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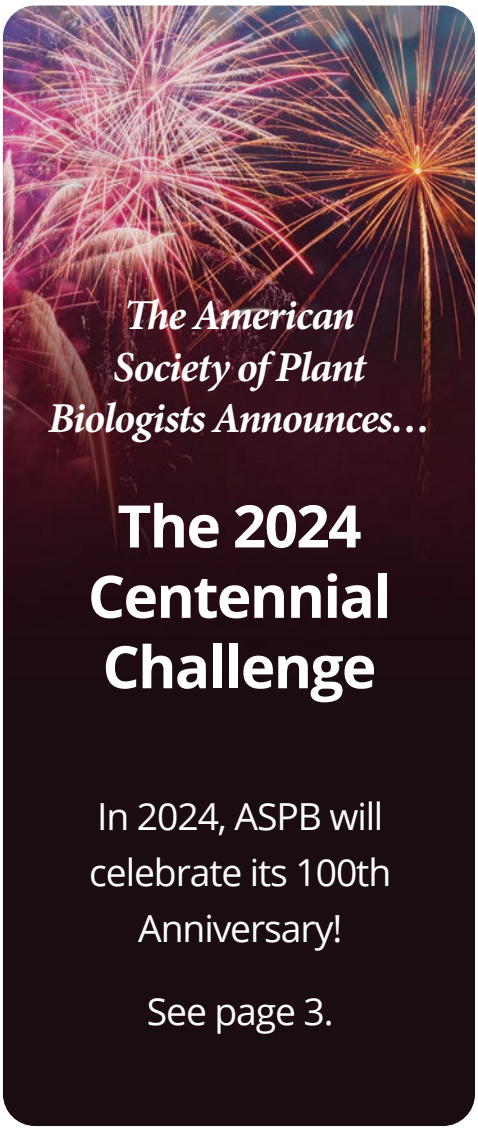
ASPB News

THE NEWSLETTER OF THE AMERICAN SOCIETY OF PLANT BIOLOGISTS



President's Letter

Critical Infrastructure

BY MAUREEN McCANN
ASPB President, National Renewable Energy Laboratory

Global agricultural production of rice, wheat, maize, and soybean, crops that together provide over 70% of human calories, was at close to record yields last year, despite the COVID-19 pandemic. Governments recognized growers as essential workers and the food supply chain as critical infrastructure. Early concerns about potential food shortages proved unfounded. Our collective fears for the fragility of our food supply should now be transformed into renewed respect and gratitude for farmers and growers, as for other frontline workers.

A key component of the critical agricultural infrastructure is the up-front investment that governments make in research. In the United States, this investment includes USDA laboratories and land grant universities, which develop technologies relevant to agriculture and give them directly to growers, and the human capital of PhDs trained in fundamental plant biology. Although mechanization, industrialization, and production of synthetic fertilizers have contributed to dramatic crop yield increases over the past 50 years, as plant scientists we can be proud of our discoveries leading to improved seed genetics and accelerated breeding strategies that changed the stature and form of plants in the fields and led to increased grain yields.

It is a remarkable achievement that, on the same land area, U.S. corn production increased from 100 metric tons in 1960 to 367 metric tons in 2020. Soybean production more than doubled, from 20 to 46 metric tons, in the same time frame. However, farmers have not reaped the full benefits of these

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Contents

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).

Contact: Crispin Taylor, Editor, *ASPB News,* 15501 Monona Drive, Rockville, MD 20855-2768 USA; ctaylor@aspb.org; 301-296-0900.

The American Society of Plant Biologists Announces…

The 2024 Centennial Challenge

In 2024, ASPB will celebrate its 100th Anniversary! To ensure that the Society will thrive for the next 100 years, we aspire to raise $3 million in donations by the Plant Biology 2024 meeting. The primary purpose of the Centennial Challenge is to significantly enhance support for ASPB professional development programs and other good works of the Society, as directed by the Board of Directors, that nurture future generations of plant scientists.

This effort is being led by the 2024 Centennial Challenge Committee (http://bit.ly/CentennialCharter; https://aspb.org/about/committees/), which currently comprises Brian Larkins (chair), Debby Delmer, Rob Last, Machi Dilworth, and Kent Chapman (treasurer; ex officio), as well as staff liaisons Clara Woodall (CFO; ex officio) and Crispin Taylor (CEO; ex officio). We thank Ralph Quatrano for his previous service on this committee. **For more details, please read on . . .**

Examples of How Your Donations Can Be Put to Good Use

- Travel grants for students and postdocs to attend ASPB meetings
- Internships and scholarships for early career members
- Support for symposia, workshops, and specialty meetings on timely topics
- Many other activities that, with your support and recommendations, can become possible!

Lifetime Giving Circles

To encourage a culture of giving that will sustain the Society through the Centennial Challenge and beyond, ASPB has set up the following lifetime giving circles. We will track your donations over time and, with your permission, add your name to each roster as you achieve the corresponding level of giving.

Charles Reid Barnes Circle	**$5,000–$9,999**
Katherine Esau Circle	**$10,000–$24,999**
George Washington Carver Circle	**$25,000–$49,999**
Melvin Calvin/Andrew Benson Circle	**$50,000–$74,999**
Joseph Varner Circle	**$75,000–$100,000**
Barbara McClintock Circle	**$100,000+**

You can learn more about these luminaries and their impacts on plant science by clicking on their names (online) to see a brief biography (https://aspb.org/aspb-lifetime-giving-circles/).

Become a Lifetime Friend of ASPB

As your contributions grow, so does your ability to have an even greater impact on the future of the Society. Whether or not you are a member of ASPB, all of your donations—from the time when our tracking system was implemented in late 2015—are recorded by our staff. You can track your contributions by using the shortcut https://invoices.aspb.org to access the member portal, logging in, and reviewing the Invoices tab by date on your profile. If you have a record of a significant donation prior to late 2015, please contact ASPB CEO Crispin Taylor at ctaylor@aspb.org so we can credit your lifetime giving record accordingly. As your donations accumulate through the coming years, your generosity will be recognized by ASPB, as shown in the Lifetime Giving Circles box to the left.

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The American Society of Plant Biologists Announces…

The 2024 Centennial Challenge

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Become a Member of the Legacy Society

Starting in 2016, prominent and long-time Society members were invited to help establish the Legacy Society. One hundred and thirty-six individuals agreed to make a donation of at least $5,000, becoming the Founding Members of the ASPB Legacy Society. Please visit https://aspb.org/aspb-legacy-society/ for a list of names and biographies of Legacy Society Founding Members. The success of this activity provided the incentive to continue moving forward with the 2024 Centennial Challenge.

We welcome new Legacy Society members, and any donor to ASPB who reaches a lifetime total of $5,000 will automatically become a member of the Legacy Society. Although new Legacy Society members will continue to need to pay annual membership dues, a great way to support the Centennial Challenge is to bring your lifetime donations up to this level—join up!

Honor an Outstanding Scientist or Mentor as a Pioneer of ASPB

- *Who do you most admire for their contributions to the field of plant biology?*
- *Who was your most important plant science teacher?*
- *Was your PhD or postdoctoral adviser an outstanding mentor not just for you, but for others as well?*

Long-time ASPB members were invited to recognize luminaries (living or deceased) as ASPB Pioneers by gathering donations from former students, postdocs, and colleagues totaling at least $5,000 in support of the Centennial Challenge. Their enthusiastic initial response has created an excellent foundation on which to build: As of mid-April 2021, 55 Pioneers had been recognized.

Our goal is to recognize more than 100 ASPB Pioneers by the Plant Biology 2024 centennial meeting. A short biography of each Pioneer and the names of their supporters appear on the ASPB Pioneer Member website (https://aspb.org/aspb-pioneer-members/), which you can access from the drop-down menu under "Membership" on the main navigation bar on the ASPB website. (Please note: If you have already donated in support of one or more Pioneers, we invite you to submit a succinct testimonial. Testimonials should be submitted via the Google form [https://aspb.org/membership/pioneer-testimonials/] that is linked from the Pioneer page.)

We encourage everyone to join the effort to recognize outstanding plant scientists and ASPB members while helping ASPB attain its financial goal for the Centennial Challenge. If you would like to lead an effort to recognize a Pioneer, please contact Brian Larkins at larkins@email.arizona.edu or Crispin Taylor at ctaylor@aspb.org for directions on how to get started. You can also add your personal recognition for an existing Pioneer by making your pledge through our donor commitment form (https://aspb.org/pioneer-legacy-donation/) and joining the current list of donors for that Pioneer.

Make a Lasting Impact on ASPB by Including the Society in Your Estate

There is perhaps no better way to support the Centennial Challenge—while making a lasting impact on the future success of ASPB and plant biology—than by including a generous gift for ASPB in your estate. For example, you may choose to

- Arrange a gift to ASPB through your will, living trust, retirement plan, or life insurance policy.
- Make ASPB a designated beneficiary for all or a portion of an investment or IRA account. The direct gift of appreciated stocks, bonds, or mutual funds is a generous and tax-advantageous way to support the Society.

Please consult ASPB's gift acceptance policy (http://bit.ly/ASPB-gift-acceptance-policy), and feel free to contact Brian Larkins (larkins@email.arizona.edu), chair of the Legacy Society Leadership Committee, or Crispin Taylor (ctaylor@aspb.org), ASPB CEO, to discuss your options for estate giving, especially if you wish to contribute some other type of asset or to learn more about the mechanisms for considering, approving, and implementing the expectations of major individual, corporate, or philanthropic donors.

Special efforts are planned between now and 2024 to encourage members to remember ASPB in their estate planning. There are opportunities to become a major personal, philanthropic, or corporate supporter of ASPB by making significant donations that are sufficient on their own to allow activities such as

- A named internship, fellowship, or award
- A special symposium or workshop at one of our meetings
- In consultation with ASPB, the opportunity to design your own special gift to the Society.

Important Information Regarding Your Donations

- ASPB is a 501(c)(3) nonprofit organization under United States Internal Revenue Service (IRS) guidelines (tax ID 53-0258999). Please consult with your tax accountant regarding possible deductibility of your gift under IRS guidelines.
- All donations received from 2016 through the end of 2024 will be counted toward the Centennial Challenge goal.
- Donations to the Centennial Challenge can be either unrestricted or restricted. Restricted gifts, such as those named in honor of a specific person and/or that have a specific purpose, require record-keeping and management actions. The funds from unrestricted donations can be used for good works as directed by the ASPB Board of Directors. See ASPB's gift acceptance policy for more details (http://bit.ly/ASPB-gift-acceptance-policy).
- If you are interested in making a major gift or considering donations of any special assets, please consult with CEO Crispin Taylor at ctaylor@aspb.org before making the gift.
- Please be sure to check whether your company or institution offers matching funds for charitable donations!
- ASPB does not have the capacity to provide advice regarding estate planning. Please consult your legal, investment, and/or tax adviser for advice on all such donations. To have your estate donation(s) credited to the 2024 Centennial Challenge, please inform Crispin Taylor before the end of 2024 of your plans for legacy giving and provide a copy of the relevant directives.

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The American Society of Plant Biologists Announces…

The 2024 Centennial Challenge

Form for Making Donations by Mail in Support of the 2024 Centennial Challenge

Giving online is easier and quicker; please visit https://aspb.org/donate/ to do so. However, if you prefer, use this form to submit by mail. If you have questions on how to complete this form, please contact Shoshana Kronfeld at skronfeld@aspb.org.

Unrestricted Donations

Unrestricted donations to ASPB (ASPB General Fund) will be used where the need is greatest, as described in the gift acceptance policy. The anticipated emphasis is to support professional development, including such things as travel grants, fellowships, and internships, as well as to cover costs associated with fundraising. Although donations to join the Legacy Society or in recognition of an ASPB Pioneer were initially considered restricted donations, going forward with the Centennial Challenge and in keeping with the current gift acceptance policy, these and all other donations below $25,000 will be considered unrestricted donations.

Check box that applies:

- ☐ ASPB General Fund — US$ amount pledged _____
- ☐ I wish to join the Legacy Society — US$ amount pledged _____ — Cumulative commitment of $5,000 required
- ☐ I wish to honor a special person as a Pioneer of ASPB — US$ amount pledged _____ — Name of honoree _____

Restricted Donations

Restricted donations are used for existing Board-approved fundraising efforts. Please visit https://aspb.org/donate/ for more details.

In accordance with Article IX of the ASPB Constitution, and with the exception of certain corporate or personal sponsorships, all permanently restricted donations for specific purposes will be invested in the ASPB investment portfolio. Income generated from these investments will be used exclusively for the activities as specified by you in the options presented below. Please check the box or boxes that apply, and indicate the amount you intend to donate for each option checked. In accordance with its gift acceptance policy (http://bit.ly/ASPB-gift-acceptance-policy), ASPB will apply 85% of your donation to the designated cause and withhold 15% as a service charge for ongoing administration of your gift.

Check box that applies:

- ☐ Excellence in Diversity and Inclusion Award — US$ amount pledged _____
- ☐ ASPB–Carnegie Winslow Briggs Mentorship Award — US$ amount pledged _____
- ☐ Lawrence Bogorad Award for Excellence in Plant Biology Research — US$ amount pledged _____
- ☐ Eric E. Conn Young Investigator Award — US$ amount pledged _____
- ☐ Robert Rabson Award — US$ amount pledged _____
- ☐ ASPB Innovation Prize for Agricultural Technology — US$ amount pledged _____
- ☐ Joe Varner Travel Award — US$ amount pledged _____
- ☐ Education Initiative (temporarily restricted) — US$ amount pledged _____
- ☐ Other (please specify) — US$ amount pledged _____

Help us meet the challenge, so we can celebrate in 2024!

Estate Giving and Major Gifts

For novel gifts and estate donations that are not appropriate for use of this online form, please read the ASPB gift acceptance policy (http://bit.ly/ASPB-gift-acceptance-policy) and then contact Brian Larkins, chair of the Legacy Society Leadership Committee, or Crispin Taylor, ASPB CEO, to discuss further the nature of your desired gift.

Please check the box that applies:

☐ I will donate by mailing a copy of this form with a check of $_____ payable to ASPB.

If the donation is unrestricted, on the memo line indicate **"Centennial Challenge Donation for the General Fund."** If it is restricted, indicate **"Restricted Donation"** and specify the fund(s) for which the donation is targeted.

Mail check and printed form to:
ASPB, 15501 Monona Drive, Rockville, MD 20855.

☐ I prefer to donate by credit card (VISA, MasterCard, American Express) and have completed the information on the adjacent panel. Please mail form to the address just above.

VISA MasterCard AMERICAN EXPRESS

Name on credit card _____ Amount _____

Credit card number _____ Expiration Date (M/Y) ___ / ___ CVV _____

Print Name _____

Signature _____ Date _____

PRESIDENT'S LETTER
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yield increases, a phenomenon that agricultural economists refer to as the "technology treadmill" (Levins and Cochrane, 1996). Although new technologies contribute to increased production, prices decrease faster as those technologies become widely adopted. The demand for agricultural products is inelastic, leaving farmers with slimmer and slimmer margins of profit.

Almost half of the production cost of an acre of corn is for nitrogen fertilizer. As corn prices rose this spring, fertilizer costs also rose, without any significant increases in the costs of ammonia production. A back-of-the-envelope calculation for gross returns on corn in 1960 comes to $60 per acre. In 2020, corn production yielded about $1,000 per acre. However, adjusting for inflation, in 2020 corn yielded $115 per acre in 1960 dollars. Thus, per acre, the yield has tripled, but the return has barely doubled. For soybeans, yields have more than doubled, but gross returns were the same in 2020 as in 1960, about $50 per acre. As the old joke goes, when the farmer who won the million-dollar lottery was asked how he would use his winnings, he replied, "I'm going to keep farming until it's all gone."

In just a couple of decades, agriculture has become data-enabled and technology-intensive. Tractors are guided by GPS, and water and fertilizer are precisely applied according to data collected by soil sensors. Innovations in red and blue light-emitting diodes supply specific wavelengths of light to crops grown in controlled environments. Developing technologies include robotic pickers that sense the color of ripe fruits using machine learning algorithms, robotic harvesters small enough not to damage and compact soils, and drones that can deliver agrochemicals more precisely (King, 2017). The protein transition from animal to vegetable proteins in products such as the Impossible™ burger, vertical agriculture using closed systems in urban and suburban environments, and weather modification technologies might impact farming in disruptive ways (de Wilde, 2016). But will these innovations, wonderful as they are, simply become additional components of the technology treadmill?

Our challenge, then, is to imagine how plant biology can add value to every plant and bring new acres into production while preserving and increasing yields. We have astonishing new tools in genetics, metabolic engineering and synthetic biology, conservation technology, bioinformatics, and biotechnology. As plant biologists, we have a responsibility to use our talents to future proof all of the species we depend on for food, feed, fiber, fuel, and pharmaceuticals, and to create the critical infrastructure for a successful and equitable plant-based bioeconomy that supports the livelihood of growers and their communities.

In the United States, a long history of policy injustices disproportionately impacted African American farmers, who now number 45,000 (of 3.4 million farmers) compared to 1,000,000 a century ago. Pathways for equal participation both in the lab and in the field need to ensure that the best and brightest can become engaged to ensure the robustness of an evolving agriculture.

A pandemic is one shock to the system. The robustness of our food supply will depend on the resilience of the global agricultural system to a series of future shocks. As the population approaches 10 billion, per capita food consumption is projected to grow 8% to 12% (Ahmed et al., 2020). Arable land and fresh water supplies are decreasing. Agricultural productivity is projected to decline as temperature increases and weather events become more erratic. Almost one-quarter of greenhouse gas emissions come through agriculture, forestry, and land-use change (Ahmed et al., 2020). Worldwide, cattle and dairy cows emit greenhouse gasses equivalent to the total emissions of the United States (Ahmed et al., 2020). Worse, agricultural emissions are heavily skewed to methane and nitrous oxide, much more potent gases than carbon dioxide for global warming.

The agricultural sector must balance food security, nutritional needs, and preservation of biodiversity with the imperative to decarbonize for climate change mitigation. But farmers and growers around the world need to have their livelihoods protected. It's time for us to step up and support our essential workers. ■

Thanks to Nick Carpita and Otto Doering for their insights and edits.

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Late-Breaking News

Yunde Zhao will Succeed Mike Blatt as Editor-in-Chief of *Plant Physiology*®

More to come in the July/August issue of the *ASPB News*.

ASPB Announces 2021 Award Winners

Each year, ASPB honors excellence in research, education, outreach, and service through its numerous awards to individuals who promote the mission of our Society. We are proud to announce this year's award recipients.

Carla Yerkes

Adrienne Roeder

Robert Goldberg

Patrick H. Brown

ASPB Innovation Prize for Agricultural Technology

Carla Yerkes
Corteva Agriscience

The 2021 ASPB Innovation Prize for Agricultural Technology is awarded to Carla Yerkes for her extensive and impactful scientific contributions that have translated to agricultural solutions that benefit farmers. We also recognize her outreach efforts as a science ambassador inspiring new generations of scientists. Carla's contributions are extensive, spanning the discovery, development, and launch of new chemical- and biotechnology-based weed control systems. The results are solutions used by farmers around the world, such as the aryl-picolinate auxin herbicide family and the Enlist weed control system. ASPB celebrates and congratulates Carla for her many contributions to the plant biology community.

Charles Albert Shull Award

Adrienne Roeder
Cornell University

Adrienne Roeder, Nancy M. and Samuel C. Fleming Term Associate Professor at Cornell University, is the 2021 recipient of the Charles Albert Shull Award. Adrienne has taken our understanding of plant development to a new level by combining computational modeling with live imaging and molecular genetics. Her research has highlighted the importance of variability in enabling plants to produce cells of different sizes and to ensure regular and reproducible organ shape and size. This is a principle that extends beyond plants and has broad implications in developmental biology.

Charles Reid Barnes Life Membership Award

Robert Goldberg
University of California, Los Angeles

Bob Goldberg's contributions to plant science exemplify the hallmarks of Charles Reid Barnes's distinguished career. Bob, recipient of a Howard Hughes Medical Institute professorship, was recognized at UCLA for innovative teaching and research with the Gold Shield Award for Excellence in Research and Undergraduate Education and the Luckmann Distinguished Teaching Award from the UCLA Academic Senate. A pioneer in plant molecular biology, Bob was elected to NAS in 2001 and received the Stephen Hales Prize from ASPB in 2015. Perhaps his most noteworthy and impactful contribution was serving as founding editor of *The Plant Cell*. His vision for the journal encompassed every detail, from policy to manuscript review, printing, and illustration. *The Plant Cell* not only helped make ASPB a premier global plant science society but, more importantly, raised the visibility of plant research among the broader community of biologists by publishing the highest quality and highest impact research studies.

Dennis R. Hoagland Award

Patrick H. Brown
University of California, Davis

Patrick Brown has made seminal contributions to our understanding of plant mineral nutrition and has been a leader in the successful application of fundamental research to improve agriculture. He demonstrated that nickel is an essential element for plants and led pioneering discoveries in the metabolism and transport of boron. Patrick is also a leader in orchard nutrition management and sustainability, foliar fertilization, and biostimulants, all with significant global impact. His leadership in basic and applied plant biology across a range of scales and disciplinary boundaries is truly exceptional.

Early Career Award

Troy Magney
University of California, Davis

The ASPB Early Career Award goes to Troy Magney, assistant professor in the Department of Plant Sciences at the University of California, Davis. Troy obtained a BA in physical geography and international studies at the University of Denver and completed his PhD in natural resources at the University of Idaho in 2015. As a NASA postdoctoral program fellow at California Institute of Technology, Troy developed innovative interdisciplinary approaches to understand vegetative structure and function from individual plant leaves to the whole planet by linking remote sensing and plant physiological data across multiple temporal and spatial scales. In 2019, Troy started his own laboratory at UC Davis and undertook a number of federally funded projects to drive innovations from ecophysiology to agriculture by

Troy Magney

Naomi Ori

Shu-Hsing Wu

Katherine M. Murphy

Rupesh Kariyat

integrating plant physiology, biophysics, remote sensing, and environmental informatics.

Enid MacRobbie Corresponding Membership Award

Corresponding Member status is conferred by election on the annual ballot. This honor, initially given in 1932, provides life membership and Society publications to distinguished plant biologists. The following individuals have been nominated this year:

Naomi Ori

Hebrew University of Jerusalem

Naomi Ori is a professor at The Robert H. Smith Institute of Plant Sciences and Genetics in the Agriculture Faculty of the Hebrew University of Jerusalem in Israel. Naomi investigated the mechanisms underlying the plasticity of plant development and patterning, and how plasticity is balanced with developmental stability. Most of her research is dedicated to leaf development and morphogenesis in plants. Naomi's research contributed some of the first examples of the cross talk between transcription factors and hormones in plant development. Her group identified several factors that affect the balance between morphogenesis and differentiation and showed that transcription factors and hormones such as auxin, cytokinin, and gibberellin interact in coordinating development in both processes. In this regard, Naomi made a substantial contribution to the unravelling of the role of different hormones in shaping leaf morphology. More recently, the Ori group has been engaged in investigating the regulation of fruit development and fruit set.

Naomi has been an ASPB member for years, and she has attended many ASPB meetings. She has contributed greatly through her service on journal editorial boards, performing an impressive service to the international research community as an editor and reviewer. She served as a senior editor of *The Plant Cell,* and she is currently a guest editor.

Shu-Hsing Wu

Academia Sinica

Shu-Hsing Wu is director and distinguished research fellow/professor at the Institute of Plant and Microbial Biology, Academia Sinica, in Taipei, Taiwan. Shu-Hsing's research is in the areas of transcriptional and posttranscriptional regulation of plant gene expression, photomorphogenesis, circadian clock, and systems biology. She has also played a leadership role in the field of plant miRNAs. Shu-Hsing served as president of the Asia and Oceania Society for Photobiology from 2015 to 2017, and she remains a sought-after speaker at international conferences on plant development and photobiology. Among the awards she has received, she was the Thompson Citation Laureate in 2006.

Shu-Hsing established her independent research career in Taiwan after receiving her basic training in the United States. She has worked to enhance the visibility of plant biology in Taiwan and to secure valuable resources for research and education on plants. She has also been a champion in promoting gender balance in the plant biology community in Taiwan and elsewhere.

Although Shu-Hsing's research program is in a country outside the United States, she has remained a dedicated ASPB member and active participant in Society activities. She has attended more than 25 annual meetings and reviewed numerous manuscripts for ASPB journals.

Eric E. Conn Young Investigator Award

Katherine M. Murphy

Donald Danforth Center

Katie Murphy is recognized for her important contributions to the field of environmental stress tolerance in plants and her dedication to outreach and service benefiting the plant biology community. Katie's combined molecular, biochemical, and genetic studies in maize have provided substantial new insights into the biosynthesis of species-specific maize terpenoids and their function in pathogen defense and other plant–microbe interactions. Katie's outreach activities are especially noteworthy for promoting diversity and inclusiveness within the plant biology community. Her activities include serving as an early career representative on the ASPB Women in Plant Biology Committee and as an ASPB Ambassador. Katie was named the 2020 ASPB Ambassador of the Year for these outstanding contributions.

Excellence in Education Award

Rupesh Kariyat

University of Texas, Rio Grande Valley

This year's Excellence in Education Award winner is Rupesh Kariyat. Rupesh has an outstanding record of excellence in teaching, mentoring, and educational outreach. Since joining the faculty in 2017, Rupesh has excelled in the class-

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room, evidenced in part by one class that underwent a seven-fold increase in student enrollment. Rupesh has mentored many graduate, undergraduate, and high school students, including first-generation students, and has published 15 research articles with students as the first or second author. Rupesh's outreach activities include being PI on a USDA Research and Extension Experiential Learning for Undergraduate grant and an ASPB Plant BLOOME grant for research and training of college students and schoolteachers. Rupesh is also a co-PI on a USDA Conservation Innovation On-Farm Trials grant to educate, train, and support farmers in locally effective cropping strategies. In addition, Rupesh has published teaching and outreach articles in *Natural Sciences Education*.

Fellow of ASPB Award

Beronda Montgomery

Stacey Harmer

Robert J. Ferl

Kent Chapman

Beronda Montgomery
Michigan State University

Beronda Montgomery, a professor at Michigan State University, works on understanding how photosynthetic organisms adapt to their environment. She is the recipient of an NSF CAREER Award, is an MSU Foundation Professor, and was elected fellow of the American Academy of Microbiology and AAAS. Beronda was recently recognized as one of 100 Inspiring Black Scientists in America. As exemplified in her book *Lessons from Plants,* Beronda is unique among ASPB members in the way she uses plant biology for the betterment of underserved individuals and society at large. Beronda currently serves as a reviewing editor for *The Plant Cell,* and she is a member of the steering committee for the ASPB Forward initiative.

Stacey Harmer
University of California, Davis

Stacey Harmer, professor at the University of California, Davis, is an internationally recognized leader in molecular mechanisms regulating circadian rhythms. She received the College of Biological Sciences research award, was a Chancellor's Fellow, and was elected fellow of AAAS. She serves as a monitoring editor for *Plant Physiology* and was appointed to the ASPB Program Committee in 2017. She is currently secretary-elect of ASPB, serving the first year of her four-year term. While secretary, she will be chair of the Program Committee and a member of the ASPB Board of Directors. Stacey has been an inspiration and mentor to many students and postdocs, and she mentors female scientists in the UC Davis Women in Science and Engineering program.

Robert J. Ferl
University of Florida

Robert J. Ferl, distinguished professor and assistant vice president for research at the University of Florida, was an early pioneer in plant molecular biology. His focus on the environmental regulation of gene activity in plants became pioneering work on plants in space flight, more than 200 publications and patents, and recognition by NASA with the Exceptional Scientific Achievement Medal. A fellow of multiple scientific societies, he has taken important leadership positions in American science, chaired National Academy studies, and written well-received textbooks. In addition to multiple teaching awards, he has mentored a large group of postdocs and students and had a unique impact on space biology in ASPB through his educational materials and presentations from his team at the Southern Section and national Plant Biology annual meetings.

Kent Chapman
University of North Texas

Kent Chapman is currently Regents Professor and director of the BioDiscovery Institute at the University of North Texas. He has served ASPB in multiple capacities, including on the Board of Trustees and the Board of Directors, and has held multiple leadership positions for the Southern Section. Kent is currently a reviewing editor for *The Plant Cell* and has contributed to the larger scientific community in significant ways, perhaps most notably as a rotating program director of the Division of Integrative Organismal Systems at NSF. He is an internationally recognized leader in the field of lipid research in plants and is well known for his pioneering studies on N-acylethanolamines, lipid droplet formation, and MALDI imaging for the study of lipid metabolism.

Marisa Otegui
University of Wisconsin–Madison

Marisa Otegui is a professor in the Department of Biology and the Center for Quantitative Cell Imaging at the University of Wisconsin–Madison. Marisa is internationally recognized for her creative combinations of genetic, biochemical, and state-of-the-art imaging approaches to elucidate the plant endomembrane system. In addition to being a highly accomplished plant cell biologist, she is an exceptionally energetic and dedicated member of ASPB and the larger plant science community. She was a member of ASPB's Women in Plant Biology Committee from 2012–2017, serving as chair from 2014.

Marisa Otegui

Jeff Dangl (with Sarah Grant)

Detlef Weigel

Vicki Chandler

Martin Gibbs Medal

Jeff Dangl
University of North Carolina, Chapel Hill

Jeff Dangl is awarded the 2021 Martin Gibbs Medal for his outstanding contributions to our understanding of how plants manage interactions with both pathogenic and mutualistic microorganisms. After receiving his PhD in genetics from the Stanford University Medical School, Jeff spent four years as a postdoctoral fellow in the Department of Biochemistry at the Max Planck Institute for Plant Breeding Research in Cologne, Germany, moving to become a group leader in the institute's Max Delbrück Laboratorium. It was there that he started his program to identify disease resistance loci in Arabidopsis.

In 1995 Jeff became associate professor at the University of North Carolina at Chapel Hill, where he is currently the John N. Couch Distinguished Professor in the Department of Biology and adjunct professor of microbiology and immunology in the School of Medicine; he is also a Howard Hughes Medical Institute–Gordon and Betty Moore Foundation plant science investigator. Jeff is an elected member of the American Academy of Microbiology, NAS, and the German National Academy of Sciences Leopoldina and is a fellow of AAAS. Jeff holds an honorary doctorate from the Hebrew University of Jerusalem and has won many awards, including the ASPB Stephen Hales Prize in 2009.

Jeff has made seminal research contributions to our understanding of the molecular players that define the plant immune system, critical for protecting food crops from pathogens. His work led to the first coherent model of the plant immune system and, in fact, the first use of that term, which is now found in several biology textbooks. Jeff's work on the mechanism of action of NLR proteins (named for their nucleotide binding and leucine-rich repeat domains) that "recognize" pathogen virulence factors (effectors) leading to activation of successful immune responses has guided subsequent discoveries in the mammalian immune system. Jeff's discovery that NLR proteins can recognize modified-self molecules led to the guard hypothesis of plant defenses. Jeff has additionally been a pioneer in defining a new research discipline to understand how the plant microbiome contributes to plant growth and productivity, showing that plants specifically recruit, maintain, and balance a taxonomically limited microbiome from native soils.

The Martin Gibbs Medal honors "an individual who has pioneered advances that have served to establish new directions of investigation in the plant sciences." Jeff has revolutionized our understanding of plant–microbe interactions in ways that have introduced new paradigms across biology.

Stephen Hales Prize

Detlef Weigel
Max Planck Institute for Developmental Biology

Detlef Weigel is executive director of the Max Planck Institute for Developmental Biology. He has made notable discoveries in diverse areas of plant molecular genetics, fostered generations of talent, and through his collaborative network made tools and genetic resources available to colleagues around the globe. Detlef has promoted the plant biology community at the international level through service on numerous advisory and editorial boards, including 10 years as coeditor of *The Plant Cell*.

Detlef's early plant work led to direct evidence for long-distance signaling to induce flowering, and his seminal discovery of a microRNA mutant provided the foundational knowledge to enable artificial miRNA technology. He has been a pioneer in exploiting natural genetic variation to understand the adaptive value in plant functions from development to immunity, heterosis, and response to environmental change. His vision of using multiple genome sequences to study genetic variation enabled his studies and formed the basis for widely used resources from the 1001 Genomes Project and online tools that allowed many labs to exploit genetic variation for other research questions.

Leadership in Public Service Award

Vicki Chandler
Minerva Schools

Vicki is Regent's Professor, Emerita at the University of Arizona and Provost of Minerva Schools at the Keck Graduate Institute. She was elected to the U.S. National Academy of Sciences in 2002 and later served on its governing council. Subsequently Vicki served as Chief Program Officer for Science at the Gordon and Betty Moore Foundation where she made a strategic investment in the first HHMI-GBMF investigators (plant science) program. She was appointed to the National Science Board by President Obama in 2014, and she is a past president of ASPB. ■

ASPB's 2021 Women's Young Investigator Travel Award Winners Announced

Each year, ASPB, through its Women in Plant Biology Committee, makes travel awards to early career women investigators to attend the Plant Biology conference. The goal of the competitive process that underpins the Women's Young Investigator Travel Award (WYITA) program is to increase attendance of early career women investigators at the Plant Biology conference by providing travel funds.

Because of the pandemic and its related effects, and to protect the safety and health of our members and community, the ASPB Board of Directors decided to convene Plant Biology 2021 as a fully virtual meeting. Because physical travel will not be necessary, the WYITA has been reframed as a conference attendance award.

Applications are open to scientists from around the world who are within the first five years of their appointment in academic faculty-level positions, government research positions, or industry research scientist positions, as well as to experienced postdocs. Selection is based on the science and quality of the abstract submitted, relative to the applicant's amount of time as an early career investigator; a statement describing why their attendance should be supported; and financial need.

Seven women—listed here, along with their abstract titles—were selected this year, and each will receive an attendance award to support their participation at Plant Biology 2021.

Congratulations to all of the 2021 WYITA winners!

Karin Albornoz
University of Concepción, Concepción, Chile

CBF1 Overexpression and the Regulation of Postharvest Chilling Injury in Tomato Fruit

Michal Breker-Dekel
The Hebrew University of Jerusalem, Jerusalem, Israel

Utilizing Novel Genetic Tools to Unravel Key Players in the Photosynthetic Cell-Size Regulatory Network

Leila Feiz
Boyce Thompson Institute, Cornell University, Ithaca, New York

Functional Characterization of Aphid Salivary Proteins and Their Effects on Plant–Insect Interactions

Namrata Jaiswal
USDA–ARS, U.S. Vegetable Laboratory, Charleston, South Carolina

Tomato GCN5-Related Histone Acetyltransferase Is Required for Plant Defense Responses and Growth

Devanshi Khokhani
University of Minnesota, St. Paul

Cross-Kingdom Microbial Associations for Efficient Transfer of Biologically Fixed Nitrogen to Crops

Jerlie Mhay Matres
International Rice Research Institute, Los Baños, Philippines

A Sink and Source Approach for Development of Iron- and Zinc-Biofortified Rice

Nadine Töpfer
Leibniz Institute of Plant Genetics and Crop Plant Research, Seeland, Germany

Alternative CAM Modes Provide Environment-Specific Water-Saving Benefits in a Leaf Metabolic Model ■

PB21 PLANT BIOLOGY *Worldwide Summit*

July 19–23

74 Reasons Not to Miss the Plant Biology 2021 Worldwide Summit

Conferences definitely give you powerful ways to share your research and build your career. However, at the end of the day, the question is, How will you know that your attendance at the conference was worthwhile? We believe your Plant Biology 2021 experience will be strongly positive, and that the stellar scientific and education sessions and multiple networking opportunities will advance your science and your career. Here's why.

4 Plenary Symposia

As with every Plant Biology conference, the plenary symposia serve as the cornerstone of the science. Each session brings together up-to-date contributions in areas of research from around the globe. This year's symposia are as follows:

Powering an rDNA-Enabled, Biomass-Based, and Circular Bioeconomy
Maureen McCann, *Chair*

Crop Productivity in a Changing World
Kris Niyogi, *Chair*

RNA: The Long and Short of It
Xuemei Chen, *Chair*

Applications of Robotics, Sensing, and Artificial Intelligence to Plant Science
George Kantor, *Chair*

1 Joint Symposium with the Botanical Society of America

Offering a unique opportunity possible only in the virtual world, the programs of Botany 2021 and Plant Biology 2021 will come together in a shared scientific space. The two conferences overlap, so both organizations' program committees wanted to find a way to create a collaborative scientific symposium, as well as a unique opportunity for participants to network jointly during an ensuing 30-minute open platform session.

The symposium topic is Symbioses, and the cochairs are Heather Hallen-Adams, University of Nebraska–Lincoln; Toby Kellogg, Danforth Center; and Gary Stacey, University of Missouri.

4 Scientific Sessions by ASPB Award Winners

Rick Vierstra
Washington University in St. Louis

Julian Schroeder
University of California San Diego

Zachary Lippman
Cold Spring Harbor Laboratory

Vicky Chandler
Provost and Chief Academic Officer at the Minerva Schools

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PLANT BIOLOGY 2021
continued from page 13

29 Concurrent Symposia

1. Immune Signaling: The Plant Strikes Back
2. Insights into How to Build a Plant
3. Signaling Modules: They Talk to One Another
4. Plants and the Environment
5. Creating the Next Generation
6. Temperature Responses
7. Genetics and Genomics in Diverse Species
8. Insights into Genome-wide Regulation of Gene Expression
9. Responses to Water Stress
10. Strength and Specificity in the Cell Wall
11. Advances in Instrumentation, Visualization, and Analysis
12. Patterns and Consequences of Molecular Evolution
13. Cell Biology: Homeostasis and Trafficking
14. Light Responses
15. Photosynthesis and Bioenergy
16. Biochemistry and Metabolism
17. Transcriptional Regulation to Plant Development and Environmental Response
18. Plants: The Master Chemists
19. Pathogenicity: The Dark Side of Plant–Microbe Interactions
20. Uses of and Advances in Gene Editing
21. Education and Outreach
22. Plant Responses to Diverse Environments
23. Microbes Playing Nicely with Plants
24. Biotechnological Approaches to Solve Food and Nutrition Problems
25. Pattern, Color, Texture, Shape: New Ideas in Plant Development
26. Plant Proteostasis: Mechanisms That Shape the Proteome Landscape
27. Discoveries in Computational Plant Science
28. Vitamin and Mineral Biology and Biofortification
29. Plant Plastid Origins and Evolution

32 Workshops

This year we have a great lineup of workshops: 32 of them, in three tracks—Equity, Diversity, and Inclusion; Professional Development; and Technical Development and Innovation. Here are just a few (you may view them all at https://plantbiology.aspb.org/workshops/):

- Beyond Law—Providing Accessibility and Inclusion Just Because
- Bioeconomy Careers Beyond Academia
- Tips and Advice for Navigating Grad School: A Q&A Panel Presented by the Early Career Plant Scientists Section
- Delivering Your Message: Tools for Better Presentations
- Building an International Career
- Workshop and Hackathon on Improving Orphan Crops to Foster Bioeconomies, sponsored by OCP North America
- "Our Lab": Building an Inclusive Lab Culture
- FlowerNetPheno: Detection of Flowers Based on Spatio-temporal Image Sequence Analysis Using Deep Learning Techniques for Event-Based Plant Phenotyping
- Plant Biology for Crop Nitrogen Use Efficiency and Sustainable Nitrogen Management
- Advances in Plant Biology and Sustainable Agriculture in the Middle East and North Africa, cosponsored by United Arab Emirates University and King Abdullah University of Science and Technology
- The Biotechnology of HIGS and SIGS for Plant Pest Resistance: What Works, What Doesn't, What's Next?
- Systems Thinking Framework for Plant Science Undergraduate Education
- Accessing Genomes and Plant Ecosystems—One SMRT Cell at a Time
- Marine Farming—Biotech for the Oceans

No. 71—Countless New Ways to Build Your Career Network Before, During, and After Plant Biology 2021

Reason No. 71 is actually many reasons, boiled down to building your professional network. We learn that the best way to network is to do about 15 things before we arrive at a meeting, but who has that kind of time? Instead, most of us rely heavily on the amazing chance encounters and informal networking sessions that typically occur during a conference. These are all the more important in the virtual space, where there is no chance to run into the one person you've wanted to meet in the hallway, in the hotel elevator, or (best of all) sitting next to you on the flight to the conference. However, the Plant Biology 2021 platform has risen to the challenge of making your networking opportunities a key and enhanced component of the meeting.

First, 2 weeks before the meeting (beginning July 5), you can set up your profile and list all the areas you are interested in, allowing you to connect with others who have the same interests. And for the next 2 weeks, during the meeting and afterwards, you can communicate with fellow attendees, exhibitors, and speakers.

Because the platform provides you with your own video chat feature, you can invite someone to chat, talk, or just text with you. And if you find enough participants interested in a particular topic or area, you can even set up your own impromptu "hallway" networking session.

Plant Biology 2021 is also structured to encourage conversations with session speakers. All concurrent symposia for 2021 will feature a 30-minute live chat with speakers after their talks, giving you a chance to ask questions or discuss research with presenters in greater depth.

In addition, of course, there will be networking meetings by topic or special interest, as well as several social gatherings.

You can plan on using social media to let folks know you are attending Plant Biology 2021 before and during the meeting. You'll be able to make comments about the platform

and sessions through the inbuilt chat function, as well as on your own and the conference's social media sites. In addition, you can post reviews of the event and, most importantly, keep up with the new friends and colleagues you meet.

No. 72—Present Your Research

The poster platform for this year's meeting is simple to use, and it includes some great outreach features. Virtual meetings allow others to see your research 24 hours a day. They can set up appointments, or you can designate your preferred times to meet during the conference. Remember: Posters and all other content are accessible to registered attendees for a full year.

For 2021, there is also an easy-to-use video chat feature that allows you to invite others to see your poster or give a brief overview. You can post the video on any social media platform and invite others to meet with you at a specified time. There will also be organized discussions on poster topics. All this means that this particular conference will offer many excellent ways to highlight your research.

No. 73—Have Fun and Participate in the Scavenger Hunt with Exhibitors

Back for a second year is our well-attended trivia night, hosted by ASPB's Early Career Plant Scientists Section. But that's not all—there are many other virtual social events in the planning. And you will want to participate in the scavenger hunt by visiting our exhibitors; there will be daily Amazon gift card prizes, and the grand mystery prize is a good one!

And Finally, No. 74—Group Rates

If you can take advantage of our group rates by signing up with others, not only will you save money, but you can "divide and conquer" by sending members of your group to attend different sessions and workshops! Then afterwards, you can get together in your chat room or networking session and share key insights with your fellow group members. There are group rates for groups of all sizes, and this year you don't have to all be from one organization, as long as you have at least five people, each with their own email address. Instructions for registering a group can be found on the registration page at https://plantbiology.aspb.org/register/.

Keep up with all the details about the Plant Biology 2021 Worldwide Summit and more at plantbiology.aspb.org. PB21 will be happening all over the globe from offices, homes, and maybe even the beach! Share your thoughts at #PlantBio21. ■

Call for Mentors!

We are all thankful for the mentors in our life. Pay it forward and become a mentor yourself.

ASPB has a mentoring platform through the Plantae Job Center. This platform allows plant science professionals to find mentors familiar with their career development goals, interests, and needs. In addition, experienced professionals have the opportunity to share their wisdom with the next generation of plant scientists. Our hope is that the platform will not only help close the gap in career development opportunities for marginalized groups, but will also serve as an effective vehicle for cross communication, interaction, and collaboration.

For the mentoring platform to continue to grow, we need to recruit more mentors with diverse backgrounds, expertise, and experience. Having a strong pool of mentors ensures that mentees can find a good match based on their career goals and professional development needs. As part of the sign-up process, you can indicate the type of mentoring you are interested in providing, your areas of expertise, and the amount of time you have available to devote to mentoring. ■

Sign up to become a mentor at https://jobs.plantae.org/eMentor/.
You can also sign up to find a mentor!

Changing Cultures and Climates: A New Online Resource for Equity, Diversity, and Inclusion

BY JUDY CALLIS, ASPB Past President
and JOANNA FRIESNER, Executive Director, and TERRI LONG, Inclusivity Scholars Subcommittee Co-chair, North American Arabidopsis Steering Committee

ASPB, in partnership with the North American Arabidopsis Steering Committee (NAASC), has created an online hub, Changing Cultures and Climates, for resources aimed at improving diversity in the plant sciences (http://bit.ly/PlantaeCCC). The mission of Changing Cultures and Climates is to provide information that supports and promotes equity, diversity, and inclusion in the international plant science community so that it grows to more accurately reflect our larger, global society.

The site is a living collection of impactful literature about culture and gender matters, information about programs and initiatives that focus on increasing and sustaining diversity in plant science, and a safe space to learn more about one another and to discuss topics around equity, diversity, and inclusion that impact our community.

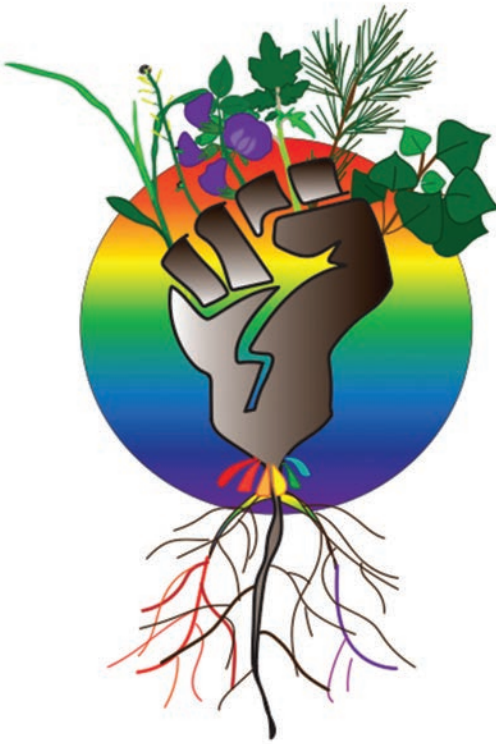
The objectives of Changing Cultures and Climates are

- to incorporate a safe virtual space for Black, Indigenous, and people of color and other minoritized folk to share experiences and access resources
- to create a rich and interactive venue that empowers all plant scientists to become better informed
- to provide resources for actively addressing the impacts of institutional racism on STEM environments, and plant biology specifically.

Visit the Changing Climates and Cultures page on Plantae to find

- posters for your lab
- notices of events related to equity, diversity, and inclusion
- the Front and Center channel—a place to meet colleagues and see highlights on Black, Indigenous, and Latine plant scientists
- the Adventitious Roots page—information and an invitation to join a safe space Discord server for plant scientists in unsupportive scientific environments based on their ethnicity or race to seek advice, support, or a listening ear
- the Anti-Racism Toolkit—collections of resources for building a culture based on racial justice to make a better space for all
- ASPB and NAASC initiatives related to equity, diversity, and inclusion.

As a living hub, we welcome suggestions for additional resources from the plant science community. Please email Katie Rogers at krogers@aspb.org or send submissions on the form at http://bit.ly/PlantaeCCC.



This is an important initiative for ASPB and NAASC, and we appreciate your engagement, feedback, and input. Many thanks for your commitment to helping our community become more diverse, more welcoming, and more inclusive.

ASPB will be holding a breakfast panel, Building Sustained Commitments to Equity and Inclusion, at the Plant Biology 2021 Worldwide Summit to continue the discussion and convert these conversations into action. In addition, NAASC will hold a workshop at the International Conference on Arabidopsis Research 2021 in June to share brief reports on new activities and partnerships from the past year and provide ample opportunity for you to share your thoughts as part of a lively conversation.

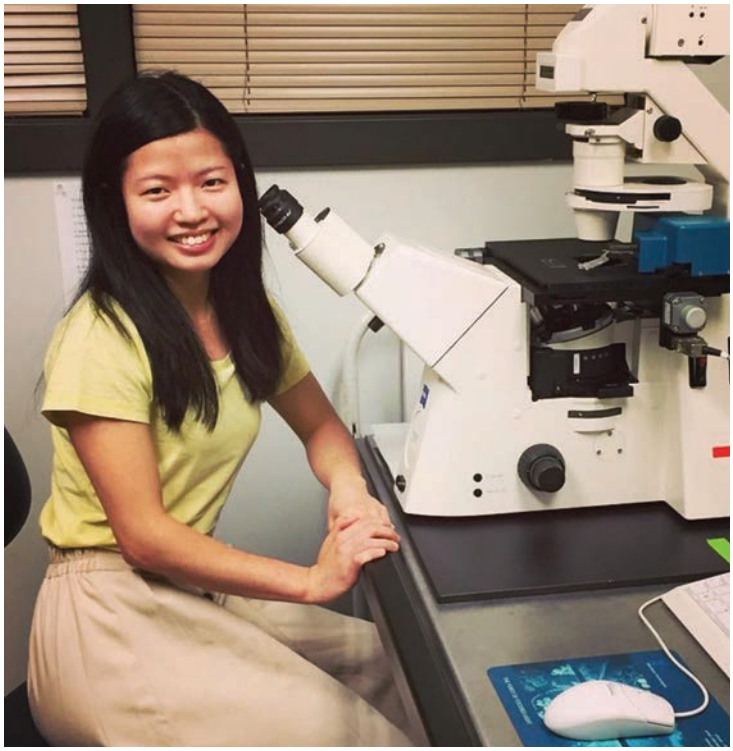
As the Changing Climates and Cultures resource hub grows, we hope to promote change in our community. We also hope to increase our collaboration with additional plant-related societies. ■

Meet Sabrina Chin, 2021 Ambassador of the Year

I'm Sabrina Chin, a research associate at the University Wisconsin–Madison in Simon Gilroy's lab. I currently work on NASA-funded projects with Simon and Elison Blancaflor, studying gene expression changes in gravity-sensing cells during gravity simulation and the effects of microgravity on the plant cell wall and root hair development.

I received my BS with a double major, one in cell molecular biology and the other in immunology and microbiology, from the Australian National University in Canberra, Australia. I then switched to plant sciences and did my honors studies with Ulrike Mathesius working on RNAi delivery via transgenic roots to parasitic root-knot nematodes. I eventually did my PhD under her guidance on the role of flavonoids in mediating host–parasite interactions during root-knot nematode infection.

Through my honors and PhD dissertations, I began to appreciate the sophistication of parasitic infection in orchestrating essential and basal host responses, particularly those of root-knot nematodes, which infect more than 300 plant species. I realized that to study interactions at that scale, I needed to learn more about bioinformatics and root development. Thus, after my PhD, I worked on Simon's NASA project on root transcriptomics at Noble Research Institute for



my postdoctoral fellowship (our NASA projects were recently transferred to the University of Wisconsin–Madison because of organizational restructuring at Noble Research Institute).

During my PhD studies, I was fortunate to be in the company of great peers and colleagues who offered me opportunities to volunteer for professional societies; I worked with the Australian Society of Plant Scientists and the International Society of Root Research when they organized their conferences in Canberra. Through these experiences, I learned that the plant science community is an anchor for scientists at every stage, particularly students. It was a natural progression for me to continue volunteering by joining the ASPB Ambassador Program when I moved to the United States.

So far, my experience with the ASPB Ambassador Program has been extremely rewarding, and I have enjoyed being able to do interesting nonbench roles. For instance, I was able to help moderate concurrent symposia for Plant Biology 2020 and got to know other ambassadors by doing so. The highlight of my role as an ambassador was writing the Unsung Heroes of Plant Biology article on Marcela Tello-Ruiz published in the January/February edition of the *ASPB News* (https://bit.ly/ASPBNewsJanFeb2021). It was extremely rewarding to hear from her that she enjoyed the article and to have created a pedestal for her experiences as a Latina scientist. I strongly recommend to students that they participate in ASPB activities to explore their scientific and nonscientific interests.

I am also privileged to be an early career representative on the Women in Plant Biology Committee and a member of the Equity, Diversity, and Inclusion subcommittee of the Early Career Plant Scientists Section. We are working on producing webinars, a resource hub, and more initiatives to showcase underrepresented scientists.

Finally, I'd like to thank the ASPB Council and staff and the other ambassadors for creating an avenue for me to contribute and learn. I would also like to extend my gratitude to Elison and to dedicate this award to him for being an excellent mentor and encouraging me to participate in ASPB. ■

Welcome to the *ASPB News* "Unsung Heroes of Plant Biology" column! These stories, brought to you by the ASPB Ambassador Program, showcase the vital contributions of non-tenure-track scientists in plant biology. Contact Shawna Rowe, ASPB ambassador and column editor, at roweshaw@gmail.com with questions or comments.

Chrislyn Particka

Michigan State University

BY ANNE-SOPHIE BOHRER
ASPB Ambassador, Postdoctoral Researcher at Michigan State University

Chrislyn Particka is director of the Michigan State University (MSU) Plant Science Research Greenhouse Facility, where she and her team facilitate the successful greenhouse research endeavors of MSU plant researchers.

When she was a teenager, Chrislyn's family bought a blueberry farm in Arkansas, which later expanded to growing blackberries, raspberries, apples, and Asian pears. From then, Chrislyn got interested in fruit horticulture.

When Chrislyn was a senior in high school, Curt Rom, professor in the Horticulture Department at the University of Arkansas, convinced her to major in horticulture. At the same time, she also discovered molecular biology and how scientists could make plants glow using a firefly gene. After a summer internship in which she mainly did molecular work, Chrislyn saw the value and the importance of lab work to develop a successful breeding program, but she decided that it was no fun being stuck in the lab when she could be outside instead. From there, she continued her studies in horticulture with an emphasis on fruit breeding. She pursued a master's degree with John Clark at the University of Arkansas, followed by a PhD at MSU with Jim Hancock, where she studied resistance to a strawberry root disease.

PHOTO BY DERRICK L. TURNER/UNIVERSITY COMMUNICATIONS

After a 5-year industry experience following grad school, Chrislyn moved to upstate New York and started a job as a coordinator for a USDA Specialty Crops Research Initiative grant led by Tim Martinson on cold-hardy grapes at Cornell University. Chrislyn reflected, "I really thrived in that job, and it was a turning point for me to find this other career path where I could still use my degree and my scientific knowledge while flexing the skills I have in other areas. I realized I was good at research management and this administrative side of science." Additionally, Chrislyn was actively involved in the outreach component of the project, working directly with growers to help them make their businesses successful by facilitating the delivery of information they needed.

Chrislyn and her family eventually moved back to Michigan, and she joined the DOE-funded Great Lakes Bioenergy Research Center (GLBRC) at MSU as a research coordinator. Although her responsibilities were very similar to the ones she had had in her previous job, the research endeavors were completely different, focusing on the development of sustainable biofuels and bioproducts from bioenergy crops grown on nonagricultural lands. In this role, Chrislyn did a complete overhaul of the GLBRC Research Experiences for Undergraduates program, "which was probably the most rewarding part of that job, and really fun for me—to bring the students in and help them figure out if they wanted to go to grad school or not."

When Chrislyn wanted to get back to her horticulture roots and felt she was ready for more responsibilities, she transitioned to her role as director of the Plant Science Research Greenhouse Facility at MSU. At the same time, MSU had made great progress to bring attention to the aging condition of the greenhouses and had requested a $20 million capital outlay project from the state of Michigan. "The chance to lead the facility through a major upgrade and a broad-scale improvement was pretty enticing and exciting to think about," Chrislyn recalled. "MSU was the pioneer land grant college in the United States, and it is really important to me that we don't lose sight of our roots and

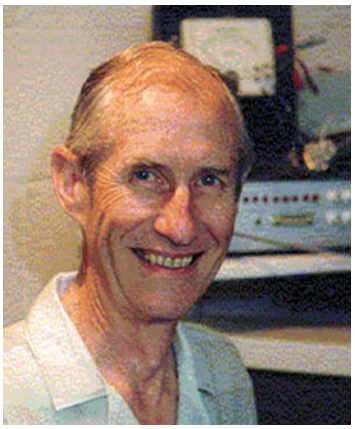
how we support farmers. With climate change and everything that is making it harder for farmers to be successful, there needs to be ongoing research to figure out how to raise good crops, and the greenhouse facility plays a part in it."

Six months into her new role, the pandemic hit. Although the big improvements might not happen for another few years, MSU announced in March 2021 that they would dedicate $4 million to support the greenhouse facility over the next few years. "It is going to make a big difference," Chrislyn said. "From the large-scale renovation plans I had, I am going to decide what can be done now to benefit the biggest numbers of greenhouse users."

The facility has remained open and operational during the pandemic, and Chrislyn's focus has been to help users find space, enable them to collect material and data, and make sure their overall research needs are being met. In the long term, Chrislyn hopes to achieve the complete overhaul of the greenhouses so she and her team can focus on offering more services to facility users. "My hope for this massive improvement of the facility is to make a difference in the quality of research that everyone is able to do, because it is important to me to keep the science that founded this land grant university at its best."

In her spare time, Chrislyn enjoys baking and cooking, reading, spending time in her yard, and camping—no need for a Wi-Fi connection! The quieter, the better. ■

Welcome to the *ASPB News* "Luminaries" column. Student and postdoc members are invited to submit their ideas for a 500- to 750-word interview they might like to conduct with a prominent scientist. Contact Membership Committee Chair Ruth Welti at welti@ksu.edu, who will help you develop some questions to frame your story. If we publish your interview, you will receive a $50 Amazon gift card.



Ian Newman

Honorary Research Associate, Biophysics, University of Tasmania

BY ANDREW EGESA
ASPB Ambassador, University of Florida

Ian Newman is an honorary research associate in biophysics at the University of Tasmania (http://bit.ly/IanNewmanTasmania). During his long teaching and research career, he has published widely in the field of plant biophysics, especially on membrane transport and ion flux measurements. He developed the microelectrode ion flux estimation (MIFE), an automated technique for measuring membrane transport such as nutrient uptake by plant roots (http://bit.ly/MIFEsystem). This technology is commercially available and widely used in plant science research.

Ian was born in Sydney, Australia, in 1936. He grew up in Sydney and then Wellington, New Zealand. At the age of 12, his father was appointed to head the Botany Department of the University of Ceylon (now Sri Lanka), so the family moved to Colombo. After a year and a half, Ian returned to Sydney for his high school and undergraduate studies.

He had a liking for mathematics and physics, so he earned his bachelor's degree in those subjects at the University of Sydney. He then completed an honors research degree at the University of Tasmania in the biophysics lab under Bruce Scott's supervision, after which he enrolled for part-time PhD studies and continued working in Bruce's lab. During this time, he was also tutoring and demonstrating at the physics lab to undergraduate students.

On completing his PhD in 1965, Ian realized that Tasmania was a very lovely place to live, so he settled there. He got married and was appointed a lecturer in medical biophysics to teach basic physics and biology to medical students, beginning a 30-year career as a lecturer and a senior lecturer while continuing with his research in plant biophysics. Essentially, Ian made electrical measurements of plants in a variety of ways and ended up developing MIFE, a noninvasive microelectrode technique automated to measure nutrient uptake by plant roots or any other tissue in a solution. This effort was stimulated in particular by a sabbatical with Bill Lucas at the University of California, Davis, in 1985. After Ian got back to Tasmania in 1986, he continued to work on the design and programming required for good functionality of MIFE, essentially updating what he had worked on while on sabbatical. Ian was supported in these studies by his postdoc, Sergey Shabala, who is now well known in the membrane transport field. Ian retired from teaching in 1996 and continued developing MIFE for diverse applications, especially for the elucidation of membrane functions and for nutrient uptake measurements.

Ian has developed dry age-related macular degeneration, a condition associated with the death of cells in the central part of the eye, leading to blindness. Ian first noticed difficulty reading a section of a poster with small print and low contrast at a conference in 2005. By late 2020, it had become impossible to read unless the text was very large; the limited reading he does now is with the use of peripheral vision.

What got you interested in plant biology in general, and what influences directed you to your specific area of research?

During the early days, my father, a botanist, used to take me along on excursions with his students, where he would explain things happening in nature. In high school, I got interested in physics because of the way my physics teacher used to teach. My love of physics, mathematics, and chemistry and the early influence of my father contributed to my future research in biophysics. During an academic trip to the University of Tasmania, I was intrigued by demonstrations of Bruce Scott's use of physics in making measurements on plants. Therefore, I decided to come to the University of Tasmania to take an honors research degree in Bruce's lab.

Who influenced your scientific thinking early in your career?

Just at the beginning of my PhD, several studies were published on auxins and their transport in plants, in particular work by Winslow Briggs on the movement of the growth hormone auxin across the tip of an Avena coleoptile. When light is shone onto it, the auxin moves away from the illuminated side toward the darker side, so the darker side grows more. When I saw the work described, I said to myself, "I want to make measurements of the electrical potential across the coleoptile," and that was the main feature of my PhD.

I started working on developing a system for measuring

electric current in Avena coleoptile using the systems laid out by Leicester McAulay, the founder of the biophysics lab at the University of Tasmania, and his predecessor, my then-supervisor Bruce Scott. My first two publications were about this work, first to show that there was an electrical wave that moved down the coleoptile when the light was shone on it, and then with some radioactive indolyl-3-acetic acid applied to the top to show that the auxin moving down could be traced and was linked to the electric wave. These two papers were letters to *Nature,* published in 1959 and 1965. With knowledge of my work, Winslow Briggs invited me for a postdoc, and we worked on phytochromes and phytochrome transformation with some electrical change.

Leicester had a key focus on the ability to design and conduct a well-planned experiment with good statistical fidelity, so that it is reproducible, and with well-defined conditions, so that observations are fully communicated and genuinely repeatable. Leicester, Bruce, and others in the biophysics group followed these approaches, which was unique at the time because previously methodologies had been poorly done. These clear methodological approaches were also used by PhD students in our lab, including me.

What scientific discoveries over the past couple of years and decades have influenced your research directions?

After an early observation of plant cell membrane potential, I wanted to find out more. In the 1950s and 1960s, there was still some discussion of whether the outer boundary of a plant cell should be called a membrane or a cell wall. Research led to discovery of the nature of the lipid bilayer membrane and its distinction from the cell wall with the complex microfibril and other structures. The cell wall is required to withstand turgor pressure, whereas the cell membrane controls the turgor itself in terms of water and nutrient exchange.

The discovery of semiconductor junctions happened while I was at school. The development of diodes, transistors, and integrated circuits allowed me to develop the equipment I wanted, and the gene revolution allowed us to start explaining the electrical observations we had made earlier, which had yet to be worked out.

If you were able to repeat your years as a graduate student or postgrad, would you do anything differently?

In terms of technical things, I don't think there is anything special that I would have done differently. However, in looking back, one important thing I should have done differently was to start going to conferences earlier. In those days, around the 1960s, I thought conferences were attended by existing research scientists, not by students, even PhD students. That was a mistake; it's possible that that perception was part of a mistake by the scientific societies and conferences themselves. Of course, ASPB does not make that mistake. So at present graduate students in America, Australia, and other countries are encouraged to go to conferences.

Because the MIFE system has become commercially viable and has turned some profit, we have real income from it—not a huge amount, but as an inventor, I get a royalty. I decided to donate the royalty to a university foundation fund that supports students working with the MIFE technique to attend conferences in Australia and overseas. Attendance at conferences is a crucial thing, and I think current graduate students should start doing this early.

As an employer, what are the key qualities you look for in a potential team member?

I have not been out in the big world as an employer, but I have employed graduate students whom I have supervised for their PhD. The very first quality, I suppose, is curiosity: Are you asking questions? Almost automatically, are you asking questions, about yourself even, little or otherwise? What is going on? Why is this happening? I would like to find more about this! The kind of curiosity that you see in a baby fooling around on the floor—I have seen that in my children, and you have seen young children, too. They want to find out what's going on in this wonderful world we are in—that kind of curiosity. I look for genuine curiosity in prospective employees—those who want to know what is going on, those who have done some research.

In science, I look for personal integrity and integrity in science, respect for the observation in concert with the raw data, vigilance for unexpected results, and humility in the results. Of course, they should have some relevant training and qualifications, as well.

What do you think are good career moves for young scientists?

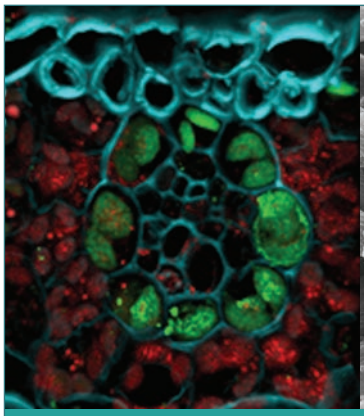
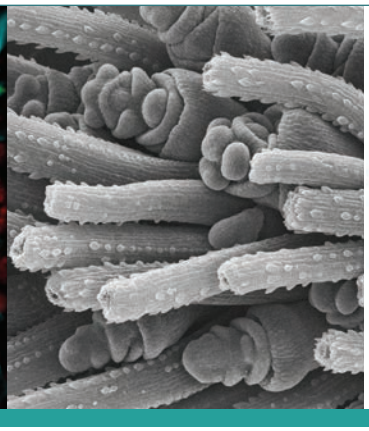
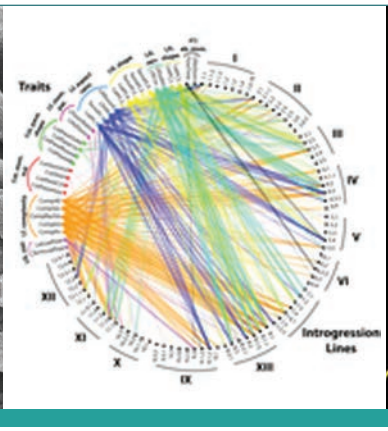
While choosing a career in plant science, have clear reasons why you want to join a particular company or group. Disregard the company you do not know completely, and look at the opportunities from the point of view of your background to make decisions on what to join or what suits you best.

What advice would you give to a student interested in plant biology today?

You need to have a broad overview of and basic background in science, including mathematics, physics, biology, and chemistry, among other subjects. These different subjects are especially necessary in plant science because for sound, good-quality research, you need well-defined research conditions, plenty of repeated observations under controlled conditions, competent statistical analysis, and reproducibility. Therefore, I advise young graduate students to consider issues of quality as they get involved in research.

What advice would you give educators to encourage young people to explore science and plant biology?

Try to stimulate the excitement. I got interested in plant science because my father took me on excursions with his students to the bush and the seashore. He would take time to talk about the interesting things that were happening there—for example, the marine algae and what they were doing there, as well as other important processes that were going on. When I got back from a conference in the 1980s, when the gene revolution was just beginning, there were these interesting discussions by people trying to transform plants. I spoke about that work on gene transformation to my students—that is an example of giving new and important information to stimulate interest. ■

Plant Physiology®

Call for Papers

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

To submit an article, go to http://pphys.msubmit.net/.

Plant morphology, physiology, and development are shaped by a combination of internal, external, and historical factors that have led to the remarkable diversity of structure and function we can observe on Earth today. Recent progress in understanding the proximate basis of plant evolution has revealed a myriad of underlying mechanisms, ranging from the genetic and epigenetic to the biophysical and microbiotic. This Focus Issue calls for review or research articles, short letters, and reports that provide novel insights into evolutionary mechanisms underpinning plant phenotypic variation. Work involving comparisons of disparate organisms (from between species to between kingdoms) is most welcome. The issue will be centered on timely topics, including but not limited to the role of epigenetic, small RNA, or phenotypic plasticity evolution in shaping plant form; the evolution of plant–microbe interactions; diversification of meristems, flowers, or root anatomy in an ecological context; and origins of CAM/C4 photosynthesis.

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Authors submitting to this Focus Issue should indicate their intent in the cover letter when submitting manuscripts online at http://pphys.msubmit.net/. Please select **"Evolution of Plant Structure and Function"** from the Focus Issue list in the online submission system. Articles published in *Plant Physiology* on this topic within 2 years before and after the Focus Issue publication date will be collected in an online Focus Collection.

Policy Update

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

BY VICTORIA HABER
Lewis-Burke Associates, LLC

Congressional Updates

Proposals to Bolster Competitiveness Through NSF

Federal policy makers in the House, Senate, and Biden administration are proposing separate approaches to improving U.S. scientific competitiveness, but the approaches all revolve around support for the National Science Foundation (NSF). The National Science Foundation for the Future Act, introduced in the House earlier this year, would authorize increased funding for NSF research, support STEM education at all levels, increase opportunities for broadening participation, and create a new Directorate for Science and Engineering Solutions to address societal grand challenges, including climate change and other environmental topics.

The House bill contains several provisions relevant to ASPB's interests, including additional support for climate change research; research at the intersection of food, energy, and water; and reaffirmation of NSF's role in sustaining biological collections. In the Senate, the Endless Frontier Act (EFA) was introduced by Majority Leader Chuck Schumer (D-NY) and Todd Young (R-IN). The EFA proposes the creation of a new Translational and Innovation Directorate authorized at a level of $100 billion (the House bill proposes a similar, but smaller new directorate). This directorate would have 11 technology focus areas, including one for biotechnology, medical technology, genomics, and synthetic biology. The bill was brought to the floor for consideration under a new title, the U.S. Innovation and Competition Act, and, after several days of debate and over 500 amendments, at the time of this writing, the bill looks poised to pass the Senate. Both the House and Senate bills only authorize funding levels; appropriated funding would come from different congressional committees.

In addition, the Biden administration included $50 billion for NSF in the recently released American Jobs Plan for supporting use-inspired research and improving U.S. scientific competitiveness. Both bills and the White House's proposed plan show a burgeoning interest in significantly boosting scientific funding, especially for translational research. It is unclear how the different plans will come together, but it is clear that there is support for increased NSF funding, the STEM workforce and education pipeline, and outcomes-focused research. Finally, the preview of the president's fiscal year (FY) 2022 budget request, with full details released on May 28, 2021, included $10.2 billion for NSF overall, and also proposed a new Directorate for Technology, Innovation, and Partnership.

Sources and Additional Information

- The National Science Foundation for the Future Act is available at https://tinyurl.com/2mcddhhc.
- A full analysis of the Endless Frontier Act can be found at https://tinyurl.com/yswu736y.

Biden Administration Releases American Jobs Plan

On March 31, President Biden announced a signature legislative proposal focused on accelerating economic growth through an ambitious $2.25 trillion stimulus plan. The American Jobs Plan would modernize America's infrastructure, spur climate action, strengthen the workforce and education, and promote U.S. global competitiveness. If passed by Congress, these goals would be achieved through investments in scientific research, federal incentives and mandates, encouragement of private sector participation and public–private partnerships, and policies that address broad and longstanding inequalities facing marginalized and underserved populations. Highlights include the following:

- $50 billion is included for NSF, part of it for creating a new technology directorate.
- $35 billion would be invested across the federal government to support climate technology R&D and mitigation techniques and practices. The proposal does not provide a detailed breakdown by federal agency but does highlight the creation of a new Advanced Research Projects Agency for Climate (ARPA-C) to fund high-risk, high-reward projects to reduce emissions, build resilience, and support climate research across the board. In addition, $5 billion is included to support and expand existing climate research programs.
- $40 billion is included for research infrastructure at research institutions and national laboratories, including research facilities and computing centers and networks. The proposal does not specify the distribution of funding across federal agencies, but it would include agencies such as NSF and DOE.
- The proposal mentions that investing in technological developments, including advanced carbon dioxide reduction methods like advanced pavements and other future-proof technologies, can help mitigate and redress the impacts of environmental disparities.
- The proposal also calls for supporting rural communities by providing R&D funding to land grant universities and helping push the agriculture industry toward net-zero emissions.

Congress will now work to translate the American Jobs Plan into legislation. The likelihood of passage, either in whole or in part, remains uncertain.

Source and Additional Information

- The White House's press release can be found at https://tinyurl.com/ktbn288m.

continued on page 24

POLICY UPDATE
continued from page 23

House Science Committee Hearing on Rebuilding the Federal Workforce

The Subcommittee on Investigations and Oversight of the House Committee on Science, Space, and Technology held a hearing examining the challenges facing the federal scientific workforce. Subcommittee Chairman Bill Foster (D-IL) used his opening remarks to outline the inflection point facing the federal workforce and the broader R&D enterprise. He noted that the House and Senate have "dueling proposals" for substantially increasing investment in federal scientific research but pointed out that enabling such a ramp-up would require an accompanying strategy for reinvigorating the federal scientific workforce that oversees research programs and performs research at federal facilities. Ranking Member Jay Obernolte (R-CA), new to the subcommittee, emphasized the importance of empowering federal agencies to be entrepreneurial in their recruitment tactics.

Members of the subcommittee heard from the witnesses, which included current and former officials with the Government Accountability Office (GAO), Partnership for Public Service (PPS), Union of Concerned Scientists (UCS), and Environmental Protection Agency, about root causes of the scientific workforce recruitment and retention challenges. Witnesses cited negative public perceptions of working in government following political interference in science-based decision making, scarce opportunities for early career professionals, lengthy hiring processes, and failure to pursue more diversity in the workforce. These shortcomings, they argued, are leading causes of the federal government's inability to compete with industry and academia in STEM talent recruitment.

Witnesses suggested solutions that varied widely, including public relations efforts and changes in compensation. In terms of specific employment mechanisms, Max Stier, president and CEO of PPS, called for more internship opportunities for early career professionals that could lead to full-time employment. Andrew Rosenberg, director of the Center for Science and Democracy at UCS, suggested that federal agencies be more aggressive in their outreach to minority serving institutions as a means to address a lack of diversity in the federal workforce. Candice Wright, acting director of Science, Technology Assessment, and Analytics at GAO, suggested that agencies offer increased pay to compete with industry's ability to attract young talent with more lucrative salaries. Finally, there was unanimous agreement that agencies—except NASA—were not doing enough to tout their own missions and frame their open positions as opportunities to serve the American public.

Source and Additional Information

- A full recording of the hearing along with written statements is available at https://tinyurl.com/wxxcmaed.

Appropriations Committee Hearing on USDA's Year Ahead

On April 14, Secretary of Agriculture Tom Vilsack appeared before the House Appropriations Committee's Agriculture, Rural Development, and Food and Drug Administration Subcommittee to outline USDA's plans for the upcoming year. During his opening remarks, he cited four pillars of focus for the agency: (1) prioritizing climate change and the unique opportunity it presents to bring jobs and resources back to the agricultural community, (2) addressing systemic discrimination across USDA programs, (3) increasing the profitability and resilience of agriculture in the United States, and (4) emphasizing nutrition insecurity in addition to food insecurity.

Vilsack drew attention to some ongoing and upcoming initiatives to address these overarching themes. He stated the intention to reestablish the task force on resilience and drought that was in place during the Obama administration and set up the Civilian Climate Corps. Ongoing initiatives include expanding climate hubs, working on flood mitigation practices, and filling the 100 positions at the National Institute of Food and Agriculture that remain vacant.

Source and Additional Information

- The full hearing is available for viewing at https://tinyurl.com/2y64rw37.

Federal Agency and Administration Updates

President's FY2022 Discretionary Budget Proposal

On May 28, President Biden released his first budget request to Congress. Unrestrained by legally imposed budget caps for the first time in a decade, this proposal includes an 18% boost in discretionary spending, for a total of $1.522 trillion. A budget request was due to Congress the first week in February, but was significantly delayed by the transition from the Trump administration and the need to fill key federal leadership positions.

Although it is ultimately up to Congress to decide which proposals to embrace, modify, or reject as part of the annual appropriations process, Congress has been waiting on the new administration to highlight its major political priorities and new funding initiatives. President Biden's top FY2022 budget priorities are public health, climate and clean energy, and education. Proposed FY2022 funding levels for major federal research and education agencies of interest are as follows:

- $10.2 billion for NSF, a $1.7 billion or 20% increase over the FY2021 enacted level. Key elements include $9.4 billion to support fundamental research across NSF, an increase of $1.6 billion or 25%; establishment of a new Directorate for Technology, Innovation, and Partnership to strengthen U.S. leadership in emerging technology areas; $1.2 billion for climate and clean energy–related research, an increase of $500 million or 71%; $100 million for programs to increase participation in STEM fields, an increase of 50%; and support for construction of major NSF facilities and new smaller research facilities and equipment across the United States.
- $46.1 billion for DOE, a $4.3 billion or 10% increase over the FY2021 enacted level, including $7.4 billion for the

Office of Science, an increase of $400 million or 6%, with targeted investments in climate change modeling, new materials for clean energy technologies, and construction of user facilities at DOE national laboratories.

- $51 billion for NIH, an increase of $8.1 billion. The funding increase would include $110 million, an increase of $100 million over the FY2021 enacted level, for NIH's Climate Change and Human Health program to focus on issues related to the health impacts of climate change with a focus on health equity.
- $27.8 billion for USDA, a $3.8 billion increase, including $4 billion for the Research, Education, and Economics mission area and a $40 million increase for USDA climate hubs to expand climate science tools and increase awareness and engagement in combating climate change.

Source and Additional Information

- A full analysis is available at https://tinyurl.com/23ded2bz.

Increasing Emphasis on Intersection Between Climate and Agriculture

The Biden administration has made clear that combating climate change will be a top priority for the duration of his term and that the agriculture sector will play a role in meeting those aspirations. The administration will take a "whole-of-government approach" to the climate crisis as exemplified by the January 27 Executive Order "Tackling the Climate Crisis at Home and Abroad," which laid out a series of actions for climate change mitigation and resilience that agencies should take. The Executive Order specified several information collection activities, and USDA released a request for information to collect "input on a climate-smart agriculture and forestry strategy" that will inform some of the department's steps to support the Executive Order and the administration's goals.

Agriculture Secretary Tom Vilsack and Senior Climate and Agriculture Policy Advisor Robert Bonnie also plan to release a report on climate change in the spring that will outline the sector's contributions to climate change and environmental quality and steps USDA will take over the next four years to address these issues. It is anticipated that carbon sequestration, regenerative agriculture, and soil health will be areas of interest, in addition to a continued focus on artificial intelligence and machine learning to improve resource use in farming.

In Congress, new leadership on both the House and Senate Agriculture Committees will focus on addressing climate impacts. Senate Agriculture Committee Chair Debbie Stabenow (D-MI) has said that climate change, supply chains, and the effects of COVID-19 on farmers will be top priorities. Similarly, House Agriculture Committee Chair David Scott (D-GA) will make climate change a major priority in addition to equity in agriculture and nutrition. Both the House and the Senate kicked off the 117th Congress with hearings focused on climate change, and hearings with leaders and stakeholders in the climate and agriculture space are expected to continue.

Farther on the horizon, conversations around the 2023 Farm Bill are beginning to take place. Although two years and an election will happen before then, congressional leaders are likely to push for the inclusion of climate provisions and will be open to new ideas for addressing climate change and agriculture.

Sources and Additional Information

- The January 27 Executive Order can be found at https://tinyurl.com/zy6jbewe.
- USDA's request for public comment is available at https://tinyurl.com/3356wnun. ■

Share Your Moment in the Spotlight with ASPB Members!

ASPB would like to highlight news coverage about plant science. If you or your research is being highlighted in newspapers, magazines, television, radio, movies, online, or other sources, please let us know! Just send a quick note, URL, and other relevant information to *ASPB News* production manager Diane McCauley at diane@aspb.org.

Support, Even from Six Feet Apart: An ASPB SURFer's Experience

BY MARTY ALANI, 2020 ASPB SURF Recipient

When I applied for a SURF fellowship in January of 2020, I thought the biggest challenge I would experience in the program would be having my experiments succeed. But in early March, it became clear that would not be the case. At my school, Cornell University, classes went entirely online, and undergraduates were denied access to research labs. As an added challenge to an already difficult year, I broke my leg at the end of the semester and lost much of my mobility. Despite the nationwide crisis, ASPB maintained the SURF program. Thanks to the support of my PI, Georg Jander, and ASPB, I was able to have a valuable research experience despite these setbacks.

In my SURF project, I investigated the transport and biosynthesis of cardiac glycosides in *Erysimum cheiranthoides,* a non–model plant in the Brassicaceae that synthesizes these compounds as an herbivore defense. Just before labs shut down on campus, I performed a mutagenesis experiment to screen for cardiac glycoside biosynthesis genes, and during the months I was kept from my research, my PI gave me regular updates on the mutant populations and maintained them for me, setting me up for success when I was allowed back into lab.

Gordon Younkin, a grad student in the lab, trained me in the basics of mass spectrometry, crucial for screening the mutant populations for phenotypes of interest. Georg, Gordon, and other lab members continued to help me manage my plants when my injury prevented me from doing so myself, and their help throughout the summer was crucial for my SURF experience. Because of the pandemic, it was harder to have the same mentor–student relationship with my PI and other lab members, yet I was able to receive the support I needed, even from 6 feet apart.

Although I'd had about a year of lab experience before my SURF fellowship, the summer of 2020 was my first time proposing, designing, and performing experiments for my own project. The plant I work on is a non–model organism, meaning that I had to optimize most procedures myself. This process was time consuming and challenging, but it ultimately gave me ownership of my project and produced results. My SURF

experience was very encouraging for me as a scientist and helped cement my plan to continue on to graduate school after graduation.

In the year before the fellowship, I found it difficult to complete work in the lab alongside my other responsibilities. Summer research allowed me to focus more completely on my work, become more acquainted with the literature, and complete time-intensive experiments that would be difficult during the semester. Since I began working in the Jander lab, I have become interested in plant secondary metabolism and how it mediates interactions with other organisms. I am excited to learn about current research in plant natural products at Plant Biology 2021 and to meet PIs to create contacts for graduate school. ■

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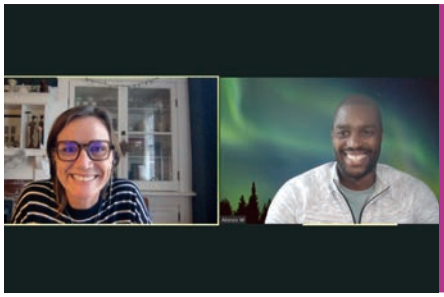

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2021 Deadlines: Jan. 30, April 30, July 30, and Oct. 30

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