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ASPB News



THE NEWSLETTER OF THE AMERICAN SOCIETY OF PLANT BIOLOGISTS

PB19
PLANT BIOLOGY
AUGUST 3-7 | SAN JOSE, CA

Are you still feeling the creative energy, community, and cutting-edge science from Plant Biology 2018 in Montreal?

Get ready to build on that excitement at Plant Biology 2019!

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President's Letter

Securing the Future of Plant Biologists

BY ROB LAST
Michigan State University

Note: To help increase the usefulness of the President's Letter and expand participation in ASPB, resources from other community members that are relevant to this topic are available at <https://tinyurl.com/y87pa762>. Links are provided to blogs written by members of our community and existing ASPB and external resources. I urge you to spend some time with these resources.

These are times of promise and peril. There are great scientific opportunities for those of us interested in understanding how plants work and using that knowledge to improve the human condition. However, external forces of politics, organizational change in the public and private sectors, and uncertain economic times create risks for scientists, educators, and policy makers. These perils are palpable for plant biologists at all stages of career and life, but we should acknowledge the greater impact of risk to our early career colleagues and those from groups underrepresented in science.



This column explores ideas of how we can help each other navigate toward a more secure future and increase the long-term stability of institutions we hold dear.

Create Opportunities for Others

Although all of us are affected by social trends and the behavior of others, early career trainees and professionals are far less secure than those more senior. In addition to overall financial insecurity, young colleagues are disproportionately affected by

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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*

social changes such as increasing education costs, reduction in tenure track teaching and research positions in favor of shorter-term appointments, larger numbers of applicants for fewer jobs, the intrusion of the gig economy deeper into our culture, and the high cost of living in areas home to many elite educational institutions and employers.

These trends put the onus on those of us who are more secure to create opportunities for others. For example, make trainees aware of resources for increasing their financial security. Several conversations may be required because people often are not comfortable talking about money, but you can ease into it by bringing up noncontroversial topics such as the evils of credit card debt and benefits of compound earnings and by emphasizing personal lessons you have learned. Food insecurity and mental and physical health problems are surprisingly high among students: if you are familiar with local resources, share this information with peers and trainees.

Hiring undergraduate students for the summer or academic year and creating paid summer Research Experience for Undergraduate (REU) programs are great ways to help trainees become more financially secure (<http://plantae.org/careers/internships>). These also provide authentic research experiences, which increase persistence in science and technology career tracks. Most established scientists can point to one or more such experiences early in their career: I have synthetic organic chemists at Hoffman LaRoche (Dr. Milan Uskokovic; 1977) and a DOE-funded REU program at

Argonne National Labs (1978) to thank. We should take the opportunity to give back by paying forward.

Maintain a Personal Development Plan

Progressing through your career, be deliberate in ways that will increase your professional security and resilience. Create and revisit your personal development plan on a regular basis: this is a great way to create goals and catalyze career-focused communication between mentors and trainees (for example, see the myIDP tool at <http://www.sciencemag.org/careers/2013/05/myidp>). Compare notes with members of your social and professional networks, and share the intellectual wealth. If your institution is not creating opportunities for trainees and mentors to learn about diverse career paths, work with your peers to develop programs that bring in successful professionals from different walks of life and stages of career. If such programs already exist, participate and bring your mentors so that they can give broader career advice to future mentees.

Hone Your Communication Skills

Learning to communicate with people of varied professional and cultural backgrounds—including nonscientists—will benefit you every day of your life. Although writing terse and compelling prose is difficult and requires practice, you can learn how excellent writers communicate. If you do not have time for novels or long-form journalism, regularly read the opinion page of your favorite newspaper. Great opinion writing has similar structure and style as strong expository science writing. If you seek experience

giving oral presentations, work with your peers and mentors to create a journal club, research forum, or symposium. Participate in events that aim to explain science to the public, whether at a local brewery or in an informal science teaching program at a museum or school.

Branch Out into New Territory

Straying from your comfort zone throughout your life and career is one of the best—and sometimes most difficult—strategies to create career and personal security. Make sure that you receive broad and deep conceptual and practical training. It is tempting to pursue a narrow set of techniques and subdisciplines, but having broad knowledge and interests can underpin a scientific career in which you live long and prosper.

Changing course is both terrifying and liberating: I promise that you will learn and grow a remarkable amount in the first six months of a completely new job in a new organization. Although I am glad to have spent most of my life in academia, four years in industry and 18 months at NSF transformed the way I think about problems and the research that our group does. Working in another country is enjoyable and has documented positive influence on career trajectories (Gewin, 2018). Seek out mentors and friends with broad networks and experiences, and encourage those who do not to get out more, meet people, and not shy away from difficult conversations and complex topics. If you are interested in learning more about the value of career changes, I highly recommend a podcast called “The Upside of Quitting” (Dubner, 2011).

Take Advantage of Opportunities for Members

ASPB can contribute to your security and well-being, and having members at all career stages involved in our organization makes all of us stronger. Our staff and volunteer community members have built opportunities for early career professional members to develop the skills and broad networks to create a secure future. The relatively new Conviron Scholars Program provides training in communication and career development to dozens of trainees across the globe (<https://aspb.org/awards-funding/aspb-awards/aspb-conviron-scholars-program/>). Plantae fellows create content and moderate events for the expanding Plantae online resource (<https://plantae.org/welcome-2017-2018-plantae-fellows/>).

A recently doubled Ambassador Program provides students, post-docs, and industry employees opportunities to engage campus communities and the public in outreach activities and contribute articles to *ASPB News* (<https://aspb.org/membership/aspb-ambassador-program/>). This program and ongoing expansion of the number of standing committees that include early career professional members provide mechanisms for securing the future relevance of ASPB.

Our three journals embrace ASPB's role in training the next generation of communicators and leaders while increasing the value and visibility of our publications to readers. Assistant features editors at *The Plant Cell* (<https://tinyurl.com/ycpa558w>) and *Plant Physiology* associate features editors (<https://tinyurl.com/yb2b6juz>) are getting experience

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PB19

PLANT BIOLOGY

AUGUST 3-7 | SAN JOSE, CA

As program chair Andrew Bent put it, "At the ASPB annual meetings, you acquaint or reacquaint yourself with a broad swath of plant biology and plant biologists. You find out what is at the cutting edge in other areas of plant biology. And you often run into a lot of good friends from your past, or make new friends who end up playing a significant role in your professional life."

Featuring the following major symposia:

Biological and Personal Networks: Why They Matter for Plant Biology ASPB President's Symposium

Organizer: Rob Last, *Michigan State University*

Receptor Signaling in Plants

The Plant Cell Editors' Symposium

Organizer: Giles Oldroyd, *University of Cambridge*

The Future of Food and Agriculture

Organizers: Andrew Bent, *University of Wisconsin*, and Crispin Taylor, *ASPB*

Plant Disease and Resistance Mechanisms

Organizer: Wenbo Ma, *University of California, Riverside*

The Future of Plant Synthetic Biology

Organizer: Andrew Hanson, *University of Florida*

(in collaboration with the Synthetic Biology satellite meeting, held immediately after Plant Biology 2019)

Spotlight: Importance of Biological and Personal Networks

This year, the ASPB President's Symposium, organized by Rob Last, presents an innovative combination of two talks about human networking and two talks about biological networking:

David Asai

David Asai, senior director of science education at Howard Hughes Medical Institute, will focus on the importance of authentic research experiences in attracting and retaining students from underrepresented groups to research. He has been influential in the highly successful SEA-PHAGES program (<https://seaphages.org/>).

Beronda Montgomery

Beronda Montgomery, foundation professor in the Departments of Biochemistry & Molecular Biology and Microbiology & Molecular Genetics at Michigan State University (<https://aan.msu.edu/staff/beronda-montgomery/>), will discuss her research on mentoring and mentoring networks in science.

Gaurav Moghe

Gaurav Moghe, assistant professor in biochemical genomics at Cornell University (<https://www.moghelab.org/>), will present his group's work on the evolution of plant metabolic networks.

Manajit Hayer-Hartl

Manajit Hayer-Hartl, group leader in the Department of Cellular Biochemistry at the Max Planck Institute of Biochemistry (<http://www.biochem.mpg.de/en/rg/hayer-hartl>), will talk about assembly of protein complexes and analysis of networks of protein complexes and interactions.

Focus on Careers and Networking at Plant Biology 2019

For 2019, the organizers have enriched the activities, workshops, and sessions for plant biologists at all stages of their career, from undergraduates to emeritus professors. Here is a small sampling of the career-boosting events at Plant Biology 2019:

Undergraduate Networking

The Undergraduate Networking event (Saturday 12–1 p.m.) provides a setting for undergraduates to network with each other as well as with ASPB leadership and ASPB Ambassadors.

Workshops and Networking

Workshops and networking events will be held for plant biologists at primarily undergraduate institutions (PUIs), including a PUI Faculty Development Workshop and Being a Plant Biologist in a PUI.

Entrepreneurship

For those ready to go beyond the bench, Phil Taylor, biotechnology new investments lead at Bayer Crop Science, will lead a workshop on entrepreneurship.

Careers Beyond Academia

The Membership Committee will host a workshop on Careers Beyond Academia, with a panel representing careers in large and small private companies and in government.

Out and About

From microprocessors to giant sequoias, there's lots within reach of the Plant Biology 2019 location. Opportunities for sightseeing and family fun abound in the San Francisco Bay Area and beyond. In San Jose, you can visit the historic Municipal Rose Garden, hike up Mission Peak, or take a tour of the Tech Museum of Innovation. In nearby Mountain View, the Computer History Museum lets you explore the technology that underlies the unique energy of Silicon Valley.

If time permits, you can schedule a day trip to wine country on a Napa Valley wine train, take a tour of Alcatraz, or stroll between towering redwood trees at Muir Woods National Monument. Children love spending time at the Santa Cruz Beach Boardwalk, which offers a variety of thrill rides, fair food, and carnival games. If you give yourself a few extra days, you'll have time to explore the breathtaking landscapes and biodiversity of Yosemite National Park, take a ferry out to Angel Island for gorgeous views of San Francisco, or unwind at Lake Tahoe.

Dates to Remember

- Registration and hotel bookings are open now!
- May 1: Early Bird Registration Deadline
- March 7: Deadline for abstract submission to be considered for a talk
- August 3–7: Plant Biology 2019 in San Jose, California
- August 7–9: Synthetic Biology Meeting in San Jose, California

For Plant Biology 2019 updates, join the Plantae Network for Plant Biology 2019, follow #plantbio19 on Twitter, and keep an eye on the program at

plantbiology.aspb.org.

Plant Physiology

Deadline for Submission:
July 1, 2019

Call for Papers
2020 Focus Issue on RNA Biology

Anticipated Publication Date: January 2020 <https://aspb.org/ppfocus/>

PRESIDENT'S LETTER *continued from page 3*

in writing, podcasting, and creating video content. *The Plant Cell* is helping us expand our reach internationally with short Mandarin plain-language article summaries on WeChat and Twitter (<https://plantae.org/research/the-plant-cell/#in-a-nutshell>), all written by Chinese assistant features editors.

Plant Direct is complementing these activities with an associate reviewer board, which will train early career professionals in reviewing and then have them provide manuscript reviews (<https://tinyurl.com/y75t64th>). In return, reviewers get valuable feedback from editorial board members. Together, our journals are going beyond publishing outstanding science to help train

the next generation of reviewers, authors, and journalists.

We each have a role in securing one another's future, and by being an active member of ASPB, you can propel your career and help those who came before you and will follow. Please share your thoughts by email (lastr@msu.edu) or on Twitter (@biokid001, #ASPBforward).

References

Dubner, S. J. (2011, September 30). The upside of quitting [Podcast]. *Freakonomics Radio*. <https://tinyurl.com/h28qsry>.

Gewin, V. (2018, November 26). Why you should move country. *Nature*. <https://tinyurl.com/yacw443x>. ■

The Plant Cell 30th Anniversary T-Shirt Competition!

Eligibility

The contest is open to all, including TPC editors and ASPB staff. Participation in the contest constitutes entrant's full and unconditional agreement to and acceptance of the following rules. There is no limit to the number of entries per person during the contest period.

Design

- Designs should be no larger than 12" x 12".
- Submissions should be in VECTOR format (no bitmap or raster images/no photos). Adobe Illustrator or editable EPS files are preferred, with all fonts converted to outline. However, if you can't provide a true VECTOR file, submit the art as a GIF, TIF, JPG, or PNG, and ASPB will recreate as vector art.
- NO PowerPoint, Word, or Microsoft Publisher files.
- Designs may be altered to ensure high-quality printing.
- ASPB reserves the right to use all designs for future marketing purposes.



Selection

The winning design will be selected by a committee of TPC editors (herein "selection committee"). The choice will be based on design alone (designs will not be associated with entrant names until after a choice is made), and members of the selection committee agree not to enter the competition.

For more information visit
plantcellteeshirt.aspb.org.

Prize

The winner will receive the following:

- One 30th Anniversary T-shirt with the winning design
- One \$50 Amazon.com gift card
- Recognition on the TPC and ASPB websites, emails, and social media.

Timeline/Process

- **Deadline for submission:** March 31, 2019.
- **Selection of winner:** April 30, 2019
- Winner will be notified via email.

A submission form will be online soon. It must be filled out completely. If you fail to complete the form, give any false information, or fail to reveal any pertinent information, you may be disqualified from the competition. All decisions are made by the selection committee and are final. If the winner cannot be contacted within two weeks of selection, the committee will notify the runner-up that theirs is the winning design.

Hawaii, Virus-Resistant Papaya, and Ukulele: Over the Rainbow with Dennis Gonsalves at Plant Biology 2017

BY MIGUEL VEGA-SANCHEZ, Bayer Crop Science, JOHN HARADA, University of California, Davis, and ADÁN COLÓN-CARMONA, University of Massachusetts Boston

It is rare when a seminar at a scientific conference ends with a standing ovation and a room full of scientists who are filled with emotion. That is what we experienced when the ASPB Minority Affairs Committee (MAC) hosted Dennis Gonsalves and his wife and collaborator, Carol Gonsalves, for a luncheon during Plant Biology 2017 in Honolulu, Hawaii, on June 25, 2017.* Dennis's talk was part of MAC's "Diversifying Science: A Personal Journey" series and focused on his career in science, showcasing how a Hawaiian native growing up on a sugar plantation became a world-renowned plant scientist and innovator.

Every scientific journey is deeply personal yet often richly relatable. We can all look back to key moments in our lives and find common themes in what contributed to our decision to become scientists, no matter our differences in background, culture, or other intrinsic factors. The value of education, as well as the influence of mentors, was paramount in Dennis's remarkable journey from his humble upbringing on the main island of Hawaii. Attending the

Kamehameha Schools for native Hawaiians, finding his passion for research, and working with Dr. Eduardo Trujillo at the University of Hawaii Experimental Station in Kauai were instrumental in his early career. It was thanks to Dr. Trujillo that Dennis was given the chance to enroll in graduate school despite his average grades, a turning point on his path to an impactful career in science.

Dennis eventually became a professor at Cornell University, where he mentored more than 20 graduate students. After his successful career on the U.S. mainland, he retired from the Cornell faculty but continued training scientists, this time in his homeland, when he became director of USDA's Pacific Basin Agricultural Center in Hilo, Hawaii. As we discovered listening to his remarkable story, Hawaii has been central to both Dennis's scientific and life journeys. Three luncheon participants summarized well the thinking of many:

"Listening to Dr. Dennis Gonsalves talk about his journey was truly inspiring. He left his home in Hawaii to grow as a scientist, but he never forgot about the people he left behind. I have always wondered how I can help my community back in Puerto Rico all the way from Washington State. After attending the MAC luncheon, I realized that as a plant biologist, it is my duty to use my



Dennis Gonsalves presenting at the Minority Affairs Committee luncheon at Plant Biology 2017.



After the Minority Affairs Committee luncheon talk at Plant Biology 2017 in Honolulu, Hawaii (left to right): Adán Colón-Carmona, Luis Vidali, Miguel Vega-Sanchez, Dennis Gonsalves, Carol Gonsalves, Sona Pandey, John Harada, and Michael Gonzales.

training to improve the well-being of my community and people's lives, and that I can do that from wherever I am."

*—Dianne Laboy Cintrón
Undergraduate, University of Washington*

"Dennis Gonsalves gave a truly inspirational talk about overcoming the challenges of becoming a first-generation faculty member

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**This article was originally prepared for publication in the fall of 2017; the lengthy delay in its appearance here is the result of an oversight.*

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with the help of mentors who identified his inner talent and provided the right opportunities. His perseverance toward returning to the agricultural community of Hawaii, generosity in helping students and early career scientists, and holistic appreciation of life are admirable. He encouraged us to dream of a life full of remarkable achievements.”

—**Juan Pablo Giraldo**

Assistant Professor, University of California, Riverside

“Key points that resonated with me, and likely for most of the other underrepresented attendees, are that regardless of our background and challenges we continue to face in our training and career, being passionate about our work and having a strong support system, including excellent mentors, are fundamental to our success.”

—**Dawn Nagel**

Assistant Professor, University of California, Riverside

Dennis took to heart two guiding principles throughout his career: helping others through science, and making sure his work had a clear, tangible impact. One of the best examples of this philosophy is how he led the development and successful

deployment of Rainbow papaya. Launched in 1998, Rainbow is a transgenic papaya variety that provides immunity to papaya ringspot, a devastating viral disease caused by the papaya ringspot virus (PRSV). PRSV infection was decimating papaya production in the early 1990s in Hawaii, and the transgenic approach developed by Dennis and his team saved the industry and farmers’ livelihoods in the islands.

Although not known at the time of development, the transgenic papaya makes use of post-transcriptional gene silencing, which makes it the first commercialized application of RNAi to control a plant disease. To this day, Rainbow papaya is the only public-sector transgenic product on the market in the United States, a fact not lost on Dennis, who challenged the audience and every academic scientist to persevere and work toward commercialization of transgenic products. As an example, he mentioned that he was currently working on getting regulatory approval of Rainbow papaya in China, funded entirely by a USDA grant.

This is what Dennis calls the human side of science and biotechnology: working to find

solutions to problems that affect people, like the papaya farmers he saved from potential ruin. It is a very powerful message from a man who made history by dedicating his research to improving lives through science, summarized well by Nick Carpita and José Dinneney:

“It was a marvelous talk. I recall several years ago, when Dennis received the prestigious Leadership in Science Public Service Award, the depth and impact of his work—the first real success story for GMOs. I loved hearing about his efforts to expand scholastic opportunities upon his return to his home.”

—**Nick Carpita**

Past ASPB President, Purdue University

“It was heartfelt and, I’m sure, resonated deeply with anyone who has struggled in science and made it through their challenges. That a boy who grew up with such simple means became a world leader in crop improvement and a pioneer in the use of biotechnology is astounding and a testament to the power of persistence. I felt how much he cared about the needs and struggles of the underrepresented minority audience he presented to. He seemed to understand that folks like himself have the most powerful

and influential voice for encouraging these scientists to shoot for their dreams.”

—**José Dinneney**

Carnegie Institution for Science, Stanford University, and Howard Hughes Medical Institute Simons Faculty Scholar

The talk ended with Dennis playing the ukulele and, together with Carol, singing a medley of “Somewhere Over the Rainbow” and “What a Wonderful World.” It was a perfect ending to a beautiful and inspiring life story deeply connected to Hawaii, its culture, and its agricultural legacy. We were very honored that Dennis made the last presentation of his scientific career for MAC, and we wish him and Carol many more years of enjoying retirement. ■

Cold Spring Harbor Laboratory's Annual Plant Course: Advancing the Careers of Next-Generation Plant Scientists Since 1981

BY SUNIL KUMAR KENCHANMANE RAJU, Michigan State University, and CHARLA LAMBERT, Cold Spring Harbor Laboratory Meetings & Courses Program

The Frontiers and Techniques in Plant Science short course at Cold Spring Harbor Laboratory (CSHL) has trained young plant scientists continuously for nearly four decades. Each summer, researchers from across the globe attend this three-week course to learn the latest techniques and approaches in plant science. The intensive course brings together an international cohort of plant scientists to discuss the latest results from a variety of organisms, including Arabidopsis, maize, tomato, and other plants with agricultural, ecological, and evolutionary importance. Its goal is to prepare the next generation of plant biologists to work at the interface of biological, computational, and physical sciences.

The course has trained 546 researchers since its inception in 1981, from plant scientists needing experience in areas outside their expertise to scientists with backgrounds in other disciplines who are transitioning into plant systems. Detlef Weigel, director of the Max Planck Institute for Developmental Biology in Tübingen, Germany, attended the course when he was a graduate student in 1987. "I had zero experience in plant molecular biology," he admitted. "The course was transformative for me, with Ian Sussex, Jo Messing, and Rob Horsch being formidable teachers,



Detlef Weigel, director of the Max Planck Institute for Developmental Biology



Vipula Shukla, senior program officer at the Bill & Melinda Gates Foundation



Joanna Feehan, PhD student at the Sainsbury Laboratory



Group picture from the 2018 Cold Spring Harbor Laboratory Plant Course with José Dinneny, associate professor of biology at Stanford University, front and center (in white shorts).

and a stellar cast of guest lecturers, including my future postdoctoral mentor Elliot Meyerowitz."

Vipula "Vi" Shukla, a senior program officer at the Bill &

Melinda Gates Foundation, trained as a plant biologist in graduate school but found the course similarly transformative in 1995 when starting her postdoc-

toral research. For Vi, the course "provided a much-needed shot of energy and reinvigoration" during this career transition. She knew

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she wanted to stay in plant biology for her postdoc but also to change systems and research topics, and the course was a “super-geeky fun” way to accomplish this goal. Vi summarized her experience in the course as “a window opening onto a whole new, much bigger view of the plant biology world. It really made me think about all the ways I could approach my postdoc work, and the rest of my career, creatively.”

According to José Dinnyeny, associate professor of biology at Stanford University and a current course instructor, assembling a class of trainees who, like Detlef and Vi, have varying levels of exposure to and expertise in plants is an explicit goal of the instructional team each year. José explained, “We pay close attention to educational background, location of the home institute, and personal background” of the applicants admitted to the course. “In particular, we tend to favor those students with a limited understanding of plants, but who show significant interest in learning and applying that knowledge.”

The reason for this strategy is that intensive training in plant biology is often difficult to get in contemporary university courses, which instead focus on generalizable molecular and cellular, biochemical, and quantitative concepts that apply across model systems. This general approach to biology education “is good in some ways as it provides students with a broadly relevant tool kit,” said José, although “plant biology in particular often loses out.” The CSHL course thus fills an educational niche by providing plant biologists the context they need to

understand their research questions and the impact of their work on the field.

The CSHL short course isn’t the only option available to aspiring plant scientists. Institutions like the European Molecular Biology Organization run several advanced short courses in specialized plant topics each year. Vi remarked that the CSHL course is unique in the breadth of topics it tackles, however: “By covering a number of topics over a few weeks, it’s kind of like immersion therapy for plant scientists. . . . There are other courses that focus on narrow topics and go much deeper, but nothing else gives the same spectrum of exposure.” Detlef agreed and added that the course “stands out both because of its very extensive experimental part and because of its duration. . . . One can really do meaningful experiments” during the three weeks.

The CSHL Plant Course admits a maximum of 16 trainees each summer, almost 90% of whom are graduate students or early postdoctoral scholars. Because each cohort is small and the trainees are at similar career levels, even those who are new to plant biology become actively involved in the lectures and laboratory experiments. Joanna Feehan, a PhD student at the Sainsbury Laboratory in Norwich, U.K., attended the course this past summer and described her class as “small and friendly, so it felt like a safe place to ask very basic questions.”

Joanna took the course on her PhD supervisor’s advice because her academic background was not in plant biology. “I did my bachelor’s degree in nursing, and I have a master’s in the development

of retinal degenerations using *Xenopus laevis* as a model system,” she said. “I had not heard of the course before . . . but I was keen to apply and excited by the idea of meeting my ‘international cohort’ of PhD students.” Joanna felt the environment was very accommodating, and each day the material continually challenged her and “approached the edge of knowledge.” She exclaimed, “I couldn’t imagine a better atmosphere for learning as a young scientist!”

Scientific and experimental skills are only half the benefit of participating in the course. Trainees immerse themselves in current research and approaches, but they benefit just as much from connecting with each other and the established plant biologists who teach and lecture in the course. Detlef’s most vivid memories involve the camaraderie among his cohort, and Vi’s are the people themselves. “What an amazing group!” Vi asserted. She made friends during the course whom she’s still close to, and she connected with senior scientists who have provided mentorship and advice throughout her career. “The interactions helped build my confidence and taught me a lot about the diversity of thought,” she explained. “The intensity of the experience cemented some really valuable relationships and networks that have been a huge benefit to my work and life.”

Joanna, the 2018 course alum, is building those relationships and networks in real time: “Since the course ended, I’ve been in contact with fellow students, invited speakers, and course coordinators for collaborations, invitations for seminars, and friendly catch-ups. I look forward to seeing people in the future at conferences and

meetings and staying in touch with the friends I’ve made.”

The camaraderie within the course is particularly evident from the number of alums who choose to return as instructors, guest lecturers, and teaching assistants. Since 2000, 14 such alums have returned to the course in senior roles, as have both Detlef and Vi. Detlef is now a respected scientist who gives invited talks all over the world, but he stated that “it’s almost a bit intimidating to come and speak at the CSHL course!” He’s always impressed by the caliber and curiosity of the course trainees, and he’s often inspired by discussions with them to think of new ideas for future research.

Vi has lectured in the course wearing a few different hats. Initially, as an employee of Dow AgroSciences, she was able to describe how innovative research is done at a big agricultural company. More recently, as a representative of the Bill & Melinda Gates Foundation, she spoke about so-called alternative careers like hers. “There was also a lot of curiosity about the developing world and how agriculture is practiced there,” Vi remarked about the lectures she’s given. “It was really gratifying to see how much interest the trainees had in creating social value and impact through their scientific efforts.”

Each year, the instructors strive to ensure diversity and equity in the course across multiple dimensions. Since 2010, approximately one-third of course trainees have come from institutions outside the United States, 14% of the U.S. trainees have self-identified as being from racial or ethnic groups underrepresented in science, and fully 66% of the

continued on page 13

Members of the ASPB Community Elected to the 2018 Class of AAAS Fellows

Twenty-three members of the ASPB community were elected to the 2018 class of AAAS fellows. Each year, the AAAS Council elects fellows based on their contributions to science and technology in the areas of research; teaching; technology; services to professional societies; administration in academe, industry, and government; and communicating and interpreting science to the public. Fellows are recognized from within the AAAS membership for their “efforts on behalf of the advancement of science or its applications [that] are scientifically or socially distinguished.”

New fellows will be honored with a certificate and a blue and gold rosette to symbolize their distinguished achievements at the 2019 AAAS annual meeting in February. The nominating procedures can be viewed at <http://www.aaas.org/current-nomination-cycle>.

Congratulations to the following:



ADVANCING SCIENCE, SERVING SOCIETY



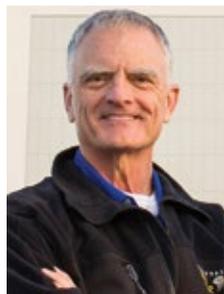
Federica Brandizzi
Michigan State University

For distinguished contributions to the field of plant cell biology, particularly for the characterization of the endoplasmic reticulum and the Golgi apparatus in plant cells.



Savithramma P. Dinesh-Kumar
University of California, Davis

For distinguished contributions to plant immune receptors and the role of chloroplast stromules and autophagy in innate immunity.



Robert J. Ferl
University of Florida

For distinguished scientific contributions to astrobiology and a leadership role in biological and physical science in space.



James A. Guikema
Kansas State University

For distinguished contributions to the fields of photosynthesis and gravitational biology and in research administration at Kansas State University and NSCORT (NASA).



Elizabeth E. Hood
Arkansas State University

For outstanding contributions to the field of plant biotechnology and molecular biology.



Carol A. Ishimaru
University of Minnesota

For distinguished contributions to the field of plant bacteriology, particularly in characterization and genomics of coryneform pathogens and development of a biological control for fireblight disease.



David (Dave) Peter Jackson
Cold Spring Harbor Laboratory

For discoveries of the genes and signals that regulate stem cell behavior in plants, thereby affecting plant architecture and yield.

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2018 AAAS FELLOWS
continued from page 11

Joseph Jez

Washington University in St. Louis

For distinguished contributions to the field of biology, particularly for studies on the molecular basis of biological processes in plants, microbes, and nematodes.



Jeffrey B. Jones

University of Florida

For distinguished contributions in research and training in the field of bacterial disease control in fruits and vegetables and toward an improved molecular understanding of bacterial disease processes.



Bruce A. Kimball

USDA-ARS/The Greenleaf Group

For outstanding contributions toward understanding crop responses to global climate change.



Andrew D. B. Leakey

University of Illinois at Urbana-Champaign

For distinguished contributions to plant science, particularly for advancing integrative understanding of crop carbon and water relations in the context of global environmental change.



Jianxin Ma

Purdue University

For distinguished contributions to the field of plant genetics and breeding, particularly for uncovering molecular networks underpinning key agricultural traits such as maturity and growth.



Ray Ming

University of Illinois at Urbana-Champaign

For distinguished contributions to the field of sex chromosome evolution, particularly using genomic technologies to study early stages of sex chromosomes relevant to crop improvement.



Karl Joseph Niklas

Cornell University

For quantifying the relationship between plant form and function using physics, engineering, and mathematics, essentially founding the field of allometry in plants.



Jeffrey M. Osborn

The College of New Jersey

For distinguished contributions to undergraduate science education, particularly through undergraduate research experiences in biology, and for faculty development with respect to undergraduate research.



Scott Charles Peck

University of Missouri

For distinguished contributions to the field of plant-microbe interactions and disease resistance in plants with major contributions to proteomics technology.



Kathrin Friederike Stanger-Hall

University of Georgia

For distinguished contributions to interdisciplinary undergraduate science education, evolution, and faculty development, particularly promotion of critical thinking in undergraduate education.



David M. Stelly
Texas A&M University

For instilling the thirst for knowledge of plant breeding, genetics, cytogenetics, and molecular methods in students and colleagues in cotton, sorghum, soybean and potato.



Joseph B. Yavitt
Cornell University

For distinguished contributions to soil biogeochemistry, particularly as it relates to production and consumption of atmospheric greenhouse gases.



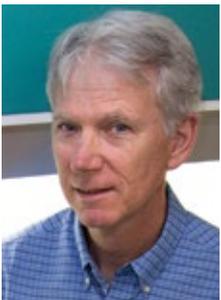
Katharine Nash Suding
University of Colorado Boulder

For distinguished contributions to the field of ecology, particularly for applying the concept of alternative stable stage theory to problems in restoration ecology.



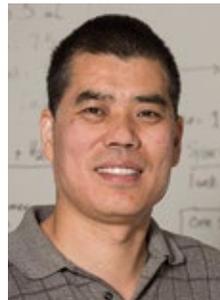
Jianming Yu
Iowa State University

For distinguished contributions to genetics and genomics of plant crops, with particular attention to processes associated with the domestication of maize.



Steven M. Theg
University of California, Davis

For distinguished contributions to the study of protein translocation across biological membranes, particularly those in chloroplasts, and of chloroplast bioenergetics.



Baohong Zhang
East Carolina University

For distinguished contributions at the interface of molecular genetics and plant science, particularly for discoveries on microRNAs and cotton biology. ■

COLD SPRING HARBOR
continued from page 10

trainees have been women. José said that diversity should always be a criterion when selecting trainees and inviting speakers and noted that “often the problem is forgetting to think enough about it.” More than 40% of invited speakers are now women, a result of the instructors thinking critically about diversity in the senior course roles and how it might best reflect the trainee demographics.

One of us (SKKR) is a 2015 alum of the course and can

personally attest to its transformative nature in the areas of scientific research skills, professional development, and network building. “Not only did I meet prominent scientists in my field, but I also developed close connections with my exceptional fellow participants, all of whom are advancing in their careers to be at the forefront of plant science. To this day, I seek out the course instructors for career advice, and I already have my network ready for collaborations when I start an independent research position. In

a way, the CSHL course has been like a booster club for my scientific advancement.”

Acknowledgments

We thank the NSF Biological Sciences Directorate, which provides major support for the CSHL course on Frontiers and Techniques in Plant Science and has generously supported it for more than half of the 37 years it’s been running. We also acknowledge the incredible efforts of course faculty both past and present, as well as Patricia Klieger of the CSHL Meetings & Courses Program, who ushered this article into existence. ■

**Frontiers and Techniques
in Plant Science Course**

June 28–July 18, 2019

<http://bit.ly/cplan19>

Application Deadline:

March 15, 2019

Course alumni webpage:

<http://bit.ly/cshlplantalum>

Twitter:

<https://twitter.com/CSHLplantcourse>

Policy Update

BY LAUREN BROCCOLI
Lewis-Burke Associates, LLC

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

FY2019 Appropriations Update

Although 75% of federal discretionary funding for fiscal year (FY) 2019 was passed into law earlier this fall, Congress has five of the 12 annual appropriations bills left to finalize. These bills provide funding for ASPB's priority agencies, including NSF, the National Institute of Food and Agriculture (NIFA), the Agriculture and Food Research Initiative, and ARS.

These agencies are currently operating under a continuing resolution (CR) for the FY2018 funding levels that expired on December 7. The federal day of mourning on December 5 for George H. W. Bush complicated efforts to finalize these bills, and Congress was expected to pass a second CR for these agencies that would extend funding through December 21. Several contentious issues unrelated to science, such as funding for the border wall, are delaying the final package. Although this additional stopgap measure provided members more time to negotiate, the increasing partisan divide over funding for the Department of Homeland Security increased the chances of a partial government shutdown.

ASPB released an Action Alert regarding the December 7 CR deadline.

Sources and Additional Information

- The text of the second CR can be found at <https://tinyurl.com/y9nb4rqn>.
- ASPB's Action Alert can be found at <https://tinyurl.com/ya3rv3nq>.

Farm Bill Update

Senate and House Agriculture Committee leadership announced they had reached a deal in principle on the 2018 Farm Bill and submitted the final package to the Congressional Budget Office for scoring. Senate leadership had been urging a final deal, with a conference report released to the public and floor votes expected in the second week of December. The bill could also be attached to a larger FY2019 funding package.

Conference negotiations stalled over controversial provisions proposed in the House bill that would impose stronger work requirements for beneficiaries of the Supplemental Nutrition Assistance Program and disagreements over the forestry title provisions related to wildfires.

The 2014 Farm Bill technically expired on September 30, but the impact of the expiration of critical programs such as dairy will not affect farmers until January. There is also increasing pressure to finalize the Farm Bill before the end of the 115th Congress from House ranking member Colin Peterson (D-MI), one of the most conservative Democratic members, who has rejected the notion of restarting the process in the 116th when he is expected to become Agriculture chairman.

Source and Additional Information

- The press release from the Senate Agriculture Committee can be found at <https://tinyurl.com/y8wqwsvu>.

Midterm Elections Impact

As a result of the midterm elections on November 6, Democrats gained 39 seats and won the majority in the House of Representatives for the 116th Congress, and Republicans expanded their majority by two seats in the Senate.

The loss of several House Republican science champions, including House Commerce, Justice, Science Appropriations Subcommittee Chair John Culberson (R-TX), will create leadership voids. Looking ahead, Democrats will use the majority to focus on oversight of the Trump administration's policies through hearings and investigations, as well as advancing an agenda through messaging legislation.

House congressional committees with jurisdiction over ASPB's priority federal agencies will experience several leadership changes in the 116th Congress:

- The House Appropriations Committee will be led by two women for the first time in history. Ranking member Nita Lowey (D-NY) will become chair, and Kay Granger (R-TX) will serve as ranking member. Subcommittee leadership has not yet been announced.
- House Science Committee ranking member Eddie Bernice Johnson (D-TX) will become chair, and Frank Lucas (R-OK) will be ranking member.
- House Agriculture Committee ranking member Collin Peterson (D-MN) will become

chair and Chairman Mike Conaway (R-TX) will shift to ranking member.

Senate leadership of congressional committees will remain largely unchanged. Of interest to ASPB is the vacancy of ranking member on the Senate Commerce, Science, and Transportation Committee after Bill Nelson (D-FL) lost his seat.

Because many moderate Republicans lost in the House and several moderate Democrats lost in the Senate, finding areas of common ground may be even more difficult in the next Congress as the House and Senate set up dueling agendas in the months ahead.

Sources and Additional Information

- More information on the midterms and a comprehensive analysis of prospective impacts on higher education and research are available at <https://tinyurl.com/y9gg8o4e>.
- Election results by district are available at <https://tinyurl.com/ybk8jy4s>.

Senate Agriculture Committee Favorably Reports Nomination of Scott Hutchins for USDA REE Undersecretary

On November 28, the Senate Agriculture Committee held a hearing to consider the nomination of Scott Hutchins as USDA Undersecretary of Agriculture for Research, Education, and Economics (REE), who also serves as USDA chief scientist.

Hutchins, the former global leader of Corteva AgriScience, is an entomologist by training and a former president of the Entomological Society of America as well as an adjunct professor at the University of Nebraska–Lincoln. There is no scheduled vote on his nomination at this time.

Both Chairman Pat Roberts (R-KS) and ranking member Debbie Stabenow (D-MI) emphasized the importance of agricultural research in their respective opening statements, as did Senator John Hoeven (R-ND), who chairs the Senate Agriculture Appropriations Subcommittee. Overall the hearing was not contentious, although committee members questioned Hutchins on several hot-button issues including climate change and the proposed relocation of NIFA and the Economic Research Service (ERS) outside the DC area.

Although he had not yet been briefed on the NIFA/ERS relocation, Hutchins stated that he assumed that logistical concerns with respect to core functions, personnel, and collaboration with other agencies had been addressed. He stressed that “details matter” for major organizational changes and that, if confirmed, he would use his professional experiences with mergers to ensure that the science, independent assessments, and collaborative efforts with other federal research agencies are not disrupted by the relocation.

Senator Sherrod Brown (D-OH) pushed Hutchins on whether humans are driving climate change and whether he would support the findings of the National Climate Assessment despite President Trump’s recent critique. Hutchins affirmed his support for the report, remarking that agricultural science

can provide solutions to carbon sequestration and facilitate the innovations required to help farmers and ranchers adapt to climate change. Additionally, he discussed overlaps between the public and private sector but also noted their independent roles in the larger research enterprise. Finally, Hutchins commented on the land-grant mission as “timeless” and committed to learning more about ARS facilities across the country, some of which were proposed for elimination by the Trump administration in the FY2018 and FY2019 budget requests.

On December 5, the Senate Agriculture Committee voted to favorably report Hutchins’s nomination to the Senate. Chairman Roberts was confident that the full senate would confirm him and other approved nominees “as quickly as possible.”

Sources and Additional Information

- The archived webcast and witness testimony are available at <https://tinyurl.com/y999dgg9>.
- The administration’s announcement of Hutchins’ appointment can be found at <https://tinyurl.com/ybp6w47m>.
- The Senate Agriculture Committee’s press release on the committee vote on Hutchins can be found at <https://tinyurl.com/y6u3rtcm>.

NSF BIO Lifts PI Limits Amid Intense Community Pressure

On November 15, NSF acting assistant director for Biological Sciences (BIO) Joanne Tornow announced that BIO is lifting all PI or co-PI limits on proposals for FY2019 and will be re-releasing solicitations to reflect these changes. Additionally, BIO is seeking to establish a new

subcommittee of the BIO Advisory Council to “assist in developing the evidence base for any future policy changes that may be needed.” This move comes after BIO received a great deal of scrutiny following the establishment of PI limits in August 2018. According to the drafted charge of the proposed subcommittee, BIO hopes to have a completed report by the end of FY2019 or early FY2020.

Sources and Additional Information

- The statement from the BIO Directorate can be found at <https://tinyurl.com/y9yundxf>.
- Additional information about the BIO Advisory Council is available at <https://tinyurl.com/y8886jgk>.

USDA Inspector General to Review Secretary Perdue’s Plan to Move Agencies

On November 1, Reps. Eleanor Holmes Norton (D-DC) and Steny Hoyer (D-MD), the House minority whip, announced that USDA Inspector General (IG) the Honorable Phyllis Fong would investigate the proposed relocation of NIFA and ERS outside the greater DC area. The investigation follows a joint letter from Norton and Hoyer to the IG questioning the legality of the move, the rationale for the reorganization, and the process through which this proposal was developed. The letter refuted the agency’s claim that the move would improve recruitment, noting that there was no evidence that NIFA or ERS has had issues with workforce recruitment and retention, and requested a cost–benefit analysis to determine the economic impact of the proposed move.

The agency’s proposal has also received significant pushback from agricultural economists and others

from the scientific community with concerns that the relocation would impede collaboration with other federal agencies and create conflicts of interest.

USDA announced it had received more than 130 expressions of interest to host one or both of the agencies in response to the *Federal Register* notice issued in August. Additionally, several lawmakers have endorsed the proposal, although it has not been officially approved by either the House or Senate Appropriations or Agriculture Committees. Secretary Perdue announced that the agency was moving forward with an “aggressive timeline” and would announce the new location by the end of the first quarter of next year.

Sources and Additional Information

- The letter from Reps. Hoyer and Norton is available at <https://tinyurl.com/ybjz8fjy>.
- The press release announcing the IG investigation is available at <https://tinyurl.com/y9s736x6>.

Administration Releases Congressionally Mandated Climate Assessment

The U.S. Global Change Research Program (USGCRP) published the fourth iteration of the National Climate Assessment, a comprehensive report published every four years that identifies ongoing climate shifts and the consequences these changes may have for the environment, public health, public safety, infrastructure, and more. This year’s report explored these changes in the context of 10 federal regions and 16 national topic areas, including but not limited to water; energy

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POLICY UPDATE *continued from page 15*

supply, delivery, and demand; oceans and marine resources; air quality; and coastal effects.

According to this congressionally mandated report, the impacts of extreme weather are not limited to one industry or region; rather, it will have lasting impacts on natural, built, and social systems, and the interconnectedness of these systems makes them increasingly vulnerable. As a result, the report encourages joint planning efforts across industries, geographic regions, and stakeholder groups to identify and respond to climate-related threats ahead of time.

The report reaffirms concerns from environmental groups that the effects of climate change and the subsequent extreme weather events will only worsen unless immediate actions are taken to curb greenhouse gas emissions. Given the way carbon dioxide lingers in the atmosphere, some projected environmental concerns are already irreversible.

In a public statement following the release of the report, President Trump dismissed the USGCRP finding that a failure to immediately pursue mitigation and adaptation strategies would result in hundreds of billions of dollars in economic losses in the coming decades. In addition, acting Environmental Protection Agency administrator Andrew Wheeler made a statement during a *Washington Post* event speculating that the previous administration had influenced the report, focusing on worst-case scenarios, and implying that the climate models used in the report could be misleading. John Holdren, the science adviser under President Obama, publicly denied that the previous administration

had any effect on the findings of the USGCRP.

The Trump administration's response to the report is consistent with previous positions on climate change, including the withdrawal of the United States from the Paris Climate Accord and the ongoing efforts to reduce environmental regulations and reinvigorate the coal industry.

Sources and Additional Information

- The full Fourth National Climate Assessment is available at <https://tinyurl.com/ybw3k3rr>.
- Additional information on the administration's response to the report is available at <https://tinyurl.com/ycwjuh29x>.

Funding Opportunities

Midscale Research Infrastructure Solicitation

On November 21, NSF released the first of two new funding opportunities for Midscale Research Infrastructure, one of NSF's 10 Big Ideas for Future Investment. Through this solicitation, NSF expects to support a wide range of design and implementation activities for equipment, infrastructure, and computational hardware and software for the advancement of fundamental science and engineering, as well as STEM education research. This solicitation is the smaller of the two planned solicitations and will support projects with budgets between \$6 million and \$20 million. (The second solicitation, which is expected in the coming weeks, will support larger projects that cost between \$20 million and \$70 million.) Proposals will be evaluated on their potential to enable transformative advances in science and engineering and will

be reviewed both by an interdisciplinary group centered in the Office of Integrative Activities and by the relevant NSF divisions.

NSF anticipates making three to 10 awards worth a total of \$60 million, depending on the availability of funds, with no limits on the number of preliminary proposals that can be submitted by a single lead organization. Lewis-Burke anticipates that these solicitations will be repeated in future years because the National Science Board recently called for NSF to make a sustained, long-term commitment to midscale infrastructure. Preliminary proposals are due February 19, 2019. Full proposals are by invitation only and will be due May 20, 2019. Letters of intent are not required.

Sources and Additional Information

- A full funding opportunity write-up by Lewis-Burke is available at <https://tinyurl.com/y8ldb9w>.
- The full solicitation can be found at <https://tinyurl.com/y9ch48y8>.
- The Dear Colleague Letter that first announced this solicitation can be found at <https://tinyurl.com/ycouj2s8>.
- More information about NSF's 10 Big Ideas can be found at <https://tinyurl.com/ya2jdlfb>.

Materials Innovation Platforms Solicitation

On November 9, NSF released their second solicitation for the Materials Innovation Platforms (MIP) program. MIP is a Midscale Research Infrastructure initiative that seeks to support novel infrastructure and tools for cutting-edge materials research. The MIP program is intended to support a community of researchers and

build a scientific ecosystem that is accessible to universities, national laboratories, and industry.

The 2019 MIP competition is focused "on the convergence of materials research with biological sciences for developing new materials." MIP is aligned with the Materials Genome Initiative's approach to achieving breakthroughs in materials research, which includes "materials synthesis/processing, materials characterization, and theory/modeling/simulation applied to targeted outcomes." NSF seeks proposals that are collaborative and reflect an understanding of the iterative process of discovery.

The MIP solicitation is intended to support acquisition and development of novel, cutting-edge infrastructure and instruments, aligning with many of NSF's 10 Big Ideas, including Growing Convergence Research, Harnessing the Data Revolution, and Midscale Research Infrastructure. NSF anticipates distributing one to three awards for a total of \$15 million to \$25 million over five years, with \$12 million available in FY2019. This solicitation does not require letters of intent or preliminary proposals, and full proposals are due February 4, 2019.

Sources and Additional Information

- The complete solicitation is available at <https://tinyurl.com/ycjg2u93>.
- Additional information on the MIP program is available at <https://tinyurl.com/y7xntdqp>.
- Additional information on NSF's 10 Big Ideas is available at <https://tinyurl.com/yboun5ge>.
- Additional information on the Materials Genome Initiative is available at <https://tinyurl.com/y9pstzsz>. ■

Promoting Plant Biology at National Association of Biology Teachers 2018

BY ALISA HUFFAKER

University of California, San Diego

The ASPB Education Committee hosted an Education & Outreach exhibit at the annual conference of the National Association of Biology Teachers in San Diego, California. Organized by ASPB Education Committee member Scott Woody and education coordinator Winnie Nham with the assistance of enthusiastic volunteers from the University of California, San Diego, the well-visited booth displayed a variety of educational materials and hands-on experiments.

Long-time ASPB members Maarten Chrispeels and Steve Briggs fielded a huge variety of questions from educators interested in using plants in the classroom. Also very popular with visitors were demonstrations and protocols for exploring plant chemistry contributed by the Alisa Huffaker and Eric Schmelz laboratories at UC San Diego. Along with the PIs, graduate students Elly Poretsky and Carleen Villareal and postdoctoral researchers Keini Dressano and Adam Steinbrenner engaged guests in a multisensory experience including a plant volatile scent panel and simple plant treatments and extractions. Visitors were intrigued to learn the chemistry behind familiar smells such as wintergreen and

eucalyptus and to find out that plants mount dynamic immune responses. Many snapped up protocols to perform simple antimicrobial assays with plant-derived chemical extracts in their own classes.

Booth visitors were also wowed by an accessible and inexpensive LED light panel growth system developed by Scott Woody to facilitate plant growth in classroom settings. Assisted by ASPB member Bharti Parihar, Woody demonstrated the setup to many enthusiastic groups eager to re-create the growth systems for use in their classrooms. Also well received were straightforward but sophisticated tools from the University of Wisconsin for teaching genetics and genomics from a plant-based perspective. Software developed by Woody and collaborators provides an *in silico* means to perform association mapping studies based on rapid-cycling *Brassica rapa* genetic resources. Booth visitors were excited to have access to inexpensive and user-friendly methods enabling hands-on student-led discovery of the connection between visible plant phenotypes and underlying genotypes.

The importance of ASPB outreach to educators was highlighted by the fact that most visitors weren't aware of plant-based



Scott Woody sharing educational resources with booth visitors at NABT 2018.

teaching resources, and given their own lack of familiarity with the area, they've often relegated plants to brief coverage of their role as carbon fixers. However, discussions with many teachers made it clear that although many weren't currently using plants in their classroom, given access to inexpensive, simple, and well-developed resources, they're excited about doing so. This enthusiasm is encouraging and

demonstrates that with continued effort, there is ample opportunity to increase engagement of educators and their students with plant biology in a classroom setting. Whether inspiring the next generation of plant researchers or simply promoting plant literacy, continued outreach by ASPB on behalf of its membership is a worthy cause! ■

The ASPB Plant Biology Learning Objectives, Outreach Materials & Education Grant

[HTTP://BLOOME.ASPB.ORG](http://BLOOME.ASPB.ORG)

Applications accepted:
December 1, 2018–April 2, 2019

Maximum funding: \$50,000



Open to ASPB members with education and outreach projects that advance youth, student, and general public knowledge or appreciation of plant biology. These projects should strive to promote and explain varying facets of the

- Importance of plants for the sustainable production of medicine, food, fibers, and fuels;
- Critical role plants play in sustaining functional ecosystems in changing environments;
- Latest developments in plant biotechnologies, including genetic modifications that improve the quality and disease and stress resistance of crops;
- Discoveries made in plants that have led to improved human health and well-being; and
- Range of careers related to plant biology or available to plant biologists.

Successful applicants will propose projects that develop, implement, widely disseminate, and evaluate resources that align with current effective scientific teaching practices such as those offered in the

- Vision and Change recommendations,
- ASPB's Core Concepts in Plant Biology,
- ASPB 12 Principles of Plant Biology, or
- Next Generation Science Standards.

Plant BLOOME supports plant science education or outreach projects only. It does not support lab or field research projects.

ASPB Summer Undergraduate Research Fellowship (SURF)

<http://surf.aspb.org/>

ASPB's Summer Undergraduate Research Fellowship (SURF) funds promising undergraduate students so they can conduct research in plant biology during the early part of their college career. SURF recipients must present their research at ASPB's annual Plant Biology meeting in the year following the fellowship award.

Eligibility

Application is open to all full-time undergraduate students in a degree-granting program. Students completing their second year are preferred, but well-prepared first- and third-year students who provide evidence of a strong interest in plant biology may apply as well. Undergraduates needing more or less than the standard four years to earn a degree may still be eligible. International students or students following nontraditional academic calendars are welcome. In order to provide support to the maximum number of students, SURF awards are limited to students without other sources of stipend or salary for the proposed research. Supplemental funds for room and board are acceptable.

Faculty Mentors

Students must secure a mentor before submitting an application. The proposed research project must be pursued in the mentor's laboratory. Mentors must be a member of ASPB, have an ongoing research program of high scientific merit, and demonstrate a commitment to undergraduate education and research. Mentors are expected to attend Plant Biology 2020 in Washington, DC, with their SURF student.

Need a Mentor? Students may work with a mentor at their own institution or at another institution. Additional guidance is available by contacting ASPB (see below).

Application

A complete application will include a research project statement and personal statement from the student, a research and mentoring statement from the mentor, a letter of recommendation from another faculty member (not the mentor or in the mentor's lab), and official undergraduate transcripts.

Selection Criteria

Competitive student applicants should have high academic achievement, strong motivation and skills for conducting research, and career objectives showing interest in or relevance to plant biology. Reviewers also will consider the contribution of the project to the mentor's research program, institutional commitment to the proposed research, and the mentor's commitment to undergraduate research.

Successful applicants receive a \$4,000 summer stipend, a one-year membership in ASPB, and \$700 (paid to the mentor or institution) for materials and supplies. Each fellowship also provides student

travel support to Plant Biology 2020, the ASPB annual meeting, to be held July 25–29, 2020, in Washington, DC. These travel funds are sent only to the 2019 SURF recipients who (1) register for the meeting, (2) submit proof of using social media or other outlets to communicate with the public or peers about the SURF project, and (3) author and submit an abstract about their SURF project to present as a poster at the meeting.

A Successful SURF Applicant's Sample Timeline

Contact potential mentors: NOW

Discuss research topics: NOW

Request a reference letter: by January 2019 (from college/university faculty member who is not the mentor)

Submit SURF application: by the deadline, March 15, 2019 (11:59 p.m. ET)

Look for emailed decisions: by mid-April 2019

Conduct research: over 10 consecutive weeks when classes are not in session

Present research: July 25–29, 2020, at Plant Biology 2020 in Washington, DC.

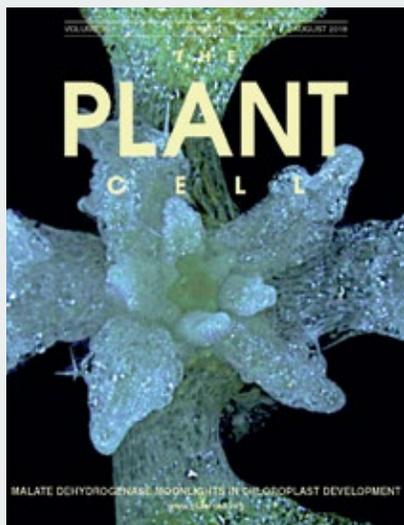
Applications will be accepted December 1, 2018, through March 15, 2019 (11:59 p.m. ET).

Need additional help?

Contact Winnie Nham, ASPB Education Coordinator (education@aspb.org).

The Plant Cell 30th Anniversary Favorite Images

Celebrating 30 years of progress in capturing and creating images in plant science



High-quality image reproduction was one of the central ideas behind the founding of *The Plant Cell* 30 years ago. Those who remember the early days of the journal will no doubt recall the novelty of a scientific journal printed on heavy weight glossy paper. The ability to capture and faithfully reproduce images obtained from living organisms, from single cells—increasingly, even single molecules—to complex tissues to whole plants and even populations of plants with remote sensing and thermal imaging, and to create images—graphs and plots—that facilitate our comprehension of data obtained by other means, is vital to any scientific endeavor. The goal of scientific research is increased knowledge and understanding, but frequently it also reveals the astonishing beauty of our world.

We invite our readers to submit their favorite images from *The Plant Cell* over the past 30 years. Images will be accepted until March 31, 2019.

Journal staff and leadership will select images to be displayed in an online picture show, and several images will be displayed as a poster at Plant Biology 2019. Selection will be based on the scientific significance and aesthetics of the image.

For more information visit plantcellbestimages.aspb.org.



ASPB staff are dedicated to serving our members.
We welcome your questions and feedback.

For quick response, email us at info@aspb.org.