigate issues related to media and democracy.
- [Marine Biological Institute Logan Science Journalism Program](#)
Provides opportunities for journalists and media professionals to explore marine science and conservation. Fellows work with scientists at the Marine Biological Institute to conduct research and produce multimedia content that communicates marine science issues to the public.

Mid-career fellowships

Mid-career fellowships are intended for individuals who have significant experience in a particular area (i.e., at least 5–10 years) and want to develop new knowledge or skills, apply their background to a new context, or undertake a deep, time-bound project.

People at this career stage are also often eligible for a number of fellowships (including many listed above) not specific to mid-career.

Examples include:

- [Mellon Fellowships in Democracy and Landscape Studies](#)
Supports scholars from diverse disciplines who are exploring the relationships between landscape and democratic practice, with a focus on understanding how the design and use of public spaces can support democracy.
- [Ashoka Fellowship](#)
A social entrepreneurship program that supports individuals who have developed innovative solutions to social problems and have the potential to create large-scale change. The program provides funding, support, and a network of like-minded individuals to help fellows scale their impact.

Radcliffe Fellowship

Fellows represent a broad range of academic, professional, and artistic fields. Fellows work on an individual project—a novel, a film, a map of the Milky Way—while mining and deepening the knowledge, ingenuity, and talent of the Harvard University community.

Resources

- “[What a Fellowship Is and Why You Might Want One](#),” by Ilana Kowarski, covering medical, research, and postdoctoral fellowships, all of which can be a component of a civic science career (and are not featured in this chapter)

SPOTLIGHT: FINDING OPPORTUNITIES

“

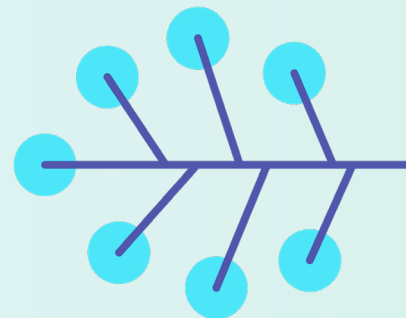
The laboratory—essentially, a physical (and sometime virtual) location where people with diverse expertise work on common problems—inspired me to build civic science connections spanning neuroscience, public engagement, bioethics, and computer science. Only together do we have the necessary expertise to build and experiment with new ideas.”

— *Lomax Boyd, 2021–23 Johns Hopkins Berman Institute of Bioethics Civic Science Fellow; Assistant Research Professor, Johns Hopkins University*

“

At the start of the fellowship we were encouraged to make progress in our projects by taking ‘the next elegant step,’ which is to consider what is known and unknown and then create a strategic step forward in the direction of your goal. I slowly realized that this mantra could be applied to my professional goals as well.”

— *Michelle Race Warren, 2021–23 ScienceCounts Civic Science Fellow; Program Manager, Resources Legacy Fund*



Civic Science Fellows have shared these insights in Civic Science Sparks conversations, a regular feature on the Civic Science Fellows website and newsletter. Read more and subscribe to the Civic Science Series at civicsciencefellows.org/stories

“

I know that everything I do eventually leads back to health and wellbeing. So, it's exciting to be in a position to lead and work collaboratively to create solutions for individuals, communities and systems. I've used best practices and lessons learned from across sectors and personal experiences to design a career that enables me to work in spaces that I am passionate about; and simultaneously share insights with young people and scholars through teaching and mentorship.”

— *Jylana L. Sheats, 2021–23 Aspen Institute Civic Science Fellow; Associate Director, Science and Society, Aspen Institute; Clinical Associate Professor, Tulane University School of Public Health and Tropical Medicine*

“

I experienced science as a difficult place, where I was brought in but then not acknowledged for my difference. I think we need to lean into discomfort and engage with and make space for what makes us uncomfortable. Then we can bring communities of all types into respectful, aware spaces where they can thrive.”

— *Karen Andrade, 2020–21 Science Philanthropy Alliance Fellow; Senior Policy Advisor, Science and Society Policy Team (STEM Next Fellow), White House Office of Science and Technology Policy*

“

My advice is to approach each conversation with an open and curious mind, to listen and consider new perspectives, and to see this space as one where we can actively be that difference that we want to see in how science and society connect.”

— *Shannon Dosemagen, 2020–21 Open Environmental Data Project Civic Science Fellow; 2021–23 Host Partner; Director, Open Environmental Data Project*

“

For myself, I hope to continue doing the work I love, widening the circle of participation in the scientific enterprise. For the field of civic science, I hope to see the day when science is indisputably woven into the fabric of our collective decision-making, and conversely, when the values and priorities of our communities are woven into the way we do science.”

— *Claire Weichselbaum, 2021–23 Dana Foundation Barbara Gill Civic Science Fellow; Education and Engagement Specialist, Allen Institute*

CONCLUSION

If there is one thing that is certain about civic science careers, it is that they will not follow a predictable path—both because of external factors in science and society that are in constant motion, and because the goal of civic science is to change the way we work, for the better. In *The Parable of the Sower*, a favorite of many in the civic science network, Octavia E. Butler writes, “All you touch, you change. All that you change, changes you.”

This guide will also continue to change, as we continue to develop it with future Civic Science Fellows cohorts, and as we hear from you—we welcome suggestions at civicscience@ritaallen.org.

We hope this guide has sparked ideas of resources, communities, and questions to help you find your next step—and build a foundation to continually build the knowledge, networks, and questions that will add up to a transformative career with significant ripples for positive change.

ACKNOWLEDGMENTS

Roadmap Contributors

This resource was initiated as a collaborative effort, and it incorporates contributions and feedback from many. Special thanks to Emily Howell and Rose Hendricks for taking co-lead roles in developing this resource as we invited many other key contributors from the Civic Science Fellows community, especially a Civic Science Fellows and Associates Design Review Team—Martina Efeyini, Jenna Hicks, and Lia Kelinsky-Jones—along with early writers Christian Ross, Hallie Thompson, and the Civic Science Fellows team. We acknowledge and appreciate the insights and feedback of all, with more to come as this resource grows.

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The Civic Science Fellows Team

Civic Science Fellows Network

[Civic Science Fellows](#) are critical connectors—early-career leaders from diverse personal and professional backgrounds ready to build bridges among communities, scientists, organizations, policymakers, disciplines, and sectors. Each of these organizations, which have hosted or provided financial support for Civic Science Fellows in the first two cohorts of the Civic Science Fellows program, have contributed expertise and network resources to help make this community of learning and action a success—laying the way for new opportunities and pathways for the future.

Civic Science Fellows Host Partners

[Advanced Visualization Lab at the National Center for Supercomputing Applications, University of Illinois at Urbana Champaign](#)

[Alan Alda Center for Communicating Science, Stony Brook University](#)

[American Association for the Advancement of Science \(AAAS\)](#)

[American Geophysical Union \(AGU\)](#)

[American Society for Cell Biology \(ASCB\)](#)

[The Aspen Institute Science and Society Program](#)

[Association of Public and Land-grant Universities \(APLU\)](#)

[Association of Science and Technology Centers \(ASTC\)](#)

[Berman Institute of Bioethics, Johns Hopkins University](#)

[Center for Academic Innovation, University of Michigan](#)

[Center for Media Engagement, University of Texas at Austin](#)

[Center for Science Communication Research, University of Oregon](#)

[Ciencia Puerto Rico](#)

[College of Communication, Boston University](#)

[Environmental Data and Governance Initiative \(EDGI\)](#)

[GBH](#)

[National Geographic Society](#)

[National Informal STEM Education Network](#)

[Open Environmental Data Project](#)

[Open Research Funders Group](#)

[Research!America](#)

[Science in Society Funder Collaborative](#)

[Science News](#)

[Science Philanthropy Alliance](#)

[Science, Media, and the Public Research Group, University of Wisconsin–Madison](#)

[ScienceCounts](#)

[Shorenstein Center on Media, Politics, and Public Policy, Harvard Kennedy School](#)

[Sigma Xi](#)

[SNF Agora Institute, Johns Hopkins University](#)

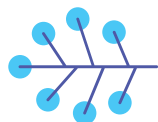
[Standing Committee on Advancing Science Communication, National Academies of Sciences, Engineering, and Medicine](#)

[The US-UK Fulbright Commission](#)

Civic Science Fellows Funding Partners



Science in Society Funder Collaborative



Civic Science Fellows

Suggested Citation: Civic Science Fellows Program. Civic Science Careers Roadmap. Princeton, N.J.: 2023.