

p.5  
**Yunde Zhao to  
Become the Next  
Editor-in-Chief  
of *Plant Physiology***



p.6  
**Plant Synthetic  
Biology 2021**  
September 25–27



p. 9  
**Plant Scientists  
Elected to the 2021  
Class of the U.S.  
National Academy  
of Sciences**

# ASPB News



THE NEWSLETTER OF THE AMERICAN SOCIETY OF PLANT BIOLOGISTS

## President's Letter

### A Difficult Decision

BY MAUREEN McCANN  
ASPB President, National Renewable Energy Laboratory

A major focus of ASPB is science policy and how it impacts research funding, the pipeline of talent into our labs, and regulatory practices. In the United States, our Science Policy Committee engages on our behalf with federal funding agencies and legislators from both parties to raise awareness of, and advocate for, the critical importance of plant biology. ASPB does



not and cannot engage in partisan politics. Nevertheless, ASPB encountered a significant challenge earlier this year when the Georgia state legislature passed the Election Integrity Act of 2021, originally Senate Bill 202. This bill, which Georgia governor Brian Kemp signed into law March 25 beneath a painting of a plantation and flanked by only white men, changes the mechanism by which

ballots are certified and applies limits on access to voting that have been widely interpreted to target marginalized communities, most recently by the U.S. Department of Justice.

The passing of this law was a challenge for ASPB. After staff members and the Program Committee visited the city in early March 2020, the ASPB Board of Directors (BoD) voted to approve the

Program Committee's recommendation that we convene Plant Biology 2023 in Savannah, Georgia. However, the provisions of Georgia's new voting law are completely counter to ASPB's stated objectives around equity, diversity, and inclusion (<https://bit.ly/ASPB-Position-Statement-Diversity>). The difficult decision to be made was whether ASPB

*continued on page 3*

## 2021 ASPB Election Results

Many thanks to those members who took the time to vote earlier this summer, and hearty congratulations to our newly elected Board members! Their new service roles for ASPB will begin on October 1, 2021, and you can look for more information about them in the next issue of the *ASPB News*.



**Incoming President-elect**  
Gustavo MacIntosh  
*Iowa State University, Ames*

**Incoming Elected Member**  
Elena Monti  
*Centre for Research in Agricultural Genomics, Barcelona, Spain*

Congratulations, too, to our newly elected Enid MacRobbie Corresponding Members: Naomi Ori and Shu-Hsing Wu!

# Contents

## ASPB Council

Council members highlighted in blue also serve on the Board of Directors.

- 1 President's Letter
- 1 2021 ASPB Election Results
- 4 Centennial Challenge Corner
- 5 Yunde Zhao to Become the Next Editor-in-Chief of *Plant Physiology*<sup>®</sup>
- 6 Plant Synthetic Biology 2021
- 7 New White Paper on Innovative, Integrative, and Inclusive Outreach in Plant Science
- 8 Plant Virtual Minisymposium Brings Scientists Together in the Mid-Atlantic Region

## People

- 9 Plant Scientists Elected to the 2021 Class of the U.S. National Academy of Sciences
- 14 Amy Marshall-Colon Receives Friedrich Wilhelm Bessel Research Award
- 15 Niba Audrey Nirmal, 2021 ASPB/AAAS Mass Media Science & Engineering Fellow, to Spend the Summer at Complexly
- 16 Haley Dunleavy Awarded 2021 AAAS Ralph W. F. Hardy Mass Media Science & Engineering Fellowship

## Membership Corner

- 17 Patrick Thomas

## Science Policy

- 18 Policy Update

## Education Forum

- 21 Plant BLOOME 2021 Winners
- 22 Announcing the 2021 ASPB Summer Undergraduate Research Fellows

<b>President</b>	Maureen McCann
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<b>Early Career Plant Scientists Section</b>	Rishi Masalia
<b>Environmental and Ecological Plant Physiology Section</b>	Emily Heaton
<b>Primarily Undergraduate Institutions Section</b>	Leeann Thornton
<b>Ambassador Alliance</b>	Katy McIntyre

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The *ASPB News* is distributed to all ASPB members and is also available online. It is published six times annually in odd-numbered months. Its purposes are to keep membership informed of ASPB activities and to reinforce the value of membership. The *ASPB News* is edited and produced by ASPB staff from material provided by members and other interested parties.

Copy deadline is the 5th day of the preceding even-numbered month (for example, April 5 for May/June publication).

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## PRESIDENT'S LETTER *continued from page 1*

should recommit to holding Plant Biology 2023 in Savannah.

Planning for the annual meeting and its satellite meetings begins years in advance. Even as we move on from the Plant Biology 2021 Worldwide Summit, venues for 2022 and for 2024, ASPB's centennial celebration, are already secured. For 2023, the contracts with the Savannah convention center and hotels were largely ready, but they remained unsigned as we all—staff, governance, and convention centers everywhere—were reimagining how conferences would be convened in a postpandemic world. It would have been difficult, but possible, to find an alternative 2023 conference location. The city of Savannah had put tremendous effort into attracting our business, and we had an obligation to make a decision quickly. ASPB's BoD is constitutionally charged with authority to act on behalf of the membership and, after a series of discussions, passed the following motion:

**The 2020–2021 ASPB BoD reaffirms ASPB's commitment to hold Plant Biology 2023 in Savannah, Georgia.**

It is fair to say that all BoD members had a visceral reaction of disgust in regard to Senate Bill 202. And it is also fair to say that the motion was not approved unanimously, that various factors weighed more or less heavily for individuals, and that every vote was made with personal integrity and deep thoughtfulness. This motion needs to be understood in the context of a set of prospective actions that ASPB will take.

First, the decision to convene Plant Biology 2023 in Savannah

was a difficult one. While companies were threatening boycotts, voting rights activists were calling for pressure to be put on legislators that would not adversely impact the economic security of Georgian communities. In one conversation with the Democratic and African American mayor of Savannah, he conveyed what withdrawing our conference would mean for local businesses and communities and reiterated his personal commitment to upholding voting rights in his city (<https://bit.ly/3eKOBbX>).

Georgia is only one among dozens of states that have already passed or are considering laws that restrict voting rights. Indeed, according to the Brennan Center for Justice (<https://bit.ly/2V1e96h>), by July of this year, legislators had introduced more than 400 bills with restrictive provisions in 49 states. Many of the states with new or proposed restrictions on voting are in the South, and we would effectively be penalizing our members in that region if we never held our annual meeting there. We considered how we could best advance ASPB's missions at a conference venue by promoting educational opportunities, recruit-

ing members from underrepresented groups into plant biology, and enabling access to scientific fora by all of our members. We discussed whether ASPB's withdrawal would influence the thinking of state legislatures or whether working under an umbrella of scientific societies would be more productive. On balance, this decision came down to a recognition that choosing not to convene in Savannah—or, for that matter, any city in a state that has passed or is considering restrictive voting laws—is unlikely to bring about positive change and would have a negative impact on this and other minority-majority cities.

Second, we evaluated what pathways exist to effect positive change consistent with our values of diversity and inclusion in our own research community. With respect to conferences, and before it passed the motion above, the BoD passed the following resolution:

**Future ASPB meetings should provide opportunities for corporate social responsibilities promoting equity, diversity, and inclusion, such as food banks, education initiatives, voter registration, and others.**

In other words, ASPB should identify ways to expand its conference footprint that allow members to participate in direct engagement with the communities in which we are meeting. For example, members might give a talk at a local school or visit with colleagues at minority-serving institutions in the vicinity of conference venues. The BoD plans to assemble a task force to identify specific activities that we might undertake at future conference venues, beginning with Portland, Oregon, in 2022 and continuing with Savannah the following year. In addition, we will develop, and share with conference attendees, lists of minority-owned restaurants and other relevant businesses in the cities where we meet. Meanwhile, a second task force will develop a robust rubric that will establish criteria for venue selection.

Please know that the decisions and actions taken by the BoD were difficult and complex. But this is where we stand. As we move forward, we want to hear your comments and suggestions to inform our future journey (<https://blog.aspb.org/please-share-your-thoughts-with-us/>). ■

## Want to stop receiving the print newsletter?

- Update your information preferences by going to <https://bit.ly/ASPBMembers>.
- Log in using your ASPB member username (your email address) and password.
- From the **My Info** page, scroll down to the **Communication Information** section and click on the "Change" button on the upper right-hand side of the section.
- Scroll down to "ASPB News - Print Edition," click on "Send Print ASPB News," and select "Don't Send Print ASPB News."
- Review your other information and make any updates.
- When finished, click on "Save" at the bottom of the section.

# Centennial Challenge Corner



## Pioneer Members of ASPB

As one component of ASPB's Centennial Challenge (<https://aspb.org/newsletter/archive/2021/MayJun2021.pdf#page=3>), plant scientists are honoring their colleagues as Pioneer Members of ASPB. ASPB Pioneers have served ASPB through education and research training for many members of our community and leadership of the Society and its journals. Their recognition as Pioneers comes from former graduate students and postdocs, colleagues, family members, and friends who collectively contributed

\$5,000 or more to honor them.

By late July 2021, the ASPB community had honored 60 Pioneers, living and deceased. We hope to honor at least 100 by the Society's centennial in 2024. The Pioneer Members web page (<https://aspb.org/membership/aspb-pioneer-members>) provides links to biographical information about the Pioneers and their contributions to plant biology, as well as the names of the folks who contributed in their honor.

To be included as a supporter of an existing Pioneer, please complete

the donor commitment form (<https://aspb.org/membership/pioneer-legacy-donation/>), and we will contact you with next steps. You can submit a testimonial on the form to go with your donation.

If you would like to initiate fundraising in support of a Pioneer not currently listed, please email Brian Larkins ([larkins@email.arizona.edu](mailto:larkins@email.arizona.edu)) or Crispin Taylor ([ctaylor@aspb.org](mailto:ctaylor@aspb.org)).

The following Pioneers were listed on the ASPB website as of July 2021:

Peter Albersheim*	Machi Dilworth	Yuji Kamiya	Peter Quail
Robert Bandurski*	Gadi Galili	Hans Kende*	Ralph Quatrano
J. Derek Bewly	Elisabeth Gantt	Joe Key	Natasha Raikhel
Lawrence Bogorad*	Martin Gibbs*	J. Clark Lagarias	Douglas Randall
Hans Bohnert	Robert Goldberg	Chris Lamb*	Anne Holiday (Holly) Schauer*
Wendy Boss	Solon Gordon*	Anton Lang*	Kazuo Shinozaki
Raymond Bressan	Richard Hageman*	Brian Larkins	Jane Silverthorne
Mary-Dell Chilton	L. Curtis (Curt) Hannah	Chu-Yung Lin*	Chris Somerville
Joanne Chory	John Hanson*	Sharon Long	Paul Stumpf*
Maarten Chrispeels	Maureen Hanson	Joachim Messing*	Masahiro Sugiura
Nam-Hai Chua	Ralph Hardy*	Elliot Meyerowitz	Ian Sussex*
Mary Clutter*	Eliot Herman	Thomas Moore	Elaine Tobin
Eric Conn*	Thomas Hodges	DeLill Nasser*	Richard Trelease
Gloria Coruzzi	Stephen Howell	Niels Nielsen*	Larry Vanderhoef*
Dean DellaPenna	André Jagendorf*	Ann Oaks*	Joseph Varner*
Debra Delmer	Ernest Jaworski	Bernard Phinney*	Jan Zeevaart*

\*Deceased

# Yunde Zhao to Become the Next Editor-in-Chief of *Plant Physiology*<sup>®</sup>

ASPB is pleased to announce the appointment of Yunde Zhao as editor-in-chief of *Plant Physiology*<sup>®</sup> beginning January 1, 2022. Established in 1926, *Plant Physiology* is a premier international journal devoted to all aspects of plant biology research, from structural and molecular discoveries to systems science and ecophysiology. *Plant Physiology* is one of the oldest and most well-respected journals in the field, and it is the most highly cited journal in the plant sciences. Its 2020 Journal Impact Factor is 8.326.

Yunde is a professor of biological sciences in the Section of Cell and Developmental Biology at the University of California San Diego; he is also director of plant biology at the Food & Fuel for the 21st Century initiative at UC San Diego. Yunde's research focuses on the plant hormone auxin, in particular its biosynthesis and its roles in axillary meristem development and organogenesis. Taking molecular genetic approaches to understand auxin biosynthesis and its regulation,



Yunde's lab is also developing tools to spatially and temporally control auxin production. Yunde's other major research endeavor is to develop gene editing technology for plants, with an emphasis on technologies that enable efficient isolation of target gene-edited and transgene-free plants.

Among his many awards and honors, in both 2019 and 2020 Yunde was a Clarivate Highly Cited Researcher, a distinction that recognizes the top 1% of the most cited researchers in a subject area. Yunde was a Life Sciences Research Foundation/

Howard Hughes Medical Institute postdoctoral fellow, and he is a recipient of the Japan Society for the Promotion of Science visiting professorship.

Yunde, who has served on the *Plant Physiology* editorial board since 2015, said, "I am honored and grateful to have the opportunity to lead *Plant Physiology*, a premier journal with a rich history and an exceptional reputation for publishing high-quality and high-impact research. The strength of the editorial board and staff and the scope and depth of topics covered distinguish *Plant Physiology* as one of the best journals I have had the privilege of working with. The journal provides an important international platform for scientists to disseminate their discoveries. As editor-in-chief, I look forward to building on *Plant Physiology*'s history of excellence and service to the plant biology community. During my tenure, I also look forward to celebrating the 100th anniversary of both *Plant Physiology* and ASPB."

Maureen McCann, ASPB president, was enthusiastic about

Yunde's appointment, commenting, "I'm delighted that Yunde has accepted the editor-in-chief position! Every editor-in-chief puts their own characteristic stamp on the journal, and I'm looking forward to seeing how Yunde drives forward his vision for *Plant Physiology*'s second century."

Crispin Taylor, ASPB's CEO, added, "I am very much looking forward to working with Yunde in his capacity as editor-in-chief of *Plant Physiology*. I was greatly impressed by his vision for the journal, his recognition of its value as a Society-owned publication, and his intent to further expand the geographic and topical reach of *Plant Physiology*."

Yunde will work closely with current editor Mike Blatt over the remainder of 2021 to ensure a smooth transition for the journal, its editorial board, its staff, and, most importantly, its authors and readers. Mike, who is Regius Professor of Botany and Head of Plant Sciences in the Institute of Molecular, Cell, and Systems Biology at the University of Glasgow, has served as editor-in-chief since 2013. ■



# PLANT SYNTHETIC BIOLOGY 2021

SEPTEMBER 25–27

## About the Conference

The second ASPB-sponsored Plant Synthetic Biology (SynBio) Conference will be held virtually September 25–27, 2021.

The conference will showcase recent advances in plant SynBio and highlight cutting-edge synthetic biology research in nonplant chassis as well as plants. Topics of interest include the development of logic circuits in plants, computer-aided and computational tools for metabolic engineering, and photosynthetic-driven biomanufacturing.

Abstract deadline: August 13 • Early-bird deadline: August 25

## Steering Committee



**Scott Lenaghan**  
(Chair)  
University of Tennessee



**Tobias Erb**  
Max Planck Institute for  
Terrestrial Microbiology



**Andrew Hanson**  
University of Florida



**Bogumil Karas**  
University of Western  
Ontario



**Markita Landry**  
University of California,  
Berkeley



**Eszter Majer**  
Massachusetts Institute  
of Technology



**Nicola Patron**  
Earlham Institute



**Sakkie Pretorius**  
Macquarie University

## PROGRAM

### Keynotes

**Matias Zurbriggen**  
University of Dusseldorf

**Ron Weiss**  
Massachusetts Institute of  
Technology

**Alison Smith**  
University of Cambridge

### Invited

**Anna Stepanova**  
North Carolina State University

**Daniel (Danny) Ducat**  
Michigan State University

**Patrick Shih**  
University of California, Davis

**Zoran Nikoloski**  
Max Planck Institute

**Amy Marshall-Colon**  
University of Illinois at  
Urbana-Champaign ■

<https://plantsyntheticbiology.org>

# New White Paper on Innovative, Integrative, and Inclusive Outreach in Plant Science

BY MARY WILLIAMS  
Features Editor, *The Plant Cell*

In November 2018, an NSF-funded workshop was held at the University of California, Davis, with the goal of sharing and disseminating knowledge about plant science outreach programs. In a recent white paper, “Broadening the Impact of Plant Science Through Innovative, Integrative, and Inclusive Outreach,” the workshop contributors, many of whom are ASPB members, summarized the workshop’s topics and outcomes and described their experiences with and insights from successful outreach efforts (Friesner et al., 2021).

This white paper was published to help plant scientists navigate the creation of an outreach program, to challenge universities to place a higher value on outreach, and to encourage scientific societies to provide their members with tools to connect more effectively with the broader public. The authors noted that although plant scientists are in many ways best positioned to share the importance and relevance of plants with the broader public, few are trained in how to do so. A successful outreach program needs to be innovative, integrative, and inclusive; the white paper gives guidelines for creating such a program and provides case studies of successful programs.

I spoke to the paper’s first author, Joanna Friesner, who is executive director of the North American Arabidopsis Steering



*The White Paper authors, gathered at UC Davis for the November 2018 workshop. PHOTO BY ROGER INNES*



*Advancing outreach in plant science through inclusion, innovation, and integration. IMAGE FROM FRIESNER ET AL., 2021*

Committee, about the broader context for the white paper and the need for effective outreach. As she observed, innovative, inte-

grative, and inclusive outreach in plant science can inform the public and aid the recruitment of new and more diverse scientists.

Not to be missed in pursuing those valuable objectives are the immense opportunities for scien-  
*continued on page 15*

# Plant Virtual Minisymposium Brings Scientists Together in the Mid-Atlantic Region

BY HUA LU

University of Maryland, Baltimore County

ASPB's Mid-Atlantic Section held a two-day meeting jointly with the University of Maryland (UMD) Plant Virtual Minisymposium on May 27 and 28 via Zoom. This conference combined science, education, and social networking to promote interactions among students and faculty in the region. The organizing committee put together an inclusive program with four scientific sessions on diverse research topics, two education panels, one poster session, and multiple social events throughout the two days. About 100 participants from the mid-Atlantic area attended.

The meeting program featured exciting research talks by two keynote speakers, Doris Wagner from the University of Pennsylvania and Yiping Qi from the University of Maryland College Park, as well as by invited speakers, students, and postdocs. This joint conference has a tradition of supporting junior faculty and students in the area; in line with this tradition, six of the 12 invited speakers were at the assistant professor level. Two postdocs, six graduate students, and one undergraduate student presented their research orally. A poster session for postdocs and students showcased their research, and awards were given to poster presenters to incentivize their participation.

The two education panels provided valuable information for



Attendees enjoying a break together for a group photo.

students and faculty on careers in teaching and the biotech industry. In the teaching panel, Samantha Elliot (St. Mary's College of Maryland), Edgar Moctezuma (UMD), and Joanna Werner-Fraczek (Morena Valley College) shared their thoughts on what it means to be an inclusive teacher, what teaching and research entail at different institutions, and what experiences are necessary to get a teaching job. There were lively discussions among the panelists and audience on how to cope with challenges in online instruction during the pandemic.

In the panel focusing on the biotech industry, Tong Zhu (Syngenta), Aaron Hummel (Pairwise), and Mike Nuccio (Inari Agriculture) gave meeting participants the chance to discuss topics such as what research is at the forefront in the biotech world,

what it is like to work in the industry, and how to prepare for future jobs.

In addition to enjoying great science and participating in the panel discussions, faculty members had a chance to meet with NSF program director Michael Mishkind to learn about current funding opportunities at NSF. There were also multiple social events during the two days for attendees to meet new friends and reconnect with old ones.

This annual conference was cancelled last year because of the pandemic. Organizing an online conference was new to members of the organizing committee, which consisted of Hua Lu (chair, University of Maryland, Baltimore County [UMBC]), Steve Mount (co-chair, UMD), Yiping Qi (co-chair, UMD), Juan Dong (Rutgers University), Angus

Murphy (UMD), Nidhi Rawat (UMD), Nick Ruppel (Randolph-Macon College), Vijay Tiwari (UMD), and Shunyuan Xiao (UMD). To ensure a great experience for attendees, the committee worked hard beginning in March to plan the event.

Overall, the conference was a success. In addition to great science talks and panel discussions, there was strong engagement by attendees. The organizing committee thanks supporting staff Shoshana Kronfeld (ASPB), Brad Paleg (UMD), Nichole Zang Do (UMBC), and Marcina Garner (UMD), as well as ASPB and the Department of Plant Science and Landscape Architecture at UMD, for their generous financial support enabling us to make this event a success. ■

# Plant Scientists Elected to the 2021 Class of the U.S. National Academy of Sciences

BY YUN-TING KAO  
Plantae Fellow, Science Writer

As one of the oldest scientific membership organizations in the United States, the National Academy of Sciences (NAS) has been advising the nation on science and technology issues since 1863. Members are elected in recognition of their outstanding contributions to research, and NAS membership is considered to be among the highest honors a scientist can achieve.

This year, eight plant scientists were elected in the new NAS class of 120 members and 30 international members. We asked the newly elected plant scientists about how the news of their election to NAS reached them, their research journey, and their advice for early career researchers. Please join us in recognizing their important contributions to the plant science community.

## Barbara Baker

Barbara Baker is a senior scientist at USDA-ARS in Albany, California, and an adjunct professor at the University of California, Berkeley.

As soon as Barbara started working in a lab as an undergrad, she knew it was where she wanted to be: “The minute I walked into the lab, I knew I was in the right place, and I just loved being there, even to wash dishes.” Barbara’s research journey began with a love for viruses and their capacity to replicate in host cells and manipulate their hosts. During

her PhD years, she studied avian tumor viruses with Mike Bishop and Harold Varmus, whom she described as the largest influences in her scientific life. “They always taught me to do good research, answer the question, and devote yourself to the research,” she recalled.

After graduate school, and inspired by her friend Pat Zambryski, Barbara traveled to Jeff Schell’s lab at the Max Planck Institute in Cologne, Germany, where she met Nina Fedoroff and worked to develop the maize *Activator* transposon as a genetic tool to disrupt and isolate genes in plants. Coming from a nonplant background, she was very motivated when she learned about plant disease resistance genes, especially a virus resistance gene that completely stops a virus from spreading throughout the plant. She thought, “That’s it—a project using new genetic tools, to answer questions in virology, and with potential for real-world application. That’s something I really want to do.”

Focusing on understanding the molecular, biochemical, and genetic mechanisms of host-microbe interactions, Barbara’s research includes pathogen-induced host disease and disease resistance by plant hosts. When she started these projects, the only plant that could be transformed was tobacco, but she and her colleagues soon turned their attention to potato and tomato,



Barbara Baker

which are closely related. “I am glad that I work with crops, because I have had a chance to learn firsthand from both breeders and growers,” Barbara noted.

Another project, which she described as one of the highlights of her career, was an NSF-supported outreach project with Charles Brown. Together, they worked with the Makah and Yakima Nations and with potato breeders, potato geneticists, students, and teachers on finding potato disease resistance genes and the origin of the potato grown by the Makah in Neah Bay, Washington. “We used genetic markers to identify where their potatoes came from. I cannot tell you how meaningful it was to learn from the tribe members and the elders,” Barbara recalled.

Barbara was surprised and delighted when her colleague and friend Sabeeha Merchant called to inform her she had been elected to NAS. “It was so thrilling for



Dean DellaPenna

me, and truly overwhelming,” Barbara affirmed.

Reflecting on her career, Barbara emphasized the importance of finding the right people to work with: “Work in labs where you feel an affinity toward the work, as well as the PI and other members in the lab. They are going to influence how you work, how you think, and what you can do.” She encourages early career researchers to keep going and be positive. “You will spend a lot of time in the lab,” she noted. “You are going to have to deal with failures and hardship, but don’t lose faith in yourself. Also, ask good questions and think about the big picture; think about how your work can be applied to other systems.”

## Dean DellaPenna

Dean DellaPenna is a university distinguished professor and MSU Foundation Professor at Michigan State University.

*continued on page 10*

## 2021 CLASS OF NAS continued from page 9

An elaborate prank was involved in breaking the news to Dean of his election to NAS. The day before the election, Dean got an email from his longtime friend, colleague, and fishing buddy Jim Giovannoni, sharing that he was excited to get his boat in the water. The next day, Jim wrote again saying that the boat's motor was having trouble. After rounds of text messages and emails trying to come up with remedies, Dean got one more phone call from Jim, but this time it was not about boats at all (and actually Jim's boat was still in storage). Dean recalled, "My first reaction was shock. I think I said, 'Are you kidding me?' Maybe with a little more color than that."

Dean did not follow a typical career path. After graduating from high school, he lacked the money and motivation for college, so he got a job in a local steel mill working in a coke plant. Coke was used to fire the mill's blast furnaces, and the mill's massive ovens continuously generated copious amounts of heat and sulfurous gas, so it was literally like working in hell! Two years of working in the mill provided some money and all the motivation he needed to enter Ohio University. An elective course—Botany 101, taught by Larry Larson—sparked Dean's interest in plants. "The more molecular I went, the more sense things made. I was hooked," Dean reflected. He started work-study projects in the plant research labs. The experience helped lay a solid scientific foundation but, more importantly, fostered trustful relationships with his work-study professors. Not knowing what to do after graduation, Dean

asked for career advice, and his professors suggested applying for graduate school, an option that had never crossed his mind. Subsequently, he entered the University of California, Davis, and worked on a cell wall enzyme in ripening tomato fruit.

Dean's research focuses on plant metabolism and molecules that intersect with human health and nutrition, such as Vitamin E and Provitamin A. He realized that doing well in research and doing good for humanity could be accomplished at the same time. He remarked, "We enjoy dissecting biochemical pathways, cloning the genes involved, and understanding how they and Mother Nature work together to determine the levels of essential human nutrients in plant tissues." His lab is working to help develop crops that can expand the availability of essential dietary nutrients.

Dean encourages early career researchers to reserve a few hours to think deeply about papers, topics, and approaches outside of their immediate research area. "My experience is that this type of reading is often where some of your better ideas come from," he advised. He noted the importance of trusting your own instincts in your research, but also of being the harshest critic of your own writing, thinking, and logic and working to continuously improve and refine each. He advocates being prepared and being kind: "At every stage of your career, take every opportunity to present your work orally, but treat each talk as if it were a job interview, because sometimes it might be, without your knowing it." Finally, he affirmed, "Try to remember each key act of kindness, encourage-

ment, and advice you've received at every stage of your education and career, and try to give as good as you've gotten as you proceed through your own career."

### Elizabeth S. Dennis

(International Member)

Elizabeth Dennis is an honorary research fellow at CSIRO Agriculture and Food and a distinguished professor in the School of Life Sciences, University of Technology Sydney, Australia.

Always interested in the molecular basis of biological processes, Liz started her career studying bacterial chromosome replication before moving to yeast and investigating how petite mutants are generated. After some time at the University of Papua New Guinea, Liz joined CSIRO in the Division of Plant Industry, one of the premier research organizations in Australia. "After a flirtation with *Drosophila*, our group decided to abide by the 'Plant Industry' name and work on plant DNA. Beginning with highly repeated DNA (which was the only DNA that could be sequenced in 1972), we progressively moved to genes and their regulation," Liz recalled. She has taken her love of plants a step further (and out of the lab) to regenerate a bare coastal property she and a group of friends own, converting it from a single-tree dairy farm into a vibrant forest. They have planted more than 30,000 trees by hand.

Focusing on elucidating the molecular basis of plant processes, Liz's lab cloned the alcohol dehydrogenase gene, which was identified on the basis of its induction in response to



Elizabeth S. Dennis

low oxygen in maize. Then they took advantage of the emerging resources for *Arabidopsis* and isolated the *FLF (FLC)* gene, which is responsible for repression of flowering in the absence of vernalization (coincidentally with Rick Amasino's lab).

More recently, Liz's group has been working on the molecular basis for hybrid vigor, one of the most important biological phenomena driving crop yield. They found that in hybrids, the methylation status of one parental allele can be transferred to the other in a process they called *trans-chromosomal methylation*. Their focus has changed to the generation of hybrid mimics, which are lines that maintain the hybrid advantage but are homozygous. She envisions that the field will "maintain the excitement of new discoveries, use new technologies as they are developed, collaborate internationally among plant scientists, and apply the discoveries to crop improvement. I hope plant research is as enjoyable in the future as it has been for me. It is a critically important field and deserves support."



Maureen R. Hanson

Because of the time difference with Australia, Liz missed the congratulatory Zoom meeting. “When I woke at about 6:30 a.m. and checked my email, I wondered why Rick Amasino and many international colleagues were writing to me. The honor was completely unexpected, so I had no inkling that I should get up at 3:00 a.m. I was stunned and excited as NAS is such an influential and esteemed body. Due to my previous work in *Arabidopsis*, I have many colleagues in the United States, and being elected to NAS is the pinnacle of my career,” Liz said.

Liz described research as a group effort: “I have used the pronoun ‘we’ when describing our research, and this is how it is. Having good collaborators is critical to scientific success. I am indebted to my partnerships with colleagues and with numerous postdoctoral fellows and students, and particularly to my long-term collaborator Jim Peacock, for any success I have had.” Liz encourages early career researchers to “find the confidence and believe in yourself. Working hard and



Regine Kahmann

following through with a project are critical. Identify an important question and persevere with answering it.”

### Maureen R. Hanson

Maureen Hanson is a Liberty Hyde Bailey Professor in the department of molecular biology and genetics at Cornell University.

Two phone calls reached Maureen to inform her of her election to NAS when she happened to be in between meetings. She joined the Zoom meeting, where many NAS plant biologists offered congratulations. “I was home in front of my computer, a spot where I have spent a lot of time during the pandemic. It occurred to me that everyone’s new familiarity with Zoom provided an opportunity that didn’t exist during most prior elections, and it was nice to see the smiling faces of so many people I know,” said Maureen.

A terrific high school biology teacher affirmed Maureen’s interest in the life sciences. Then, the summer after her freshman year at Duke University, she worked with Edwin Civerolo on a bacteriophage that attacks a peach bacteri-

al pathogen in the USDA–ARS lab in Beltsville, Maryland. Despite spending a great deal of time loading and unloading the dishwasher, she had a good experience and decided to major in botany.

As a graduate student, Maureen began studying chloroplast ribosome biogenesis, and her research always involved some aspect of organelle gene expression, nuclear–organelle interactions, and organelle dynamics. Her lab has studied the phenomenon of cytoplasmic male sterility and fertility restoration and the dynamic stroma-filled tubular structures known as stromules, which function in the formation of chloroplast compartments and in protein trafficking. Currently, Maureen’s lab focuses on chloroplast and mitochondrial RNA editing and the use of photosynthetic biochemistry and synthetic biology to enhance photosynthesis. “By studying chloroplasts, we had been indirectly studying photosynthesis in the past, but we are now more directly working on it by taking a synthetic biology approach to incorporate a carbon-concentration mechanism into chloroplasts and using a genetic engineering strategy to improve Rubisco.” Maureen added, “I believe that engineering photosynthesis will continue to be an important area for research into the future as climate change continues to affect agriculture and as natural diversity for use in plant breeding becomes exhausted.”

Maureen advises PhD scientists to carefully evaluate their goals: “Finishing one’s PhD is both a milestone and a crossroads. It is a good time for graduates to carefully evaluate their goals, rather than proceeding in

lockstep to a postdoc. Although there is no question that a successful postdoctoral period is usually essential for a position at a research university, government lab, or private research institute, it often is not needed for someone heading toward patent law, the biotech industry, or community or small college teaching.” In addition, she encourages early career researchers to venture far and wide: “I was shocked some years ago to read a statistic about the high percentage of PhDs who never venture far from their thesis project. It’s important to keep learning and stay up-to-date on new technology. Much of what goes on in my lab, or campus-wide service facilities, would not even have been imagined when I was a student. Scientific conferences are great places to sample new areas of research that might spark your interest.”

### Regine Kahmann

(International Member)

Regine Kahmann is an emeritus director at the Max Planck Institute for Terrestrial Microbiology in Marburg, Germany.

In the early 1980s, Regine decided to explore a new system in the area of plant–microbe interactions. At the time, the molecular mechanisms underlying tumor induction in the *Agrobacterium tumefaciens* system had just been uncovered. Although she was very much attracted by the *Agrobacterium* system, and especially by how intricately such a microbe had evolved to manipulate its host and cause disease, she felt that the field was far too competitive for her small start-up group.

*continued on page 12*

## 2021 CLASS OF NAS continued from page 11

She visited Barbara McClintock, whom she knew from her six years at the Cold Spring Harbor Laboratory, and asked for advice. Barbara suggested she look into other systems in which microbes or insects induce plant tumors. “I have to admit here that I do not like insects, and therefore I concentrated my literature searches on microbes (these were pre-Internet times),” recalled Regine. However, she did not reach a decision after her reading.

Fortunately, she participated in an EMBO course on plant molecular biology, and one of the instructors, Fred Meins, was working with *Ustilago maydis* with the thought that this fungus might be capable of transforming monocot plants, much as *A. tumefaciens* does for dicots. “It was in his lab that I saw for the first time a *U. maydis*-infected maize plant, and it was clear that the system could be easily handled: The fungus could be grown in the lab, small maize seedlings could be infected, and a week later one could score symptoms. Coming from a background in bacterial genetics, this all seemed manageable. So when I returned from that course, I knew I had found my new system,” Regine reflected.

Since then, Regine’s lab has studied *U. maydis*: “It is a fascinating fungus, because mating, sexual development, and ability to cause disease are intimately linked. My simple (and in retrospect, a bit naive) idea at the time was that if one could understand mating, one would understand what triggers disease.” Regine’s group cloned and elucidated the function of the *a* and *b* mating

type loci of *U. maydis*, but the mechanisms underlying pathogenic development remained unclear because they underappreciated the part played by the plant host. Not until the sequence of *U. maydis* was available and analyzed did they realize that many genes encoding novel secreted proteins, so-called effectors, were clustered in the genome and were expressed only during host colonization. They characterized several effectors and showed that they are used for the downregulation of plant immunity and for modulation of the metabolism of the host: “These are crucial features of biotrophic pathogens, which need to ensure that the infected plant tissue is kept alive to provide the pathogen with nutrients.” They recently identified a surface-exposed fungal protein complex that has an essential virulence function and is proposed to aid in delivering effectors to the host.

The news of her election to NAS reached Regine when she was sitting in her office at home, working on an autobiographical review for *Annual Reviews in Microbiology*. She recalled, “I was absolutely thrilled and surprised because I had no idea that I had been proposed. It is such a huge honor, and to get recognized for work on a nonmodel organism is simply wonderful and immensely gratifying.”

Regine encourages early career researchers to “take chances, identify a biological problem that fascinates you, try to solve it—and do not give up.” She is also particularly happy and grateful that at all the institutes where she has worked (and there are many), a few colleagues became close friends, “and these are wonderful, lasting friendships.”

## Joseph Kieber

Joe Kieber is a Kenan Distinguished Professor at the University of North Carolina at Chapel Hill.

While crossing rice lines in the greenhouse, Joe missed the phone call from his friend and colleague Jeff Dangl to break the news of his election. Later, he noticed that he had been invited to join a Zoom call to congratulate the new NAS members. “At first, it didn’t register with me that I was one of the new members!” he recounted. “I was incredibly thrilled and humbled to hear the news and then to hear from so many friends and colleagues congratulating me. Although of course this is a wonderful honor for me, it really reflects the amazing students and postdocs I have had in the lab and the many wonderful colleagues I have had the pleasure to work with over the years.”

Science has deep roots in Joe’s family, which includes chemists, oceanographers, a computer programmer, and a physicist. “My dad was originally a bacteriologist and ended up teaching in my high school, which of course had a major influence on me and instilled in me a love of science,” Joe reflected. His lifelong fascination with plants (a passion for gardening started at an early age) and his undergraduate lab experience at Cornell got him really excited about research: “I decided to pursue a career in plant science to understand basic questions about how plants grow and develop, which I hoped would ultimately contribute to helping address food shortages in the world.”

Joe’s research focuses on signal transduction in plants. He



Joseph Kieber

began studying ethylene signaling when he worked as a postdoc with Joe Ecker. At the time, very little was known about the perception of any plant hormone, including ethylene. He continued to work on ethylene signaling and the regulation of its biosynthesis when he started up his own lab. After much reading and consideration, Joe decided to address the signaling pathways of a second phytohormone, cytokinin, which at the time was a nearly complete black box. Along with other labs, Joe’s lab helped elucidate the cytokinin signaling pathway and the roles that cytokinin plays in plant growth and development, particularly in Arabidopsis. More recently, Joe’s lab has also studied the role of cytokinin in rice, as well as the signaling pathways that regulate the synthesis of cellulose, the main component of plant cell walls.

Joe encourages early career researchers to “find areas of research that are not already crowded, and do not be afraid to set off in completely new directions. Focus on the questions most interesting to you,



Zachary Lippman

and acquire the tools needed to address these questions or collaborate when needed. Develop close-knit relationships with colleagues with whom you can freely discuss your ideas.”

### Zachary Lippman

Zach Lippman is the Jacob Goldfield Professor of Genetics at the Cold Spring Harbor Laboratory (CSHL) and an investigator at the Howard Hughes Medical Institute.

The news that he had been elected to NAS reached Zach on a special day. “I was visiting my parents, whom I had not seen in a very long time,” he recalled. “I was sitting with them and sharing some recent cool discoveries in the lab when I received the phone call with the news. It was a special moment to first share the excitement with them, and then my wife and six children.”

“For unknown reasons, I have always been deeply fascinated by plants,” explained Zach, “especially how, with just a few seeds and a bit of a green thumb, you can have this remarkable production of free food.” At a young age, Zach worked on a vegetable farm, and

the experience made him appreciate the importance of farming and agriculture to humanity. He chose to major in plant breeding and genetics at Cornell and later studied transposons and epigenetic gene regulation for his PhD at CSHL.

Zach reflected, “I’m always thinking about questions of evolutionary diversity in nature and in agriculture and the intersection of the two, and how natural mutations have contributed to human-driven evolutionary selections.” In exploring and seeking to understand the complex genetics that have led to the diversity of crops, Zach’s lab studies how mutations—in genes and their regulatory regions—contribute to phenotypic variation. How and where do mutations arise? What effects do they have on gene activity and function? To what extent do genes and mutations interact to control quantitative trait variation? Can we extract principles from what we are learning in the lab and apply them in the field? These and many other questions keep Zach going. He thinks that “by tackling these questions as a community, we can achieve a



Giles E. D. Oldroyd

deep understanding of genotype-to-phenotype relationships so that any complex trait can be predictably modified for any purpose.”

Zach advises early career researchers to “love what you do in your scientific pursuits. Otherwise, what’s the point? It is an incredibly exciting time to be in plant biology, and the future looks even more exciting. I am hopeful and optimistic that plant biology and plant biologists will be at the forefront of addressing some of humanity’s most pressing problems. With the brains, tools, and drive, we can get there.”

### Giles E. D. Oldroyd

(International Member)

Giles Oldroyd is the Russell R. Geiger Professor of Crop Sciences and director of the Crop Science Centre at the University of Cambridge, United Kingdom.

It was chance that brought Giles to working with plants. His undergraduate program in the United Kingdom provided the opportunity to study abroad at the University of California. Knowing that he had a place at UC Berkeley, someone in his department told him that Brian

Staskawicz was doing a sabbatical at The Sainsbury Laboratory. He went to meet Brian and later joined the lab. “It was a really exciting time to join his lab: There were many projects attempting to clone disease resistance genes from multiple plant species. This was pioneering at that time, as no one had positionally cloned a gene from plants,” Giles recalled.

With an interest in understanding the beneficial interactions between plants and microorganisms that facilitate the capture of limiting nutrients from the environment, Giles’s lab focuses on arbuscular mycorrhizal fungal and nitrogen-fixing bacterial associations. His work involves understanding the symbiosis signaling pathway and how it establishes the developmental and cellular environments that support symbiotic microorganisms. They are applying this foundational knowledge to improve crops and maximize the benefits of these symbioses. Giles’s vision is to eradicate the need for inorganic fertilizers to drive the sustainability and equity of global food production: “I believe this is possible, and I plan to spend the next 20 years of my career focused on making this happen.”

Several phone calls broke the news to Giles while he was cooking dinner at home. He was shocked and delighted. He joined the celebratory Zoom call, which had three Zoom pages of the great and good in plant science. “It highlighted the honor of joining such a fellowship,” he noted.

Giles encourages early career researchers to follow their passion: “You need to love the work you are doing. When I am involved in recruiting new scien-

*continued on page 16*

This article was first published April 14, 2021, on the University of Bonn website (<https://bit.ly/3A1Lk0>). It is adapted here with permission from the University of Bonn.

## Amy Marshall-Colon Receives Friedrich Wilhelm Bessel Research Award

**W**hat effects does environmentally induced stress have on crops, and how can these effects be predicted? Amy Marshall-Colon is working on this question at the University of Illinois at Urbana-Champaign and, soon, also as a guest professor at the Robotics and Phenotyping for Sustainable Crop Production (PhenoRob) Cluster of Excellence at the University of Bonn in Germany. She has received a Friedrich Wilhelm Bessel Research Award from the Alexander von Humboldt Foundation, endowed with €45,000. To conduct her research, Amy will be in Bonn from May 15 to August 15, 2022.

Every year, the Alexander von Humboldt Foundation awards around 20 Friedrich Wilhelm Bessel Research Awards to internationally renowned researchers from abroad in recognition of their outstanding research achievements. The award bears the name of the German astronomer and mathematician Friedrich Wilhelm Bessel (1784–1846) and is funded by the Federal Ministry of Education and Research.

Amy is professor of plant biology at the University of Illinois at Urbana-Champaign and previously conducted research at



PHOTO BY JORDAN GOEBIG, ISEE

New York University and Purdue University. She develops models that show how plants respond to environmental perturbations on the basis of their genetic characteristics. “Amy’s research activities are outstanding, particularly her achievements in developing mathematical multiscale models to analyze gene-by-environment interactions,” noted Frank Ewert, PI at the Cluster, who nominated her for the award and with whom she has already collaborated.

Among other things, Amy investigates how plants take up nitrogen fertilizer in higher

temperatures caused by climate change. She is exploring the underlying genetic and molecular mechanisms of nitrogen use efficiency with an eye to preventing nitrogen loss leading to air and water pollution. Her models are constructed to provide a better understanding of plant growth processes and to support the breeding of crops that can withstand stressful environments.

Amy has given several lectures at the PhenoRob Seminar Series and the Cluster’s flagship conference DigiCrop 2020. “What’s special is that her presentations

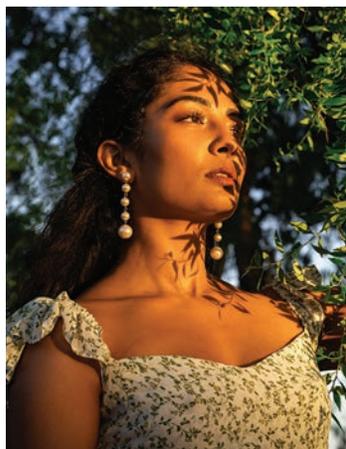
resonated not only with a small group of specialists but also with a wider audience of scientists from diverse disciplines,” said Nora Berning, PhenoRob’s chief administrative officer. Amy’s research topic attracts researchers from various fields, including genetics, plant biology, and crop physiology, as well as geodesy, photogrammetry and robotics, soil sciences, and agricultural policy. All of these disciplines are represented in PhenoRob with the overarching goal of exploring new ways to grow crops and manage fields sustainably.

PhenoRob is one of six Clusters of Excellence at the University of Bonn and is carried out in cooperation with the Forschungszentrum Jülich. It is the only Cluster of Excellence in Germany in the agricultural sciences. The project started on January 1, 2019, and will run until the end of 2025, with the possibility to receive funding for another seven years. The Clusters of Excellence are part of the excellence strategy of the federal and state governments and are funded by the German Research Foundation. PhenoRob is led by two spokespersons, Heiner Kuhlmann and Cyrill Stachniss. More information can be found at [www.phenorob.de](http://www.phenorob.de). ■

## Niba Audrey Nirmal, 2021 ASPB/AAAS Mass Media Science & Engineering Fellow, Working at Complexly this Summer

**N**iba Audrey Nirmal has been awarded the 2021 ASPB/AAAS Mass Media Science & Engineering Fellowship. Over the summer, she is working at SciShow of Complexly, a digital video and audio production company with over 23 million combined followers.

Niba received her MS in December 2020 from Duke University, studying the development, form, and function of plant roots in Philip Benfey's lab. Niba received her undergraduate degree from the University of California, Davis, where she investigated the effects of climate change on crops in Siobhan Brady's lab.



Niba is passionate about plant science, the climate crisis, and science storytelling through video. To pursue her passions for

plant science and media production, Niba created Notes by Niba ([notesbyniba.org](https://notesbyniba.org)), in which she explores plant science in cosmetics, fashion, and skin care. She received the 2020 STEM Advocacy Institute Fellowship for her channel @NotesByNiba. She was also awarded a 2020 Jackson Wild filmmaking fellowship, in which she was mentored by filmmakers from National Geographic and BBC.

Since graduating from Duke, Niba has hosted, taught, and produced videos. She writes and hosts videos for Seeker, a digital science communication company with over 6.5 million combined followers. At the PBS NOVA

Science Studio, she is leading high schoolers in producing scientific videos. She also produced videos through her graduate-level digital science communication course at the University of North Carolina, Charlotte. She has also created articles and short videos with Stanford Linear Acceleratory Laboratory.

Niba will continue to create scientific content through multimedia formats as an ASPB/AAAS Mass Media Science & Engineering Fellow and hopes to further flora appreciation in the public. She is excited to be working at Complexly's SciShow and is grateful to ASPB for providing the opportunity. ■

### OUTREACH IN PLANT SCIENCE *continued from page 7*

tists themselves to be informed about public perspectives, values, and concerns. Joanna noted that many scientists are not trained to engage with social issues or to fully consider the context of plant science research within society. As an example, she pointed out that plant scientists often suggest that our discipline will solve hunger through intensification and increased yield, without also acknowledging their other contributions or the need for plant science to be part of larger

solutions that involve other disciplines and societal input.

Joanna stressed that outreach should also provide opportunities for scientists to broaden their own knowledge and experience base. Listening to relevant communities can underpin more holistic approaches in experimental design, including what questions are posed, what the metrics are, how results are framed, what future research is called for, and who is involved in the research process (e.g., projects developed in collaboration with farmers, small growers, and Indigenous peoples). Scientists'

unsuccessful past attempts to broadly introduce GMO plants (and the continuing struggle to this day) provide lessons on the need to better incorporate societal perspectives and concerns into research, education, and communication of risks and benefits.

Clearly, scientists and the public will benefit from more dialogue and opportunities to learn from one another. The white paper provides several examples of successful outreach programs and many suggestions for designing, assessing, and disseminating such programs. There is also an eight-step guide to what you can do

now to improve outreach in your community, including encouraging universities to recognize outreach as a valued component of academic excellence and to add a service component to PhD training. Please have a look at this paper and consider its findings when planning outreach activities. ■

#### Reference

Friesner, J., Colón-Carmona, A., Schnoes, A. M., . . . Dinneny, J. R. (2021). Broadening the impact of plant science through innovative, integrative, and inclusive outreach. *Plant Direct* 5: e00316. <https://onlinelibrary.wiley.com/doi/10.1002/pld3.316>

## Haley Dunleavy Awarded 2021 AAAS Ralph W. F. Hardy Mass Media Science & Engineering Fellowship

**H**aley Dunleavy, a recent graduate from Northern Arizona University (NAU), has been selected as a 2021 AAAS Ralph W. F. Hardy Mass Media Science & Engineering Fellow. She will spend 10 weeks this summer training as a science journalist at *Inside Climate News*.

Haley earned her PhD in biology under the advisement of Michelle Mack at NAU's Center for Ecosystem Science and Society. Her dissertation focused on responses of root symbionts to shifts in tundra plant communities. Working with both the Arctic and Bonanza Creek Long Term Ecological Research (LTER) Network sites in Alaska, she



explored how mycorrhizal nutrient cycling and nitrogen fixation—two key processes in tundra ecosystems—may change as host shrubs expand across the warming Arctic.

Haley's love for Arctic ecosystems developed as an undergraduate at Alaska Pacific University, where she received her BS in environmental science. There, she witnessed the extensive impacts of climate change on northern latitudes.

Both the urgency of a changing North and the innate wonder of ecology fueled Haley's passion to pursue a career in communicating science to the public. During her degree, Haley earned a graduate certificate in science communication and served as an outreach fellow with NAU's McAllister Program in Culture, Community, and the Environment. Additionally, she was a graduate science writer for

the LTER Network, where she focused on depicting the human experience of science—for example, by detailing the full body movements for taking cores from permafrost soils and reflecting on the quieter moments of research, such as what it means to tend to an experiment for decades. Her writing has appeared on the radio show *Earth Notes*, produced by NPR affiliate KNAU.

Haley is thrilled to dive deeper into stories of climate science and action this summer. She thanks the sponsorship of the Ralph W. F. Hardy Endowment in honor of a scientist whose legacy in both biochemistry and the public understanding of science serves as inspiration. ■

### 2021 CLASS OF NAS *continued from page 13*

tists at all levels, I am looking for evidence of that passion. When you interview, don't be ashamed to let your feelings show; it's refreshing to see excitement when someone talks about their work." He encourages new scientists to make themselves maximally

competitive by strategically prioritizing their focus.

Reflecting on his career, Giles emphasizes the importance of being authentic: "Plant science leadership is not very diverse. If you feel like an outsider, that is normal. There are plenty of us that do not fit the 'norm,' and in my opinion the diversity of our

community is increasing. I made the mistake early on of downplaying my queerness at work, because that is what I thought a successful scientist looked like. This had significant impacts on my life and on my mental health. I wasn't serving myself, or my community. I know it is hard to be an outsider, but express-

ing your differences is the only way we can drive change in our community. Don't fall into the trap I fell in; be authentically yourself at work, and be proud of who you are, even when you don't see anyone else who looks like you." ■

ASPB members share a common goal of promoting the growth, development, and outreach of plant biology as a pure and applied science. This column features some of the dedicated and innovative members of ASPB who believe that membership in our Society is crucial to the future of plant biology. If you are interested in contributing to this feature, please contact ASPB Membership at [info@aspb.org](mailto:info@aspb.org).

## Patrick Thomas

**Title:** Graduate Student

**Place of Work or School:** University of California, Riverside

**Member Since:** 2019

**Research Area:** Genetics, Bioinformatics, Plant–Pathogen Interactions (Whitefly Resistance in Alfalfa)

### What would you tell colleagues to encourage them to join ASPB?

Professional societies are important for building relationships in the discipline. There have always been opportunities to get involved in activities surrounding ASPB, which has broadened my professional network. As an early career scientist, I already appreciate the network I've built, and being involved with the Early Career Plant Scientist (ECPS) Section has challenged me to be the best science communicator and liaison for plant biology I can be.

### Was someone instrumental in getting you to join ASPB?

I don't think any one person played an instrumental role in my joining ASPB. I had been aware of the Society since my undergraduate years but felt a stronger push to join in grad school once I was around more folks associated with the Society.

### Have you enhanced your career, lab, research, or education using ASPB, the Plant Biology meetings, section meetings, *Plantae.org*, *The Plant Cell*, *Plant Physiology*, or *Plant Direct*?

The Plant Biology meetings have been a great place to meet folks, and the travel grant program was so helpful in allowing me to attend. I hadn't been to a Plant Biology meeting before, so going to Plant Biology 2019 was a great introduction to the Society. The section meeting was where I met a number of folks involved with the ECPS Section and the Equity, Diversity, and Inclusion Committee. I've enjoyed working with them and hope to do more in the future.

### How and why did you get into plant science?

I chose plant biology because although my parents wanted me to be a doctor, I didn't, but I really liked science. My high school was one of a few with an urban/suburban FFA chapter, and we focused on plant research. Plants seemed



more niche than the medical science everyone I knew wanted to pursue, so I stuck with plants.

### What is your favorite thing about being a plant biologist?

The diversity in my workday. There are days when I'm in the greenhouse managing an experiment, but I also have the luxury of coding from my desk at home. The diversity of means to answer questions in plant biology has to be one of the things I enjoy most about what I do.

### How do you gather scientific information? What are your sources?

I usually use a Google Alert to drop papers in my mailbox for terms tangentially related to my dissertation and sift through them that way. My PI also has a tendency to nudge papers that might be of interest to me. I'm also not afraid to do a quick and dirty Google search if I need something very specific.

### What advice would you give to a plant scientist just starting out?

Sounds cliché, but: Learn to code. It makes everything you do easier and faster. It also makes you more competitive.

### What do you see as the most important role for scientific societies such as ASPB?

Societies like ASPB have many roles. Aside from being a networking hub for scientists, they also have a role to play with nonscientists. Professional societies do a considerable amount of science communication and help convey our work to scientists and nonscientists alike. Having folks who understand the work but know how to communicate makes iterating the importance of our field that much easier.

### What are you reading these days?

Aside from Penn State football previews on *The Athletic*, I am currently working on *Before the Mayflower* by Lerone Bennett Jr. and *Sprawlball* by Kirk Goldsberry.

### What are your hobbies?

Outside of the lab, I enjoy basketball, podcasts (on a *Knowledge Fight* run right now), baking, and being eternally disappointed that Penn State can't beat Ohio State in football nearly every fall. ■

## Policy Update

BY VICTORIA HABER  
Lewis-Burke Associates, LLC

The information in this article was accurate at the time of writing.

### Congressional Updates

#### House Appropriations Committee Releases Agriculture Report

On June 29, the House Appropriations Committee unveiled its fiscal year (FY) 2022 Agriculture, Rural Development, Food and Drug Administration, and Related Agencies appropriations bill and accompanying report. The bill would provide \$26.55 billion in discretionary funding for USDA and the Food and Drug Administration, of which more than \$3.3 billion would fund agricultural research, \$321 million over the FY2021 enacted level.

ARS, USDA's intramural research arm, would receive \$1.637 billion for its salaries and expenses account, \$145.3 million or 9.7% above the FY2021 level and \$21.5 million below the budget request. The report highlights more than 75 activities within ARS, ranging from alfalfa research to human nutrition throughout the lifespan to precision agriculture. The report states that ARS is "uniquely positioned to develop agricultural solutions to climate change on a national, regional, and local scale. The committee recommends funding for the Administration's clean energy and climate science goals in targeted areas to build upon ongoing research activities and lay the groundwork for innovative approaches in the future." To that end, the bill would provide \$20 million in support of clean energy research and an additional

\$50 million to support agricultural climate science.

Within the National Institute of Food and Agriculture (NIFA), many signature research and extension programs would see modest funding increases. The Agriculture and Food Research Initiative (AFRI) would receive \$450 million, an increase of \$15 million over the FY2021 enacted level but much less than the requested \$700 million.

As with ARS, the report singles out numerous areas of interest within NIFA, including the following:

- **Farm of the Future:** The committee encourages further integration of "applied research in precision agriculture, smart automation, resilient agricultural practices, applied socioeconomics, and improved crop varieties from advanced genomics and phenotyping across varied landscapes and locations to advance data-driven solutions to increase productivity, integrate technology, create value-added agricultural products, and enhance connectivity and resilience for thriving rural communities." \$6 million would be provided for this activity.
- **Genome to Phenome:** The bill includes \$2 million for the Agricultural Genome to Phenome Initiative, a \$1 million increase over FY2021. The committee instructs "NIFA to use a competitive process to issue awards in the Genome to

Phenome program and urges additional focus on root stocks that increase carbon capture and can support grain crop covers. In addition, the committee supports the development of tools and datasets for the analysis of phenotypes that can be used across multiple livestock and crop species to improve the output and efficiency of agriculture."

- **Next Generation Crops:** The committee encourages "the development of new, economically viable crops to improve the nation's agricultural output and applications."
- **Specialty Crop Research Initiative:** The committee highlights the importance of "addressing the needs of the specialty crop industry through research and extension activities" and encourages "NIFA to address tools, growing techniques, and technology emissions." The matching requirement would once again be removed.
- **Pests and Beneficial Species Program:** The committee highlights that "projects that use agro-acoustics to manage pests are eligible for AFRI awards."

#### Sources and Additional Information

- The report can be found at <https://tinyurl.com/6zsbcd2w>.
- Lewis-Burke's full analysis of the report can be found at <https://tinyurl.com/3j64ba6w>.

#### House and Senate NSF Authorization Bills Continue to Progress

On June 8, the Senate passed the Endless Frontier Act as part of a giant package containing innovation, trade, and research security legislation called the U.S. Innovation and Competition Act of 2021 (USICA). The bipartisan vote of 68–32 indicated strong support for investment in research and technology development as key planks for enhanced competitiveness and economic revitalization across several federal agencies.

USICA would prioritize 10 key technology focus areas such as artificial intelligence, advanced computing, resilience, advanced communications, wireless research, energy innovation, and biotechnology. In addition to reauthorizing NSF, the bill includes several major innovation provisions for the agency, including a new Technology and Innovation Directorate to focus on research and development in the key technology areas, University Technology Centers to advance use-inspired research, technology test beds, and other activities to enhance commercialization and technology transfer capabilities. The bill would also authorize \$100 billion for the new directorate, 20% of which would be designated to support research in the key technology focus areas through the Established Program to Stimulate Competitive Research. In addition, \$16.9 billion would be authorized for the DOE Office of Science to fund the same focus areas.

The legislation now heads to the House of Representatives, which is aiming to produce its own package of competitiveness legislation to be voted on as individual bills. The furthest along of these bills are the DOE Science for the Future Act and the NSF for the Future Act. The NSF for the Future Act would (among other provisions) also create a new NSF directorate to support collaborative, use-inspired, and translational research but is generally less prescriptive than USICA about its proposed activities. Both measures advanced through the full House Science, Space, and Technology Committee on June 15 and were passed by the full House of Representatives on June 28. House leadership has charged all committees of relevance to produce additional competitiveness legislation. The House and Senate are likely to use an informal conference negotiation to produce a final package merging USICA and relevant House-passed bills. This final package could be passed on its own or ride major must-pass legislation later in the year.

#### *Sources and Additional Information*

- Information on USICA is available at <https://tinyurl.com/f8bahcmk>.
- Information about the NSF for the Future Act is available at <https://tinyurl.com/u2ajyz5f>.

#### **Senate Confirms Key Biden Administration Nominees**

Nearly four and half months into the Biden administration, agency and department leadership positions have mostly been confirmed

or appointed. Recently, two more confirmations took place that will play an important role in the research community. On May 28, the Senate confirmed Eric Lander as director of the White House Office of Science and Technology Policy, which has been elevated to a cabinet-level position. Lander, a mathematician and geneticist, will play a key role in advising and advancing President Biden's research agenda, including climate change and scientific competition. Also confirmed by Senate vote was Deputy Secretary of USDA Jewel Bronaugh. Bronaugh has a long, distinguished career advocating for small and mid-sized farmers and ranchers and developing strategies to meet environmental and water quality goals, which will be critical at USDA as it works toward achieving its resilience and sustainability goals. Most recently, Sanah Baig was named USDA's chief of staff for Research, Education, and Economics. Although Baig is new to this role, she had six years of experience working at USDA under the Obama-Biden administration, where she served as an adviser in the Office of the Secretary, a special adviser in Rural Development, and a confidential assistant in the Marketing and Regulatory Programs mission area.

#### *Sources and Additional Information*

- More information on Eric Lander's confirmation can be found at <https://tinyurl.com/58kbw4kk>.
- The press release on Jewel Bronaugh's confirmation can be found at <https://tinyurl.com/3j722ctn>.

## **Federal Agency and Administration Updates**

### **President's Budget Request Highlights Importance of Climate and Environmental Research**

President Biden has released the full details of his first budget proposal to Congress, which includes a proposed 18% boost in discretionary spending for a total of \$1.522 trillion. Climate and clean energy are among the administration's top FY2022 budget priorities, which also include public health, innovation, and education. The budget request kicks off the FY2022 congressional appropriations process; however, the timing for passing final versions of funding bills remains uncertain, and the late start to the appropriations process increases the likelihood of a continuing resolution to avoid a government shutdown and continue to fund federal agencies beyond September 30, which is the end of FY2021. Congressional Democrats are largely supportive of the initiatives laid out in the president's budget request, but congressional Republicans are concerned that the proposal does not provide sufficient funding for the Department of Defense and are wary of increasing the federal deficit through large levels of spending on domestic programs.

Overall, the budget request affirms Biden's commitment to taking a cross-cutting approach to both climate change and environmental justice, with significant boosts proposed across environment-focused agencies in these areas. Although much of the funding increase is devoted to activities to combat climate change directly, there is a sizable

increase in research spending in some key areas of priority to the environmental research community. Some significant initiatives worth highlighting include the following:

- \$500 million for a new Advanced Research Projects Agency for Climate, managed by DOE but funded in collaboration with other agencies. However, this program did not receive any proposed funding through the House Appropriations bills.
- Increases to major environmental research funding agencies. DOE would be funded at \$46.2 billion, a \$4.4 billion or 10% increase compared with the FY2021 enacted level. This includes \$500 million, a \$100 million increase, for the Advanced Research Projects Agency for Energy; \$9 billion, a \$5.8 billion increase, for DOE applied energy programs; and \$422 million, an increase of \$71 million or 20% above the FY2021 enacted level, for Earth and environmental systems sciences.
- The discretionary programs within USDA's NIFA would see an increase of \$386 million, or 23.9%, compared with the FY2021 enacted level. ARS would see an increase of \$358 million, or 19.3%. This would be the first year that the Agriculture Advanced Research and Development Authority (AgARDA) would see funding. The program, authorized in the 2018 Farm Bill, would be funded at \$5 million and would likely support precision and digital agriculture and climate-related research proj-

*continued on page 20*

**POLICY UPDATE**  
*continued from page 19*

ects. Crop Protection and Pest Management would receive flat funding for FY2022. The Minor Crop Pest Management Program (IR-4) had a proposed increase of \$8 million.

*Sources and Additional Information*

- The President's budget request is available at <https://tinyurl.com/yvcaduun>, although each agency provides budget details in separate budget justifications.
- Lewis-Burke's full analysis of President Biden's budget request, which includes links to agency budget justifications, is available at <https://tinyurl.com/daz9uz28>.

**USDA Releases Progress Report on Climate-Smart Agriculture and Forestry Strategy**

In response to President Biden's January 27 Climate Crisis Executive Order, USDA compiled a report titled *Climate-Smart Agriculture and Forestry Strategy: 90-Day Progress Report* with recommendations for climate-smart agriculture and forestry (CSAF) to enhance climate change mitigation and resilience. USDA was tasked with developing tangible steps to decrease climate change–incited wildfires, source sustainable bioproducts and fuels, and reduce carbon through conservation and sequestration, so the report includes recommendations in seven priority areas:

1. Prepare USDA to quantify, track, and report the benefits of CSAF activities

2. Develop a CSAF strategy that works for all farmers, ranchers, forest landowners, and communities
3. Leverage existing USDA programs to support CSAF strategies
4. Strengthen education, training, and technical assistance for CSAF practices
5. Support new and better markets for agriculture and forestry products generated through CSAF practices
6. Develop a forest and wildfire resilience strategy
7. Improve research.

USDA has identified several thrusts for improving research and making it more inclusive of all stakeholders, specifically working to include input from tribes. The report recommends increased development and investment in

research on landscape-scale conservation and management practices, the potential of new CSAF technologies, the impact of climate change on agriculture and forests, and the financial implications of climate change for agriculture-dependent communities. The president's budget request reflected the administration's commitment to many of these recommendations, such as investing in and strengthening the role of USDA Climate Hubs to help pinpoint regional climate vulnerabilities and proposing funding increases for climate initiatives within AFRI, ARS, and AgARDA.

*Source and Additional Information*

- The full report can be found at <https://tinyurl.com/y84k-8bpw>. ■



**Call for Papers**

*Plant Physiology*<sup>®</sup>

**2022 Focus Issue on Circadian Rhythms**

Edited by Stacey Harmer, Alex Webb, and Christian Fankhauser

Submission Deadline: November 1, 2021  
Publication Date: July/August 2022

For more information, go to <http://bit.ly/Circadian-Rhythms>

## Plant BLOOME 2021 Winners

**A**SPB established the Plant Biology Learning Objectives, Outreach Materials, & Education (Plant BLOOME) grant program with the goal to enhance public awareness and understanding of the essential roles of plants in all areas of life (<http://bloome.aspb.org>). Congratulations to the 2021 ASPB Plant BLOOME grant recipients!

### The Legume–Rhizobium Mutualism: A Model for Inquiry in the Classroom

#### PI: Michael Grillo

*Loyola University of Chicago*

The plant–microbe mutualism between legumes and nitrogen-fixing bacteria (rhizobia) is one of the most economically and ecologically significant interactions on Earth. This classic symbiosis also presents considerable potential as a K–12 classroom model for engaging students in scientific inquiry and plant biology. Most existing teaching materials involving this system are largely composed of stand-alone, cookbook-style experiments with limited opportunities for authentic student investigation. The primary goal of this Plant BLOOME project is to train high school teachers to develop, implement, and revise Next Generation Science Standards–aligned laboratory materials to complement Grade 9–12 biology instructional storylines.

More and more teachers are asked to implement inquiry-based approaches in the classroom—a difficult task, as most teachers have not had personal experi-



*Michael Grillo*

ence with inquiry and scientific research. Moreover, teachers rarely take plant-specific courses and thereby have limited exposure to and low comfort levels with plant biology content. Thus, a secondary goal of this project is to provide Research Experiences for Teachers (RET) using legume–rhizobium experiments in Grillo’s lab. Mentoring teachers allows this project to have lasting benefits and reach a large and diverse population of students. This proposal greatly benefits from partnership with the NSF-funded Loyola University of Chicago (LUC) Robert Noyce Teacher Scholarship Program, which is directed by co-PI Lara Smetana. RET participants will be recruited from the LUC–Noyce Teacher Scholar alumni who currently teach high school biology in Chicago Public Schools.

During the summer of 2021, three RET participants will conduct research in Grillo’s lab and develop teaching modules they will then implement in their



*Dior Kelley*

classrooms. In the summer of 2022, the teaching modules will be presented at ASPB and teacher conferences, as well as in relevant websites and journals. Although the results of this work will be disseminated broadly, this project is well suited to provide classroom materials and exposure to plants for students in Chicago Public Schools, many of whom are underserved and from underrepresented backgrounds in STEM.

### Amazing Roots: Adventures in RStudio

#### PI: Dior Kelley

*Iowa State University*

Plants are a fundamental component of a healthy and sustainable future for our world. As plant scientists, we are responsible for increasing plant awareness, especially at critical educational transition points.

The Iowa State University (ISU) Plant BLOOME team consists of PI Dior Kelley, assistant professor, and Renu Srivastava, assistant teaching

professor, Department of Genetics, Development and Cell Biology, and Alexis Campbell, director of the ISU Science Bound program. Our collaborative female scientist team will provide hands-on plant biology laboratory experiences at ISU for underserved precollege students in partnership with the ISU Science Bound program during the 2021–2022 academic calendar. Through the generous support of the Plant BLOOME grant, we have designed three hands-on educational Science Bound Saturday events geared toward eighth- and ninth-grade students. Additionally, this grant will launch a new five-day campus residential program for 10th- and 11th-grade Science Bound students to be offered in summer 2022.

These educational activities will cultivate multidisciplinary research experiences for Science Bound students through hands-on involvement with microscopy, plant phenotyping, and basic coding using maize root systems grown in a controlled environment system. The students will gain new knowledge about root growth and development in the “amaizing” crop *Zea mays*, acquire new experience with plant growth regulators such as auxin and cytokinin, and develop basic quantitative phenotyping skills using ImageJ and RStudio.

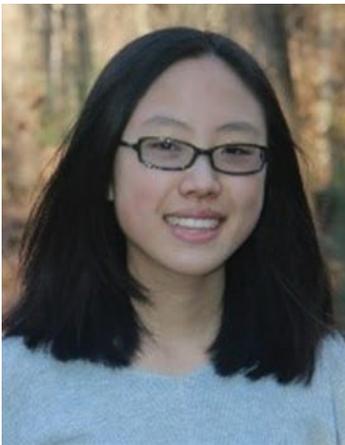
We will use pre- and post-event surveys to assess students’ interests in plant and data sciences. In addition, we will be able to compile longitudinal demographic data through the Science

*continued on page 23*

# Announcing the 2021 ASPB Summer Undergraduate Research Fellows (SURF)

The ASPB Summer Undergraduate Research Fellows (SURF) program funds promising undergraduate students so they can conduct research in plant biology during the early part of their college career over the course of 10 consecutive weeks. This year's SURF recipients will present their research at Plant Biology 2022. Congratulations to the 2021 Summer Undergraduate Research Fellows and their mentors!

## SURFers from Doctoral Granting Institutions



### Amanda Dee

Northeastern University

**Project:** Developing and implementing an inducible synthetic biology tool for regulating alkaloid biosynthesis in *Catharanthus roseus*

**Mentor:** Carolyn Lee-Parsons

I am incredibly grateful for the opportunity to continue plant biology research through the ASPB SURF program! This award will allow me to advance my research career while also providing the opportunity to share my work at Plant Biology 2022.



### Patricia Gallardo

Iowa State University

**Project:** Role of isoflavones in the resistance of *Glycine max* against *Aphis glycines* Matsumura

**Mentor:** Gustavo MacIntosh

Receiving the ASPB SURF award is an incredible honor. This will give me the opportunity to continue my research during the summer and then present my findings at Plant Biology 2022, which will be invaluable as I prepare for graduate school.



### Ashley Knight

Colorado State University

**Project:** Screening for resistance in Colorado wheat varieties for wheat streak mosaic virus and stripe rust resistance

**Mentor:** Robyn Roberts

I am honored to receive the ASPB SURF award, and I thank my mentor for helping me get here. This fellowship allows me to start developing my research skills in the plant biology field while using my background in microbiology. I know that this opportunity will help me as I approach graduate school and work my way toward a career in plant biology.



### Harper Lowrey

Yale University

**Project:** Functional studies of an *F-box* gene that links the circadian clock to plant growth

**Mentor:** Joshua Gendron

It is such an honor to receive an ASPB SURF grant, and I am grateful to my mentor for always supporting me and my research. I am excited for the opportunity to dive deep into plant research of my own this summer, and I know the depth of this project and the structure of ASPB support will help me develop as a scientist in and out of the lab.

SURFers from Doctoral Granting Institutions (*continued*)

**Lauren Owens**  
Cornell University

**Project:** Identification and characterization of ORHis suppressors in the mutated ORHis *Arabidopsis thaliana*

**Mentor:** Li Li

Receiving the ASPB SURF award is an honor that will prove invaluable in my pursuit of a graduate degree as it provides me with experience in conducting research, presenting my findings, and interacting with others in my field. I am grateful to my mentor for pushing me to apply and for the opportunity to further explore chromoplast biosynthesis in mutant *Arabidopsis thaliana*.

## SURFers from Primarily Undergraduate Institutions



**Miriam Li**  
Williams College

**Project:** Biochemical investigation of anthranilate phosphoribosyltransferase in plants

**Mentor:** Cynthia Holland

I am honored and excited to have this opportunity to do research in plant biology this summer. Participating in the ASPB SURF program will prepare me for a future science career and allow me to spend this summer completing meaningful work that will build on our collective understanding of the natural world around us.



**Katherine Stegemann**  
Marian University

**Project:** Determining the localization of O-polysaccharides and building a molecular model for OPS function in *Arabidopsis thaliana*

**Mentor:** Carina Collins

I am blessed and grateful for the opportunity to carry out research as an ASPB Summer Undergraduate Research Fellow. Performing this research will further my academic career past undergraduate studies and fuel my passion for plant biology into the future. Participating in Plant Biology 2022 will allow me to make invaluable connections in the plant biology community and share my work with students and scientists who share a similar passion.



**Alyka Zahnd**  
Missouri Western State University

**Project:** Offense and defense strategies in plants' chemical warfare for resources and survival: Can native "heroes" rescue other native plant species, sensitive to allelopathic inhibition, triggered by highly competitive invasive species?

**Mentor:** Csengele Barta

I am honored to receive a 2021 SURF grant, and I thank ASPB for selecting my proposal. Working on this project will give me full ownership of a scientific investigation, from planning through experimentation to analysis and presentation, while learning and practicing skills essential for a professional and research career. Developing this project is also a wonderful opportunity to learn more about plant-plant interactions and conduct applied research that is relevant to invasive species control, an area I am particularly interested in as a wildlife conservation and management major. I am looking forward to sharing my results with the plant science community and networking with peers and professionals at Plant Biology 2022. ■

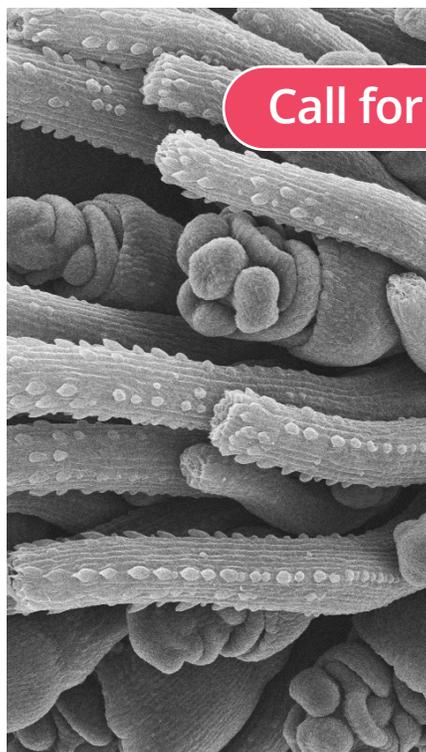
**PLANT BLOOME WINNERS**  
*continued from page 21*

Bound program, which works with students through a five-year precollege program and a total of nine years if they attend ISU.

Our dissemination plan to communicate these educa-

tional activities to the plant biology community will include a poster presentation at Plant Biology 2022 and an electronic tool kit outlining the materials and methods for the hands-on activities. This project will be sustained

through ISU funding and support via the Science Bound program and the Department of Genetics, Development and Cell Biology. ■



Call for Papers

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### 2022 Focus Issue on Evolution of Plant Structure and Function

Edited by Elizabeth A. Kellogg, Jill C. Preston, Neelima R. Sinha,  
and Keiko Torii

Submission Deadline: January 1, 2022

Publication Date: September 2022

For more information, go to <https://bit.ly/PlantStructureFunction>



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