

SCHMIDT SCIENCE FELLOWS
ANNUAL REPORT 2020-2021



SCHMIDT SCIENCE FELLOWS

Schmidt Science Fellows is an initiative of Schmidt Futures, delivered in partnership with the Rhodes Trust

Annual Report 2020-2021



 SCHMIDT FUTURES

 RHODES
TRUST

Developing the next generation of science leaders
to transcend disciplines, advance discovery, and
solve the world's most pressing problems.



Schmidt Science Fellows

Schmidt Science Fellows is an initiative of Schmidt Futures, delivered in partnership with the Rhodes Trust, that believes in a vision of a world where interdisciplinary science flourishes without limit, accelerating discoveries to benefit the world, and driving innovation that improves quality of life for all.

We help scientists solve bigger problems faster by identifying, developing, and amplifying the next generation of science leaders, building a community of scientists and supporters of interdisciplinary science, and leveraging this network to drive sector-wide change.

schmidtsciencefellows.org

Schmidt Futures

Schmidt Futures is a philanthropic initiative, founded by Eric and Wendy Schmidt, that bets early on exceptional people making the world better. It knits talent into networks, bets on the most promising ideas through diverse forms of competition and support, and equips people to scale through partners and modern tools.

schmidtfutures.com

The Rhodes Trust

The Rhodes Trust is the home of the world's preeminent graduate fellowship, the Rhodes Scholarship, based at the University of Oxford since 1903. In its second century, they are expanding the Rhodes Scholarships globally and broadening their impact through partnerships that develop exceptional leaders across different life stages and areas of focus.

rhodeshouse.ox.ac.uk



This Annual Report reviews the progress and development of our Fellowship and highlights some of the achievements of our Fellows from August 2020 to December 2021, to allow us to get on to a calendar year annual report cycle from 2022 and beyond.

As our Program evolves, so has our Annual Report. We have decided to move to a calendar year reporting period as a better fit for our major activities and therefore a more effective way to share our updates and the work of our Fellows with our partners. This 2020-21 Annual Report brings us up to date following the 2019-20 edition, and we look forward to publishing an annual update early each year in future.

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Cover image: Jyotirmoy Mandal, 2019 Fellow, uses a thermal camera to measure the temperature of the sky and urban environment to give an idea of the distribution of ambient heat. This, in turn, will give Jyotirmoy an idea of how to create designs that control spectral heat flows to cool buildings.

Executive Director's Review



As we close out our fourth year of operations and prepare to welcome our fifth cohort of Fellows and launch our five-year anniversary celebrations in 2022-23, I find myself reflecting on how far we have come in these first four years. Our Fellows are no longer just exceptional people with great potential, but they are making discoveries with tangible impact on the world today. We are starting to see the power of the community that we created to connect our Fellows with a science family of individuals who share the common desire to make a positive difference through science and diverse areas of expertise. And our Program structure is solidifying and being recognized as a model for how science should be done.

Our Fellows are Having an Impact

You can read about our Fellows' progress in the case studies in this report and the Science Highlights on pg 12-17. Throughout this report you will see stories of Fellows making real world impact. For instance, OJ Watson, a 2020 Fellow, has become one of the world's experts in COVID modeling and analysis, influencing directly how seven countries and five multinational agencies, including the WHO, have responded to the ongoing pandemic, advising them in the best approaches for vaccine rollout.

Another 2020 Fellow, Shriya Srinivasan, was named to the Forbes 30 under 30 list in Healthcare recently in recognition for her work in medical engineering. During the pandemic, she created the iSave device that allows one ventilator to be safely shared by multiple COVID-19 patients. Her device was used in 10 hospitals in India last year and helped save many lives.

Peyton Greenside is a member of our inaugural cohort, a 2018 Fellow. Peyton completed her Fellowship Research Placement in the Computer Science Department at Stanford University before co-founding a start-up, BigHat Biosciences. Big Hat is integrating machine learning with wet lab techniques to develop new generations of safer and more effective treatments. BigHat has already raised more than \$24m in venture capital funding and has just completed its first acquisition to further accelerate its growth.

Our Community Has an Amplifying Effect

We see an even more powerful effect when our Fellows come together. They support one another through the challenges and successes of doing this kind of high-risk high-reward science through the peer mentorship programs and the networks that we created, and many are now collaborating with one another on their science. Notably, our 2018 Fellows Hal Holmes and Fahim Farzadfard worked together to use Fahim's knowledge of molecular biology to repurpose Hal's handheld DNA scanner that was originally designed to help curb the illegal trade of endangered wildlife species, to instead create a quick mobile PCR testing device for COVID-19. In fact, the only reason that Fahim realized that Hal's device could be repurposed in this way is that he had seen the device up close when Hal had hosted us all on a tour of his first post-Fellowship lab during a Schmidt Science Fellows alumni meeting in 2020, right before the pandemic broke out.

As our Fellowship community grows, we will continue to catalyze collaboration and strengthen the unique network that our Fellowship represents.

But our Fellowship is not just about scientific collaboration. It is also about supporting one another. Our Senior Fellows are already demonstrating a gracious and generous commitment to giving back to the Fellowship and our community. We have Program-led opportunities, such as the Peer-Mentoring Scheme, that pairs experienced Fellows with new Fellows each year and invitations to support programming through sharing experiences on discussion panels. We also know that this ethos extends to informal networks with Fellows offering advice and guidance to each other on negotiating job offers, relocating to new cities, and overcoming scientific challenges.

Programmatic Changes Support our Fellows

During the past 18 months, we have evolved several features of the Program to meet the needs of Fellows better. All of these changes were a result of our model of co-creation with our Fellows, Principal Investigators, Selectors and supporters, listening to their feedback and using it to improve our operations to best achieve our mission. These changes include implementing a flexible 12-24-month duration for the Fellowship Research Placement and reviewing the structure of the programming we deliver to Fellows through the Global Meeting Series and Senior Fellows Programming. We have also made adjustments to the schedule of our selection process, firstly to provide flexibility to support Nominating Partner Organizations and candidates but also to align better with many international doctorate timetables. We have reaffirmed our commitment to supporting a diverse field of applications to the Fellowship each year, underpinned by investment in outreach and support for all candidates.

Schmidt Science Fellows as a Model of Science Training

We recognize that our long-term ambition – a world where interdisciplinary science knows no bounds and to accelerate discovery to make a positive impact on the world – cannot be delivered through the Program alone. Over the last 18-months we have taken significant steps to put form on our ambition and to develop ideas and partnerships that we hope will, in time, help to reshape how science is done.

From the beginning of Schmidt Science Fellows, we have taken the approach of opening our hood so that all those who were interested could see how our Fellowship works up close and use our learnings to inform their own interdisciplinary initiative, amplifying our model and impact across science. I am pleased that we have been fortunate to share this information with several nascent programs with similar aims, including funding agencies, not-for-profits, and a university-based fellowship. We are always happy to make our ‘source-code’ open for anyone with aligned values and missions.

We have also completed important work to redefine our theory of change and to confirm our Strategic Plan through to 2025 helping to ensure all our Program effort is aligned with this long-term vision. Our ‘Advancing Interdisciplinary Discovery’ strategic theme is how we focus and articulate our initiatives that aim to further systemic change across science. 2020-21 was a period for engagement, information-gathering, and creativity. In the coming years, I look forward to sharing the initiatives, partnerships, and impacts of this work.

I hope you enjoy reading about the achievements of our Fellows and developments in our Program since our last report and that you, too, are inspired to join us to harness interdisciplinary science to benefit global society.



Dr. Megan Kenna
Executive Director



Chair of the Academic Council's Review



Our Academic Council provides academic and scientific advice and guidance to our growing Fellowship and mentoring to our outstanding Schmidt Science Fellows.

The mentoring program is at the heart of how the Academic Council contributes to the development of our Fellows. As our Fellowship has grown, I am delighted to say that our Academic Council has also grown, providing greater diversity in expertise and geography in the process. To the initial Academic Council Members of Professor John Boothroyd (Stanford University) and myself, the Council has now also welcomed Professor Chiara Daraio (California Institute of Technology), Professor Amy Herr (University of California, Berkeley), Professor Renée Hložek, (University of Toronto), and Associate Member, Dr. Liliane Chamas (Oxford Science Enterprises).

As Fellows undertake the challenge of a significant disciplinary pivot via Placements with world-leading scientific leaders in internationally renowned labs, our Academic Council Members – themselves accomplished scientists – provide personalized regular mentoring, support, and wise counsel to them. I am heartened that our feedback reveals that Fellows deeply value this.

Our mentoring program includes confidential individual sessions, group meetings, and specialist support in key areas such as career development and commercialization throughout the Fellowship Placement period and beyond. New Fellows are also now able to draw on the experience of Senior Fellows, who share their experiences as new Directors, Principal Investigators, and in scientific start-ups.

Since 2020, the Fellowship has not only expanded significantly in duration and cohort size, but our Fellows have each faced the challenges of undertaking ambitious scientific work in the midst of a global pandemic. There have also been personal milestones – marriages and babies – as well as challenges of ill health and bereavement, and tough choices about scientific focus and how to make a meaningful difference in either an academic or commercial context. Throughout it all, it has been a joy to witness what is possible when outstanding scientists form a true Fellowship and are supported in their development. Our Academic Council is now building its own wealth of experience in supporting interdisciplinary work through the struggles and achievements of our Fellows.

Our commitment is genuine and lasting. The Academic Council and the wider Fellowship team are dedicated to supporting the Fellows' interests over the long term through true mentoring and a commitment to the value of interdisciplinary science. Although this period has, without a doubt, been one of both scientific and personal challenges due to COVID-19, I believe that the Fellowship is going from strength to strength. We are looking forward to growing and evolving the Academic Council further to support the changing needs of the Fellowship community – and most of all, I am looking forward to meeting Fellows in person once again.

Keith Burnett

Professor Sir Keith Burnett FRS CBE
Chair of the Academic Council of Schmidt Science Fellows

Science Highlights from the Schmidt Science Fellows Community

Our Fellows' science and achievements have been published in journals such as Nature, PNAS, Cell, and more. The papers detail work carried out before and during their Fellowship Research Placement and beyond. Here are a few highlights from the past year.

Machine learning algorithms used by Netflix, Amazon, and Facebook can be used to predict the biological language of cancer and Alzheimer's



2019 Fellow, **Dr. Kadi Liis Saar**, published research as first-author in PNAS that demonstrated machine learning approaches originally developed for analyzing languages, and used by major companies such as Netflix, Amazon, and Facebook to improve customer experiences, can be applied to uncover the molecular principles behind biomolecular condensate formation, a process that is implicated in a vast range of diseases from neurodegenerative disorders to cancer. Kadi used machine-learning technology often employed by online consumer and machine translation companies to train a large-scale language model to look at what happens when something goes wrong with proteins inside the body to cause disease.



Active particles crystallize

2019 Fellow, **Dr. Ahmad Omar**, 2021 Fellow, **Dr. Trevor GrandPre**, and colleagues published research in Physical Review Letters that demonstrates active particles – energy-consuming units whose directed motion resembles that of living bacteria and flocks of birds – exhibit the same phases as common molecular substances: gas, liquid and solid. Ahmad, who is first author on the paper explains how unlike common substances, active particles do not require cohesive interactions to condense into a liquid upon cooling, or to freeze into a crystalline solid at modest pressure.

Developing ELANE into a broad anti-cancer therapeutic

2019 Fellow, **Dr. Kasturi Chakraborty**, as part of a team at the University of Chicago, published work in Cell which raises the possibility of developing a broad anti-cancer therapy. The team identified an anti-cancer factor (neutrophil elastase, ELANE) secreted by neutrophils, the first responders of the innate immune system. This work has the potential to improve cancer therapeutic intervention.



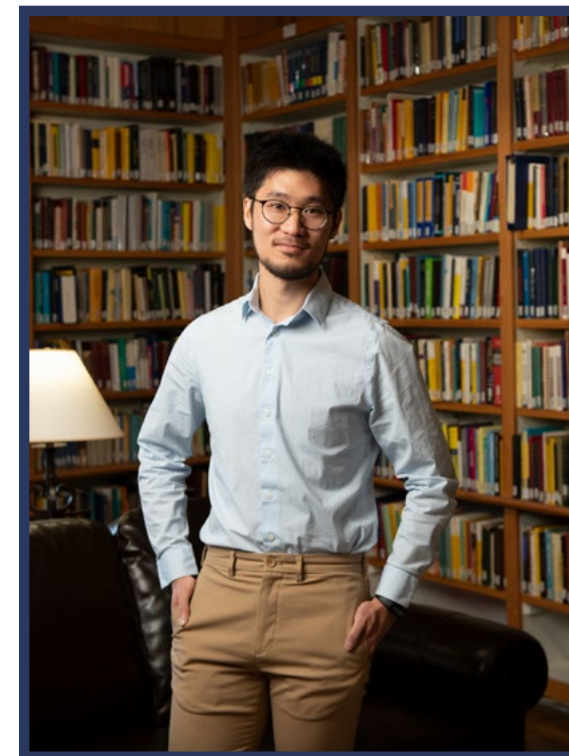


Pristine quantum criticality

2018 Fellow, **Dr. Wes Fuhrman** published work in *Science Advances* alongside an international team that presents ground-breaking experimental evidence of naturally occurring quantum criticality in a material. Wes commented: "The future of quantum technology will rely on the ability to manipulate quantum states." This study paves the way for materials that are "ideally suited for manipulation, being at the precipice of multiple phases."

Getting in sync with limited resources

From power grids to neuronal populations, getting in sync is critical to the function of many distributed systems. Being fundamentally a non-equilibrium process, synchronization costs energy and resources to maintain. 2020 Fellow, **Dr. Yuanzhao Zhang's** findings in *Nature Communications* show that, by allocating resources in a time-dependent manner (modeled as temporal networks), one can go below the fundamental limit set by the optimal static networks and synchronize a system more efficiently.



Controlling light tornadoes

2019 Fellow, **Dr. Grisha Spektor** and colleagues from Kaiserslautern University, published work in *Nano Letters* and *Science Advances*, presenting spatial and temporal control of surface confined light tornadoes. These results generalize the external control over surface-confined orbital angular momentum (OAM) and provide a wide toolkit for on-demand tailored angular momentum generation and delivery. Besides fundamental interest, these results could become pivotal in vortex-based applications such as quantum initialization schemes and plasmonic-optical tweezers.

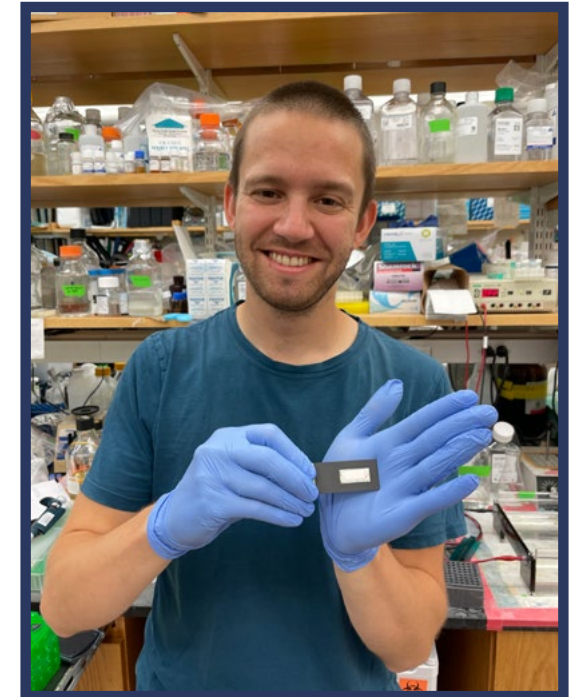
Distinct brain areas found to be responsible for recognizing familiar faces

2020 Fellow, **Dr. Sofia Landi** has published work in *Science* alongside colleagues at the Rockefeller University showing that distinct brain areas are responsible for recognizing the faces of the individuals we personally know. Sofia, who is the first author of the paper, found that neurons in the temporal pole were highly selective, responding specifically to familiar faces that the subjects had seen before. These neurons only identify familiar individuals from real life, but not familiar faces seen only on the screen.



New CRISPR-based technology could revolutionize antibody-based medical diagnostics

2018 Fellow, **Dr. Karl Barber** and a team led by Dr. Stephen Elledge at Harvard Medical School and Brigham and Women's Hospital, Boston, published research in *Molecular Cell* detailing how scientists have repurposed the genetic modification technology CRISPR to identify antibodies in patient blood samples in a move that could inspire a new class of medical diagnostics in addition to a host of other applications. The research team has demonstrated that the technology works to assemble thousands of different proteins, suggesting that it could be readily adapted as a broad-spectrum medical diagnostic tool.



Karl Barber, 2018 Fellow, holding a PICASSO microarray.



Understanding why we find multitasking hard

2021 Fellow, **Dr. Sebastian Musslick** has published work from his PhD at Princeton University in *Trends in Cognitive Sciences* that suggests the human brain may trade the benefits of shared representation for rapid learning and generalization – a mechanism increasingly exploited in machine learning – against constraints on multitasking performance. Sebastian drew on recent insights from neuroscience, psychology, and machine learning. His work builds on fundamental computational dilemmas in neural architectures and suggests that our limited capacity to multitask arises from representation sharing between tasks.



New technology for modifying bacterial genomes

2018 Fellow, **Dr. Fahim Farzadfard** and colleagues at MIT published a paper in *Cell Systems*, describing a new technology for modifying bacterial genomes. With this new DNA writing system, one can precisely and efficiently edit bacterial genomes without the need for any form of selection within complex bacterial ecosystems. The researchers also showed that they could use this technique to engineer a synthetic ecosystem made of bacteria and bacteriophages that can continuously rewrite certain segments of their genome and evolve autonomously with a rate higher than would be possible by natural evolution.

Global Selection

The Schmidt Science Fellows journey begins with Nomination and Selection. We strive to achieve a diverse, international pool of applicants with a broad range of characteristics. Our Nomination process invites Nominating Partner Organizations to identify the most promising early-career scientists completing their PhDs within their institutions. Nominated candidates submit applications to a multi-stage selection process which first reviews academic achievement, intellect, and Program alignment through a 'paper-based' Academic Review.

Finalists for each year's cohort are then invited to participate in an online panel interview, with senior figures from academia, business, and society, which considers all parts of our selection criteria.

Our process aims to distinguish exceptional scientists who are committed to making a disciplinary shift, seek to have a positive impact in society, and who possess a relentless ambition to become world-class interdisciplinary science leaders. Our Fellows share the highest levels of academic excellence and leadership potential, together with boundless scientific curiosity. The Nominating Partner Organizations, Academic Reviewers, and Selectors we work with make it possible for us to build cohorts of such outstanding quality and depth. We thank all of those individuals and institutions who join us in contributing so much to our Fellowship community.

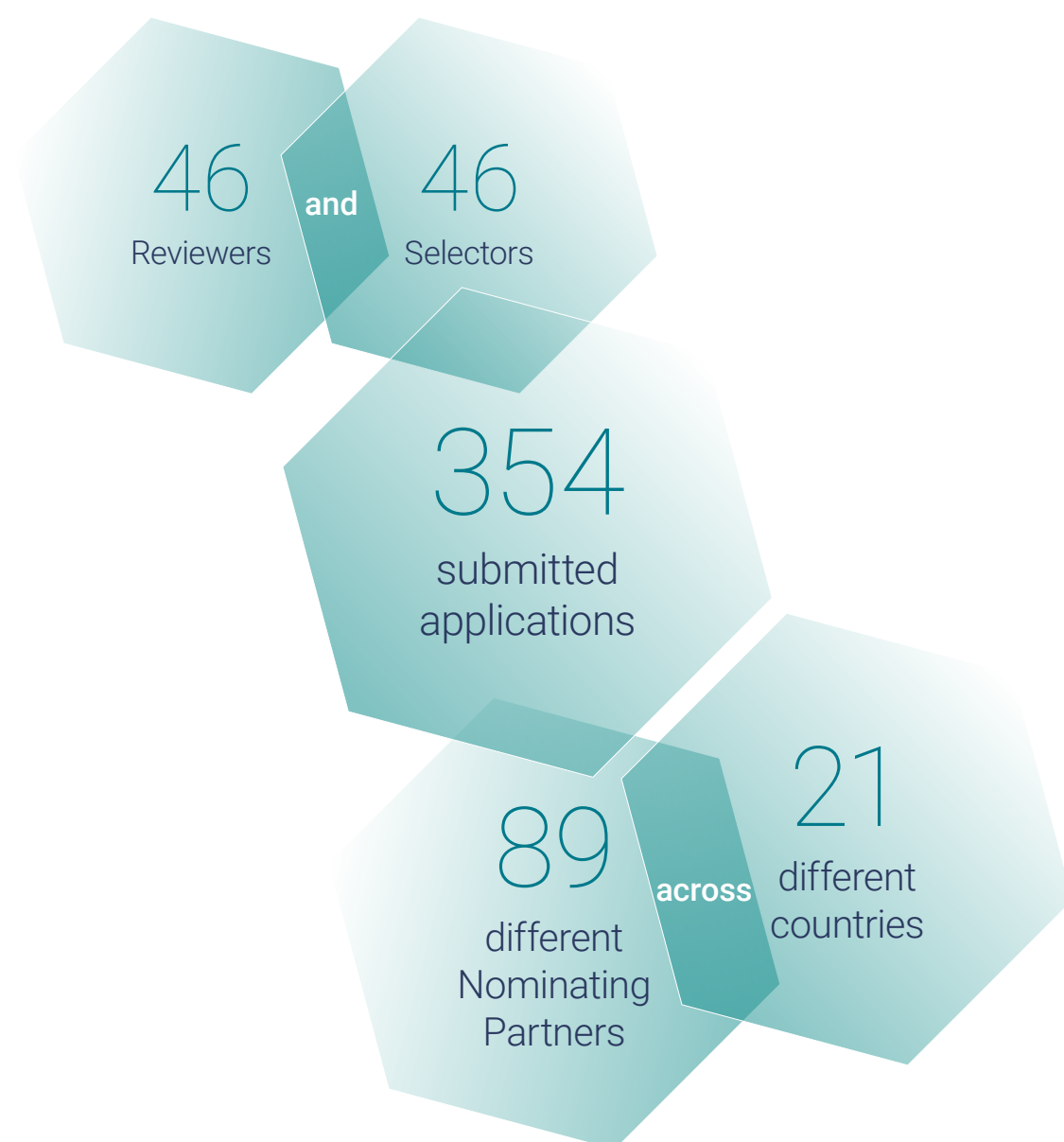
“At Schmidt Futures, we believe the key to a better future is investing in talented people, connecting them in a network, and giving them the resources to do more together than they could ever do alone. Schmidt Science Fellows was our first initiative, and the work of the Fellows speaks for itself – especially as we saw so many of our current Fellows pivot their research to tackle the coronavirus pandemic. I’m eager to witness how these Fellows continue to push the conventional boundaries of science in the years ahead.”
Eric Schmidt



The 2021 Schmidt Science Fellows cohort

Selecting the 2021 cohort

In June 2021 Eric and Wendy Schmidt announced the fourth cohort to join the Schmidt Science Fellows community. The 2021 Fellows are 28 early-career scientists who represent 13 nationalities and 19 Nominating Partner Organizations from eight countries.



The 2021 Fellows come from a wide range of disciplinary backgrounds and bring a significant array of expertise to the Schmidt Science Fellows community. Their PhD research areas incorporate Agricultural Engineering, Biomedical Sciences, Chemical Engineering, Developmental Biology, Environmental Sciences, Neuroscience, Physics, and multiple subdisciplines within these broader categories. They are each now embarking on a Fellowship Research Placement that represents a scientific pivot into a new field where they will develop new skills and insight across a still-wider breadth of disciplines.

“The Schmidt Science Fellows are proving that bringing together brilliant people across disciplines is the only way to tackle the problems our world faces this century. We could not be prouder of the Fellows, who have already improved cancer diagnostics, advanced the way new drug therapies are delivered and brought life-saving, COVID-fighting technologies to people around the globe. We can’t wait to see what the 2021 cohort will accomplish.”

Wendy Schmidt

At a time when the crucial need for interdisciplinary approaches has been brought into sharp relief by the COVID-19 pandemic, our Fellows are pursuing projects with ambitions to tackle a wide range of global challenges and realize real benefits for society. In common with our previous cohorts, the 2021 Fellows are committed to deploying interdisciplinary science to tackle some of the world’s biggest and most intractable challenges, including preservation of biodiversity, the climate crisis, energy supply, water resource management, quantum materials and computing, infectious and non-infectious disease, and health inequalities.

Our Fellows

We are committed to diversity within our Fellowship community. We believe that identifying and selecting Fellows from multiple backgrounds brings a wealth of experience and perspective to each cohort, enhances the Fellowship experience, increases the overall impact of our growing community, and leads to better science as collaborations develop that address the world’s major challenges building on multiple layers of experience and expertise.

Our full Fellowship community now numbers 84 Fellows, 43 female and 41 male, nominated by 41 different Nominating Partner Organizations in 12 different countries. The international diversity of our Fellowship community continues to increase, with 28 nationalities now represented. With the 2021 Fellows, our community now includes Fellows from Turkey, Bulgaria, and France for the first time.

Our Selection Criteria

Intellect

**Extraordinary Achievement**

Clear record of academic achievement of the highest quality in the sciences and an extraordinary degree of intelligence.

**Scientific Curiosity**

High degree of intellectual curiosity combined with energy and creativity; a record of continuous innovation and/or use of new technologies.

Programmatic Fit

**Alignment with the Program**

Interest in pursuing a year or more of postdoctoral study in a field different from the applicant's PhD discipline and a belief that interdisciplinary science and the taking of appropriate scientific risks are important for the advancement of discovery.

**Collaborative Spirit**

History of effective collaboration with diverse team members.

Leadership

**Global Ambition for Social Good**

Desire to use one's personal talents and science to make a positive difference in society and the world.

**Character and Leadership**

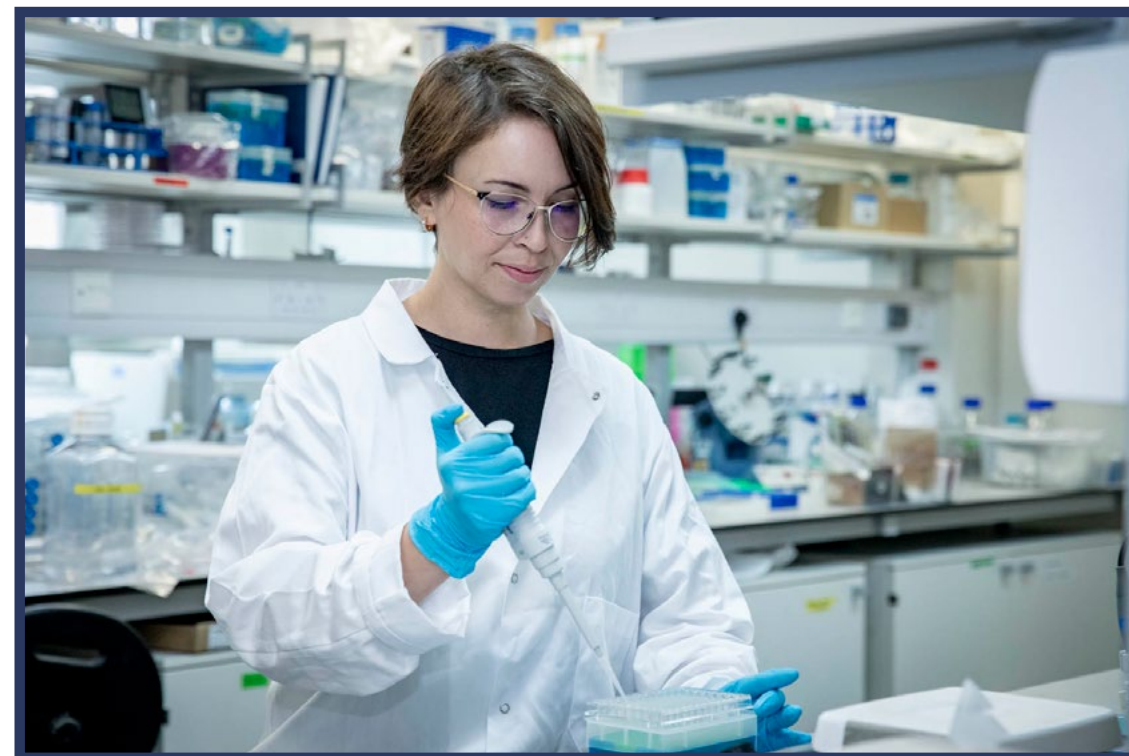
Genuine and demonstrable potential for science leadership; displaying perseverance, resilience, a moral compass, and a galvanizing force of personality.

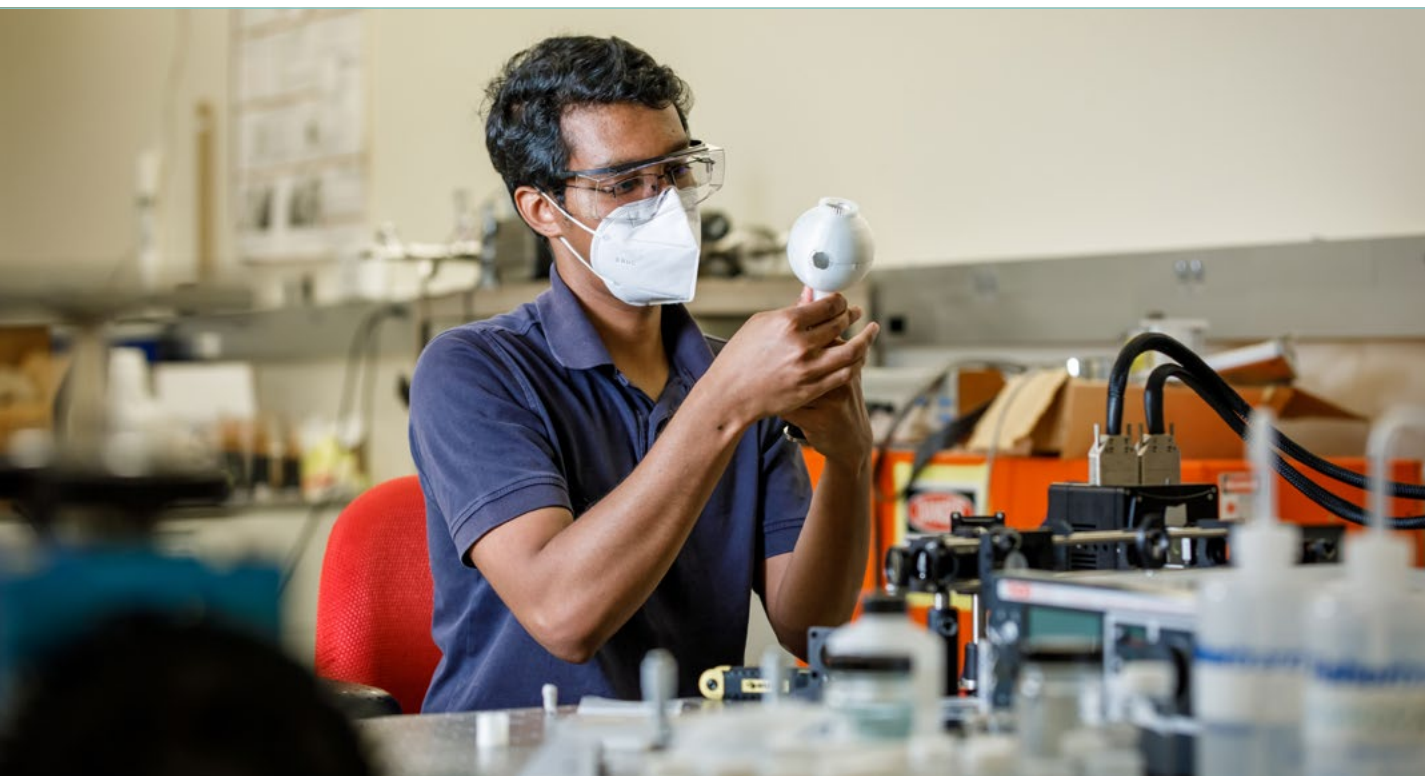
Whilst we aim to recruit across the breadth of disciplines within the natural sciences, mathematics, engineering, and computing, we do not set disciplinary targets for each cohort. We ask our Nominating Partner Organizations to make the opportunity available to all eligible candidates at their institutions and to put forward the most promising candidates each year, regardless of PhD subject area. Similarly, our Reviewers and Selectors are instructed to make their recommendations on the basis of alignment to the selection criteria and merit alone.

Across our community our Fellows are comprised of 34% from Engineering, 25% from Biological Sciences, 14% from Physics and Astronomy, 11% from Chemistry, 6% from Mathematics and Computing, and 10% from Earth Sciences.

Our Nomination and Selection process aims to identify and select the highest achieving candidates and those with the greatest potential to be interdisciplinary science leaders. The effectiveness of our approach is shown through the external and institutional recognition that new Fellows receive each year for their doctoral work. This year, for example, saw Dr. Shriya Srinivasan named by *MIT Technology Review* as one of the Innovators Under 35 for 2020 and as part of the Forbes 30 Under 30 Class of 2022 in Healthcare. In October 2020, Dr. Yang Guo's thesis was recognized by the Chinese Society for Environmental Sciences as one of the top PhDs in China on an environmental topic. Dr. Yuanzhao Zhang was awarded the SIAM Student Paper Prize for 2021 by the Society for Industrial and Applied Mathematics.

Jacqueline Campbell, 2020 Fellow, is working to understand the impact of ocean acidification on biodiversity and inform new strategies to prevent the loss of marine species.





Jyotirmoy Mandal, 2019 Fellow, working on a interferometer that he built in the Raman Lab, University of California, Los Angeles.

Our Selection Process

Our Nomination and Selection process for the 2021 cohort was significantly adapted and built upon the successful model we implemented for the 2020 intake when COVID restrictions initially necessitated more of a shift online. The move to online-only has proved very successful and is delivering significant benefits – particularly in facilitating more equitable engagement with the application process across such a diverse and international pool of both candidates and Selectors.

We will continue with the virtual approach for the foreseeable future but plan to supplement this with an in-person public announcement event for new Fellows each year as travel restrictions ease.

As we scale our Admissions process to steadily increase the number of Fellows in each cohort, we will also increase the number of Reviewers and Selectors involved in each cycle of Admissions. In line with our commitment to diversity amongst our Fellows we will also strive to broaden the diversity of perspectives and backgrounds represented among our Reviewers and Selectors. A total of 92 Reviewers and Selectors were involved in the selection of the 2021 cohort, they represent a total of 55 different organizations and were based in 12 different countries.

We are truly grateful to all our Nominating Partners, Academic Reviewers, and Final Selectors for the time, energy, expertise, and professionalism they devote to recommending candidates to our Fellowship. The pool of talent nominated to Schmidt Science Fellows each year is simply exceptional, and we appreciate our Reviewers and Selectors have an often-difficult task where decisions have to be made on the very finest of margins.

Future Developments

Effective from the 2022 cohort onwards, we will be adjusting our annual Admissions timetable, bringing forward the nominations stage allowing Nominating Partners increased time to select their nominees. We are also moving forward the application, review, and selection stages, whilst pushing back the start of our Global Meeting Series, to allow for an in-person announcement event and more time for Fellows onboarding ahead of starting their Fellowship Research Placements.

We are committed to broadening the international diversity of our candidate pool still further and will invest in additional outreach and engagement in Africa, Asia, Australia, Europe, and South America. We will also take steps to increase our engagement with Nominating Partners, including recruiting Reviewers and Selectors from an increasingly diverse range of organizations around the world.

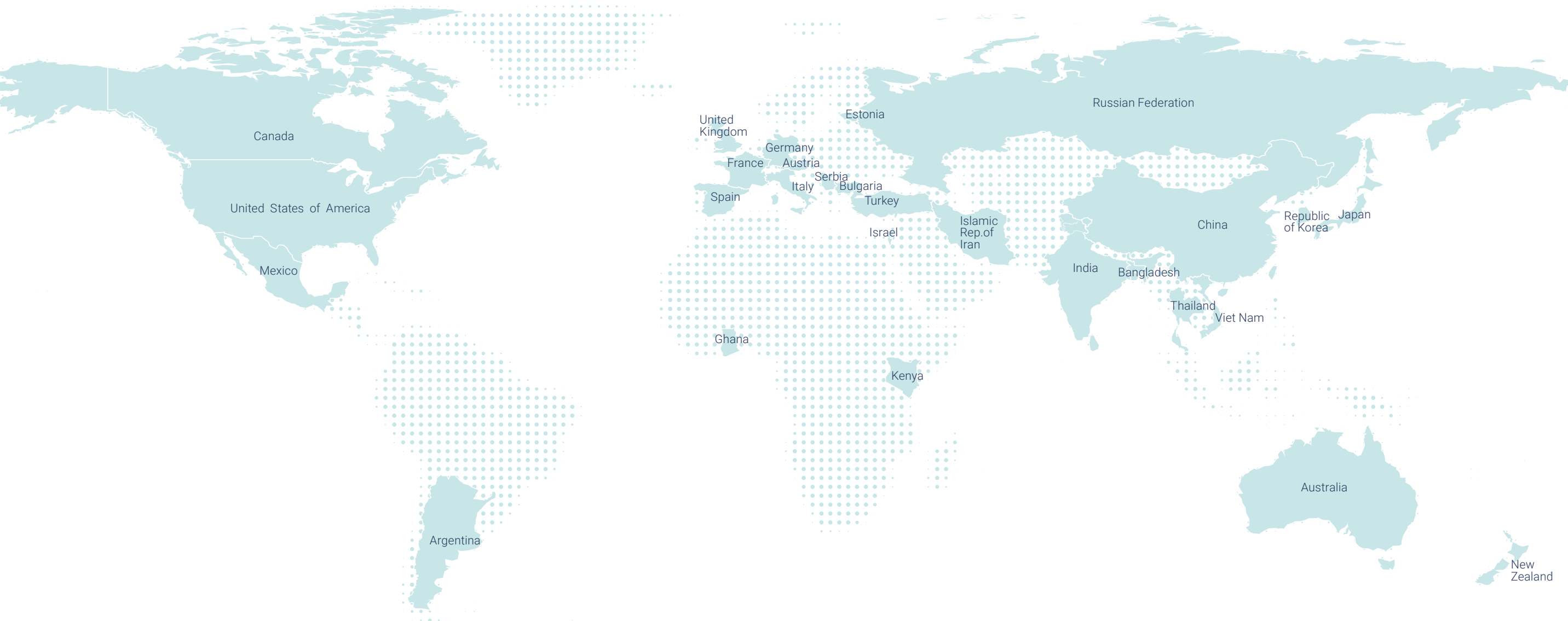
As part of our outreach strategy we also seek to further our engagement with potential candidates and to provide more equitable support for all candidates applying to Schmidt Science Fellows. We were therefore pleased to be able to provide three regional webinars to nominees for the 2022 intake. Our Admissions Team, with the support of nine Fellows from our current and Senior Fellows community, presented information about the application process. We collated 160 engaging questions from participants across the three webinars. These were summarized and answers made available on our website to guide candidates as they continued their applications. We plan to repeat these webinars in a similar format in future years.

Future candidates will also benefit from new content, including a series of short films, that aim to clarify what it means to be a Schmidt Science Fellow and to highlight some of the key elements involved in applying to and joining the Program.



Gabriella Heller, 2020 Fellow, pivoted from computation into experimental structural biology to uncover the rules of drug binding to viral disordered proteins.

Schmidt Science Fellows 2018–2021



Our
84 Fellows
include
41 men and 43 women
who come from
28 different nations of origin.

Across the four cohorts of our Fellowship,
our Fellows have, to date, worked with
81 Principal Investigators
at
50 host institutions.

Map and borders source: United Nations Geospatial, 2020 Map of the World

An Infectious Disease Modeler's Work Tackling COVID-19

Dr. OJ Watson is a 2020 Schmidt Science Fellow and infectious disease modeler. He completed his PhD at Imperial College London before being granted an exceptional deferral by Schmidt Science Fellows to pursue COVID-19 work at a critical time during the pandemic. His response to COVID-19 has led to work with the Ministry of Health in Sudan and contributions to VacSafe - a working group, supported by Schmidt Futures, convened by Dr. Wilmot James at Columbia University involving universities and vaccine education groups from tech and public health and policy creation. As a Schmidt Science Fellow, OJ is pivoting into evolutionary genetics and mortality estimation at the London School of Hygiene and Tropical Medicine.

Tell us about your involvement with the response to COVID-19 and the impact of your work.

Scientists and public health officials needed COVID-19 models to give some impression of the size of the pandemic and to give projections of future scenarios to tackle the virus and ultimately save lives. I focused on developing software for an infectious disease model forecasting tool to support public health agencies responding to the pandemic in low and middle-income countries.

My work eventually fed through into a collaboration with the World Health Organization (WHO) – specifically the Essential Supply Forecasting Tool (ESFT). This is a large-scale tool informing government responses to the pandemic and how to plan for future demands on health care resources. All the work I've done during the pandemic has been very interdisciplinary and very multi-institutional in its nature.

What is next for you and your COVID work?

My work has recently focused on better characterizing and quantifying the scale of reported COVID-19 mortality. This included working with Dr. Maysoon Dahab at the London School of Hygiene and Tropical Medicine (LSHTM) and the Y-PEER Sudan program to support the Sudanese Ministry of Health, which led to an advocacy and shielding campaign distributed before their second wave.

Much of the advocacy work has been in collaboration with Professor Francesco Checchi from the LSHTM, which focused on generating evidence that officially reported deaths do not correctly represent the size of the pandemic. These data gaps have obscured our understanding of how far COVID-19 has spread and how effective previous interventions have been, ultimately hindering vaccine rollout.

My COVID work will never really finish and will always be ongoing working with researchers at Imperial College and LSHTM.

How has Schmidt Science Fellows supported you and your science?

The Program has helped shape my science and the path I have taken. The pandemic caught the world off guard, and we did not have the techniques we needed for modeling and responding to COVID-19. We needed these new tools very quickly for rapid deployment.

The Fellowship fully supported me and my mission to support low and middle-income countries responding to the pandemic by offering me an exceptional deferral to my Fellowship Year. The Program has been incredibly flexible and very understanding of my work in such rare circumstances. Support from the Academic Council removed a lot of pressure and allowed me to focus on my COVID work.

What is your contribution to VacSafe, and how did that come about?

I am using coding tools I developed to help the VacSafe group explore the impact of COVID-19 vaccination and vaccine hesitancy. The group includes various backgrounds of expertise to look at vaccine safety and confidence-building in Africa with an expressed interest from a modeling perspective. Pilot projects have been set up to monitor adverse events to vaccine rollout in Africa. One of the aims is to build an evidence base for the safety of vaccines that can lead to increased confidence in vaccine uptake.

What is next for you and your science at the London School of Hygiene and Tropical Medicine?

I want to develop new methods that will combine geospatial techniques and computer vision models to quantify mortality from satellite imagery data of cemeteries. I will also be continuing my work on COVID-19 mortality with Prof. Checchi as part of a recently funded 5-year US CDC grant supporting research groups in DRC, Sudan, Somalia, and South Sudan to estimate mortality during the pandemic and generate evidence for humanitarian public health action.



“I focused on developing software for an infectious disease model forecasting tool to support public health agencies responding to the pandemic in low and middle-income countries.”

Fellow Training, Development, and Support

We support our Fellows to maximize their potential as interdisciplinary science leaders and to accelerate their impact. We do this through providing a bespoke training and development program throughout a Fellow's period of active Fellowship, underpinned by initiatives to build community within our active cohorts and across the full Fellowship community plus comprehensive mentoring from our Academic Council and Fellowship Affairs with support from our Program Team.

At the heart of the Schmidt Science Fellows experience is the Fellowship Research Placement, the primary interdisciplinary scientific training opportunity for Fellows. Our unique Global Meeting Series, delivered in partnership with international hosts, aims to deliver learning outcomes including leadership and management, engaging society, and community development. On completion of their active Fellowship, Fellows progress to our lifelong community of alumni – the Senior Fellows. Our growing Senior Fellows program focuses on building connections and collaboration as Fellows follow individual career paths and providing opportunities for career-stage specific personal and professional development.

Each strand of our training, development, and support helps our Fellows on their journey to become exceptional interdisciplinary science leaders.

Chair of the Academic Council,
Professor Sir Keith Burnett mentoring
2021 Fellow Álvaro Fernández Galiana.



Fellowship Research Placement

All Schmidt Science Fellows undertake a postdoctoral research Placement at a world-leading laboratory. With the support and guidance from our Academic Council, our Fellows have full freedom to choose a laboratory anywhere in the world so that they can continue developing their skills in a scientific discipline completely independent from their PhD discipline.

From the 2021 cohort, we introduced more flexibility around the duration of the research Placement. Engagement with our PI community and feedback from Fellows revealed that offering a change of this kind would mean our Fellows could respond better to the features of their scientific landscape. We have therefore extended the fixed Placement period of 11-14 months that we initially operated to a flexible 12-24 months, with any period beyond 12 months subject to a review point. This change will allow our Fellows to further benefit from the freedom and flexibility Schmidt Science Fellows offers. In turn, it will ensure that we can continue to attract the very strongest candidates to join us in our mission to advance interdisciplinarity, recognizing that different needs and career paths across the disciplines and sectors that Fellows work in mean that a shorter postdoc period can be most effective for some, with others needing a longer period of support due to the nature of their scientific pivot.

This development also builds on the success and uptake of the Additional Study Grants that were made available to our 2018 and 2019 cohorts, offering up to an additional 12-months of Program support to continue or consolidate Fellows' interdisciplinary projects. The 2020 cohort of Fellows has been offered a hybrid scheme – the Second Year Funding award – to bridge the gap between the original 12-month Placement, the Additional Study Grant and the new 12-24 month option. This provides the same level of support to continue interdisciplinary research while offering a flexible threshold when making a case for support.

We have retained the flexibility developed over the last 18 months to take account of COVID-19 restrictions, mindful of the fact that travel restrictions and delays in visa processing, in particular, have delayed Placement start dates for some Fellows.

The 2020 and 2021 Fellows have joined a broad range of Placement institutions, including research groups in Germany, the Netherlands, Austria, China, Canada, the UK, and the USA.

First hosted Fellows in 2018

Brigham and Women's Hospital
MIT
Harvard Medical School
University of Maryland College Park
Stanford University
University of Pennsylvania
The Whitehead Institute
Virginia Tech
Harvard University
University of Cambridge
University of Oxford
Massachusetts General Hospital

First hosted Fellows in 2019

Ontario Cancer Research Institute
The Broad Institute
University of Chicago
University of California, Santa Barbara
University of California, Los Angeles
Columbia University
University of California, Berkeley
Duke University
National Institute of Standards and Technology
University of California, San Francisco
Northwestern University

First hosted Fellows in 2020

Princeton University
Harvard & Smithsonian Center for Astrophysics
University College London
Harvard School of Public Health
University of Washington
University of California, San Diego
University of Colorado, Boulder
Boston Children's Hospital
McGill University
Memorial Sloan Kettering Cancer Center
Cornell University
Wyss Institute
NYU
London School of Hygiene and Tropical Medicine

First hosted Fellows in 2021

University of Toronto
Picower Institute
Carnegie Mellon University
Utrecht University
CAS Beijing
ETH/EAWAG (Dübendorf)
Imperial College London
Brown University
Max Planck Hamburg
University of Hawaii
Institute for Applied Systems Analysis - Vienna
ETH Zurich
Ragon Institute



Mercy Asiedu, 2019 Fellow, progressing into the Senior Fellows community in December 2020, following a virtual event to celebrate the cohort's progress and achievements.

We now have a total of 50 different institutions that have welcomed Fellows for Placements across four cohorts. Many institutions are host to multiple Fellows or over multiple cohorts.

Fellows progress to our Senior Fellows community on the completion of their core Global Meeting programming and a minimum of 12 months of Fellowship Research Placement. While Fellows progress as a cohort group, some individuals will defer to a later group due to Family Leave or Sick Leave. Despite delays due to COVID-19, we were delighted to progress our 2019 Fellows as Senior Fellows in December 2020 in a virtual event with the cohort joining from around the world, accompanied by members of the Program Team and guests from Schmidt Futures and the Rhodes Trust. We look forward to our 2020 and 2021 cohorts progressing at different in person events during the coming year.

Global Meeting Series

Our Global Meeting Series is one of the key pillars of the Fellowship. Spanning the Fellowship year, the Global Meetings deliver tailored training for our Fellows in science communication, leadership, and the facilitation of interdisciplinary research. Fellows come together to learn about new techniques and ideas in research, with sessions delivered by leading thinkers and institutions. The chance to experience a variety of scientific cultures is joined by the opportunity to build professional networks, giving Fellows the tools to make the greatest possible positive impact on the world.

Our Global Meeting Series covers:

- leadership | **ethics** | managing diverse cross-disciplinary teams | teaching
- | **problem-solving** | verbal, visual, and written communication skills
- | resilience and perseverance | budgeting | funding |
- intellectual property | **cutting-edge science** | innovative research tools
- | engagement with interdisciplinary science organizations | policy issues |
- addressing societal and global challenges** | **building communities** | networking

During 2020-21, we continued virtual programming for all active cohorts as the ongoing pandemic situation made in-person meetings unsafe and impractical. We continue to be grateful to all our partners for working closely with us to develop such engaging virtual sessions. Later in 2021, as restrictions began to ease, we were able to organize a small-scale regional retreat series for the 2020 cohort through September and October 2021.



Beginning the Fellowship Year session with the 2021 Fellows.

Our virtual Global Meeting series for the 2020 cohort began in September 2020, hosted by MIT and the Broad Institute. We were also pleased to work again with the Alan Alda Center for Communicating Science. October's sessions included a discussion with Professor Bob Langer and Professor Phil Sharp of the Koch Institute and a cross-cohort session looking at interdisciplinary responses to the pandemic, led by Dr. Roby Bhattacharyya and Dr. Niall Lennon of the Broad Institute. In November, Fellows came together for sessions which included MIT researchers Dr. George Ricker speaking about the Transiting Exoplanet Survey Satellite (TESS) and Dr. Ike Chuang outlining his work in quantum information systems.

The Northern California virtual Global Meeting Series for the 2020 cohort was hosted by Stanford University and the University of California, Berkeley. Beginning in February 2021 and running through to May 2021, sessions featured discussions on charting a career path, negotiation skills, and the unique innovation culture of the Bay Area. We welcomed speakers including Nobel Prize winner Professor Saul Perlmutter and got unique insights into the world of venture capital from Ryan Panchadsaram at Kleiner Perkins.

Senior Fellow Dr. Peyton Greenside joined a session on innovation and entrepreneurship, together with speakers from Innovation Endeavors, and shared her experience of the Northern California science and venture capital landscape and how this has led to the establishment of her start-up company BigHat Biosciences.

We were delighted that the program could feature a special panel discussion on leadership in times of crisis, reflecting on learnings from the pandemic, including Eric Schmidt, co-founder of Schmidt Futures, Carol Christ, Chancellor of the University of California, Berkeley, and Marc Tessier-Lavigne, President of Stanford University.

In parallel with the Northern California virtual Global Meeting sessions, we trialed a small group initiative to support Fellows in building stronger links with one other and in enhancing their analytical and problem-solving skills. Fellows worked on a project aligned with our strategic objective of 'Advancing Interdisciplinary Discovery', exploring how they would identify and tackle obstacles to interdisciplinary science, culminating in a presentation to senior leaders from Schmidt Science Fellows, Schmidt Futures, and our Academic Council.

For the first time, we piloted Learning Teams with our 2021 Fellows. The Fellows were placed in small teams, based on diverse interests and regional alignment, to provide a 'home base' for group work, reflection, and for informal contact to sustain connections in the times between Global Meeting programmed sessions. As we anticipate bringing the 2021 cohort together for in-person Global Meetings during 2022, we will explore how the Learning Teams can support enhanced cohort interactions in-person as well as when working remotely. With the Fellowship growing and our annual cohort size increasing too, we anticipate that Learning Teams will have an important role in supporting the sense of community and close interaction that has been a Schmidt Science Fellows hallmark from the beginning.

We launched programming for the 2021 cohort with a Kick-Off Workshop in September 2021. This ran over two days and included time for reflection and informal bonding as well as the chance to learn about leadership skills. In one highlight, Professor Arjun Raj, a former Fellowship PI, joined Academic Council member Professor Chiara Daraio and 2020 Fellow, Dr. Callan Luetkemeyer to deliver a panel discussion on collaboration and community, introducing the different types of collaboration and community that Fellows can access over the course of their careers.

“The Schmidt Science Fellows community has been critical for each of us in the 2020 cohort to find the support we needed to thrive personally and scientifically during this challenging year. It was remarkable that we are able to build such a strong community virtually and I think it's that foundation that made these retreats so wonderful – because when we finally met in person for the first time the personal connections with our colleagues were almost instantaneous.”
Andrea d'Aquino, 2020 Fellow



From top left, Principal Investigator, Dr. Arjun Raj, 2020 Fellow Callan Luetkemeyer, Director of Strategy and Fellowship Affairs, Matt Goode, and Academic Council Member, Dr. Chiara Daraio speaking at the 2021 Fellows virtual Global Meeting kick-off session.

We delivered a virtual United Kingdom Global Meeting program for our 2021 cohort through October and November 2021. Charles Conn, former CEO and Warden of the Rhodes Trust, began our sessions with a workshop on problem-solving. Other programed virtual sessions included a session on data representation with Dr. Alex Freeman of the Winton Centre for Risk and Evidence Communication, and a deep dive into climate science with Professor Emily Shuckburgh. In November, the series continued with a half-day given by the Blavatnik School of Government. Other sessions included a discussion of perseverance, risk and failure with Dr. Nadiya Figueroa, former Dean of Scholarships at the Rhodes Trust. We are grateful to the University of Cambridge as hosts of this Global Meeting and working in partnership as programming switched online. The meeting program also included the chance for Fellows to meet Cambridge faculty.

Members of our 2020 cohort came together for the first time in person in September and October 2021, building connections and strengthening their spirit of Fellowship as we hosted three COVID-safe regional convenings in Berkeley, California, Washington, D.C., and Oxford, UK. Delivery of the regional retreats included sessions for those who could not join in-person. Alongside in-depth discussions about their science and opportunities to share interdisciplinary approaches to global challenges, Fellows also had the chance to make connections and build friendships. In California, Fellows hiked together in the Berkeley Hills, and in Washington, D.C., they visited sites of the US capital, including the Tidal Basin and the National Zoo. At the third and final retreat in Oxford, UK, Fellows enjoyed a cruise on the River Isis (Thames) as well as a tour of the historic city center led by our Chair of the Academic Council, Professor Sir Keith Burnett. At each retreat, Fellows were hosted by Dr. Megan Kenna and members of the Program Team and in Oxford, Fellows were joined by Schmidt Futures' CEO Eric Braverman and the Warden and CEO of the Rhodes Trust Dr. Elizabeth Kiss.



Director of Global Meetings, Maysa Mustafa at the 2020 Fellows Oxford Retreat in 2021.

We anticipate and are planning for a return to in-person Global Meetings in 2022. We will be working to maintain the special character of Fellowship convenings while ensuring COVID-19 safe protocols and adapting to changes from our pre-pandemic operations. Our cohorts are now 50% larger than the 2019 cohort, the last group to have been able to meet in person. Evolutionary change to support this will allow a greater role for cross-cohort interactions and involvement for Senior Fellows. In the future, we plan to take our Global Meetings to a wider range of locations, and we have been building partnerships in Singapore, with our first Global Meeting due to be held there in 2023.

Fellowship Support

Our comprehensive Fellowship support package begins immediately following the selection of each cohort with onboarding of new Fellows and continues through setting up Placements and the duration of the active period of Fellowships.

Throughout, the focus is on enabling Fellows to maximize the opportunity from the Fellowship and enabling them to concentrate on their scientific and professional development.

Following the Selection process, new Fellows work with our Fellowship Affairs office and the Academic Council to identify the best location and environment for their proposed pivot. From 2021, the full membership of the Academic Council have an increased role within this process, and this will expand further into the future. Fellows work with the Academic Council to propose and evaluate a number of possible options for their Placement, exploring these in the context of their proposed scientific work and their long-term career aims.



Members of the 2020 cohort with Executive Director, Dr. Megan Kenna (second from right) and Manager of Office Operations and Executive Assistant to the Executive Director, Christine Norton (furthest right) at the Washington, D.C. Retreat in 2021.

Onboarding is vital for every cohort, offering important practical briefings about Placements, support networks, and funding whilst also introducing Fellows to the Schmidt Science Fellows mission and community. Our 2021 cohort enjoyed onboarding across a series of virtual sessions, beginning in July 2021 with introductions and a “look ahead” from our Senior Fellows. We anticipate leveraging in person opportunities to provide an enhanced welcome and onboarding experience for new Fellows for the 2022 cohort onwards.

Fellowship Support helps Fellows to reduce obstacles to their interdisciplinary science, to engage with other Fellows, and make productive connections. Our support measures have been especially important as Fellows have encountered more significant challenges over the last 18 months. Working closely with members of the Academic Council, our team has helped Fellows with issues including negotiating job opportunities, planning career shifts, new babies, physical and mental health issues, family health issues, visa problems, housing, and injury at a time when the pandemic and its associated restrictions have made everyday life more challenging for all of us.

Mentoring

Our Fellows benefit from a personalized mentoring program, providing professional development support from experienced and internationally accomplished scientists. The mentoring equips Fellows to maximize the opportunity of their placement, to build their networks, and to plan their future career paths.

Mentoring is delivered by our Academic Council members, each of whom are highly experienced scientists with extensive track records in institutional leadership, management, and team development. Senior Fellows are offered access to mentoring support as they continue their careers.

Following selection and during Placement, Fellows engaged in monthly video calls with Mentors, offering the chance for wide-ranging conversations covering everything from scientific progress to practical issues, ensuring that every Fellow has a place for reflection and trust as they move forward. Small group mentoring every other month has been used to discuss topics of interest, including professional development issues that are common to Fellows. These might include pivoting to a new field, managing up, strategies for learning new skills, and career planning. Mentoring is closely allied with the support offered to Fellows by the Program team, and Fellows are encouraged to seek advice and input from across the Schmidt Science Fellows community.

Over the last eighteen months, the Academic Council has grown. Chair of the Academic Council Professor Sir Keith Burnett and Professor John Boothroyd have now been joined by Professor Chiara Daraio (G. Bradford Jones Professor of Mechanical Engineering and Applied Physics at Caltech), Professor Amy Herr (John D. & Catherine T. MacArthur Professor at the Department of Bioengineering at the University of California, Berkeley and a Chan Zuckerberg Biohub Investigator), and Dr. Renée Hložek (Assistant Professor of Astrophysics at the Dunlap Institute, University of Toronto). Fellows can also draw on the experience of Associate Academic Council Member, Dr. Liliane Chamas. Diversifying the breadth of experience and expertise across our Mentors means we can ensure that every future Fellow receives the same level and quality of support that cohorts thus far have enjoyed. As our Fellowship grows, we plan to expand our Academic Council membership accordingly.

An Interdisciplinary Journey

Dr. Yogesh Goyal is a member of the inaugural cohort of Schmidt Science Fellows, selected in 2018. As a first-generation low-income student born and raised in rural Jammu and Kashmir, Yogesh studied for his undergraduate degree at the Indian Institute of Technology Gandhinagar. Yogesh then moved to the US and completed his PhD at Princeton University in chemical and biological engineering. During his Fellowship Year, he pivoted his science into single-cell biology at the University of Pennsylvania. He is now an Assistant Professor at Northwestern University, jointly with the Department of Cell and Developmental Biology and the Center for Synthetic Biology.

Describe your journey from your Fellowship Year to your current role as Assistant Professor at Northwestern and how that came about?

My work as a Schmidt Science Fellow was a big pivot from my PhD in developmental biology to completely different systems and completely new types of questions in cancer and single-cell biology. It was a very challenging transition. I often questioned if this was the right choice, but now that I am starting my own lab, I am grateful for the knowledge and skills I have from two conceptually distinct areas.

Many of the projects in my own lab will be driven by both fields, which is only possible because I developed this ability and confidence to successfully switch disciplines and make connections across unrelated areas.

How did Schmidt Science Fellows help you progress after your Fellowship Year?

A unique aspect of the Fellowship is the one-on-one interactions that have continued since I became a Senior Fellow. Everybody throughout the Fellowship cares about my progress. When I began to receive job offers, both Keith Burnett and John Boothroyd worked with me to mentor me in the process of negotiation. They taught me how to strike a good deal and what to avoid, which helped me navigate difficult obstacles that postdocs are typically not trained to know in this highly competitive market.

If you could pick one aspect from your Fellowship Year you value most, what would it be?

Community. I have interacted with a lot of different people from my Fellowship Year. We are a growing community – it's a very synergistic partnership where we look out for each other and provide feedback across the Fellowship.

Ryan Truby from the 2018 cohort is also an Assistant Professor at Northwestern, so I asked him and other biology folks within the Fellowship questions about job markets and moving to Chicago. To have a community where we can discuss not only science but share emotions and be vulnerable has helped me overcome further boundaries. I am grateful for meeting people from different foundations and universities, and this network would not have been possible if not for the Fellowship.

What skills and experiences have you gained from the Fellowship that you have now utilized in your scientific career?

How to manage people and how to understand what people want. I realize running a lab is more than just doing good science. All the diverse training during the Global Meetings taught me how different people think and approach their goals and incentives. As a leader, that is just as important as asking the right science questions because you must motivate people.

I have also particularly enjoyed the peer-mentor scheme where I have mentored current Fellows. As the name suggests, it creates a balance of being a peer and mentor to exceptional Fellows and getting to know how they think and how I can help them advance their journey in the Fellowship. That has been an enriching experience and will help me in my lab as I communicate with a wide variety of people.

What are your scientific ambitions now at Northwestern University?

I view myself as an interdisciplinary scientist bringing my training in engineering and mathematics to study biological questions. My lab will focus both on studying cancer drug resistance and on how we go from a single cell to a fully developed animal – importantly with a major goal to measure everything to have a more quantitative understanding of how these disparate biological processes work.

I care about running a group with people from all scientific backgrounds. I want to have a mix of biologists, physicists, engineers, mathematicians, and computer scientists who collaborate inside and outside of the lab to ensure a robust interdisciplinary approach to answer open problems in biology.

“I view myself as an interdisciplinary scientist bringing my training in engineering and mathematics to study biological questions.”



Building a Lifelong Community

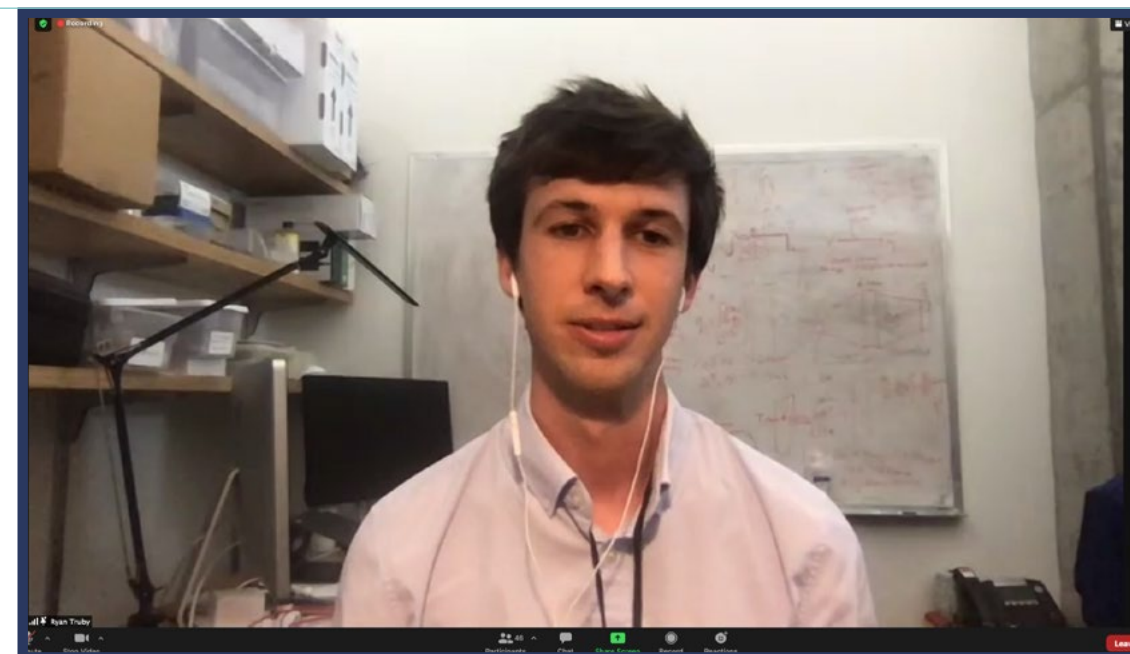
From the point of selection and throughout their careers, Schmidt Science Fellows belong to a genuine lifelong community that supports, inspires, and challenges them to achieve more. Through that community, we aim to amplify each individual Fellow's impact. As individuals, and as a group, Senior Fellows are changing the way that science is done and are powerful advocates for interdisciplinary science. We work to ensure our Fellowship community stays connected, supported, and engaged – when on the 'active' Fellowship and beyond. Fellows progress to be Senior Fellows on completion of at least 12 months of their Fellowship Research Placement and core Global Meeting programming. This is a lifelong community of exceptional interdisciplinary science leaders who are Fellows for life, supporting one another to tackle and solve global problems.

Senior Fellows

Our Senior Fellows community currently encompasses the Fellows of the 2018 and 2019 cohorts. During 2022, once we can come together in person again, our 2020 Fellows will progress formally to become Senior Fellows. The Program has worked to build and support this alumni community and we believe it will be crucial to our long-term aims. Beyond Program activities Senior Fellows have formed a strong informal network, engaging across all parts of our community in friendship and support.

Throughout 2020-21, our Senior Fellows have given back generously and extensively to current Fellows, bringing our Fellowship community full circle. This has been through the sharing of their time, expertise, and insights through speaking opportunities, mentoring, and bespoke advice.

Senior Fellows joined Academic Council Member Professor John Boothroyd and Schmidt Science Fellow Final Selector and Global Meeting Faculty Director Professor Tsu-Jae King Liu, Dean of the University of California, Berkeley College of Engineering, for a virtual Faculty Hiring Session. They shared their experiences on finding the right job in academia, on interviewing, the negotiation process, and pitfalls to avoid, all from the standpoint of an interdisciplinary scientist. Fellows from across every cohort joined to hear about and discuss guidance, hints, and tips, and to learn about securing and negotiating the perfect faculty job in academia. The event was followed by a panel discussion with three of our Senior Fellows who have successfully secured faculty roles – Dr. Ryan Truby (2018 Fellow) at Northwestern, Dr. Ina Anreiter (2019 Fellow) at the University of Toronto, and Dr. Mattia Serra (2018 Fellow) at the University of California, San Diego. A lively Q&A session with all speakers continued outside the session itself.



Senior Fellow, Ryan Truby, Assistant Professor of Materials Science and Engineering and Mechanical Engineering at Northwestern University speaks to Fellows across all cohorts at a Faculty Hiring Session sharing guidance on securing faculty jobs.

As our community of Fellows grows, Senior Fellows have taken a growing role in our Global Meeting Series, contributing as speakers and collaborators. Fellows from our 2018, 2019, and 2020 cohorts who have led Learning Team breakout sessions include inaugural Fellows Dr. Jina Ko and Dr. Wesley Furhrman, 2019 Fellows Dr. Ina Anreiter and Dr. James Briggs, and 2020 Fellow Dr. Andrea d'Aquino. We anticipate creating further opportunities and engaging our Senior Fellows further as we return to in person Global Meeting programming through 2022.

Senior Fellows joined our Admissions Team for three successful advice webinars, offered to 310 attendees across Asia/Oceania, Europe/Africa, and North America. The Team presented information about our application and Selection process to guide candidates in making their applications. Nine Senior Fellows answered live questions from attendees.

The impact of our Senior Fellows and their work is increasingly being felt across science, business, and society. Dr. Mercy Asiedu (2019 Fellow) invented the 'Pocket Colposcope', a handheld device that combines machine learning and medical imaging to revolutionize cervical cancer screening in low-income countries and now 200,000 patients have the potential to benefit from pre-orders for the device. In the fight against COVID-19, 2020 Fellow Dr. Shriya Srinivasan and her team have developed iSave, a system that allows one ventilator to be shared safely by multiple COVID-19 patients, extending life-saving equipment in resource-constrained environments. 10 hospitals in India are now deploying iSave.

“My advice is to lean into this community... I had so much unwavering support from the Schmidt Science Fellows team and my cohort and the only reason I made it through as a successful scientist was because of this group.”
Ryan Truby, 2018 Fellow

Peyton Greenside, 2018 Fellow, and co-founder of start-up company, BigHat Biosciences.



“Being a Schmidt Science Fellow has definitely shaped me as a leader. Above all, the Fellowship experience has shown me that leadership can take many forms.”
Peyton Greenside, 2018 Fellow

Fellows have now launched six start-up companies, securing a total of \$36.8 million of investment funding across all our Fellowship cohorts. 2018 Fellow Dr. Peyton Greenside's start-up BigHat Bioscience continues to flourish, and in 2021 Peyton was named a Woman of Influence in Silicon Valley. BigHat Biosciences' mission is to improve human health by making it far easier to design advanced, next-generation antibody therapeutics.

By 2022, 15 Fellows had received tenure-track faculty positions or their international equivalent. Fellows secured over \$25 million of research funding and published 65 papers on direct Program-supported interdisciplinary science. Fellows have had over 20 science-policy interactions, including with national and state-level governments and agencies in the US, UK, Europe, China, and Africa.

To support our growing Senior Fellows community to achieve more and to accelerate impact we continue to increase our support for them. In 2022, we will launch our Senior Fellows Catalyst Grant Scheme, piloting a funding model to deliver effective small-scale and proof-of-concept funding to incentivize interdisciplinary science across our community and beyond.



As part of our virtual Senior Fellows programming, a group of our Senior Fellows and program staff joined a 'ship-to-shore' link up event with scientists onboard Schmidt Ocean Institute's R/V FALKOR.

Fellowship Community

We place great emphasis on bringing members of our community together. While gatherings in recent times have of necessity been virtual, we have continued to offer a program of events. For our Senior Fellows, there was the opportunity to connect with and learn about a sister organization in the Schmidt community, Schmidt Ocean Institute. Senior Fellows were able to explore marine science in action, joining a live 'ship-to-shore' link-up event with scientists onboard Schmidt Ocean Institute's R/V FALKOR as it undertook a research cruise 100 miles off the coast of Northern Australia. The interactive event featured a Q&A format whilst showing live footage of a remote sub dive expedition exploring Ashmore Reef Marine Park, and of the dive control room onboard.

Virtual events have also kept us in touch with all our Fellows for social time and we have enjoyed virtual challenges and time away from the stresses of the pandemic. We utilized virtual Town Halls to share Fellowship news and engage the community with strategy development.

Looking ahead, virtual ways to be together will continue to be a part of our programming however we also look forward to organizing in-person events once it is safe to do so.

“My biggest pivot was after the Schmidt Science Fellowship year, unquestionably. The training was critical to being successful in the new domain. So much less fear.”
Wes Fuhrman, 2018 Fellow, speaking at our virtual Town Hall



In the last year, we have been planning for our inaugural Senior Fellows conference, co-creating this event with a steering group of cohort leaders from among our Senior Fellows. The conference will take place in Palo Alto, California in October 2022, having been postponed due to COVID-19, and will align with one of our Global Meetings for the 2020 and 2021 cohorts, enabling full interaction across the Fellowship. As our community grows, we will be looking to support regional and interest clusters. Consultation across the community about how best to develop effective clusters will take place during 2022, for a planned launch after our Senior Fellows Conference.

Engaging with Current Fellows

2020 saw the launch of our Peer-Mentoring scheme. The aim was to 'buddy' each new 2020 Fellow with a volunteer Senior Fellow who could offer informal advice and act as a guide to the Fellowship community. Senior Fellows have generously given their time to share their experience and expertise, and the scheme is building strong links across different cohorts. Last year's pairs discussed everything from how to adapt to the pivot field to general work-life challenges.

“Really liked the changes you have made to the application process to make it more inclusive and the longer Fellowship period, which provides some extra stability and flexibility.”
Jacqueline Campbell, 2020 Fellow, speaking at our virtual Town Hall



Deepak Krishnamurthy, 2020 Fellow, developing microscopy and molecular tools for a cross-scale understanding of cell behaviors relevant to ocean ecology.

Our evaluation of the first round of Peer-Mentoring took place in May 2021, gathering views from both mentors and mentees, and proving that the scheme has been both popular and successful. Mentees rated the scheme an average of 8/10 for usefulness, and 50% of pairs continued meeting for more than six months, with more than a third still in regular contact over a year after the scheme began. 100% of Peer-Mentors are interested in serving again, and 95% of Peer-Mentees say they would volunteer to support future Fellows. A second round of Peer-Mentoring was launched for our 2021 Fellows.

Comments from Mentees included:

“The match between different cultural backgrounds is surprisingly inspiring for each other to be more inclusive and open-minded.”

“This was a great idea and a very nice way to connect with other members of the Schmidt Science Fellows family beyond my cohort.”

“This was probably the best part of the entire Program for me. I have really enjoyed the Peer-Mentoring.”

Developing International Networks of Communication

Dr. Amy Shepherd is a 2020 Schmidt Science Fellow trying to understand the role of the millions of neurons that exist in the gut and what the link is between gastrointestinal symptoms and neurological disease. She is working at Boston Children's Hospital in Harvard Medical School. Amy describes her scientific journey thus far that has taken her from New Zealand to Australia, to America, and her plans for the future.

Tell us about your academic journey in New Zealand and Australia before becoming a Schmidt Science Fellow.

I have always been interested in the brain. I went to my local university in the town where I grew up in Wellington, New Zealand. I did one year of graduate research on potential anti-addictive therapies, then worked for two years as a research assistant at the Malaghan Institute of Medical Research, focusing on immune responses in cancer, parasitic infections, and allergies.

“Schmidt Science Fellows is unique because it gives you the freedom to pursue pivots in your science at any lab in the world.”

I moved to Australia to complete my PhD in behavioral neuroscience at the Florey Institute of Neuroscience and Mental Health at the University of Melbourne. I worked with mouse touchscreens taking similar tasks that a human would carry out and giving them almost directly to the mouse. I used the findings to assess how well the mouse models of Alzheimer's recapitulated the human syndrome.

As a Schmidt Science Fellow, I decided I wanted to combine these two disparate fields in neuroscience and immunology. To do this, I wanted to move to study the gastrointestinal tract and how the local brain cells there can alter function in both normal and inflammatory settings. The gut is so fascinating to me because it is constantly figuring out what is good, such as nutrients and normal microbiota, and what is a potential threat, for example, pathogens like Salmonella. This required moving into a new field and learning about the gut. When you want to make a change like that, it is difficult to get funded as you don't have experience in the new field. Schmidt Science Fellows is unique because it gives you the freedom to pursue pivots in your science at any lab in the world.



How do you feel your early scientific experiences have shaped you?

The research culture in New Zealand and Australia is tight-knit and supportive. The support I received during my undergraduate and PhD studies made it possible to believe an interdisciplinary approach to my work is doable. There are inherent advantages and disadvantages to a small community – and one of the biggest benefits is that there is automatically more interdisciplinarity. We communicate our science, our challenges, and our new ideas regardless of strict disciplinary definitions. I benefited significantly from this, and I now try to continue this principle of being open to communication and collaboration as I move into larger scientific communities – such as life in the Boston ecosystem.

How has the Fellowship impacted your thinking?

I have gained a whole new perspective on science from the Fellowship based on the different scientific research ongoing throughout my cohort and how the people around me are thinking about approaching problems. In Boston particularly there is a mini-hub of Fellows, and being able to meet casually has been particularly critical during COVID. I also know my Fellowship community and Mentors are only one video call away. The community is very open and willing to help, not only with research questions but also with what grants to apply for and managing interpersonal relationships with lab members. Even though these are all critical skills in science, they are very rarely taught. Schmidt Science Fellows not only teaches these skills but also provides support and advice in the complex and unique situations you may find yourself in.

What are your future plans and aspirations for your science?

I'm in two divisions – the gastroenterology division and a neuroscience division – and I am actively building those networks. There is so much we do not know about the nervous system in the gut and how it interacts with the immune system there. I want to build up fundamental knowledge in this new and exciting field, taking gastrointestinal and classic neuroscience research to build tools to understand better how the body works.

Learn more about **Amy Shepherd** and her science at: schmidtsciencefellows.org/fellow/amy-shepherd

Advancing Interdisciplinary Discovery

Our Fellowship vision is clear: we help scientists solve bigger problems faster by identifying, developing, and amplifying the next generation of interdisciplinary science leaders, by building a community of scientists and supporters of interdisciplinary science, and by utilizing this network to drive sector-wide change.

Advancing interdisciplinary discovery means creating and delivering initiatives that drive long-term change across all of science and for the wider benefit of society. Our long-term goal is to remove systemic obstacles that prevent scientists from engaging in interdisciplinary approaches and thereby accelerate discovery for positive global impact.



Engaging with Partners and Building our Network

As our Fellowship has developed and our community of Fellows and partners has grown, we have deepened our insights of the challenges to interdisciplinary science that persist. We hear about the exciting interdisciplinary science that struggles to get funding or the outputs that are difficult to share. We receive feedback from the promising early-career scientists who get told by recruiting panels to de-emphasize their interdisciplinary experience and plans.

Before we can meaningfully build initiatives to foster greater interdisciplinarity we recognize the need for engagement and more detailed knowledge of the drivers of these barriers and where interventions would have the greatest effect. During 2021, we invited a targeted group of leading US and European experts from academia, business, policy, and funders to participate in focused, in-depth, individual conversations with us. Their willingness to share their experiences allowed us to identify potential interventions that can make a real difference and incentivize shifts in institutional and organizational behavior. These interviews enabled us to identify three major obstacles to greater interdisciplinary science:

- Scientific career structures and incentives, and the behaviors these encourage.
- Lack of an interdisciplinary science community.
- Conservative funding systems.

Each of these obstacles is, in turn, underpinned by a number of contributory factors.

The insights gathered from our partners and contacts have fed into a detailed build-out of our 2021-2025 strategic plan. We will work with our Program Joint Committee to develop some of these specific ideas. These include developing the evidence base for interdisciplinary interventions and incentivizing support for interdisciplinary science. We aim to deliver multiple projects during 2022.

Our own community represents a rich source of expertise and perspectives from the frontline of interdisciplinary science. We have been drawing on this, holding workshops with Senior Fellows to explore their thoughts on challenges to interdisciplinary practice and potential interventions and integrating small group project work with similar aims into Global Meeting programming for active Fellows.

We have been working with Schmidt Futures by holding a series of workshops with Senior Fellows in 2021 on the theme of ‘Reimagining 2050’. Discussions focused on identifying novel and radical ideas – ‘feasible science fiction’ science – that could bring us to the future world we want to see. Fellows identified several ideas for further exploration, looking particularly at how we can lead healthier lives, the development of organic urban systems and sustainable materials, and ways to digitize human experiences. The next steps in 2022 include small working groups of Fellows who will explore these concepts in greater depth, with the aim of producing ‘white papers’ to share with Schmidt Futures colleagues.

Our Principal Investigator Community

The Principal Investigators (PIs) who host Schmidt Science Fellows are enormously valuable partners for the Program, demonstrating a commitment to scientific mentoring and to interdisciplinarity which is crucial for the long-term success of the Fellowship. They are key members of our community. In this time when we have not been able to meet PIs in person, we have been especially grateful to them for their ongoing support, time, and expertise. To name but a few: Professor James Collins of the Wyss Institute at Harvard (PI to Dr. Evan Zhao, 2020 Fellow) and Dr. Eli Vlaisavljevich of Virginia Tech (PI to Dr. Hal Holmes, 2018 Fellow) acted as Reviewers and Selectors. Dr. Arjun Raj of The University of Pennsylvania (PI to Dr. Yogesh Goyal, 2018 Fellow) spoke at our Global Meeting Kick-off session for the 2021 cohort. Professor Alison Noble of the University of Oxford (PI to Dr. Jielai Zhang, 2018 Fellow) contributed her time to participate in the filming of a welcome film for our 2021 Fellows. We look forward to inviting PIs to join us at our events in the coming year, including the in-person announcement of our 2022 Fellowship cohort, to be held in June 2022.

Jyotirmoy Mandal, 2019 Fellow, describing his work on thermal imaging and sensing, and the centrality of the atmosphere's optical properties to it, to Academic Council Member, Dr. Chiara Daraio.



Fernando Soto, 2020 Fellow working in BAMM Lab at Stanford University.

Communications

Sharing the stories of our Fellows and their work is at the heart of our communications strategy. By using engaging, exciting content, we can emphasize the importance of interdisciplinary science, share our model, and support our Fellows to reach diverse audiences.

In the last eighteen months, we have produced a ‘Fellows Fighting COVID-19’ package to demonstrate the power of interdisciplinary science in the pandemic. Featured work includes the rapid diagnostic tool developed when 2018 Fellows Dr. Hal Holmes and Dr. Fahim Farzadfard came together to put interdisciplinary science into action. They combined Fahim’s knowledge of molecular biology with Hal’s handheld DNA scanner (originally designed to help curb the illegal trade of endangered wildlife) to create a handheld diagnostic scanner for COVID-19. These two Fellows also worked with us in June 2021 to author a joint op-ed in the *Seattle Times*, expanding on their interdisciplinary collaboration as an example of how scientists with different expertise can achieve greater impact.

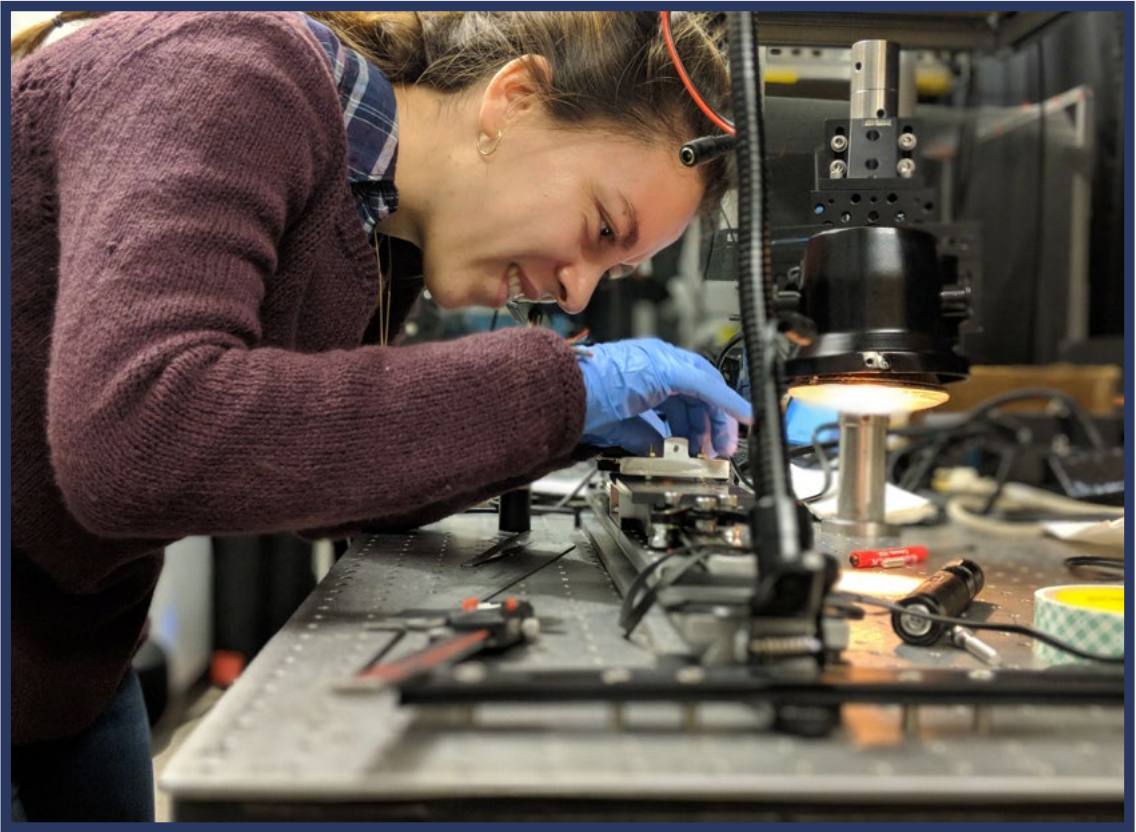
In June 2021 we launched a regular e-newsletter, and this now reaches over 3000 subscribers.

“We are two scientists with unique backgrounds, motivations and skills, but in the middle of our generation’s greatest emergency, we stepped across disciplines to merge our different areas of expertise to help tackle the immediate issue in front of us – COVID-19.”
Hal Holmes and Fahim Farzadfard, 2018 Fellows, *The Seattle Times*, Summer 2021

We work regularly with our partners the Rhodes Trust and Schmidt Futures to amplify messages and to shine a light on the work of our Fellows within their broad communities and then bring their work to life with our Fellowship. Major events such as COP26 and International Day of Women and Girls in Science provided opportunities to work with our partners to engage audiences around climate change and diversity.

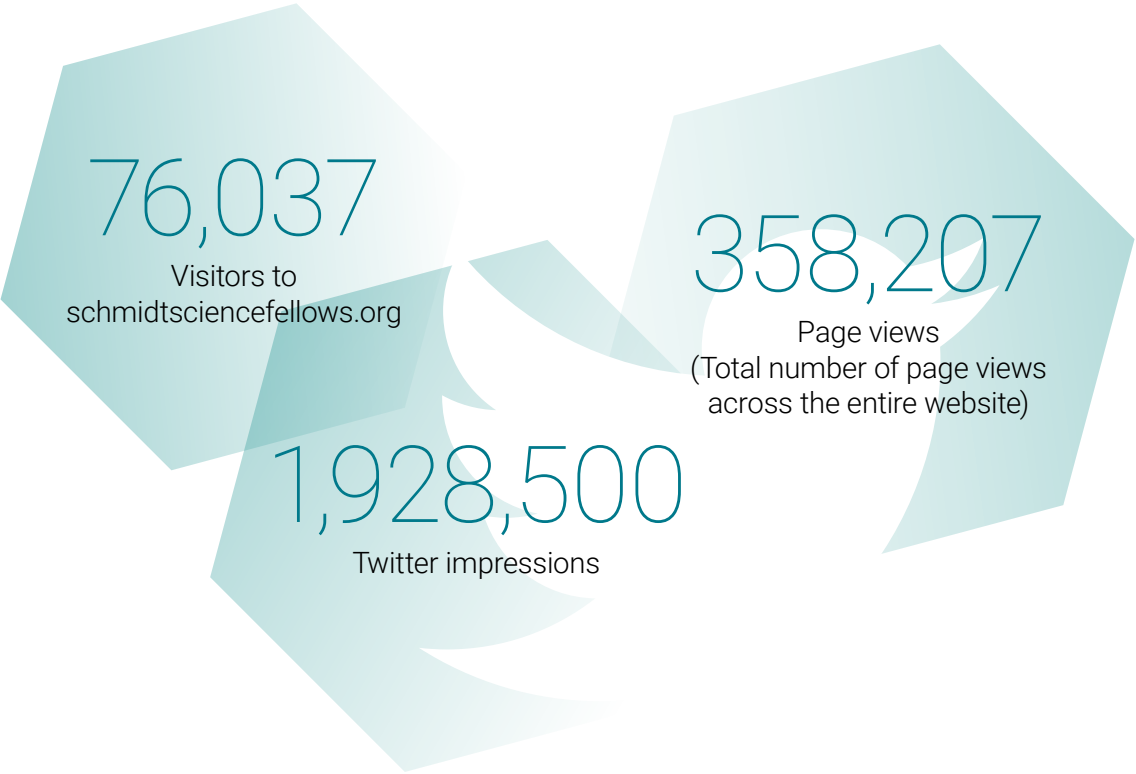
As we celebrate five years of Schmidt Science Fellows through 2022-23, we will be seeking to leverage our anniversary so that we can promote the strength and reputation of the Fellowship and share our ambitions even more widely. Our Fellows are now forging careers in science leadership, and this is our chance to showcase their journeys and open a window into their worlds in a way that will widen recruitment to the Fellowship of the future and draw new partners into our initiatives. At the same time, we aim to strengthen engagement with our supporter communities, and particularly with our Reviewers and Selectors. We hope to offer more in-person meeting opportunities, creating the space for interaction and discussion among our stakeholders.

Andrea d'Aquino, 2020 Fellow dispensing liquid nitrogen into a dewar in preparation for a chemical reaction at Stanford University.



Sirma Orguc, 2021 Fellow, conducting experiments to design a fiber-based artificial muscle.

During August 2020 – December 2021, our key communications metrics were:



Excellent Infrastructure

Underpinning our Fellowship Program and all the activities that emanate from it is a strong base of clear strategies and policies for impact, together with efficient digital infrastructure and a world-class Program Team. This year has seen the further development of our infrastructure pillars, supported by new additions to our team. Alongside this, we continue to build on the valuable lessons learned from adaptations during COVID-19, offering flexible modes of delivery and support for our Fellows.

Impact Strategy and Metrics

Our first impact and progress survey in 2020 yielded valuable information about the many achievements of our Fellows. This exercise was always intended to be repeated on an annual basis and the success of the first year enabled us to deploy this to a larger section of the growing community in 2021.

Many of the impacts from Fellows have been highlighted throughout this report.

Looking across three cohorts for this latest survey has produced a dataset that is informing our theory of change and showing us how we can continue to drive the impact of our Program model. Our Program Joint Committee reviewed and approved a long-term Impact and Metrics Strategy and our theory of change during meetings in 2021, ensuring we have a robust foundation for future actions. We anticipate building on this work with deeper engagement with community members, partners, and stakeholders to generate more rich impact data during our fifth year.

Digital Infrastructure

We worked with volunteer Fellows to scope and test the early phases of our Fellows' Hub, which completed its final phase of testing in late 2021 and will launch in the first quarter of 2022. The Hub will provide a single digital home for both our current cohort and our Senior Fellows. It will also include useful policy documents and templates, as well as an events calendar. Its aim is to offer a tool whereby Fellows can communicate and collaborate on a lifelong basis, sharing and disseminating science within the community. The Hub will enable Fellows to connect with one another in a simple and effective way, encouraging the formation of networks and groups and thereby helping to advance and amplify the aims of the Program.



Behind the scenes, we have also invested in significant enhancements to our new Customer Relationship Management (CRM) platform and working systems. The platform is already up and running, and as the Fellowship grows it will allow us to keep track of our interactions with Fellows so that we can continue to identify and respond quickly to their needs, helping them to make progress and build the connections they need for success.

Program Team

As our Fellowship community grows, we are also gradually adding to our Program Team to ensure a high level of support for the Fellowship community. In 2021, we were delighted to welcome Dr. Abby Guillermo, who joined us in March as Admissions Officer, and Christina Baur, who arrived in November 2021 to take up the post of Events Manager. This last year has also seen Christine Norton, Executive Assistant to the Executive Director, expand her remit to co-ordinate our activities as Manager of Office Operations. In 2022, as the scale and complexity of our community increases further, we will look to invest in additional support, particularly in admissions and to build capacity in Fellowship Affairs.

Flexible and remote working has continued through 2020-21 as we have adapted in response to COVID-19 restrictions. We have maintained a focus on supporting our Fellows and ensuring the wellbeing of our team. As the pandemic has evolved, we were able to bring our team together in the UK and US and anticipate a gradual return to some office-based working.

We remain fully engaged with our partners at the Rhodes Trust as they continue the project to reimagine and reconstruct Rhodes House as a leadership hub and conference facility for the 21st century. We look forward to 2023 when our Program Team will be able to work from the new office space and we are involved with a range of relevant working groups to scope and specify the physical and soft infrastructure for the building.

2021 Fellows

We announced the 28 Fellows in our 2021 cohort following a virtual Final Selection process in June 2021. The cohort represents 13 nationalities and 19 Nominating Partner Organizations.

The 2021 Fellows have joined the Schmidt Science Fellows community through virtual programming and we look forward to welcoming the cohort to come together in person as soon as it is safe to do so.

The majority of 2021 Fellows were able to identify and commence their Fellowship Placements between July and October 2021. In a small number of cases, the impact of COVID-19 has delayed PhD completions or where Fellows have refocused their current research to help combat the pandemic, has meant individuals will begin their Placements in 2022.



Dr. Austin Evans >

PhD Institution:

Northwestern University

Fellowship Placement:

The Nuckolls Group, Columbia University

Austin pioneered new methods to prepare macromolecular sheets, which have atomically precise structures, molecular-scale thicknesses, and immense porosities. As a Schmidt Science Fellow, he is developing molecularly precise electronics that host spin-spin interactions.



Dr. Vivian Feig >

PhD Institution:

Stanford University

Fellowship Placement:

Langer Lab, MIT

Vivian spent her PhD developing conductive polymer hydrogels that can effectively interface with the body's cells and offer the opportunity to realize the potential of electronics in medicine. As a Schmidt Science Fellow she will pivot her science to applying metals to biomedical challenges.



Dr. Gergana Daskalova >

PhD Institution:

University of Edinburgh

Fellowship Placement:

Visconti Group, International Institute for Applied Systems Analysis

During her PhD, Gergana studied the individual and cumulative impact of human activities on global biodiversity, exploiting the recent revolution in the availability of ecological data. As a Schmidt Science Fellow, she plans to integrate remote sensing, data science, and human demography to explore the impact of abandoned land on biodiversity and conservation efforts.



Dr. Álvaro Fernández Galiana >

PhD Institution:

MIT

Fellowship Placement:

Stevens Group, Imperial College London

Álvaro is a mechanical and aerospace engineer whose research interests lie at the interface between physics and engineering. As a Schmidt Science Fellow, Álvaro aims to develop low-cost biosensors for general pathogen detection.





Dr. Shashank Gandhi >

PhD Institution:

California Institute of Technology

Fellowship Placement:

Clevers Lab, Hubrecht Institute, Royal Netherlands Academy of Arts and Sciences

During his PhD, Shashank studied a versatile embryonic stem cell population called the neural crest. As a Schmidt Science Fellow he aims to develop cutting-edge human tissue culture techniques to identify novel cancer-causing mutations, enable efficient prioritization of drug targets, and personalize the testing of treatment options.



Dr. Trevor GrandPre >

PhD Institution:

University of California, Berkeley

Fellowship Placement:

Bialek Lab, Princeton University

Trevor's PhD focused on using modern statistical physics techniques to quantify fluctuations in systems that are far from equilibrium to understand processes such as diffusion and energy dissipation. As a Schmidt Science Fellow he will pivot into biophysics to study the growth dynamics of E. Coli.



Dr. Max Hülsey >

PhD Institution:

National University of Singapore

Fellowship Placement:

Surendranath Lab, MIT

During his PhD Max worked with molecularly defined model catalysts to understand correlations between the structure and performance of catalysts. As a Schmidt Science Fellow, Max plans to combine his previous expertise with electrocatalysis.



Dr. Fatima Hussain >

PhD Institution:

MIT

Fellowship Placement:

Kwon Lab, Ragon Institute, Harvard, Harvard Medical School

Fatima's PhD research focused on understanding the genetic dynamics involved in how viruses drive bacterial evolution in the wild. As a Schmidt Science Fellow she plans to use insights from her research to design synthetic communities and test them in the lab for their potential to improve women's health outcomes.



Dr. Geraldine Jowett >

PhD Institution:

King's College London

Fellowship Placement:

Surani Lab, University of Cambridge

Geraldine's PhD focused on a new population of white blood cells called innate lymphoid cells and revealed an unexpected role for these cells in intestinal cancer and fibrotic scar tissue formation. As a Fellow, she aims to find a way to study more effectively the physical forces that determine egg and sperm development and can inspire bioengineered gonad designs.



Dr. Sema Karakurt-Fischer >

PhD Institution:

Technical University of Munich

Fellowship Placement:

Microbial Community Assembly Group, Swiss Federal Institute of Aquatic Science and Technology (Eawag)

As a process engineer, Sema investigated the contributions of treated wastewater in rivers and its impact on downstream drinking water quality. As a Schmidt Science Fellow Sema aims to engineer a microbial assembly and explore the potential for biodegradation of poly- and perfluorinated chemicals by directed evolution or genome editing tools.



Dr. Anastasia Korolj >

PhD Institution:

University of Toronto

Fellowship Placement:

Weissleder Lab, Massachusetts General Hospital, Harvard Medical School

Anastasia's PhD research demonstrated how kidney cells grown on fractally-patterned curved and biomimetic shapes in vitro developed better structure and function than cells on standard flat petri dishes. As a Schmidt Science Fellow she aims to grow higher-fidelity patient-derived tissues and mathematically model their growth and exosome signaling using chaos math to discover insights on disease progression.



Dr. Suhas Mahesh >

PhD Institution:

University of Oxford

Fellowship Placement:

Sargent Group, University of Toronto

Suhas is a physicist who is pioneering next-generation photovoltaic technology to combat climate change. As a Schmidt Science Fellow, Suhas has pivoted his science to focus on accelerated materials discovery for clean-energy technologies using machine learning and accelerated experiments.



Dr. Ji Mun Yoo >

PhD Institution:

Seoul National University

Fellowship Placement:

Lukatskaya Group, ETH Zürich

Ji Mun is a chemical engineer. During his PhD he explored the functional correlation between chemical structures of metal electrode surfaces and their electrocatalytic performances, especially for fuel cell and water electrolyzer. As a Schmidt Science Fellow, Ji Mun aims to pivot from energy science into the environmental science sector with electrochemistry as a core principle.



Dr. Sebastian Musslick >

PhD Institution:

Princeton University

Fellowship Placement:

Brainstorm Program, Carney Institute for Brain Science, Brown University

Sebastian completed his Ph.D. in Neuroscience where he studied constraints in human and artificial cognition. As a Schmidt Science Fellow Sebastian seeks to develop an open-source programming language for autonomous empirical research by incorporating machine learning techniques into a closed-loop system for the generation, estimation, and empirical validation of scientific models.



Dr. Ofer Neufeld >

PhD Institution:

Technion – Israel Institute of Technology

Fellowship Placement:

Rubio Group, Max Planck Institute for the Structure and Dynamics of Matter

During his PhD Ofer studied atomic, molecular and optical physics with an emphasis on nonlinear optics. As a Schmidt Science Fellow, Ofer aims to theoretically explore strong light-matter interactions in condensed matter systems, including two-dimensional, strongly-correlated, and topological materials.



Dr. Mengyao Niu >

PhD Institution:

University of Wisconsin-Madison

Fellowship Placement:

The Collins Research Group, Wyss Institute

Mengyao's PhD research has focused on the biological significance of a group of fatty acids called oxylipins and their metabolic pathways in fungi. As a Schmidt Science Fellow, Mengyao aims to build computational and engineering approaches to understand signals of chronic lung diseases to create new methods, knowledge, and interventions to address this increasing problem for global society. Currently on leave.



Dr. Sirma Orguc >

PhD Institution:

MIT

Fellowship Placement:

Neuroscience Statistics Research Lab, MIT

During her PhD Sirma worked on developing wearable and implantable devices for medical and neuroscience applications, with a focus on overcoming challenges around efficiency and size. As a Schmidt Science Fellow she aims to build a simplified model of complex brain activity with control systems to allow the study of various neuroscience problems such as depth of unconsciousness under anesthesia, sleep, and pain.



Dr. Rebecca Pinals >

PhD Institution:

University of California, Berkeley

Fellowship Placement:

Tsai Lab, MIT

Rebecca is a chemical engineer that develops nanotechnologies to probe biological systems. As a Schmidt Science Fellow she is pivoting into neuroscience and plans to use her nanoscale tools to understand the molecular mechanisms driving Alzheimer's Disease by developing novel nanosensors that target key Alzheimer's Disease biomarkers.



Dr. Jacob Paiano >

PhD Institution:

University of Pennsylvania

Fellowship Placement:

Perrimon Lab, Harvard Medical School

Jacob's PhD research examined fundamental cell biology questions around how cells purposely initiate, process, and repair DNA breaks during cell division while avoiding catastrophic consequences. As a Schmidt Science Fellow, Jacob will pivot into systems biology to work with fruit flies to explore tissue communication networks and to develop a systems-level understanding of health and disease.



Dr. Manuel Razo-Mejia >

PhD Institution:

California Institute of Technology

Fellowship Placement:

Petrov Lab, Stanford University

During his PhD, Manuel worked on understanding and predicting how bacteria can gather information from the environment to respond accordingly, allowing cells to survive in an ever-changing world. As a Schmidt Science Fellow, Manuel has pivoted into evolutionary biology and plans to tackle the problem of convergent evolution at the molecular scale.



Dr. Elisabetta Perotti >

PhD Institution:

Uppsala University

Fellowship Placement:

Dall'Anese Group, University of Colorado Boulder

During her PhD Elisabetta studied hadron physics and aimed to further our understanding of the fundamentals of the universe. As a Schmidt Science Fellow she plans to model and simulate an autonomous future electric grid, able to cope with the variability of renewable generation and changing consumer demand.



Dr. Kurt Ristroph >

PhD Institution:

Princeton University

Fellowship Placement:

Lowry Lab, Carnegie Mellon University

Kurt is a chemical engineer who specializes in large-scale therapeutic nanocarrier formulation and processing. As a Schmidt Science Fellow Kurt will bring his nanoformulation expertise to the problem of safely and efficiently delivering agrochemicals to plants.



Dr. Sandra Schachat >

PhD Institution:
Stanford University
Fellowship Placement:
Rubinoff Lab, University of Hawaii

Sandra's PhD involved the study of prehistoric oxygen and carbon dioxide levels, fossils, and geology to answer fundamental questions about what drove early species out of the oceans and onto the land. As a Schmidt Science Fellow she plans to pivot into present day behavioral ecology to investigate what drives asexual reproduction in insects.



Dr. Sapna Sinha >

PhD Institution:
University of Oxford
Fellowship Placement:
Synthetic Neurobiology Group, MIT

During her PhD Sapna studied graphene and specifically working to overcome its limitations for use in electronics by integrating it into other systems. As a Schmidt Science Fellow, Sapna plans to combine nanoscience and neuroscience to develop new devices to image complex nerve systems during surgery.



Dr. Jenelle Wallace >

PhD Institution:
Harvard University
Fellowship Placement:
Pollen Lab, University of California, San Francisco

Jenelle is a neuroscientist interested in the evolution of neural circuits. As a Schmidt Science Fellow, Jenelle will gain expertise in evolutionary genetics and stem cell biology to investigate how alterations in gene regulation have driven human brain evolution, addressing questions about what makes the human brain different from the brains of other primates.



Dr. Jamison Watson >

PhD Institution:
University of Illinois at Urbana-Champaign
Fellowship Placement:
Román Research Group, MIT

During his PhD, Jamison studied the thermochemical conversion and upstream processing of waste products. As a Schmidt Science Fellow Jamison aims to create a next-generation refinery that holistically integrates electrochemistry and thermochemistry in tandem to produce sustainable aviation fuel and high-value chemicals from recalcitrant waste streams.



Dr. Bryan Wilder >

PhD Institution:
Harvard University
Fellowship Placement:
Chan Lab, Harvard School of Public Health

Bryan is a computer scientist who develops methods rooted in machine learning and optimization to improve decision making in public health. As a Schmidt Science Fellow he plans to dive more deeply into epidemiology and global health, using large administrative and cohort datasets to understand the roots of health disparities and discover effective points of intervention.



Dr. Kevin Zhao >

PhD Institution:
Harvard University
Fellowship Placement:
Gao Lab, Chinese Academy of Sciences

Kevin spent his PhD engineering protein complexes that enable precision genome editing in living cells. As a Schmidt Science fellow, Kevin will generate a high-throughput screening platform that links genetic variations to phenotypic traits of interest. Specifically, he hopes to link genetic perturbations to functional outputs to identify desirable traits in agriculture such as increased drought resistance, improved increased yields, and disease resistance.

2020 Fellows

We announced the 22 Fellows in our 2020 cohort following a virtual Final Selection process in April 2020. The cohort represents eight nationalities and 17 different Nominating Institutions.

The majority of the 2020 cohort has taken advantage of the increased flexibility and change in duration of the Fellowship Research Placement and are completing Placements of up to two years.



Dr. Mar Cabeza – Cabrerizo >

PhD Institution:
The Francis Crick Institute
Fellowship Placement:
GBernardes lab, University of Cambridge



Dr. Jacqueline Campbell >

PhD Institution:
University College London
Fellowship Placement:
OceanBUG Group, University of Oxford



Dr. James Chen >

PhD Institution:
The Rockefeller University
Fellowship Placement:
Bhabha/Ekiert Labs, NYU Grossman School of Medicine



Dr. Andrea d'Aquino >

PhD Institution:
Northwestern University
Fellowship Placement:
The Appel Group, Stanford University



Dr. Yang Guo >

PhD Institution:
Tsinghua University
Fellowship Placement:
Mauzerall Group, Princeton University



Dr. Kirsten Hall >

PhD Institution:
Johns Hopkins University
Fellowship Placement:
Atmospheric Measurements Group, Harvard & Smithsonian Center for Astrophysics



Dr. Gabriella Heller >

PhD Institution:
University of Cambridge
Fellowship Placement:
Hansen Lab, University College London





Dr. Kalli Kappel >

PhD Institution:
Stanford University
Fellowship Placement:
Regev Lab, The Broad Institute of MIT and Harvard



Dr. Phuong Le >

PhD Institution:
University of Illinois Urbana-Champaign
Fellowship Placement:
Yeo Lab, University of California, San Diego



Dr. Deepak Krishnamurthy >

PhD Institution:
Stanford University
Fellowship Placement:
Fletcher Lab, University of California, Berkeley



Dr. Callan Luetkemeyer >

PhD Institution:
University of Michigan
Fellowship Placement:
Calve Group, University of Colorado Boulder



Dr. Jennifer Lai Remmel >

PhD Institution:
Dartmouth College
Fellowship Placement:
Mina Lab, Harvard University

Next Steps: Scientist at Flagship 80 Inc



Dr. Amy Shepherd >

PhD Institution:
University of Melbourne
Fellowship Placement:
Rao Lab, Boston Children's Hospital, Harvard Medical School



Dr. Sofia Landi >

PhD Institution:
The Rockefeller University
Fellowship Placement:
Buffalo Group, University of Washington



Dr. Fernando Soto >

PhD Institution:
University of California, San Diego
Fellowship Placement:
BAMM Lab, Stanford University



Dr. Shriya Srinivasan >

PhD Institution:
MIT
Fellowship Placement:
Langer Lab, MIT



Dr. Chuck Witt >

PhD Institution:
Princeton University
Fellowship Placement:
Materials Theory Group, University of Cambridge



Dr. Andreas Wallucks >

PhD Institution:
Delft University of Technology
Fellowship Placement:
Juncker Lab, McGill University



Dr. Yuanzhao Zhang >

PhD Institution:
Northwestern University
Fellowship Placement:
Strogatz Group, Cornell University



Dr. OJ Watson >

PhD Institution:
Wellcome/Imperial College London
Fellowship Placement:
Sutherland Group, London School of Hygiene & Tropical Medicine



Dr. Evan Zhao >

PhD Institution:
Princeton University
Fellowship Placement:
The Collins Research Group, Wyss Institute

Next Steps: Postdoc at Harvard University
and CEO at Revela, Inc.



Dr. Ben Winer >

PhD Institution:
Princeton University
Postdoctoral institution and lab:
The Morgan Huse Lab, Sloan Kettering Institute

2019 Fellows

The 2019 cohort joined the Fellowship community following their Selection in April 2019. During their Fellowship Year, the cohort pursued research at 14 different Placement host institutions, including 11 institutions new to the Fellowship community.

Members of the 2019 cohort felt the greatest impact on their Fellowship science from the pandemic –14 received support from the Emergency Placement Extension Grant scheme to mitigate the effect on their projects.



Dr. Ina Anreiter >

PhD Institution:
University of Toronto
Fellowship Placement:
Simpson Lab, Ontario Institute for Cancer Research

Next Steps: Stanford Science Fellow at Stanford University
Current Position: Assistant Professor at the University of Toronto



Dr. Mercy Nyamewaa Asiedu >

PhD Institution:
Duke University
Fellowship Placement:
Learning to Cure group, Computer Science and Artificial Intelligence (CSAIL), MIT



Dr. James Briggs >

PhD Institution:
Harvard University
Fellowship Placement:
Zhang Lab, The Broad Institute of MIT and Harvard

Next Steps: Postdoc at The Broad Institute



Dr. Kasturi Chakraborty >

PhD Institution:
University of Chicago
Fellowship Placement:
Becker Group, University of Chicago

Next Steps: Postdoc at University of Chicago



Dr. Megan Engel >

PhD Institution:
University of Oxford
Fellowship Placement:
Brenner Group, Harvard University



Dr. Kaitlyn Gaynor >

PhD Institution:
University of California, Berkeley
Fellowship Placement:
National Center for Ecological Analysis and Synthesis, University of California, Santa Barbara

Next Steps: Postdoc at the University of California Santa Barbara
Current Position: Assistant Professor at the University of British Columbia from July 2022





Dr. Mina Konakovic Lukovic >

PhD Institution:
École Polytechnique Fédérale de Lausanne / Swiss
Federal Institute of Technology Lausanne

Fellowship Placement:
Matusik Group, MIT

Next Steps: Assistant Professor at MIT from July 2022



Dr. Paul Ohno >

PhD Institution:
Northwestern University

Fellowship Placement:
Martin Lab, Harvard University

Next Steps: Environmental Fellow, Harvard
University Center for the Environment



Dr. Jyotirmoy Mandal >

PhD Institution:
Columbia University

Fellowship Placement:
Raman Lab, University of California, Los Angeles

Next Steps: Schmidt Science Fellows Additional Study
Grant at the University of California, Los Angeles



Dr. Ahmad Omar >

PhD Institution:
California Institute of Technology

Fellowship Placement:
Geissler Group, University of California, Berkeley

Next Steps: Assistant Professor, University of California, Berkeley



Dr. Aleksandr Montelli >

PhD Institution:
University of Cambridge

Fellowship Placement:
Kingslake Group, Columbia University

Next Steps: Research Fellow, Peterhouse,
University of Cambridge



Dr. Asja Radja >

PhD Institution:
University of Pennsylvania

Fellowship Placement:
Mahadevan Group, Harvard University

Next Steps: NSF-Simons Postdoctoral Fellowship at
Harvard University's Initiative in Quantitative Biology



Dr. Gladys Ngetich >

PhD Institution:
University of Oxford

Fellowship Placement:
Space Enabled group, MIT

Next Steps: Postdoc in Space Enabled group, MIT



Dr. Daniel Raudabaugh >

PhD Institution:
University of Illinois, Urbana-Champaign

Fellowship Placement:
Gunsch Lab, Duke University

Next Steps: Postdoc at Wildlife Veterinary
Epidemiology laboratory, Illinois Natural History
Survey, University of Illinois Urbana-Champaign



Dr. Kadi Liis Saar >

PhD Institution:
University of Cambridge

Fellowship Placement:
Lee Group, University of Cambridge, in collaboration with the Knowles Lab, University of Cambridge



Dr. Saki Takahashi >

PhD Institution:
Princeton University

Fellowship Placement:
Greenhouse Lab, Experimental & Population-based Pathogen Investigation Center, University of California, San Francisco

Next Steps: Postdoc at the University of California, San Francisco



Dr. Andreas Schlueter >

PhD Institution:
Karlsruhe Institute of Technology

Fellowship Placement:
Ermon Lab, Stanford University



Dr. Wiriya Thongsomboon >

PhD Institution:
Stanford University

Fellowship Placement:
Aristilde Lab, Northwestern University

Next Steps: Faculty in the department of Chemistry at Mahasarakham University, Thailand



Dr. Rebecca Sherbo >

PhD Institution:
University of British Columbia

Fellowship Placement:
Nocera and Silver Labs, Harvard University

Next Steps: Burroughs Wellcome Career Awards at the Scientific Interface (CASI)



Dr. Grisha Spektor >

PhD Institution:
Technion — Israel Institute of Technology

Fellowship Placement:
Papp Group, National Institute of Standards and Technology

Next Steps: Postdoc at Papp Group, National Institute of Standards and Technology

2018 Fellows

We selected and announced our 2018 Fellows, the Program's inaugural cohort in April 2018. All 14 Fellows graduated from their Fellowship Year on the completion of their Placement and Global Meeting programming, becoming the first members of our Senior Fellows community.

Individuals from the cohort have progressed onto the next stages of their interdisciplinary careers, including roles in academia, start-ups, not-for-profits, government labs, and further postdoctoral research.



Dr. Karl Barber >

PhD Institution:
Yale University

Fellowship Placement:
Elledge Lab, Brigham & Women's Hospital, Harvard Medical School

Next Steps: Schmidt Science Fellows Additional Study Grant
A Jane Coffin Childs Fellowship at Brigham & Women's Hospital, Harvard Medical School



Dr. Fahim Farzadfard >

PhD Institution:
MIT

Fellowship Placement:
Boyden Lab, MIT, and Church Lab, Harvard Medical School

Next Steps: Postdoc at MIT
Current Position: CTO and co-founder, March Therapeutics



Dr. Wes Fuhrman >

PhD Institution:
Johns Hopkins University

Fellowship Placement:
Paglione Group, University of Maryland College Park

Next Steps: Senior Scientist at The Johns Hopkins Applied Physics Laboratory, Space Exploration Sector



Dr. Xiwen Gong >

PhD Institution:
University of Toronto

Fellowship Placement:
Bao Group, Stanford University

Next Steps: Schmidt Science Fellows Additional Study Grant at Stanford University
Faculty position in January 2021 at University of Michigan



Dr. Yogesh Goyal >

PhD Institution:
Princeton University

Fellowship Placement:
Raj Lab, University of Pennsylvania

Next Steps: Assistant Professor, Northwestern University jointly with the Department of Cell and Developmental Biology and the Center for Synthetic Biology



Dr. Peyton Greenside >

PhD Institution:
Stanford University

Fellowship Placement:
Brunskill Group, Stanford University

Next Steps: CSO and Co-Founder of BigHat Biosciences





Dr. Abbie Groff >

PhD Institution:
Harvard University
Fellowship Placement:
Page Lab, Whitehead Institute for Biomedical Research

Next Steps: Jane Coffin Childs Fellowship, Whitehead Institute for Biomedical Research
Current Position: Senior Bioinformatician at Conception



Dr. Hal Holmes >

PhD Institution:
University of Washington
Fellowship Placement:
Vlaisavljevich Lab, Virginia Tech

Next Steps: Chief Engineer, Conservation X Labs Seattle, supported by the Gordon & Betty Moore Foundation



Dr. Jina Ko >

PhD Institution:
University of Pennsylvania
Fellowship Placement:
Weissleder Lab, Massachusetts General Hospital, Harvard Medical School, and Wyss Institute

Next Steps: Assistant Professor in Pathology and Laboratory Medicine and Bioengineering at University of Pennsylvania



Dr. Fred Richards >

PhD Institution:
University of Cambridge
Fellowship Placement:
Mitrovica Group, Harvard University

Next Steps: Imperial College Research Fellow at Imperial College London



Dr. Mattia Serra >

PhD Institution:
ETH Zurich
Fellowship Placement:
The Applied Math Lab, Harvard University

Next Steps: Swiss National Foundation Postdoc Mobility Fellowship, Harvard
Current Position: Assistant Professor of Physics at University of California, San Diego



Dr. Adi Steif >

PhD Institution:
University of British Columbia
Fellowship Placement:
Marioni Group, Cancer Research UK Cambridge Institute, University of Cambridge

Next Steps: Junior Research Fellowship at Trinity College, University of Cambridge
Current Position: Assistant Professor at The University of British Columbia



Dr. Ryan Truby >

PhD Institution:
Harvard University
Fellowship Placement:
Distributed Robotics Laboratory, MIT

Next Steps: Assistant Professor of Materials Science & Engineering and Mechanical Engineering, Northwestern University



Dr. Jielai Zhang >

PhD Institution:
University of Toronto
Fellowship Placement:
Nobel Group, University of Oxford

Next Steps: OzGrav Postdoctoral Research Fellow, Swinburne University of Technology



“A Schmidt Science Fellow is somebody willing to take scientific risks. They are curious, passionate, and innovative and bring information and techniques from their previous discipline into a new one to solve complex problems. The Program hugely supports this interdisciplinary journey.”

Dr. Jacqueline Campbell,
2020 Schmidt Science Fellow

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Dr. Simon Vaughan
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Dr. Renée Hložek
Academic Council Member

Ruth Arnold
Executive Assistant to the Chair of the Academic Council

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To learn more about the background, motivations, and work of some of our Fellows, please visit:
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