

**PLANT
SYNTHETIC
BIOLOGY 2019**

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San Jose, CA

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Join the Synthetic
Biology Revolution
at Plant Biology
2019 and Plant
Synthetic Biology
2019



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James Birchler Will
Receive Prestigious
Barbara McClintock
Prize in 2020



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Julian Schroeder
Awarded Khalifa
International
Award

ASPB News



THE NEWSLETTER OF THE AMERICAN SOCIETY OF PLANT BIOLOGISTS

ASPB Announces 2019 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.

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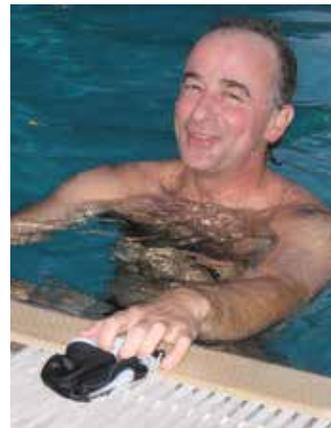


President's Letter

Into the Second Century: ASPB 2024

BY ROB LAST
Michigan State University

We continue the minitradition of publishing the President's Letter as part of a collection of essays and other resources related to the topic (<http://bit.ly/secondcentury>). Please have a look at the previous two collections on member security (<http://bit.ly/SecuringFuturePlantBiologist>) and future careers (<http://bit.ly/NextGenerationCareers>), and send your feedback about these topics and collections to roblast1@gmail.com or [@Biokid001](https://twitter.com/Biokid001) on Twitter.



Nobel laureate Barbara McClintock received her doctorate from Cornell, and the birth year of neutral theory population geneticist Motoo Kimura. A long time has passed, with unprecedented social, technological, and political changes. The intent of this letter is to challenge each of us—both as individuals and

as members of an international community of 3,000+ members—to think about what makes ASPB relevant, and what will make it continue to serve science and education in the next decade and century.

Why Is ASPB Critical to Thousands of Plant Biologists?

ASPB provides members with goods and services that have great value to the commu-

Members of ASPB will celebrate the organization's 100th anniversary in 2024. Pause for a moment to let the idea wash over you. ASPB was founded in 1924, a few months after Vladimir Lenin's death and early in the Jazz Age, when the telegraph was the dominant method for rapid communication. It was five years before the Great Depression, three years before future

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ASPB Council

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

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The *ASPB News* is distributed to all ASPB members and is also available online. It is published six times annually in odd-numbered months. Its purposes are to keep membership informed of ASPB activities and to reinforce the value of membership. The *ASPB News* is edited and produced by ASPB staff from material provided by members and other interested parties. Copy deadline is the 5th day of the preceding even-numbered month (for example, April 5 for May/June publication).

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nity. Four that are broadly valued by members are as follows:

1. three journals that collectively publish 600+ articles each year—*Plant Physiology*, established in 1926; *The Plant Cell*, celebrating its 30th anniversary; and *Plant Direct*, an open access sound science journal
2. an annual Plant Biology Meeting that provides an average of 1,500+ attendees exposure to great science and career information and diverse education and career development opportunities
3. Summer Undergraduate Research Fellowships awarded each year to more than a dozen undergraduate students working with ASPB member mentors
4. dozens of travel awards for early career professionals, women, and members of underrepresented minority groups from around the world to attend the Plant Biology meeting each year.

Providing a Public Good Does Not Ensure Longevity

Despite the success of these and other programs, our membership numbers have declined by 40% over the past few years, finally appearing to stabilize in 2018. Other professional organizations are also dealing with membership attrition; although this indicates that our community is not alone in this respect, we should be able to do much better than average.

Membership is not required to get many of the benefits that ASPB offers. You can publish in our excellent journals, enjoying

the high standard of review and editorial services provided, and charge your grants the additional nonmember publication and open access charges. Most of the content on *Plantae* is freely available. Many nonmembers around the world can get the full contents of our journals because institutions pay for subscriptions and ASPB makes all content freely available 12 months after publication. Nonmembers can attend the Plant Biology annual conference by paying a couple of hundred dollars extra. Finally, many of our awards are available to nonmembers.

What Would the Plant Biology Community Look Like Without ASPB?

Why should ASPB and other long-lived professional organizations exist? As social, political, and economic systems evolve, is it inevitable that scientific organizations will perish as a result of the “tragedy of the commons”—the mismanagement of a resource that does not specifically belong to anyone? What would be the outcomes of such a scenario?

Consider a world in which the major functions of ASPB are filled by commercial entities, starting with the journals. What would happen if *Plant Physiology* and *The Plant Cell* were sold to a commercial publisher and no longer had ASPB community involvement? It is possible that the current model of high-quality voluntary peer review guided by expert editors would persist, although many commercial journals use full-time professionals to assign and evaluate peer reviews and thus do not benefit from expert oversight. My author experience with society journals is far superior to my

experience with commercially published journals—even those with strong name recognition.

Even if you disagree that society journals provide added value, it is unarguable that the profits from our journals are the major source of revenues that fund the infrastructure for our conferences, conference travel awards, and education and outreach activities. Our community would lose the ability to fund Summer Undergraduate Research Fellowships; Plant Biology Learning Objectives, Outreach Materials, & Education (Plant BLOOME) grants; Transforming Education in Plant Biology awards; and booths at educator conferences. We would be forced to give up these activities or find other funding mechanisms. However, even if funds were found to maintain these activities, we would lose the professional staff who collaborate with community members to make these programs successful.

The annual meeting could be run by a commercial organization, but this scenario is a poor cousin to our current system. I have gone to a few for-profit conferences and never found them to be of high enough quality to merit attending a second time. The conferences would be more expensive to attend because we aim only to break even on our meetings, and when a conference loses money, it is subsidized with journal revenues or endowment. The program would not include as many early career presenters; speakers with broad name recognition tend to be favored when large registration revenue is sought. And there would be relatively few networking and career development activities unless

paid for by sponsors. It would be challenging to coordinate with other organizations, such as in our triennial collaboration with the Canadian Society of Plant Biologists, because a commercial entity would be involved. Innovating with new meetings such as Phenome and the Plant Synthetic Biology conference would be challenging for at least two reasons: community members are less likely to be motivated to serve a commercial enterprise, and a company would need to make a profit, even on a fledgling conference.

Future-Proofing ASPB

I hope the last few paragraphs convince you that ASPB is worth your support and, at a community level, is too important to fail. As we approach the 2024 centenary, we have plans to strengthen the Society's finances and mission in preparation for the next hundred years. What can you do to make ASPB a resource for the 22nd century?

You can support ASPB by participating: be a member, and help bring in new members. Talk to your friends about why you are a member, and tell them about what they are missing. Participate in the Plant Biology conferences (do you know the way to San Jose 2019? DC 2020? Pittsburgh 2021?) and regional meetings. Tell us what we can do to support you and those in your professional network. Apply to participate in our fantastic Ambassador, Convivon Scholars, and *Plantae* Fellows professional development programs. Make nominations for awards and elected offices on a regular basis, and vote every year. If a president-elect invites you to

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serve on a standing governance or award committee, please accept, and bring your energy and ideas.

Support journals published by ASPB and other not-for-profit organizations by submitting manuscripts to, reviewing for, and serving on the editorial boards of these journals. Society journals directly serve our mission of promoting and disseminating high-quality research and nurturing the next generation while funding the good works we do. Thus, we must focus on keeping our journals strong, even as competition from newer

journals continues and members of the broader community push more forcibly for changes in academic publishing. I am a strong proponent of voluntary open access and posting of preprints, but I am steadfastly opposed to Plan S (<https://www.coalition-s.org/>) and other models that would force immediate open access publishing. Much of the enthusiasm for immediate open access is prompted by real concerns about the profit model of commercial publishers. Unfortunately, not-for-profit society journals would be imperiled by these initiatives, and the collateral damage could include dramatic

increases in author processing charges (publication fees) and the possibility of bankrupting or drastically reducing services provided by professional societies, including ASPB. Let policy makers, librarians, and colleagues know your views on the future of publishing.

We are in the early days of planning major fundraising efforts to recognize the 2024 centenary and support the future of ASPB: this is a great time to think about providing financial support at a level that you can afford. We use endowment dollars to support awards, fellowships,

and grants, and more funds mean more opportunities for good works. Former ASPB president Brian Larkins spearheaded a very successful initial Legacy Society fundraising effort, and he is working with former presidents Debby Delmer and Ralph Quatrano to increase the endowment substantially by active fundraising. If you are contacted, please respond, and contact one of us if you are ready to talk about donating.

I look forward to celebrating the 100th anniversary of ASPB with you and the new members who join our community over the next five years! ■

Six ASPB Members Elected to 2019 National Academy of Sciences Class

Gloria Coruzzi

Carroll and Milton Petrie Professor of Biology, Department of Biology, Center for Genomics and Systems Biology, New York University

Maria Harrison

William H. Crocker Research Chair, Boyce Thompson Institute for Plant Research, Cornell University, Ithaca, New York

Jane Langdale (foreign member)

Senior research fellow, Queen's College, and professor, Department of Plant Development, University of Oxford, United Kingdom

Steve Long

Gutgsell Endowed Professor and Ikenberry Endowed University Chair, Departments of Plant Biology and Crop Sciences, University of Illinois, Urbana-Champaign

Pam Ronald

Director of Grass Genetics, Joint BioEnergy Institute, and distinguished professor, Department of Plant Pathology, College of Agricultural and Environmental Sciences, Genome Center, University of California, Davis

Dan Voytas

Director, Center for Genome Engineering, and professor, Department of Genetics, Cell Biology, and Development, University of Minnesota, St. Paul

The full article will appear in the July/August 2019 issue of the *ASPB News*.



Maarten Chrispeels



David J. Mackill



Siobhan Brady



Bob B. Buchanan



James Schnable

ASPB AWARD WINNERS
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Adolph E. Gude, Jr. Award

Maarten Chrispeels

University of California, San Diego

Maarten Chrispeels is the 2019 recipient of the Adolph E. Gude, Jr. Award in recognition of his outstanding service to the science of plant biology. Maarten is awarded for his elucidation of the plant endomembrane and secretory systems, vacuoles, and water-transport proteins; his advocacy of plant biology and biotechnology in international agriculture as author of three textbooks and as science ambassador, most notably in the Americas; his improvement of the editorial and peer-review processes as editor-in-chief of *Plant Physiology* from 1992 to 2000; and his tireless promotion of diversity and education in plant science.

ASPB Innovation Prize for Agricultural Technology

David J. Mackill

University of California, Davis, and Mars, Inc.

The 2019 ASPB Innovation Prize for Agricultural Technology is awarded to David J. Mackill for his leadership in the breeding of

submergence-resilient rice and its distribution to millions of farmers in Asia. At the International Rice Research Institute and the USDA in Davis, Dave identified the *SUBMERGENE1 (SUB1)* locus that led, through collaboration, to recognition of *SUB1A* as the submergence-tolerance determinant and knowledge of its function. Dave developed a molecular breeding strategy using farmer-preferred varieties that accelerated the acceptance of Sub1 rice and other improved varieties by governments and farmers.

Charles Albert Shull Award

Siobhan Brady

University of California, Davis

Siobhan Brady, associate professor in the Department of Plant Biology and the Genome Center at the University of California, Davis, is the 2019 recipient of the Charles Albert Shull Award. Siobhan is a leader in using systems biology to understand the gene regulatory networks that control plant root development and function. She pioneered research on cell type-specific gene expression profiling in roots, and she has integrated cutting-edge experimental and computational

approaches to define the transcriptional regulatory networks involved in root vascular development and nitrogen metabolism. In addition to her groundbreaking research, Siobhan has been recognized as an outstanding adviser and mentor to students at UC Davis, and she has provided generous service to the wider plant biology community and ASPB, serving most notably on the editorial board of *The Plant Cell* since 2015.

Charles Reid Barnes Life Membership Award

Bob B. Buchanan

University of California, Berkeley

Bob Buchanan has made extraordinary contributions to plant biology through his research and service. Bob's seminal work uncovered the central regulatory role of thioredoxin in linking the activity of critical enzymes of the photosynthetic carbon reduction cycle to light. This work resulted from his discovery of a new pathway of carbon fixation in bacteria that involved a direct role for reduced ferredoxin generated through the light reactions of photosynthesis. These groundbreaking discoveries led to his

election to the National Academy of Sciences. In addition, as president of the (then) American Society of Plant Physiologists, Bob made many outstanding contributions via his service to the field, including leading the development of the successful textbook *Biochemistry & Molecular Biology of Plants*. Bob is among a handful of plant biologists who helped define their own generation of plant biologists while launching the next generation of scholars.

Early Career Award

James Schnable

University of Nebraska

The ASPB Early Career Award is bestowed upon James Schnable, assistant professor in the Department of Agronomy & Horticulture at the University of Nebraska. James obtained his PhD from the University of California, Berkeley, and split his postdoctoral training between the Donald Danforth Plant Science Center and the Chinese Academy of Agricultural Sciences. Expertise in the Schnable laboratory focuses on quantitative and functional genomics across grass species, as well as automated

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plant phenotyping. James's work has shed light on the evolution, expression, and function of the multiple subgenomes of paleopolyploid crops. James has accumulated a truly impressive track record of collaborations, publications, funded research projects, editorial positions, companies cofounded, and community resources developed.

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 outside the United States.

Robert T. Furbank

Australian National University

Robert Furbank is director of the Australian Research Council Centre of Excellence for Translational Photosynthesis, Australian National University. Prior to that, he was director and chair of the Executive Management Committee of High Resolution Plant Phenomics Centre (2008–2014). Robert has been a member of ASPB since 1980 and has been active in reviewing for *Plant Physiology* and *The Plant Cell*, as well as publishing in these journals. He is an internationally recognized pioneer of multiscale or “systems” plant biology, with major contributions spanning from gene discovery to plant growth and field photosynthetic performance aimed at piecing together components of yield in crops. He has been at the forefront of our understanding of



Robert T. Furbank



Yi-Fang Tsay



Andreas P. Weber

C_4 photosynthesis, characterizing why these plants perform better than the traditional crops wheat and rice. He established Australia's first Plant Phenomics Centre, allowing exploration of plant performance from the leaf to the field. In C_4 photosynthesis, early groundbreaking publications have been in defining the size and composition of the bundle sheath CO_2 pool and modeling efficiencies of the C_4 CO_2 pump. His recent impact on the field is evidenced by many invited reviews, such as in *Science* on C_4 rice engineering, an invited editorship of *Current Opinion in Plant Biology*, a Darwin Review for the *Journal of Experimental Botany* to mark 50 years since the discovery of the C_4 pathway, a commissioned “In Retrospect” article in *Nature* on “50 Years of C_4 Photosynthesis,” and a commentary in *Nature Plants*. He was the first to clone and manipulate sucrose transporters from rice and wheat and to demonstrate their importance in controlling grain filling and germination rather than phloem loading. His exploration of the path of sugar import to cotton fiber was the first demonstration of reversible gating of plasmodesmata and the coordination of

this process with expression of solute transporters to drive cell elongation. This work became the basis for many years of research in cotton fiber improvement based on this mechanism of fiber elongation. Robert established the Plant Phenomics national facilities in Australia with high international profile in whole plant systems biology and developed tools to nondestructively measure the photosynthetic performance, growth, and yield of plants under a range of environmental conditions. The technologies and approaches he developed are now widely adopted by the scientific community to allow researchers to rapidly phenotype photosynthetic traits and determine the impact of photosynthetic performance on growth and yield in the laboratory and the field. He has an impressive record of publications, and his work is highly cited.

Yi-Fang Tsay

Academia Sinica

Yi-Fang Tsay is a distinguished research fellow and acting director at the Institute of Molecular Biology, Academia Sinica, Taipei. Yi-Fang is an internationally renowned plant nutritionist ac-

tively engaged in the research of membrane transport, and she has made outstanding contributions in this important research field. Her discoveries provided new leads for the sustainable development of agriculture and have led to patents in Taiwan and the United States. Among her outstanding achievements is the discovery of the first nitrate transporter in plants; this was subsequently shown to also function as the nitrate sensor, giving rise to the new term “transceptor” describing a protein that has both transporter and receptor functions. These important breakthroughs enabled Yi-Fang to rewrite the theory of nitrate transport, introducing innovative ideas on how nitrate is delivered to various parts of the plant. Of particular note, Yi-Fang translated basic research to applications by designing new strategies for improving the nitrogen use efficiency of crops to help alleviate the environmental hazards of over application of nitrogen fertilizers. Yi-Fang has actively participated in international academic communities. She has been an editor of *Plant Physiology* for nine consecutive years, and she also au-



Craig A. Schenck



Tara Phelps-Durr

thored a chapter in *Biochemistry & Molecular Biology of Plants, Second Edition*, published by Wiley and ASPB. She has also been invited by F1000 as a contributing member. As a matter of recognition, she was invited by *Nature* in 2014 to write a “News & Views” account on the structure of the nitrate transporter, and she has been invited twice by *Annual Review of Plant Biology* to write reviews. These distinct honors clearly indicate that Yi-Fang is highly valued by the international community. Her leadership is also evident as she is acting director of her institute and cochair of the organizing committee for Japan–Taiwan Plant Biology 2019.

Andreas P. Weber

Heinrich-Heine University

Andreas P. Weber is a full professor of plant biochemistry, Department of Biological Sciences, at the Heinrich-Heine University Düsseldorf in Germany. Andreas started his career in the lab of Ulf-Ingo Flügge in Würzburg (later Cologne), and his focus at that time was already on the characterization of chloroplast development, primary plastid metabolism, and cor-

responding transport processes. From 2002 to 2007, he was associate professor for plant biology at the Department of Plant Biology, Michigan State University. Andreas discovered early on putative limitations and, for further progress, introduced biochemical, forward- and reverse-genetics, and bioinformatics approaches. Thus, he has developed and applied tools for comparative (cross-species) transcriptomic approaches in a phylogenetic framework. This work led to the first quantitative comparison of related plant species at the transcriptomic levels, which allowed both the identification of a large number of candidate genes required for C_4 photosynthesis and in-depth understanding of photorespiration in higher plants. Moreover, Andreas became an acknowledged expert on algal biology and land-plant evolution. More recently, he has introduced approaches from synthetic biology into his research aimed at the improvement of plant productivity and directed crop breeding. Andreas is head of a large research group, and since 2012 he has served as speaker of the Cluster of Excellence on Plant Science (<http://ceplas.eu>).

He has been among the world’s top scientists in the area of plant research for more than 20 years and has authored more than 200 peer-reviewed publications, many of them in top journals. In addition, Andreas has been an elected member of the Review Board for Plant Biology of the German Research Foundation (DFG) since 2016. Since 2009, he has been the spokesperson of a DFG-funded International Research Training Group, through which well-regarded early career scientists receive their PhD degrees. Thus, Andreas has great personal merit in the development of the academic field through both his research and his support for education.

Eric E. Conn Young Investigator Award

Craig A. Schenck

Michigan State University

Craig Schenck is recognized for his important contributions to the field of plant specialized metabolism and his commitment to student mentoring, public outreach, and service to the profession. Craig’s research has generated an impressive body of publications and patents focused on the discovery, characterization, and evolution of novel pathways of specialized metabolism in multiple plant species. In addition to his dedication to teaching, mentoring, and service at his home institution, Craig has contributed to the mission of the Society by serving as an ASPB Ambassador and as the early career representative on the Publications Committee. He has received numerous honors for his research and service, including an NSF Postdoctoral Research Fellowship in Biology.

Excellence in Education Award

Tara Phelps-Durr

Radford University

This year’s Excellence in Education Award winner is Tara Phelps-Durr. Tara has an outstanding record of teaching, mentoring, and outreach. She was instrumental in leading her department to infuse the curriculum with concepts derived from NSF’s Vision and Change initiative. Tara has included computational biology in her courses and has disseminated her courses through various venues, including CourseSource and a Gordon Research Conference on Undergraduate Biology Education. Tara led the application to the Howard Hughes Medical Institute for a project fostering inclusive excellence, and the project was funded. As one of her students stated in the application, “She goes out of her way to make sure her students are able to succeed in her class and during their time in college. It creates a permanent, positive impact on us students when we know our professors want us to succeed by how they treat us, which helps motivate us to work even harder.”

Fellow of ASPB Award

James Carrington

Donald Danforth Plant Science Center

Jim has made substantial contributions to ASPB and to the plant community at large while performing outstanding research in the areas of viral and RNA biology. He served as a member of the editorial board of *The Plant Cell*, and he is currently serving on ASPB’s Science Policy Committee.

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James Carrington



Jill Deikman



Karen Koster



Scott Peck



Doris Wagner

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Since 2011, he has been president of the Donald Danforth Plant Science Center, helping the center raise a large endowment and building strong relationships with neighboring universities, thus providing their graduate students the opportunity to be trained at the center. Jim also serves on numerous other editorial boards and scientific committees. His research publications have been cited more than 30,000 times, and in 2011 he was elected to the National Academy of Sciences in recognition of his superb scientific achievements.

Jill Deikman

Bayer Crop Sciences

Jill works as a scientist and has a long history of contributions to ASPB, as well as to other endeavors in the plant community. She currently serves as chair of the Membership Committee and as a member of the ASPB Council. Jill's guidance of the Membership Committee has been particularly noted for helping expand the reach of ASPB. Previously, Jill served on numerous other ASPB committees. She has also

sat on grant panels at USDA, DOE, NSF, and NASA, and she has been involved in organizing and chairing scientific meetings. It is notable that some of Jill's research for BASF, and previously for Monsanto, has been published in scientific journals accessible to the public; she is also named on several patents and many patent applications.

Karen Koster

University of South Dakota

Karen is an internationally recognized expert in the physiology and biophysics of membranes during desiccation, particularly in regard to seed storage and plant freezing stress. Three of her seminal papers, published in *Plant Physiology*, that defined the role of soluble sugars and other solutes in desiccation tolerance have received nearly 1,200 citations. Karen has made major contributions in service to ASPB at the section and national levels during her 34 years of membership in the Society. At the national level, Karen served as ASPB treasurer from 2012 to 2015 and chaired the Society's Board of Trustees during that time; she also served on the Minority

Affairs Committee (2004–2007) and the Summer Undergraduate Research Fellowship Committee (2011–2012). Karen is actively involved in the leadership of the International Molecular Moss Society and the International Society of Seed Science. Karen was an associate editor of the *American Journal of Botany* (2013–2018).

Scott Peck

University of Missouri

Scott served as a coeditor of *The Plant Cell* for 10 years and has been serving on the editorial boards of several other journals. He has sat on multiple grant panels in the United States and abroad. He is noted for doing pioneering work in phosphoproteomics, with emphasis on biotic and abiotic stress, particularly in the roots. Scott was elected AAAS fellow in 2018 in recognition of his contributions to the field of plant–microbe interactions and disease resistance in plants, with major contributions to proteomics technologies. He has been commended for his interest and success in mentoring students at all levels, particularly undergraduates.

Doris Wagner

University of Pennsylvania

Doris pioneered the field of epigenetic regulation of plant development, with specific emphasis on the role of chromatin remodeling. In a series of influential scientific reports over the past two decades, her group has demonstrated the direct role of the SWI/SNF complex, as well as other elements, in regulating key transcription factors specifying shoot and floral development. Doris has served as a monitoring editor for *Plant Physiology*, as an associate editor for *The Arabidopsis Book*, and on many other editorial boards; she is currently serving as editor-in-chief of *Current Opinion in Plant Biology*. She has also served on numerous grant panels and has been involved in organizing multiple conferences. She is known for her mentoring efforts, with one notable project being an advanced undergraduate research course in which students engage in highly sophisticated plant research and even publish their results in prestigious scientific journals, such as *The Plant Cell*.

Martin Gibbs Medal

Robert A. Martienssen

Cold Spring Harbor Laboratory

Robert A. Martienssen is awarded the 2019 Martin Gibbs Medal for his groundbreaking research on the role of small RNAs in chromatin and DNA modifications, heterochromatin formation, transposable element control, and developmental processes. After receiving his PhD in 1986 from the University of Cambridge, U.K., Rob spent two years as a post-doctoral fellow at the University of California, Berkeley, before moving to the Cold Spring Harbor Laboratory as assistant professor in 1989. He was promoted to full professor in 1996. Rob has been a Howard Hughes Medical Institute Gordon and Betty Moore Foundation Investigator in Plant Biology since 2012. Rob's research has transformed our thinking about the role of small RNAs in plants and beyond. His work has laid the foundation in many areas of epigenetics involving the functions of small RNAs, the establishment of heterochromatin, the control of replication, the modification of histones, the control and inheritance of transposable elements, the establishment of DNA methylation, and the roles of small RNAs in plant development. Many of his publications are viewed as classics. Two examples are his discovery that RNAi is responsible for heterochromatic silencing and methylation of histone H3, described in a paper that was heralded by *Science* magazine as the Breakthrough of the Year in 2002, and his discovery of the DDM1 mutation in *Arabidopsis* that affects the DNA methylation status of multiple areas of the genome. Furthermore, Rob has success-



Robert A. Martienssen



Rick Vierstra

fully applied aspects of this work in the areas of leaf development and floral architecture in maize and oil yield and heterosis in oil palm. Because of the consistently high impact of his contributions to plant science, Rob is a most deserving recipient of the Martin Gibbs Medal, which honors “an individual who has pioneered advances that have served to establish new directions of investigation in the plant sciences.”

Stephen Hales Prize

Rick Vierstra

Washington University

Rick Vierstra is an exceptional scientist who has a career of achievement and service to the plant biology community. Rick is the George and Charmaine Mallinckrodt Professor in the Department of Biology at Washington University. He has made seminal and sustained contributions to two major areas of biology: the role of protein degradation by the ubiquitin-proteasome system in plant signaling, and the structure, function, and evolution of the phytochrome family of red light photoreceptors. His work has contributed signifi-

cantly to the broadening recognition of the preeminent role played by regulated protein degradation in a diverse spectrum of cell signaling pathways, including multiple hormones, stress, and light. Rick has made outstanding contributions to the plant science com-

munity through his many activities in ASPB and the International Society of Plant Molecular Biology. Rick's innovative research and outstanding service make him a worthy recipient of the Stephen Hales Prize. ■

2019 ASPB Election Results

Many thanks to those members who took the time to vote this spring, and hearty congratulations to our new Board members! They will begin their service to ASPB on October 1, 2019. Look for more information about our new leaders in the next issue of the *ASPB News*.

Incoming President-elect

Maureen McCann

Purdue University

Incoming Elected Member

Clint Chapple

Purdue University

Congratulations, too, to the newly elected ASPB Enid MacRobbie Corresponding Members, Robert Furbank, Yi-Fang Tsay, and Andreas Weber!

Join the Synthetic Biology Revolution at Plant Biology 2019 and Plant Synthetic Biology 2019

Imagine a world in which plants are designed, almost from the ground up, for specific traits that could range from increased yield, through chemical biosensing, to drug production. This is the world of plant synthetic biology, where plant biologists, biochemists, and engineers apply the principles of engineering to plants, the bacteria they associate with, and photosynthetic microbes. Andrew Hanson, from the University of Florida, asked, “How is SynBio going to affect everyday plant bioscience research? It might be easier to say what *won't* be affected in the long run. SynBio is to plant science today what recombinant DNA was in the 1980s. Can you name an area of plant science that recombinant DNA hasn't impacted?”

He further described two applications of synthetic biology that he wants every plant biologist to know about: “One is directed evolution, which opens up protein ‘design space’ that plants have never accessed. The other (and it's an enabling technology, rather than SynBio proper) is cheap DNA synthesis. It's rapidly making cloning skills redundant. As Twist Bioscience CEO Emily Leproust puts it, ‘Friends don't let friends clone.’”

Synthetic biology aims not just to optimize metabolic pathways in existing organisms, but to eventually develop entirely new enzymes and other proteins as biological components that can be mixed and matched to

create novel pathways and genetic circuits for specific functions in optimized hosts. Andrew described synthetic biology as “an earthquake that transforms biology from descriptive into prescriptive, analytical, and synthetic. This is not how we used to do biology, and it's not how we're going to do it for the rest of time.”

ASPB is highlighting this emerging field in two ways. First, **Plant Biology 2019** (<http://plantbiology.aspb.org>), August 3–7, in San Jose, California, includes a symposium on synthetic biology. Major Symposium 5, “The Future of Plant Synthetic Biology,” will feature talks from four global leaders in synthetic biology: **Pamela Silver** (Harvard University), **June Medford** (Colorado State University), **Tobias Erb** (Max Planck Institute for Terrestrial Microbiology), and **Sean Cutler** (University of California, Riverside).

Second, ASPB is holding the inaugural **Plant Synthetic Biology** conference ([https://](https://plantsyntheticbiology.org/)



plantsyntheticbiology.org/), August 7–9, immediately following Plant Biology 2019 and at the hotel attached to the San Jose convention center. Incorporating talks from 10 university and industry scientists, Plant Synthetic Biology 2019 will showcase state-of-the-art work in plant synthetic biology as well as the technologies enabling it—a field that was recently featured in a Focus Issue of *Plant Physiology* (<http://www.plantphysiol.org/content/179/3>) as well as in an ongoing series of *Plantae* inter-

views (<https://community.plantae.org/organization/synthetic-biology>) and a Twitter account @plantsynbio2019.

The sessions at Plant Synthetic Biology 2019 are “The SynBio Revolution,” “Desirable Traits (Primary and Specialized Metabolism),” and “Cool Tools/ Industry.” Speakers will include the following:

- **Aileen Mastouri** (Joyn Bio) will give an “Introduction to the Use of Synthetic Biology to Improve Microbial Products for Agriculture,” describing the work of Joyn Bio in using synthetic biology to engineer beneficial microbes that improve key agricultural processes such as nitrogen fixation.
- **Nicola Patron** (Earlham Institute, U.K.) will speak on “Recoding Regulation,” describing “bioinformatic and experimental approaches to decode the intrinsic properties of plant regulatory sequences enabled by nanoscale, automated workflows that have

PLANT SYNTHETIC BIOLOGY 2019

August 7-9, 2019 | San Jose, CA

informed the rational design of synthetic genetic regulatory elements for plants.”

- **Karsten Temme** (Pivot Bio) will discuss “Sustainable Nitrogen Production” and describe the work at Pivot Bio “to develop a robust biological nitrogen fixation platform for cereals, leveraging crop–microbe interaction data to rationally develop a diazotroph capable of fixing agriculturally relevant quantities of nitrogen for corn to serve as an alternative to current fertilizer practices.”
- **Vincent Martin** (Concordia University, Canada) will describe work on engineering microbes to produce high-value benzyloquinoline alkaloids.

For more on Plant Synthetic Biology 2019 speakers, join the network on Plantae (<https://>

community.plantae.org/organization/synthetic-biology/dashboard). Attendees interested in giving a 15-minute talk at Plant Synthetic Biology 2019 should submit their abstracts by June 14. Each attendee selected to present a talk will receive a \$1,000 travel award covering registration and two nights in the conference hotel.

There is plenty of time left to register for Plant Biology 2019 and Plant Synthetic Biology 2019, and if you register for both meetings, you get a discount. For more information and conference updates, follow @PlantSynBio and #PlantSynBio19 on Twitter, and join the Plantae Synthetic Biology network (<https://community.plantae.org/organization/synthetic-biology/dashboard>). ■

Dates to Remember

Ongoing

Registration for Plant Biology 2019 (<https://bit.ly/2MFicgk>), registration for Plant Synthetic Biology 2019 (<https://plantsyntheticbiology.org/>), and hotel bookings (<https://bit.ly/2SsRnRL>)

June 14

Deadline for abstract submission (<https://plantsyntheticbiology.org/>) to be considered for a talk at Plant Synthetic Biology 2019

August 3–7

Plant Biology 2019 in San Jose, California

August 7–9

Plant Synthetic Biology 2019 in San Jose, California

The Plant Cell Is 30!

Commemorative T-shirt will be the Plant Biology 2019 tee

Place your order for the Plant Biology 2019 meeting T-shirt (<https://my.aspb.org/store>). This year the meeting celebrates 30 years of *The Plant Cell*, which blossomed in January 1989. The design was created by Nan Eckardt, senior features editor of *The Plant Cell*. It features nine outstanding images from the thousands of beautiful photos published in the journal over the years. The T-shirt also commemorates Plant Biology 2019 with the meeting logo featured on the sleeve. Men’s and women’s styles are available.

#ThePlantCellebration30



Rebuild, Recruit, Reenergize: An Update on Ambassador Activities from 2018

BY SUNIL K. KENCHANMANE RAJU
Michigan State University, Vice Chair of the Ambassador Alliance

The ASPB Ambassador Program (<http://bit.ly/ASPBambassador>) provides a platform for early career researchers, including students, postdocs, and industry employees, to engage in communicating the mission of ASPB to fellow scientists and the general public through outreach activities. Since its initiation, ASPB ambassadors have been actively spreading the vision of ASPB through science communication and outreach activities within their campuses and local communities. In recognition of the success of the program and to further strengthen it, 17 new ambassadors from around the world were recruited in March 2019, bringing the total number of ASPB ambassadors to 36, representing seven countries. Among them are 26 graduate students, eight postdoctoral fellows, and two industry employees. Each year, new ambassadors will be recruited through an open call during November and December.

Ambassadors are required to complete two outreach or science communication activities aligned with ASPB's mission of communicating the importance of plant science and to submit a detailed year-end report describing their participation and plans for the next calendar year. In 2018, ASPB ambassadors were involved in at least 20 unique outreach activities, including volunteering in Fascination of Plants Day, at the

Plant Biology annual meeting, and at ASPB sectional meetings and organizing outreach activities at their home institutions and local museums. Most ambassadors were active on online and social media platforms, spreading the message of ASPB through articles in the *ASPB News*, including contributions to the Luminaries column, and posting or blogging on *Plantae*.

With guidance from the Membership Committee, the Ambassador Program is now self-governed by an ad hoc committee, the Ambassador Alliance. The founding members of the Ambassador Alliance are Stephanie Klein (chair), PhD candidate at Penn State University; Sunil K. Kenchanmane Raju (vice chair), postdoc at Michigan State University; Katy McIntyre (secretary), PhD student and NSF fellow at Colorado State University; and Rishi R. Masalia (representative to the Membership Committee), director of Bioinformatics at LeafWorks. The Ambassador Alliance is responsible for rolling out the revised program, recruiting and orienting new ambassadors, creating resources to support ambassador activities, and increasing the involvement of early career researchers in ASPB. Each officer will serve a one-year term, and future officers will be elected by ambassadors annually in September.



Stephanie Klein



Sunil K. Kenchanmane Raju



Katy McIntyre



Rishi R. Masalia

Along with the addition of new ambassadors, the revised program will provide additional leadership training and career development opportunities, with enhanced features including discounted registration to the annual Plant Biology meeting, free registration to sectional meetings, seed grants for outreach activities, and the Ambassador of the Year (AOTY) award. The AOTY will be selected for exceptional contributions to the program on the basis of the ambassador's year-end report.

This award carries free registration and a \$575 travel stipend to attend the Plant Biology meeting. Arif Ashraf, from Iwate University, Japan, was selected as the inaugural AOTY (see article on page 17).

Acknowledgment: The Ambassador Alliance thanks the ASPB Membership Committee for their support, particularly Jill Deikman. The Alliance also expresses its gratitude to Shoshana Kronfeld for helping with program activities. ■

PSRN Updates: Inclusivity in the Plant Sciences and Plant Summit 2019

BY NATALIE HENKHAUS

Executive Coordinator for the Plant Science Research Network

In early 2019, the Plant Science Research Network (PSRN) held two strategic planning meetings. The PSRN is an NSF-supported Research Coordination Network whose members are research councils and scientific societies, including ASPB. Among the participants at both workshops were early career researchers and scientists from the public and private sectors across the plant science research community. The participants were selected to represent diverse research backgrounds, including plant pathology, crop and soil sciences, ecology, genetics, molecular biology, and other areas of plant science. These events were the most recent in a series of convening events that used scenario planning to stretch participants' thinking about the future. Previous meetings addressed postgraduate training and cyberinfrastructure resources.

The Inclusivity in the Plant Sciences meeting was held January 8–11, 2019, at the Howard Hughes Medical Institute in Maryland. About 40 participants were selected through a competitive application to attend. Through the facilitated workshop, participants identified strategic recommendations to support and promote equity, diversity, and inclusion in the plant sciences.

The Plant Summit 2019 meeting was held February 10–13, 2019, at Biosphere 2 in Arizona. About 50 participants were selected



Plant Summit 2019 attendees outside Biosphere 2 in February 2019.



Inclusivity in the Plant Sciences attendees at the Howard Hughes Medical Institute in January 2019.

through a competitive application to attend the summit. The PSRN is now working with stakeholders to develop a 10-year strategic plan or

decadal vision (2020–2030) document to communicate outcomes from the summit. The report will present the plant science research

goals and the workforce and infrastructure components necessary to achieve our decadal vision.

A summary of each meeting and other information about the PSRN are available online in our network on *Plantae* (plantae.org/PSRN). We invite you to join the network to hear about PSRN activities and to access workshop reports (to be available in fall 2019). Please contact

Natalie Henkhaus (nhenkhaus@aspb.org) or reach out on Twitter [@PlantSciResNet](https://twitter.com/PlantSciResNet) to share questions and comments. ■

The following article is adapted with permission from the University of Missouri. This article first appeared on the University of Missouri website on March 16, 2019 (<http://bit.ly/BirchlerReceivesMcClintockPrize>).

James Birchler Will Receive Prestigious Barbara McClintock Prize in 2020

The Maize Genetics Executive Committee has announced that University of Missouri Professor James Birchler will receive the 2020 Barbara McClintock Prize for Plant Genetics and Genome Studies.

The announcement was made in St. Louis, Missouri, on March 15 during the 61st annual Maize Genetics Conference.

Barbara McClintock is recognized as one of the greatest geneticists of the 20th century. In 1983, she became the first woman to win a solo Nobel Prize in Physiology or Medicine for discovering genetic transposition, or so-called jumping genes that move from one chromosome to another. The Barbara McClintock Prize for Plant Genetics and Genome Studies was established by the Maize Genetics Executive Committee to memorialize her contributions by honoring the discoveries of the world's leading plant geneticists.

"I am humbled by this recognition," said Jim, who is a Curators' Professor of Biological Sciences in the College of Arts and Science. "It is especially humbling to be associated with Dr. McClintock's name because I have studied her work for all of my career, and I am still learning from it."

Jim is recognized for his studies of gene expression at the



Jim Birchler

gene and chromosome levels in both corn and fruit flies. His research has been at the forefront of understanding how dosage, or copies, of genes work together and sometimes fail. A common example of a change in gene dosage in humans is Down syndrome. Together with Reiner Veitia (University of Paris), Jim proposed the gene balance hypothesis, which posits selection on proteins involved in regulation in response to changes in dosage. In other work, his lab developed the first synthetic chromosomes in plants as well as a method for microscopically visualizing plant chromosomes, two inventions that have had broad scientific and industrial applications.

Of particular relevance to this award, his research has provided novel insights into several of Dr. McClintock's discoveries, including the breakage–fusion–bridge cycle, a phenomenon that can occur during cell division that leads to chromosomal instability.

"Jim Birchler's work on chromosome structure and function has revolutionized our understanding of gene regulation and its effect on phenotypes, including hybrid vigor, and genome evolution. This recognition is especially significant given the beautiful intersection of his work with that of Barbara McClintock herself. He is an exceptionally worthy recipient of this award," said Natalia de Leon, professor and H. I. Romnes

Faculty Fellow in the Department of Agronomy at the University of Wisconsin and a member of the committee that selected Jim for the prize.

Previous recipients of the McClintock Prize are David Baulcombe (University of Cambridge), Susan Wessler (University of California, Riverside), Jeffrey D. Palmer (Indiana University at Bloomington), Michael Freeling (University of California, Berkeley), Rob Martienssen (Cold Spring Harbor Laboratory), and Detlef Weigel (Max Planck Institute of Developmental Biology).

The award and medal will be conferred during a ceremony at the 2020 Annual Maize Genetics Conference in Hawaii.

Jim joined the University of Missouri faculty in 1991. He is an elected member of the National Academy of Sciences, and an elected fellow of the National Academy of Inventors, AAAS, and ASPB. In 2017, he was awarded the Southeastern Conference's Professor of the Year Award.

The Maize Genetics Executive Committee is a professional organization for scientists and researchers working in the field of maize genetics. ■

The following article is adapted with permission from the University of California, San Diego. This article first appeared on UC San Diego's website on March 11, 2018 (<http://bit.ly/SchroederKhalifaAward>).

Julian Schroeder Awarded Khalifa International Award for Date Palm and Agricultural Innovation

BY MARIO AGUILERA
University of California, San Diego

Julian Schroeder has been awarded a prestigious international prize for his research achievements in plant drought and salt tolerance, and in improving the water use efficiency of plants. Julian received the Khalifa International Award for Date Palm and Agricultural Innovation during a March 10 award ceremony in Abu Dhabi, United Arab Emirates.

The award was established “in recognition of the outstanding efforts and contributions made by both individuals and institutions in the field of agricultural innovation and date palm and to encourage and motivate them to exert further efforts towards upgrading the agricultural sector and date palm tree.” Award winners are selected by an international scientific committee.

Julian, Novartis Chair in Plant Sciences in the Division



Julian Schroeder

of Biological Sciences at the University of California, San Diego, pioneered the characterization of ion channels in higher plants. His laboratory also conducted groundbreaking research in identifying the basic molecular mechanisms by which plants respond to and mount resistance to drought and salinity stress

and regulate water loss in response to the continuing rise in atmospheric carbon dioxide.

His laboratory's research on heavy metal stress led to the codiscovery of key genes encoding central heavy metal transporters and detoxification enzymes in plants. Such basic research can provide tools for engineering plants for environmental remediation, or “bioremediation,” to remove heavy metals from soils. His laboratory has conducted outreach activities in disadvantaged areas such as Southeast San Diego to test edible plant tissues at urban garden sites, and some were found to be at risk for heavy metal consumption. Led by Keith Pezzoli, a teaching professor with the Urban Studies and Planning Program, contaminated soils were replaced by clean soils and crops retested as part of community efforts to reduce exposure to such risks.

A member of the Section of Cell and Developmental Biology, Julian was elected to the National Academy of Sciences in 2015. In 2017 he was elected to the German National Academy of Sciences Leopoldina.

Julian served as president of ASPB in 2014–2015. He directed the Plant Systems Biology Graduate Training program at UC San Diego and the Salk Institute for Biological Studies. He received the Charles Albert Shull Award from ASPB, a Presidential Young Investigator Award from the NSF, a Deutsche Forschungsgemeinschaft Heinz-Maier-Leibnitz Research Prize, and the Blasker Award in Environmental Science and Engineering. He is a fellow of AAAS. ■

Nikki Forrester, 2019 ASPB/AAAS Mass Media Fellow, Spending Summer at *St. Louis Post-Dispatch*



Nikki Forrester

Nikki Forrester has been selected to represent ASPB as the 2019 ASPB/AAAS Mass Media Science & Engineering Fellow. She will spend 10 weeks this summer training as a science journalist at the *St. Louis Post-Dispatch* in St. Louis, Missouri.

Nikki received a BA in anthropology from the College of William and Mary and recently earned a PhD in ecology and evolutionary biology from the University of Pittsburgh. Her dissertation research explored how plant polyploidy enhanced interactions with mutualistic bacteria.

During her graduate experience, Nikki participated in various science communication and outreach activities. She pioneered an invasive species awareness program for rock climbers in West Virginia and designed an ecology and evolution workshop for local high school teachers in Pittsburgh. After attending a workshop led by the Plant Science Research Network, Nikki developed a science communication training course on Plantae with several workshop attendees, the PSRN, and ASPB.

Now Nikki tells stories about science for broad public audi-

ences as a freelance writer based in Davis, West Virginia. Her work has appeared in *Science*, *Nature*, the *ASPB News*, and other media outlets. In addition, Nikki is associate editor of *Highland Outdoors*, West Virginia's only independent outdoor magazine. She is particularly passionate about linking ecology, conservation, and recreation opportunities to promote the amazing places and people of West Virginia. Nikki can't wait to start working as a science writing intern at the *St. Louis Post-Dispatch* this summer and is grateful to ASPB for this opportunity. ■

Becky Mackelprang Awarded 2019 AAAS Ralph W. F. Hardy Mass Media Science & Engineering Fellowship



Becky Mackelprang

Becky Mackelprang, from the University of California, Berkeley, has been selected as a 2019 AAAS Ralph W. F. Hardy Mass Media Science & Engineering Fellow. She will spend 10 weeks this summer training as a science journalist at *Ensis* in Minneapolis, Minnesota. Her fellowship is being supported by funds honoring the late Ralph W. F. Hardy, a biochemist and founder of the North American Agricultural Biotechnology Committee who advocated for transparency and informed public discourse about biotechnology.

Becky received a BS in biology from the University of Utah. Her interest in plant responses to biotic stress took her to UC Berkeley for graduate school. She joined the lab of Mary Wildermuth, where she studied the regulation of salicylic acid, an essential hormone for plant responses to microbial pathogens. She was an NSF Graduate Research Fellow, and since graduating she has worked as a postdoctoral scholar with Peggy Lemaux researching agricultural biotechnology.

During graduate school, Becky was actively involved in science

outreach. She regularly volunteered in elementary and middle-school classrooms. She joined The CLEAR Project (Communication, Literacy, & Education for Agricultural Research), led by Lemaux, and has helped CLEAR develop outreach efforts in various venues and settings, such as local farmers markets and high schools. She enjoys the challenge of writing about science for general audiences and hopes that her experiences this summer will help her work toward a career in science communication. ■

Meet the 2019 Ambassador of the Year, Arif Ashraf

We are happy to announce that this year's Ambassador of the Year award is presented to Arif Ashraf, who is currently in Japan but will be moving to Michigan shortly. Learn more about Arif, in his own words.

I am Arif Ashraf. I graduated from the Department of Biochemistry and Molecular Biology, University of Dhaka, Bangladesh. I developed my passion for plant science research during my undergraduate years. It's easier to get plant samples and play with them in the lab all year round if you work with model plants. I started working in the Plant Biotechnology Lab at the University of Dhaka, and the initial research focus was abiotic stress, mostly salinity and submergence stress. I worked on identifying stress-inducible promoters from a bioinformatics perspective and functionally validated one stress-inducible promoter, ADH1 (alcohol dehydrogenase 1), under salt and submergence stress. I had been awarded the National Science and Technology Fellowship for this project.

My research interest in plant science took me to the next step with the help of a MEXT scholarship from the Japanese government in 2014. I moved to Iwate, in the northern part of Japan, from Bangladesh. I started working in the Cryobiofrontier Research Center. This institute focuses on local problems in a global perspective. I had two major projects as a PhD student—(1) understanding plant growth and response at low



Arif Ashraf

temperature and (2) identifying potassium-independent cesium transporters (Fukushima, site of the 2011 tsunami disaster, is nearby). I identified GNOM as a cold-responsive regulator from the former project and characterized two potassium-independent cesium transporters for the latter one. During my four and half years as a PhD student, I received the Iwate University President's Award for Academic Excellence (2016–2017), won the best poster presenter award in the first conference of the United Graduate School of Agricultural Sciences in 2017, was selected as a summer intern at the University of Saskatchewan, secured an individual research grant (\$2,000) as a graduate student, and was awarded a travel grant fellowship (\$575) for Plant Biology 2017.

Now that it is 2019, I will have my doctorate and will move from Japan to the United States. I'll move to Michigan

State University to continue my research in plant science as a postdoc. MSU is a great hub for plant scientists. I'm expecting to broaden my horizons as a plant biologist in the coming days.

Apart from the hard-core research, I have been involved with ASPB since the beginning of 2015. I was selected as the first graduate student ambassador of ASPB from Japan. During my time as ambassador, I translated *My Life as a Plant* into Bengali and contributed to the Luminaries section of the *ASPB News*, presenting interviews with Philip N. Benfey and Eric Schaller in the September/October 2016 and July/August 2018 issues, respectively.

I organized a student seminar at Iwate University in 2018 via satellite to connect plant biology students from three other universities (Hirotsuki University, Yamagata University, and Obihiro University) from northern Japan. I wrote summaries of more than 60 articles for *Plant Science Research Weekly in Plantae*; I also was guest editor for a few weeks. Recently, I was appointed a *Plantae* fellow and started an interview series (“Faculty Job: Myths and Realities”) about early career plant biology faculty in *Plantae*.

Apart from contributing to ASPB and *Plantae*, I maintain a plant science blog www.aribidopsis.com (Arif + Arabidopsis = Aribidopsis!) to share stories. I've put together 70+ blog posts in the past four years, including “Mutant Series” and “Why Arabidopsis

Why?” and yearly plant science research highlights. It has more than 32,000 reads so far from all over the world.

The ASPB Ambassador Program opened up many opportunities for me. It's a large family consisting of a diverse group of people. I could use my passion for scientific writing in the ASPB and *Plantae* platforms to reach a wider reader group. Because of my involvement with ASPB, I've had opportunities to work, collaborate, and communicate with amazing plant biology graduate students, postdocs, and faculty. I believe this engagement will help me in the future.

I wish to continue my research work in plant science and contributions to ASPB and *Plantae* into the future. I strongly recommend that plant biology students become ASPB members to be part of this network. It's been a pleasant and productive journey with ASPB so far, and I'm looking forward to working on more exciting projects in the upcoming years.

You'll find me and my work at the following links:

- arif.ashraf.opu@gmail.com
- Twitter: @aribidopsis
- Blog: www.aribidopsis.com
- Google scholar: <https://scholar.google.com/citations?user=HgVJx4gAAAAJ&hl=en>
- ResearchGate: https://www.researchgate.net/profile/Arif_Ashraf5 ■

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Policy Update

BY MICHAEL BUSE
Lewis-Burke Associates, LLC

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

NIFA and ERS Relocation Update

Amid continued criticism from the community, USDA released a “middle list” of more than 60 locations for the relocation of the Economic Research Service (ERS) and the National Institute of Food and Agriculture (NIFA). USDA intends to narrow this list further to 30, with site visits to five or six and a final decision sometime in May. According to NIFA Director Scott Angle, roughly 20 NIFA personnel will remain in DC to support the institute’s mission.

On March 27, the House Agriculture Appropriations Subcommittee hosted a partisan, two-part hearing on the proposed relocation of NIFA and ERS. Republicans supported the relocation, while Democrats, including subcommittee chairman Sanford Bishop (D-GA), criticized the lack of data to support the move and the general lack of transparency by USDA throughout this process. He went further to state that the move was a “bad idea.” Ranking member Jeff Fortenberry (R-NE) remained neutral on the relocation but indicated there was still work to be done in convincing the subcommittee. Immediately after the hearing, 30 Republicans, including all House Agriculture Committee Republicans, sent a letter supporting the move to the House Agriculture Appropriations Committee. This is the first formal support by members since the move was proposed in August 2018.

USDA Secretary Sonny Perdue did not attend the hearing, and Kristi Boswell, a senior adviser, testified on his behalf for the first panel. She emphasized that the relocation process was ongoing and that a “shorter” list of potential sites was expected to be released in the upcoming weeks, with a final decision made in May. She talked about the five criteria for proposal evaluation based on mission operations for both NIFA and ERS as well as internal agency input that informed resources for employees’ families and spouses. Boswell indicated that the relocation is part of a lengthy process that will require further discussions, negotiations, site visits, and additional qualitative analysis.

Boswell said that 76 ERS employees and 20 NIFA employees will remain in DC to ensure continued interagency collaboration and engagement with both policy makers and constituents. She also stated that the proposed relocation was not intended to be a reduction in force but an opportunity to better serve stakeholders and their communities. Chairman Bishop questioned the proposed cuts to ERS in the fiscal year (FY) 2020 budget request, but Boswell declined to answer any questions on the budget.

The second panel consisted of prior USDA leadership, including former undersecretaries for Research, Education, and Economics (REE) Gail Buchanan and Catherine Woteki. Both provided insights into why the

proposed relocation would have a negative impact on NIFA’s ability to maintain interagency collaborations, retain institutional knowledge, attract qualified personnel, and interact with researchers and constituents and would disrupt the overall integrity of the research. These testimonies echoed their previous statements in a September webinar hosted by the Association of Public Data Users (APDU).

Sources and Additional Information

- The letter from House Republicans can be found at <https://tinyurl.com/yxoqpv34>.
- The press release from USDA can be found at <https://tinyurl.com/y44gtudh>.
- The Agriculture Appropriations Subcommittee hearing can be viewed at <https://tinyurl.com/y6njwrzk>.
- The September webinar from APDU can be found at <https://tinyurl.com/y7kxx8pv>.

Administration’s FY2020 Budget Request Cuts Research Overall, Raises AFRI

The Trump administration’s FY2020 budget request, released on March 11, called for drastic cuts to many of the nondefense discretionary research programs. Under the proposal, NSF would see a cut of 13%, or approximately \$1 billion; the EPA Science and Technology account would be funded at a level of \$440.1 million, or 37.7% below the FY2019 enacted level; and ARS would

see a 25.6% reduction compared with the FY2019 enacted level. Meanwhile, the Agriculture and Food Research Initiative (AFRI) would see an \$85 million increase, for a total of \$500 million.

Congress is expected to reject the majority of these cuts, as they have the past two years. The following are relevant highlights:

- NSF would be funded at \$7.1 billion in FY2020, a 13% or \$1 billion cut below the FY2019 enacted level. The Research and Related Activities account would see a 13.1% cut. All NSF directorates would face cuts from 8.1% to 16.5% below FY 2018 levels. NSF continues to prioritize the Ten Big Ideas for Future Investment and proposes funding levels for these initiatives similar to those in the FY2019 budget request.
- DOE would receive \$31.7 billion, a \$4 billion reduction from the FY2019 enacted level. The budget request would once again eliminate the Advanced Research Projects Agency–Energy and cut the Office of Science by \$1.04 billion, or 16% compared with the FY2019 enacted level. Cuts are proposed for all six major Office of Science programs. The most significant reduction would be for climate change research under the Office of Biological and Environmental Research, which would be reduced by \$211 million, or 30%. The Office of Basic Energy

continued on page 20

POLICY UPDATE *continued from page 19*

Sciences would receive \$1.86 billion, a decrease of 14.2%, or \$308 million.

- The discretionary programs within USDA's NIFA would receive \$1.391 billion, a decrease of \$80 million compared with the FY2019 enacted level. NIFA's competitive research program, AFRI, would receive a significant increase of \$85 million, or 21% above the FY2019 enacted level.
- The budget request also proposes to cut NIH by \$4.7 billion for a top-line funding level of \$34.4 billion, a 12% decrease from FY2019.

Sources and Additional Information

- The president's FY2020 budget request can be found at <https://tinyurl.com/yb5p6t6y>.
- Lewis-Burke's full analysis of the president's budget request can be found at <https://tinyurl.com/y2kjfccy>.

Nominations Update: Senate Republicans Go Nuclear

Senate Republicans, under the leadership of Mitch McConnell (R-KY), have instituted a series of dramatic rule changes in an effort to expedite the confirmation process for remaining Trump administration nominees. This move will reduce the number of necessary hours for debate from 30 to two. In the context of USDA, this could mean that Mindy Brashears, nominee for undersecretary for food safety; Naomi Earp, nominee for deputy assistant secretary for civil rights; and Scott Hutchins, nominee for undersecretary for REE, could see their confirmation processes move much more

quickly than they did in the previous session. These nominees are currently in a deputy role at their respective agencies.

Sources and Additional Information

- A list of all the confirmed nominees is available at <https://tinyurl.com/yb3rate3>.
- USDA's press release announcing the appointment of Hutchins and others to their deputy posts can be found at <https://tinyurl.com/yb49qgr4>.
- An ongoing list of pending nominations can be found at <https://tinyurl.com/y2ssv3yk>.

House Science Committee Looks to Increase Investment in Engineering Biology

On March 12, the House Science, Space, and Technology Subcommittee on Research and Technology held a hearing on "Engineering Our Way to a Sustainable Bioeconomy." In her opening statement, subcommittee chairwoman Haley Stevens (D-MI) lamented the lack of coordination among federal agencies that fund biotechnology research and expressed the importance of a national strategy to steer investment in the topic.

In her remarks, Stevens endorsed the Engineering Biology Research and Development Act, which was first introduced by full committee Chairwoman Eddie Bernice Johnson (D-TX) in 2015 and reintroduced by Johnson late last year. The measure would create a national strategy for investment in engineering biology and direct a coordinated, cross-agency effort to advance U.S. leadership in the space.

The leadership of the full committee and the subcommittee emphasized the cross-cutting

benefits of fundamental research in engineering biology to numerous fields, including agriculture, computer science, advanced manufacturing, and energy. Chairwoman Johnson, ranking member Frank Lucas (R-OK), and subcommittee ranking member Jim Baird (R-IN) also offered opening remarks echoing the importance of coordinating engineering biology research and development activities. The witnesses praised the benefits of engineering biology research but noted that the technology comes with some issues, specifically a lack of data on the bioeconomy and uncertainty surrounding effective governance of the industry. Overall, the hearing reflected bipartisan support for further investments in engineering biology research and the Engineering Biology Research and Development Act.

Sources and Additional Information

- The Engineering Biology Research and Development Act can be found at <https://tinyurl.com/y5rcz9fr>.
- A recording of the full hearing, along with written testimony and copies of opening statements, can be found at <https://tinyurl.com/yyyuzbtbf>.

Report Recommends Ways Federal Government Can Better Manage Climate Change

On March 6, the Government Accountability Office (GAO) released its biennial "high-risk list" report that details areas of the federal government most susceptible to waste, fraud, abuse, and mismanagement. Of note, the 2019 high-risk list report includes recommendations for the federal government to limit its financial risks by creating policies that better

manage national climate change risks. This is not the first time GAO has included climate change risk factors in its report, but GAO's assessment of the federal government's performance in monitoring the nation's climate change risks has decreased.

The report details that as the federal government, specifically the Trump administration, has continued to either rescind past policies or ignore recommendations for new policies on climate resilience, the financial risk to the government as a result of climate change-related activities will only increase. GAO criticized the administration for lacking a "cohesive strategic approach with strong leadership and the authority to manage climate change risks across the entire range of federal activities." The cost to the federal government will grow as communities and states rely more heavily on the federal government for recovery and cleanup efforts, which will become more frequent and more expensive with the increasing frequency and severity of extreme weather events.

Source and Additional Information

- The full GAO report, entitled *Substantial Efforts Needed to Achieve Greater Progress on High-Risk Areas*, can be found at <https://tinyurl.com/y5jqy5qn>.

Federal Agencies Announce New Initiative for Addressing Gaps in Bioeconomic Technology

A coalition of members across multiple federal agencies known as the Biomass Research and Development (BR&D) Board released a new initiative that details a government-wide strategy for

bioeconomics, broadly defined as the global transition toward use of renewable terrestrial and marine biomass for economic applications. This initiative aims to maximize the results of federal investment in new agriculture and forest markets to foster a more economically stable industry by bolstering research in a range of new technologies, from algae systems to advanced carbon utilization technologies. This initiative was inspired by a 2016 DOE report predicting that the United States will produce 1 billion dry tons of biomass annually by 2040.

The new Bioeconomy Initiative will focus on several topics, including feedstock genetic improvement, production and management, and logistics. Although no funding is yet associated with this effort, it encourages federal agencies to develop new science and technology in biotechnology, provide support and resources to encourage technology transfer to the private sector, and support the development of relationships between agencies and major players in bioeconomics.

Sources and Additional Information

- A press release announcing the Bioeconomy Initiative can be found at <https://tinyurl.com/y65b6ve8>.
- The full framework the B&RD Board has put forth for implementing the initiative can be found at <https://tinyurl.com/y5u7gug9>.

Dear Colleague Letter for Research at the Intersection of Agricultural Science, Informatics, and Smart Communities

NSF and NIFA released a Dear Colleague Letter (DCL) expressing their intention to jointly fund

“convergent research that combines methods in agricultural, biological, and computer and information science and engineering to address pressing challenges and opportunities in digital agriculture.” The letter steers proposals toward three solicitations and seeks to advance research at the nexus of agricultural science, informatics, and smart communities. These three solicitations align with NSF’s Harnessing the Data Revolution Big Idea, which aims to prepare for large-scale investments at the intersection of computational, agricultural, and biological sciences.

This DCL seeks out projects with applications for economically important plants, animals, and their environments and the ability to transfer findings to or use findings to inform research in other agricultural application areas. The leveraging of data science in agriculture is consistent with NSF’s continued emphasis on convergence as well as the broader agricultural research community’s drive toward transdisciplinary research. It also builds on NSF’s and NIFA’s history of collaboration, including the Innovations at the Nexus of Food, Energy and Water Systems program and the ongoing Plant Biotic Interactions program.

Proposals may also pursue the development of curricula or “workforce development pathways” with the intent not only to expose students to cross-disciplinary approaches to agriculture and computer science but also to “improve retention and capabilities of a region’s agricultural workforce.”

Relevant proposals can be submitted to one of three programs: Cyber-Physical Systems (CPS), Information

and Intelligent Systems (IIS) Information Integration and Informatics (III) program, and the Smart and Connected Communities (S&CC) program. These projects support integrative research that addresses the fundamental technological and social science dimensions of smart and connected communities. This research would take the integration of technology into the natural and built environment, and proposal authors are encouraged to include demonstration or pilot activities. NSF has indicated interest in increasing its investment in S&CC next year.

Specific topics of interest and additional instructions are available in the DCL and the relevant program solicitations.

Award Size

The size of awards for these funding opportunities varies by solicitation and application.

- CPS program applications have three levels: small (\$500,000 over up to three years), medium (\$500,000 to \$1.2 million over up to three years), and frontier (\$1.2 to \$7 million over four to five years).
- IIS–III program applications have three levels: small (\$500,000 over up to three years), medium (\$500,000 to \$1.2 million over up to four years), and large (\$1.2 to \$3 million over up to five years).
- S&CC program applications have two tracks: Track 1 (for budgets greater than \$1.5 million with no recommended budget limit for up to four years of support) and Track 2 (budgets not to exceed \$1,500,000 for up to three years of support).

Eligibility

These programs are open to institutions of higher education and nonprofit and nonacademic organizations including independent museums, observatories, research labs, professional societies, and similar organizations in the United States associated with educational or research activities.

Due Dates

The due dates for these funding opportunities vary by solicitation.

- For the CPS program, full small and medium proposals are due between April 1 and April 12, 2019. Frontier applications are due between September 12 and September 26, 2019.
- For the IIS program, full small proposals are due between October 31 and November 14, 2019. Full medium proposals are due between September 9 and September 16, 2019. Full large proposals are due between September 18 and September 25, 2019.
- For S&CC program applications, required letters of intent are due by August 6, 2019. Full proposals are due by September 6, 2019.

Sources and Additional Information

- The full Lewis-Burke write-up of this funding opportunity is available at <https://tinyurl.com/y3xquesc>.
- The full Dear Colleague Letter can be found at <https://tinyurl.com/y4jtpxr9>. ■

2019 Spring Science Policy Committee Congressional Visit Day

BY TYRONE SPADY

ASPB Legislative and Public Affairs Director

On March 26, 2019, the ASPB Science Policy Committee held its annual Congressional Visit Day. This also happened to be the day that the Senate voted on the Green New Deal proposal championed by Rep. Alexandria Ocasio-Cortez (D-NY). In a tactical maneuver to pit liberals against more moderate Democrats from Republican-leaning districts, Senate Majority Leader Mitch McConnell (R-KY) put the measure up for a vote that he knew was doomed to fail.

While the Senate battled over Ocasio-Cortez's proposal to reduce dependence on fossil fuels and fight climate change, ASPB President Rob Last, Science Policy Committee members, ASPB staff, and Lewis-Burke lobbyists met with 32 congressional offices and committees related to plant science to call for increased funding for the agencies that support plant science research and education. When afforded the chance, ASPB representatives made sure to point out that investments in plant science research will be a critical part of efforts to develop more resilient crops, better biofuels, and other measures to mitigate the impacts of climate change. Hill meetings included personal meetings with Rep. Elissa Slotkin (D-MI) and Sens. Chuck Grassley (R-IA), Gary Peters (D-MI), Debbie Stabenow (D-MI), and Roger Wicker (R-MS).



ASPB President Rob Last and Science Policy Committee Chair Nathan Springer (right) looking on as Sens. Ed Markey (D-MA; not visible) and Jeff Merkley (D-OR) speak at the Green New Deal rally in front of the U.S. Capitol.

Fiscal Year 2020 Funding Priorities for Plant Biology

ASPB urged robust funding at federal research agencies for fiscal year (FY) 2020 to support and spur revolutionary breakthroughs in producing nutritious foods, sustainable energy, new medicines, and medical treatments; protecting our environment; and advancing our fundamental understanding of plant biology.

- **NSF:** ASPB supports \$9 billion for NSF in FY2020 and encourages the greatest possible

support for the Directorate of Biological Sciences. This support includes the Plant Genome Research Program (PGRP), which furthers not only fundamental knowledge but also our ability to enhance agricultural productivity, grow nutritious foods, and diminish the effects of devastating plant parasites. Sustained funding growth over multiple years for PGRP will be critical to address many challenges of the 21st century.

- **DOE:** ASPB supports \$7 billion for DOE's Office of Science in FY2020 with proportional increases for the Basic Energy Sciences and Biological and Environmental Research programs. These programs support dynamic research at the interface of plant biology and other scientific disciplines. ASPB also supports \$400 million for the Advanced Research Projects Agency-Energy (ARPA-E) in FY2020. ARPA-E has proved to be a valuable program that advances high-impact energy



Science Policy Committee member Carolyn Lawrence-Dill meeting with Sen. Chuck Grassley (R-IA).



ASPB President Rob Last (center) and Science Policy Committee Chair Nathan Springer meeting with Sen. Debbie Stabenow (D-MI).

technologies, including biotechnology, that are important to the plant science community.

- **USDA:** ASPB supports funding of \$500 million for the Agriculture and Food Research Initiative (AFRI). AFRI administers competitive funding for innovative research on issues such as food security, global health, and renewable energy that are critical in maintaining global economic competitiveness. ASPB also supports funding of \$1.821 billion for ARS and robust funding for new Farm Bill programs, such as Genome to Phenome, that

have the power to transform agricultural research.

- **NIH:** ASPB supports funding of \$41.6 billion for NIH and advocates increased support for plant science research within NIH's Centers and Institutes to continue the development of lifesaving cures such as the ZMapp drug used to combat the Ebola virus, a medical breakthrough made possible by plant science research.

ASPB recognizes the tight fiscal environment facing the nation, and the Science Policy Committee members shared their appreciation for congressional

support for federal research agencies. Robust investments in these agencies and their programs are vital, they argued, to ensuring America's ability to meet critical challenges such as increasing crop production, achieving energy independence, training the next generation of scientists and engineers, and improving science education. These investments will contribute to the already substantial economic impact of the agriculture industry, which accounts for nearly 5.5% (\$992 billion) of the U.S. gross domestic product and 21.6 million jobs. ■

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(2018–2022)

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Carolyn Lawrence-Dill

(2018–2022)

Iowa State University

Tyrone Spady

Staff Liaison



Welcome New ASPB Staff Member Teresa Leath

Teresa Leath officially joined ASPB in January 2019 as the accounting manager. However, she has been affiliated with ASPB since May 2018. Teresa has a BS in business administration/finance with over 25 years of ac-

counting and finance experience. She possesses a wide range of leadership skills, and she intends to use her expertise to help advance the overall functionality of the Finance and Administration Department.

In her spare time, Teresa enjoys reading, dining out, and going to the theater. ■



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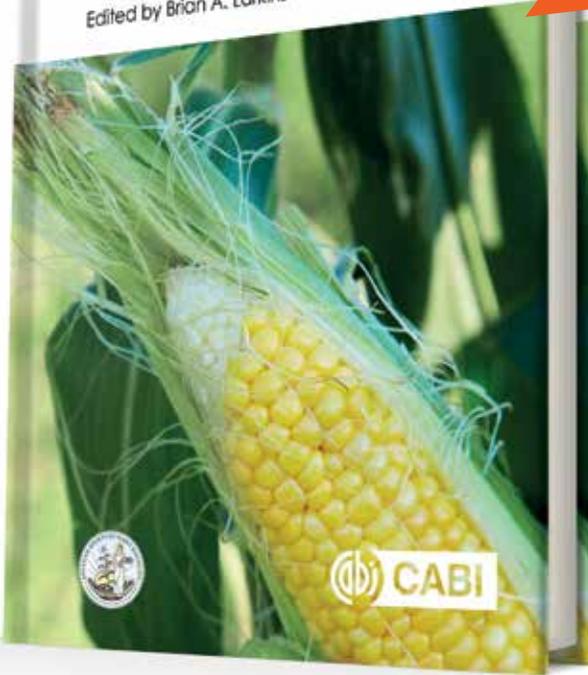
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William P. Jacobs

(1919–2019)

BY MARK JACOBS

Arizona State University

William P. Jacobs, professor of biology, emeritus, at Princeton University and a renowned plant biologist who studied and explained the hormonal basis of plant development, died March 3, 2019, in Princeton, New Jersey, two months short of his 100th birthday.

A 1998 recipient of the Charles Reid Barnes Lifetime Achievement Award from ASPB and the author of more than 170 research articles, Bill was an early proponent of quantitative techniques in plant development research, planning experiments with multiple replicates and applying statistical measures of reliability to the outcomes. The result was to bring research in plant development into an age of reproducible experiments and sounder conclusions. It was using these techniques to study the question of what makes leaves fall that led Bill to the discovery that a leaf abscises when a decreased level of the plant hormone auxin moves down the petiole attaching the leaf blade to the plant as the leaf ages. Below a critical level of auxin, a specialized layer of self-destructing cells—the abscission layer—forms transversely across the petiole, weakening the blade's attachment to the plant until a minor wind current can break the remaining connection and the leaf falls off.

Bill studied hormonal control of plant development in many



plant species and in many areas of plant development. He was a major contributor to the research reporting how a plant regenerates its water- and sugar-transporting tissues (the xylem and the phloem) after it has sustained a wound to its stem. He found that, again, changing levels of auxin in previously undifferentiated stem cells after a wound interrupts the transporting tissues lead them to differentiate into new xylem and phloem tissue around the wound, allowing the plant to keep its transporting “pipes” intact along its soil-to-air axis.

“Bill was a world-class biologist who had a huge impact on the understanding of the hormonal control of vascular differentiation in plants,” said Roni Aloni, professor in the Department of Molecular Biology and Ecology of Plants at Tel Aviv University, who worked as a post-



Bill with Jane, his wife of 70 years. Jane accompanied Bill to a number of ASPB meetings over the years. ASPB members who knew Bill would likely know Jane as well.

doctoral researcher in Bill's lab. “His pioneering study published in 1952 in the *American Journal of Botany* opened the field of auxin research in vascular differentiation by revealing that auxin produced in young leaves induces and controls xylem regeneration around a wound.”

Bill was generally interested in how plant hormones move through plants from their areas of biosynthesis to their areas of action, and he studied that movement with different plant hormones (auxin, gibberellin, abscisic acid, and cytokinins) and in different plants (*Coleus*, maize, zucchini, oats, pea, and the giant coenocytic alga *Caulerpa*) throughout his career. In fact, he had major papers accepted and published in *Scientific American*

40 years apart on “What Makes Leaves Fall” (1955) and auxin transport in *Caulerpa* (1994). His book *Plant Hormones and Plant Development* was published in 1979 (Cambridge University Press).

Bill was born May 25, 1919, in Boston, attended Boston English High School, received his BA from Harvard magna cum laude in 1942, and then joined the U.S. Army Medical Corps. After World War II, he entered a PhD program in biology at Harvard, obtaining his degree in 1946 with Ralph Wetmore. During postdoctoral study at Caltech, he was lost for 11 days, while skiing in the snows of Yosemite after a blizzard in the winter of 1946, living on lichens and meltwater.

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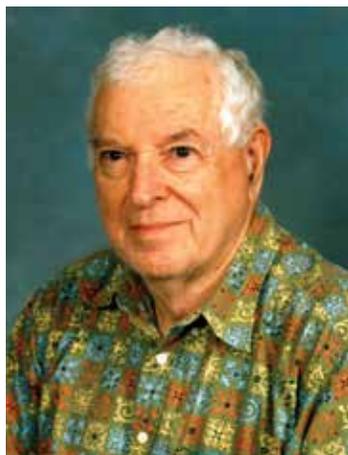
Bob Rabson

(1926–2019)

BY MICHAEL R. SUSSMAN
University of Wisconsin–Madison

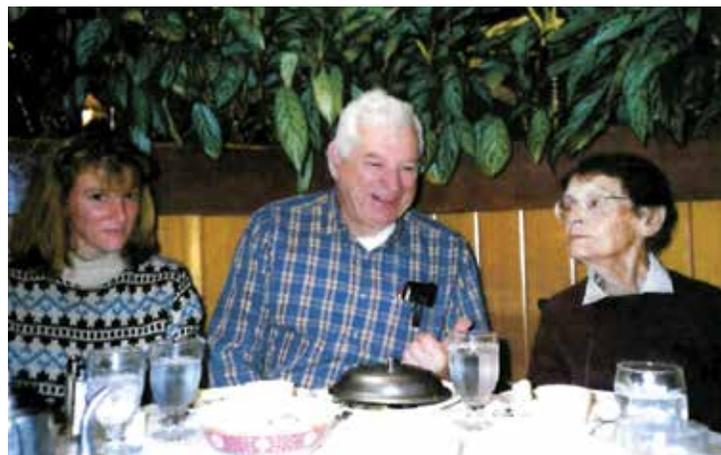
Robert Rabson passed away on March 1, 2019, just three days shy of his 93rd birthday. Bob spent the greater part of his professional life employed at DOE in the Office of Basic Energy Sciences (BES), where he was the grant manager in a small but critical part of BES called the Energy Biosciences (EB) Division. Many of us in the plant science community owe a great deal to Bob, since, in his roles at DOE and as a member of the advisory board for the McKnight Foundation, he was a steadfast supporter of funding for pure basic research in the plant sciences. Bob helped many plant biologists obtain financial support to explore the frontiers of basic plant research, for which our community is very grateful. His greatest joy was in helping young scientists kick-start and nurture their careers, and the ASPB award that his family has endowed in his name is devoted to advancing that goal.

Bob was born in Brooklyn, New York, to Rose and Sam Rabson. As a boy, he enjoyed walking and camping along the Appalachian Trail, and his love of plants developed during a summer job at the Brooklyn Botanical Garden. He attended Stuyvesant High School in Manhattan, one of the three specialized science schools in New York City that have spawned many of our country's top scien-



tists and leaders. He served in the 86th Infantry Division during World War II, then went to college with the GI Bill, first at Brooklyn College, then Syracuse University, and then Cornell University, where he studied plant physiology, receiving a BS in 1951 and a PhD in 1956.

He was a postdoctoral fellow at the Oak Ridge National Laboratory in Tennessee. From 1958 to 1963, he was assistant professor and then associate professor at the University of Houston. In 1963, he joined the Civil Biology and Medicine division of the Atomic Energy Commission (AEC), where he served as assistant branch chief from 1967 to 1973. In 1973, Bob became the first officer of the plant breeding and genetic section of the International Atomic Energy Agency in Vienna,



Bob with his daughter (left) and Barbara McClintock.

Austria, where he served for three years. In 1976, he returned to the AEC (renamed the U.S. Department of Energy in 1977), initially in the Division of Biomedical and Environmental Science and ultimately as director of EB until his retirement in 1995.

Bob was a member of the advisory board for the Research School of Biology of the Australian National University from 1991 to 1995, a member of the plant science advisory board for the McKnight Foundation, a fellow of AAAS, and a member and officer of the American Society of Plant Physiologists. He was awarded the Adolph E. Gude, Jr. Award by ASPP in 1986.

Bob's tenure at DOE was enormously impactful. Upon the establishment of the small program within BES in 1979 that would grow and ultimately

become Energy Biosciences, he wrote, "While other DOE programs emphasize near- to mid-term research and development needs, the [EB] program is oriented towards longer-term and fundamental research. The [EB] program aims at developing broader and deeper understanding [of biological phenomena] and places emphasis on development of understanding of fundamental mechanisms."

The ensuing years were the golden age in the development of new genetic and molecular biological tools, and Bob always felt fortunate to have helped nurture this revolution. Yet he was also aware that molecular biology alone would not lead to the "fundamental understanding" he envisioned: "Our conception is that a whole constellation of techniques and studies, besides genet-

ic ones, constitute biotechnology and will be required for substantial progress,” he wrote in 1982. In 1985, shortly after his leadership in establishing the Complex Carbohydrate Research Center at the University of Georgia, he added, “Of considerable importance also will be efforts to encourage the utilization of the many powerful analytical techniques of chemistry in approaching difficult biological problems (e.g., nuclear magnetic resonance spectroscopy, molecular structure studies using neutron and x-ray diffraction, and others).”

Under Bob’s tenure, the Energy Biosciences program was always evolving, and he thought that an essential part of his mission was to support research outside the mainstream. “The program makes a deliberate effort to identify and emphasize important research topic areas that have been relatively neglected by the scientific community,” he wrote in 1990. He recognized the role of modest but longer-term support of research in advancing science in such areas: “The nature of the [EB] program includes the support of high quality, long term contemporary research. There are fields and problems where there has been neglect despite perceived importance, or the problem area has been refractory with the available tools and thinking, or the experimental system requires an extensive investment of time and effort before dividends may be anticipated.”

Holistic in his thinking and cognizant that collaboration and interdisciplinary approaches were an essential ingredient of science as he saw it, in 1993 he wrote, “One important current aspect of the program is the effort



Bob as an associate professor at the University of Houston, in the lab.

to encourage collaborations and coordination among investigators. No one individual can be expert in everything, nor can every lab afford to have all of the instrumentation. The integration of varied approaches to problems including genetics, physiology, biochemistry, and others such as computational and biophysical sciences will certainly provide deeper insights into biological functions and will be fostered where feasible.” For many years, Bob was “boss” at the Michigan State University Plant Research Laboratory (PRL) and advocate in Washington DC, and many of the scientists currently in leadership roles in the plant science community benefited from their experiences there. It is difficult to overstate the impact Bob had on plant biology, and it was the long-term research support from the EB program that played a critical role in establishing the careers of many of the top scientists in our community.

I got to know Bob in two very different parts of his, and my, life—first, when I was a graduate student with Hans Kende at the PRL in the early 1970s, while Bob was DOE BES program manager, and then again, more recently, while he spent the last decade of his life in Madison, Wisconsin, where his family helped him cope with the struggles and frustrations of dementia, which many of us have had personal experiences with in our own families. One of Bob’s favorite outings was to go to a Chinese restaurant and eat sweet and sour chicken. I had the honor of accompanying him and his wife, Eileen, on those outings, and perhaps as a sign of the affinity that would accidentally place me in his sphere twice in our lifetime, I discovered that their wedding and anniversary are within five days of my own date of birth. Although it was sometimes difficult to watch him struggle recalling to me the stories of his many earlier interac-



Bob giving a talk at an anniversary dinner for Anton Lang, founding director of the Plant Research Laboratory at Michigan State University.

tions with scientists at meetings and during his travels, the amazingly strong spirit and single-minded determination that helped secure plant sciences funding through the thick and thin of this country’s political whims shone through like a laser pointed, I felt, at the struggling cells in his brain.

At Bob’s funeral, his daughter read from a letter sent to the family a few days before his passing. It spoke appreciatively of a time when the letter writer was a young assistant professor and gave a talk that Bob attended. Bob listened to the talk and then invited the individual to submit a proposal for funding. After a positive review, Bob gave the new faculty member a choice. He would support the project either at 70% of the proposed budget or at the full amount requested; the only condition was that if the higher award was accepted, this scientist was not to submit any

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BOB RABSON
continued from page 29

other proposals for the next three years and would concentrate just on the DOE-funded research. Bob wanted this assistant professor to be able to focus, publish, and succeed. This was an amazingly wise and generous approach and advice that many other grant managers might use, although I

suspect Bob was, and is, unique in this creative and strong effort to help budding young scientists.

If you wish to help foster this same spirit, please send donations (<https://my.aspb.org/get-involved/donations>) to ASPB's Robert Rabson Award, which was established in 2012 in recognition of Bob's steadfast advocacy of plant biology and recognizes postdoc-

toral scholars and faculty-level early career scientists who have made contributions in the area of biological energy research.

Bob is survived by his wife of 68 years, Eileen Klionsky Rabson, whom he met in 1947 while they were camp counselors. He is also survived by their children Michael Rabson (Debbie Moritz) of Atherton, California;

Barbra Rabson (John Silletto) of Belmont, Massachusetts; and Laurel Rabson (Bill O'Brien) of Madison, Wisconsin, and six grandchildren: Mark Moritz-Rabson, Daniel Moritz-Rabson, Lewis Silletto, Elisabeth Silletto, Russell O'Brien, and Hanna O'Brien. Another daughter, Lisa Rabson, died in 1979. ■

WILLIAM P. JACOBS
continued from page 27

He wrote about the experience for *The Boston Globe*. The story was reprinted as a booklet titled "Lost in the Snows of the Yosemite." In 1983, when the *Globe* reached out to Jacobs for a follow-up, the newspaper quoted him as saying he became a scientist "because it seemed to be one of the few creative activities in American life where most of the pressures that one could anticipate would help one to live up to one's ideals, where one would have a minimum of bosses, and yet where one could expect to earn a stable, adequate living. So far as biology is concerned, my guesses turned out to be correct."

Bill joined the faculty of biology at Princeton University in 1948 and remained at Princeton until his retirement in 1989. He loved being a professional scientist and eschewed chances to leave his pure research and teaching position at Princeton to head departments or schools as an administrator. He loved actually carrying out research in the laboratory and getting new results

that no one had ever uncovered before. He particularly enjoyed attending international scientific meetings because of the friendships he could reaffirm each time with the international family of scientists he felt represented his true colleagues. He also carefully planned his frequent sabbaticals from Princeton to allow him and his family to explore new cultures and places from which the whole family could learn and benefit.

Bill's courses at Princeton included introductory botany and biology as well as advanced studies of plant development. His interest in pedagogy led him to serve on a committee studying the role of botany in college curricula for the Botanical Society of America and another on innovation in lab instruction for the revision of high school biology curricula under the aegis of the American Institute of Biological Sciences.

"Bill was, in some regards, a real pioneer in the relationship between plant hormones—especially the growth hormone—and the development of key anatomical features in plants, like the vascular tissues that connected

the extremities of the plants," said Cliff LaMotte, professor emeritus at Iowa State University, who worked as Bill's first postdoctoral associate in 1961. "That was the reputation that attracted me to him." Cliff said that Bill was a lively instructor who occasionally would jump up on a table during a lecture and "hold forth from there. Bill was a wonderful guy, always ebullient, always zestful, always enthusiastic—an almost flamboyant character."

Bill conducted research in a range of laboratories around the world, including the Bahamas, Cuba, England, Italy, and Switzerland. He worked as an adviser to NASA, serving on a space biology advisory panel in 1976 and 1978 and a Space Shuttle/Salyut payloads study group in 1978. Along with NASA, his research was sponsored by NSF, the Office of Naval Research, the U.S. Army, the American Cancer Society, and the Hoyt Foundation.

Among his many awards, Bill received the Dimond Prize from the Botanical Society of America in 1975 and a Guggenheim

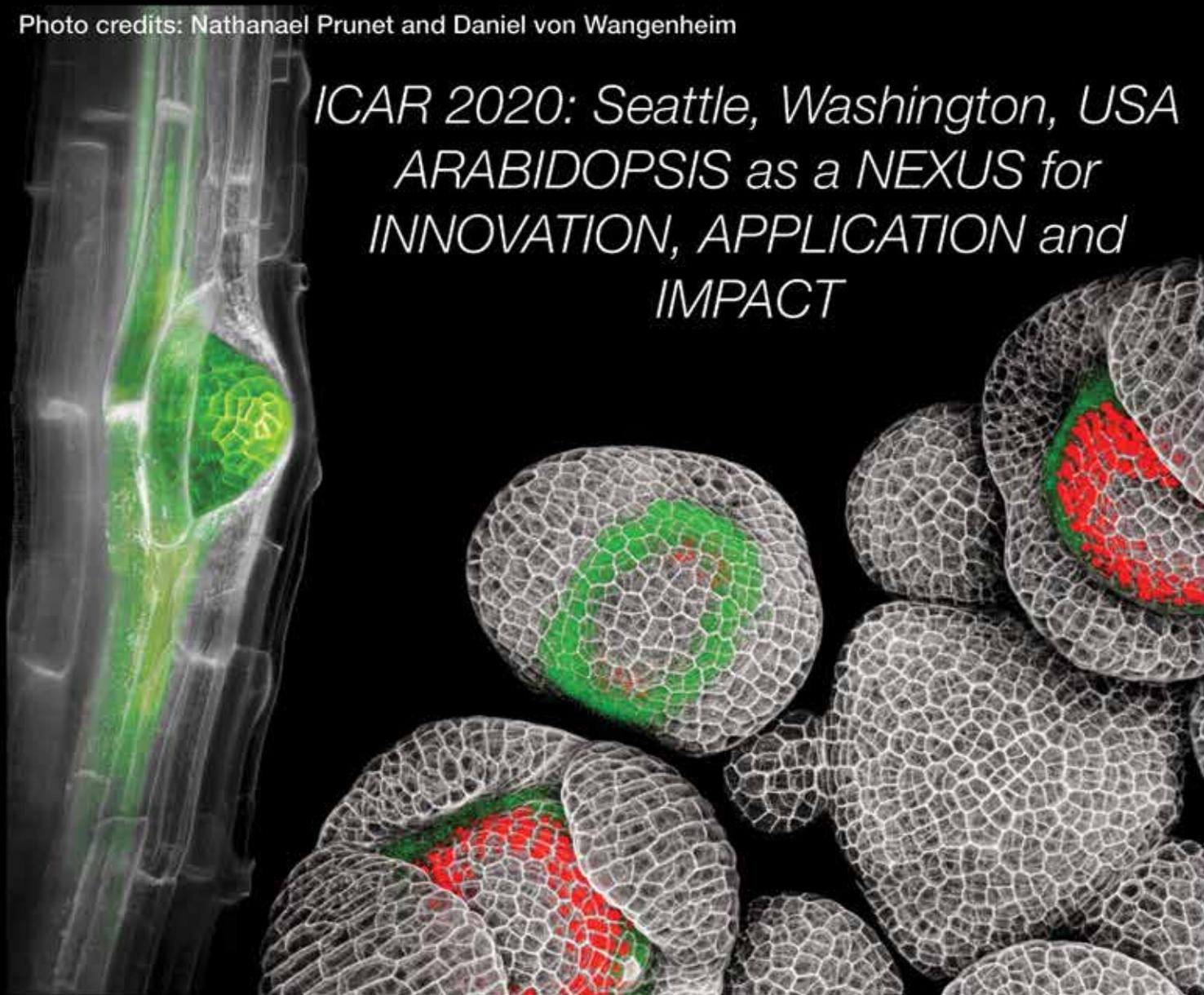
fellowship in 1967. In addition to ASPB, Jacobs was a member of AAAS, the Botanical Society of America, the British Society for Experimental Biology, the Japanese Society of Plant Physiologists, the International Phycological Society, the International Society for Plant Morphologists, the American Society for Photobiology, and the American Institute of Biological Sciences, among others.

He is survived by his wife, Jane Shaw Jacobs; two children, Mark of Phoenix, Arizona, and Anne of West Windsor, New Jersey; a sister, Mary Jacobs Brown of Worcester, Massachusetts; five grandchildren; and six great-grandchildren. ■

This article includes content from a notice from the Princeton University Office of Communications that first appeared on the Princeton University website on March 15, 2019.

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