The 31st International Conference on Arabidopsis Research (ICAR)

Arabidopsis as a nexus for Discovery, Innovation, Application and Impact

ICAR 2021 VIRTUAL 21 -25 June

Organized by the North American Arabidopsis Steering Committee (NAASC)

Monday, 21 June, 2021

All times in Pacific Time, USA

6:30 - 7:00 am — **ICAR 2021 OPENING WELCOME & INFORMATION FROM THE ORGANIZING COMMITTEE**

7:00–8:00 am — **Keynote Seminar 1**

Session Chair: Jennifer Nemhauser, University of Washington, Seattle, NAASC

Submission 363

Fighting Climate Change with Plants: Arabidopsis takes center stage

Joanne Chory- Howard Hughes Medical Institute Investigator; The Salk Institute, USA

8:30 am–9:30 am — **Plenary 1: Post-transcriptional Mechanisms of Gene Regulation**

Session Chair: Keith Slotkin, Danforth Center & University of Missouri, Columbia, NAASC

Submission 461

8:30-9:00 — The widespread endogenous 22-nt siRNAs mediate silencing amplification and stress adaptation in Arabidopsis. Hongwei Guo- SUSTech, China

Submission 412

9:00-9:30 — Ubiquitin ligase relays and diverse chain topologies coordinate transcriptional reprogramming. Steven Spoel- University of Edinburgh, UK

9:45 am–11:45 am — **Plenary 2: Systems Approaches to Understanding and Engineering Plant Biology**

Session Chairs: Anna Stepanova, NCSU, NAASC & Jennifer Nemhauser, University of Washington, Seattle, NAASC

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New Phytologist Foundation

9:45-10:15 — Submission 434

Reconstructing regulation: Synthetic expansions of plant metabolism. Nicola Patron- Earlham Institute, UK

10:15-10:45 — Submission 354

Engineering approaches to untangle plant forms and function. Naomi Nakayama- Imperial College London, UK

10:45-11:15 — Submission 550

Functional reconstitution of the bacterial CO2 concentrating mechanism. David Savage- University of California, Berkeley, USA

11:15-11:45 — Submission 555

Discovery and Engineering of Plant Chemistry for Plant and Human Health. Elizabeth Sattely- Stanford University & Howard Hughes Medical Institute, USA

12:00–1:15 pm **Mini-Symposium 1.1: When Development Meets Stress- Integration of Plant Growth and Defense.** *Session Chair: Cris Argueso, Colorado State University, USA*

1. Submission 501: **To grow or defend? Mechanistic insights from the jasmonate signaling pathway.** Presenter: Gregg Howe
2. Submission 430: **Reduction of the canonical function of a glycolytic enzyme enolase triggers immune responses via perturbing metabolism homeostasis in Arabidopsis.** Presenter: Jian Hua
3. Submission 319: **Control of FLS2-triggered immunity by GOLVEN phytocytokines**. Presenter: Martin Stegmann
4. Submission 73: **The receptor kinase SRF3 coordinates iron-defense-growth tradeoff in plants**. Presenter: Matthieu Platre
5. Submission 153. **A conserved module regulates receptor kinase signaling in immunity and development**. Presenter: Thomas DeFalco
6. Submission 50: **A light-dependent molecular link between competition cues and defense responses in plants**. Presenter: Guadalupe Fernández-Milmanda

12:00–1:15 pm **Mini-Symposium 1.2: Cell Polarity: Driving Morphological and Functional Complexity.** *Session Chairs: Yan Gong, Stanford University, USA; João Ramalho, Wageningen University, The Netherlands*

1. Chair's Introduction
2. Submission 554: **Polarly localized receptor-like kinases PXC2 and IRK act redundantly during Arabidopsis root development in the radial axis**. Presenter: Jaimie Van Norman
3. Submission 460: **A hatching plant cell - Polar RhoGTPase signaling in pollen germination of Arabidopsis thaliana.** Presenter: Philipp Denninger
4. Submission 489: **Breaking symmetry: Mechanisms of auxin dependent division plane orientation in early Arabidopsis embryos**. Presenter: Prasad Vaddepalli
5. Submission 419: **Polarity-mediated cytoskeletal pathways orient asymmetric divisions during leaf patterning.** Presenter: Andrew Muroyama
6. Submission 120: **A Spatiotemporal Molecular Switch Governs Plant Asymmetric Cell Division.** Presenter: Xiaoyu Guo
7. Submission 206: **Opposite polarity programs regulate asymmetric subsidiary cell divisions in grasses.** Presenter: Michael Raissig

1:30–2:45 pm **Mini-Symposium 2.1: From Molecules to Organs: Quantitative Imaging in Plant Biology.** *Session Chairs: Daniel Kierzkowski, University of Montreal, Canada; Charlotte Kirchhelle, University of Oxford, UK, Marisa Otegui, University of Wisconsin-Madison, USA*

1. Chair's Introduction
2. Submission 541: **Single Particle Cryo-EM: Illuminating Phytochrome Structure/Function.** Presenter: Richard D. Vierstra
3. Submission 186: **Imaging ESCRT-dependent protein trafficking in tapetal cells during pollen formation**. Presenter: Marisa Otegui
4. Submission 156: **Quantitative analysis of transporter activity biosensors**. Presenter: Lily S Cheung
5. Submission 188: **Tracking cell fates at shoot apical meristem: the power of clonal analysis**. Presenter: Agata Burian
6. Submission 212: **Live-imaging uncovers cellular growth patterns shaping Arabidopsis stamen**. Presenter: Daniel Kierzkowski
7. Submission 187: **Cytoskeleton-mediated spatial accommodation shapes lateral root morphogenesis.** Presenter: Dorothee Stöckle

1:30–2:45 pm **Mini-Symposium 2.2: Running a Research Group in the Next Generation.** *Moderators: Jacqueline Monaghan, Queen's University and Heather McFarlane, University of Toronto, Canada*

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1. **Submission 539: Running a research group in the next generation**. Presenters: Siobhan Brady, Elizabeth Haswell, Heather McFarlane, Jacqueline Monaghan, Sonali Roy

3:00-4:30 pm **Workshop: Improving Outreach in Plant Science.** Organized by José Dinneny, Stanford University.

3:00-4:30 pm **Workshop: Changing Cultures & Climates.** Organized by Dr. Jennifer Nemhauser (NAASC, University of Washington, Seattle), Dr. Siobhan Brady (NAASC ISP co-chair, University of California, Davis), and Dr. Terri Long (NAASC ISP co-chair, NCSU).

5:00–6:15 pm **Mini-Symposium 3.1: Leveraging Natural Variation to Understand Immune Functions.** *Chair: Adam Steinbrenner, University of Washington, USA*

1. Submission 545: **Adaptation of Pseudomonas to colonize genetically diverse hosts.** Presenter: Talia Karasov
2. Submission 207: **Genetic variation, environment and demography intersect to shape Arabidopsis defense metabolite variation across Europe**. Presenter: Ella Katz
3. Submission 369: **A rich genetic architecture shapes defensive metabolite diversity (glucosinolates) within an Arabidopsis thaliana population**. Presenter: Andrew Gloss
4. Submission 125: **Genome-wide association study reveals RPB1 as major component of resistance in the interaction between Plasmodiophora brassicae and Arabidopsis thaliana**. Presenter: Juan Ochoa
5. Submission 329: **Leveraging natural variation in tomato to identify and characterize sources of multiple disease resistance**. Presenter: Robyn Roberts
6. Submission 328: **The highly variable plant immune receptors and how to catch them**. Presenter: Ksenia Krasileva
7. Submission 464: **Leveraging natural variation to understand NLR haplotype, function and network.** Presenter: Eunyoung Chae

5:00–6:15 pm **Mini-Symposium 3.2: The Arabidopsis Algorithm: Mathematical Modeling in Plant Biology.** *Chair: Kari Miller, Washington University in St. Louis, USA*

1. Submission 486: **The origins of strength and flexibility: modeling development and dynamics in stomatal guard cells.** Presenter: Charles Anderson
2. Submission 325: **Optimization- and explicit Runge-Kutta- based Approach to Perform Dynamic Flux Balance** Analysis: Presenter: Rajib Saha
3. Submission 528: **A Mechanical Framework of Leaf Formation.** Presenter: Fei Du
4. Submission 233: **Transcription-coupled and epigenome-encoded H3K4 methylations are governed by multiple methyltransferases with different targeting mechanisms**. Presenter: Satoyo Oya
5. Submission 293: **In silico model for mining the cis-regulatory determinants of tissue-specific gene expression.** Presenter: Valerie Fraser

6:30–7:30 pm ***Replay of Morning Keynote 1***

7:45-8:45 pm ***Replay of Morning Plenary I***

9:00-11:00 pm ***Replay of Morning Plenary II***

Tuesday, 22 June, 2021

All times in Pacific Time, USA

5:30–6:45 am **Mini-Symposium 4.1: Stochasticity and Robustness in Plant Development**. *Co-Chairs: Adrienne Roeder and Batthula Vijaya Lakshmi Vadde, Cornell University; Jennifer Lachowiec, Montana State University, USA; Arezki Boudaoud, ENS- Lyon, France and James Locke, Cambridge, UK*

1. Submission 494: **Searching for conserved modes of robustness in plant emergence**. Presenter: Jennifer Lachowiec
2. Christian Fleck, Freiburg Center for Data Analysis and Modeling *(No abstract submitted)*
3. Submission 75: **Upstream open reading frames buffer gene expression noise**. Presenter: Ho-Wei Wu
4. Submission 334: **How do organs maintain robust morphology**? Presenter: Lilan Hong
5. Submission 343: **The same, yet different: gene expression variability between genetically identical plants.** Presenter: Sandra Cortijo
6. Submission 292: **Mechanistic details of ATML1 thresholds in giant cell development**. Presenter: Batthula Vijaya Lakshmi Vadde

5:30–6:45 am Mini-Symposium 4.2: Translational Regulation of Gene Expression. *Co-Chairs: Catharina Merchante, University of Málaga, Spain; Astrid Gadeyne, VIB-UGent, Belgium; Pamela A. Ribone, Sainsbury, University of Cambridge, UK*

1. Submission 454: **Actively translated uORFs suppress the translation of highly transcribed transcription factor and protein kinase genes in Arabidopsis**. Presenter: Polly Hsu.
2. Submission 477: **CERES, a novel regulator of protein synthesis in plants**. Presenter: M. Mar Castellano
3. Submission 392: **Translation regulation mechanisms in the plants' responses to ethylene and auxin**. Presenter: Jose Alonso
4. Submission 164: **Translational control and RNA decay in beneficial plant-microbe interactions.** Presenter: María Eugenia Zanetti
5. Submission 113: **An RNA thermoswitch controls PIF7 translation to regulate temperature-dependent daytime growth**. Presenter: Martin Balcerowicz
6. Submission 95: **Loss of inner-envelope K+/H+ exchangers impairs plastid rRNA maturation and gene expression.** Presenter: Rachael DeTar
7. Submission 342: **Translational Control of Plant Immunity.** Presenter: Guoyong Xu

5:30–6:45 am **Mini-Symposium 4.3: Arabidopsis Transposable Element Biology.** *Chair: R. Keith Slotkin, Danforth Center, USA*

1. Submission 408: **Jumping in the wild: What drives transposon mobilization in nature?** Presenter: Leandro Quadrana
2. Xiaoqi Feng, John Innes Centre *(No abstract submitted)*
3. Angélique Deleris, Institut de Biologie Integrative de la Cellule (I2BC) *(No abstract submitted)*
4. Submission 427: **Generation of Transcriptional Novelty by Transposable Element Insertions in Arabidopsis thaliana.** Presenter: David Roquis
5. Submission 286: **The invasion of the Arabidopsis thaliana centromeres by ATHILA LTR retrotransposons.** Presenter: Alexandros Bousios
6. Submission 288: **Selection against LTR retrotransposons in Arabidopsis thaliana is balanced by locally adapted alleles**. Presenter: Michelle Stitzer
7. Submission 300: **Natural variation of long non-coding RNAs in Arabidopsis thaliana**. Presenter: Aleksandra Kornienko

7:00 am- 8:30 am **Plenary 3: Intercellular Communication**
Session Chairs: Anna Stepanova, NCSU, NAASC & Siobhan Braybrook, UCLA, NAASC

7:00-7:30 Submission 468
Intercellular communication mediated by mobile transcription factors in the development of root vascular tissues. Ji-Young Lee, Seoul National University, South Korea

7:30-8:00 Submission 344
Molecular rejection mechanisms of pollen in pistils. Sota Fujii, University of Tokyo, Japan

8:00-8:30 Submission 469
Beyond defense: glucosinolates as signals for regulating intercellular communication. Tessa Burch-Smith, University of Tennessee, Knoxville, USA

8:45 am- 10:15 am **Plenary 4: Plasticity of Plant Development In Response to the Environment**
Session Chairs: Siobhan Braybrook, UCLA, NAASC & Federica Brandizzi, MSU, NAASC

8:45-9:15 Submission 353
Stochastic gene expression drives mesophyll protoplast regeneration. Yuling Jiao, Institute of Genetics and Developmental Biology, CAS, China

9:15-9:45 Submission 360
The genetic basis for diversification of leaf form: from understanding to reconstructing. Miltiades Tsiantis, Max Planck Institute for Plant Breeding Research, Germany

9:45-10:15 Submission 355
Responses to environments within and across generations: A case study of phenology. Kathleen Donohue, Duke University, USA

10:30 -11:50 am **EXHIBIT BOOTH SESSION**

12:00–1:15 pm **Mini-Symposium 5.1: Exploring Brassicaceae Diversity.** *Co-Chairs: Kathleen Greenham, University of Minnesota; Patrick Edger, Michigan State University, USA*

1. Submission 348: **Nested whole-genome duplications coincide with diversification and high morphological disparity in Brassicaceae.** Presenter: Marcus A. Koch
2. Submission 518: **Honor by association: leveraging global gene co-expression networks to study the evolution of specialized metabolism in the Brassicaceae**. Presenter: Jennifer Wisecaver
3. Submission 256: **Using Arabidopsis to understand gene expression patterns associated with C4 photosynthesis.** Presenter: Patrick Dickinson
4. Ratan Chopra, University of Minnesota *(No abstract submitted)*
5. Submission 110: **Evolution of Conserved Noncoding Sequences in Arabidopsis thaliana**. Presenter: Alan E. Yocca
6. Submission 556**: Using large-scale transcriptomics and comparative genomics to identify functional long non-coding RNAs in plants the Brassicaceae**. Presenter: Andrew Nelson
7. Submission 258: **Strong temporal dynamics of QTL action on vegetative growth revealed through high-throughput phenotyping in canola and Arabidopsis**. Presenter: Rhonda Meyer
8. Mackenzie Mabry, University of Florida/ Florida Museum of Natural History *(No abstract submitted)*

12:00–1:15 pm **Mini-Symposium 5.2: How Do Plants Sense and Respond to Elevated Carbon Dioxide, Ozone and Drought?** *Co-Chairs: Maija Sierla, University of Helsinki, Finland; Julian Schroeder, University of California, San Diego, USA*
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1. Submission 359: **GHR1 and its interactors in stomatal movements**. Presenter: Maija Sierla.
2. Submission 415: **Engineering Stomatal Development**. Presenter: Julie Gray.
3. Submission 488: **Mesophyll-derived sugars are positive regulators of stomatal opening**. Presenter: Diana Santelia
4. Submission 502: **Role of Raf-like MAPKKK-dependent SnRK2 kinase activation in ABA and osmotic stress responses**. Presenter: Yohei Takahashi
5. Submission 178: **Intracellular anion channels coordination, the stomata gatekeepers regulating leaf transpiration**. Presenter: Paloma Cubero-Font
6. Submission 284: **Drought-responsive RING E3 Ligase XERICO maintains proper stomatal density and distribution during leaf epidermal development**. Presenter: Deka Mohamed
7. Submission 306: **Spatial Regulation of ABA-Induced ROS Accumulation During Stomatal Closure**. Presenter: Anthony Postiglione

1:30–2:45 pm **Mini-Symposium 6.1: Metabolite-mediated Regulation of Plant Growth and Development**
Co-Chairs: Hiroshi A. Maeda, UW-Madison; Jazz Dickinson and Mark Estelle, UC, San Diego, USA
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the plant journal

1. Submission 351: **Uncovering metabolite-driven pathways that regulate root development**. Presenter: Alexandra J. Dickinson
2. Submission 513. **Genetic components associated with plant responses to aromatic amino acid imbalance in Arabidopsis thaliana**. Presenter: Marcos Vinicius Viana de Oliveira
3. Submission 425: **Dipeptides, novel class of small-molecule metabolic regulators**. Presenter: Aleksandra Skirycz
4. Submission 326: **Diverse Glucosinolates and their catabolites independently influence growth and development**. Presenter: Daniel Kliebenstein
5. Submission 214: **Natural variation unveils different modes of regulation for Arabidopsis metabolism under control and stress conditions**. Presenter: Corina M. Fusari

6. Submission 129: **Roles of aldoximes on plant secondary metabolism and growth**. Presenter: Jeongim Kim
7. Submission 239: **Dissection of specific JAZ-MYC regulators of tryptophan-derived defense and growth**. Presenter: Ian Major

1:30–2:45 pm **Mini-Symposium 6.2: Quantitative Development in the Digital World**. *Co-Chairs: Margaret Frank, Cornell University; Sam Leiboff, Oregon State University, USA*

1. Sam Leiboff, Oregon State University *(No abstract submitted)*
2. Submission 362: **Insights into the Evolution of the Grass Leaf**. Presenter: Annis Richardson
3. Submission 379: **Examples of Mathematical Methods in Quantitative Analysis**. Presenter: Mao Li
4. Submission 227: **Biomechanical heterogeneity underlies growth variation in the Arabidopsis shoot apical meristem**. Presenter: Yuchen Long
5. Submission 272: **A multifaceted analysis reveals two distinct phases of chloroplast biogenesis during de-etiolation in Arabidopsis**. Presenter: Emilie Demarsy
6. Submission 290: **Arabidopsis stomatal polarity protein BASL mediates distinct processes before and after cell division to coordinate cell size and fate asymmetries**. Presenter: Yan Gong

3:00-4:30 pm **Poster Session: Americas Focus**

4:30-6:30 pm **Free Time, Informal Networking, Poster Browsing**

6:30–8:00 pm ***Replay of Morning Plenary III***

8:30-10:00 pm ***Replay of Morning Plenary IV***

Wednesday, 23 June, 2021

All times in Pacific Time, USA

5:30–6:45 am **Mini-Symposium 7.1: Getting More Power From Your Flower: Multi-functional Flowers Improve Plant Fitness** *Chair: Diarmuid O'Maoileidigh, University of Liverpool, UK*

1. Submission 48: **Tabula floris - panoramic view of the cell types of the flower.** Presenter: Lachezar Nikolov
2. Submission 418: **Evolution, development, and mechanisms of floral organ photosynthesis**. Presenter: Diarmuid O'Maoileidigh
3. Submission 423: **Attract or defend, how floral P450s turn attractive volatiles into a defense arsenal against insects and affect floral microbiome**. Presenter: Benoit Boachon
4. Submission 372: **Generation of Brassica plants with supernumerary trichomes**. Presenter: Kevin Goslin
5. Submission 476: **Inflorescence arrest in Arabidopsis is a flexible two stage process**. Presenter: Catriona Walker

5:30–6:45 am Mini-Symposium 7.2: Plant Memory: Environmental Information Integration Within and Across Generations *Chair: Gabriela Auge, IIBBA-CONICET, Argentina*

1. Submission 380: **Within-generation and transgenerational plasticity in the ecological context of Arabidopsis thaliana**. Presenter: Christian Lampei
2. Mariano Alvarez, Wesleyan University *(No abstract submitted)*
3. Submission 316: **Epigenetic memory in Arabidopsis seed: regulation mechanisms of cold temperature-induced seed dormancy**. Presenter: Mayumi Iwasaki
4. Submission 409: **Transposon-induced loss of DNA methylation: Some new kids on the block.** Presenter: Leandro Quadrana
5. Submission 271: **Diurnal Regulation of Folate-mediated One-Carbon Homeostas Ensures Gene Silencing by DNA Methylation in Arabidopsis**. Presenter: Valentin Hankofer
6. Submission 236: **Mathematical models of winter sensing in plants: a tale of growth and unpredictable predictions.** Presenter: Rea L Antoniou-Kourounioti
7. Submission 512: **Theory of adaptive within and across generation plasticity for stressful environments**. Presenter: Irja Ida Ratikainen

5:30–6:45 am **Mini-Symposium 7.3: Advancing Quantitative Proteomics in Plant Science** *Chair: R. Glen Uhrig, University of Alberta, Canada*

1. Submission 547: **Integrated omics networks reveal the temporal signaling events of brassinosteroid response in Arabidopsis**. Presenter: Justin Walley
2. Submission 318: **A cell-sorting-based nano-scale pipeline for single-cell-proteomics in plants.** Presenter: Pengcheng Wang
3. Submission 57: **The Arabidopsis thaliana PeptideAtlas; harnessing world-wide proteomics data for a comprehensive community proteomics resource**. Presenter: Klaas van Wijk
4. Submission 180: **Shining a light on the "black box" of effector-triggered immunity signalling with quantitative proteomics.** Presenter: Sophie Johnson
5. Submission 375: **Data acquisition approaches in bottom-up proteomics: solving technological limitations for proteomics-driven systems biology in plants**. Presenter: Devang Mehta
6. Submission 218: **Looking at the other side: investigating protein networks and function of a novel polarity domain in stomatal development**. Presenter: Eva-Sophie Wallner

7:00 am- 8:30 am **Plenary 5: New Frontiers in Plant-Biotic Interactions**
Session Chairs: Roger Innes, Indiana University & Cris Argueso, Colorado State University, NAASC
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7:00-7:30 Submission 404
Molecular mechanism of host recognition in parasitic plants. Ken Shirasu, Japan RIKEN

7:30-8:00 Submission 552
Clustering of NLR genes: patterns and functions. Xin Li. Michael Smith Laboratories, University of British Columbia, Canada

8:00-8:30 Submission 364
My model organism eats your model organism: A Drosophila that attacks Arabidopsis. Noah Whiteman, University of California, Berkeley, USA

8:45 am- 10:15 am **Plenary 6: Molecular Mechanisms Underlying Cell Differentiation and Intracellular Signaling**
Session Chairs: Terri Long, NCSU & Jennifer Nemhauser, University of Washington, Seattle
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frontiers in Plant Science

8:45-9:15 Submission 540
Retrograde signal triggers diametrically opposed growth and systemic stress responses. Katayoon (Katie) Dehesh, UC Riverside, USA

9:15-9:45 Submission 553
Investigations of the relationship between chromatin dynamics and plant cell potency. Roger Deal. Emory University, USA

9:45-10:15 Submission 339
Gene Imprinting Dynamics Across Scales. Mary Gehring, Whitehead Institute, USA

10:30 -11:50 am **EXHIBIT BOOTH SESSION**

12:00–1:15 pm **Mini-Symposium 8.1: The Role of Intrinsically Disordered Proteins in Plant Biology**
Co-Chairs: Heather Meyer, Carnegie Institution, USA; Cesar Cuevas-Velazquez, Universidad Nacional Autónoma de México

1. Submission 551: **How can one hormone do everything? Unraveling the complexities of auxin activity**. Presenter: Lucia Strader

2. Submission 234: **Arabidopsis Poly(ADP-ribose)-binding protein RCD1 interacts with Photoregulatory Protein Kinases in nuclear bodies.** Presenter: Richard Gossens
3. Submission 534: **PCH1-dependent photobody formation is required for phytochrome signaling**. Presenter: Dmitri A Nusinow
4. Submission 138: **ELF3 phase separation mediates Arabidopsis thermoresponse**. Presenter: Stephanie Hutin
5. Submission 132: **Temperature-dependent Arabidopsis FRIGIDA sequestration for autumn sensing**. Presenter: Pan Zhu
6. Submission 119: **Biomolecular Condensates: A New Phase in Plant Host Defense**. Presenter: Shuai Huang
7. Submission 448: **LEA proteins, a paradigm to study the role of structural disorder in the plant response to adverse environments.** Presenter: Alejandra A: Covarrubias

12:00–1:15 pm **Mini-Symposium 8.2: Molecules on the Move (MOM): Plant-microorganism Communication**
Co-Chairs: Patricia Baldrich, Danforth Center; Ryan DelPercio, University of Missouri Columbia, USA

1. **Plant Exosome-mediated Small RNAs Delivery to Fungal Pathogens.** Presenter: Baoye He, UC Riverside *(No abstract submitted)*
2. Submission 228: **Phytoplasma make you MADS: investigating how phyllogens interact with floral MADS transcription factors**. Presenter: Antonin Galien
3. Submission 192: **Utilizing quantitative proteomics to investigate rapid changes in the plasma membrane proteome during pattern triggered immunity.** Presenter: Gabrielle Rupp
4. Submission 157: **The helper NLR NRG1 signals with EDS1 and SAG101 to mediate immune responses in Arabidopsis.** Presenter: Joanna Feehan
5. Submission 45: **Bacterial effectors target plasmodesmata to promote virulence in Arabidopsis**. Presenter: Kyaw Aung
6. Submission 111: **Actin remodeling via biomolecular condensation during plant-microbe communications**. Presenter: Yansong Miao
7. Submission 242: **The molecular dialogue of an incompatible plant symbiont interaction**. Presenter: Marco Cosme
8. Submission 387: **Plant extracellular RNAs and their function in Host Induced Gene Silencing.** Presenter: Hana Zand Karimi

1:30–2:45 pm **Mini-Symposium 9.1: Active Learning and CUREs in Undergraduate Plant Science Education**
Co-Chairs: Brit Moss, Whitman College; Thelma Madzima, University of Washington-Bothell, USA

1. Submission 243: A**n Integrated Approach to Introduce Modeling in Undergraduate Plant Science Education.** Presenter: Mentewab Ayalew
2. Submission 376: **Utilizing CRISPR-Cas9 in an undergraduate course-based research laboratory on A. thaliana to improve understanding of gene editing technology**. Presenter: Michael Wolyniak
3. Submission 402: **The Dynamic Genome: A research experience for first-year students**. Presenter: Jim Burnette.
4. Submission 144: **The "Outpace" Phytopathology Summer Institute: Taking Arabidopsis Molecular Biology to an Urban Garden.** Presenter: Karolina Pajerowska-Mukhtar
5. Submission 160: **Hybrid CURE lab for freshmen Biology**. Presenter: Ruth Ndathe
6. Submission 247: **Identification of ARF19 targets using yeast: A Molecular Biology CURE**. Presenter: Ke Z. Reid

1:30–2:45 pm **Mini-Symposium 9.2: Encoding Calcium Spikes, Waves, and Oscillations in Arabidopsis.**
Chair: Sheng Luan, UC Berkeley, USA

1. Submission 400: **Encoding calcium signatures in plant cell growth and biotic responses**. Presenter: Sheng Luan
2. Submission 532: **FERONIA-dependent RALF1 and mechanical signaling – a parting of the (path)ways**. Presenter: Gabriele Monshausen
3. Submission 198: **Translating calcium-signatures: Imaging of Arabidopsis calcium-sensor kinase conformation monitors real time activation dynamics in vivo.** Presenter: Anja Liese
4. Submission 199: **Early plant neighbor detection via mechanostimulation in trichomes**. Presenter: Chrysa Pantazopoulou
5. Submission 150: **Establishing the role of SINE proteins in regulating stomatal dynamics in Arabidopsis thaliana**. Presenter: Morgan Moser

3:00-4:30 pm **Workshop: Addressing Taboo Issues to Increase Queer and Trans Recruitment and Retention.** Organized by Dr. Jennifer Nemhauser (NAASC and ICAR 2021 co-organizer) and Román Ramos Baez, both at the University of Washington, Seattle

3:00-4:30 pm **Workshop: Exploring Acting in Allyship.** Organized by Siobhan Braybrook (NAASC, ICAR co-organizer, UCLA) and Joanna Friesner (NAASC, ICAR organizer).

4:30-6:30 pm **Free Time, Informal Networking, Poster Browsing**

6:30–8:00 pm ***Replay of Morning Plenary IV***

8:30-10:00 pm ***Replay of Morning Plenary VI***

10:00-11:30 pm **Poster Session: Asia, Oceania Focus**

Thursday, 24 June, 2021

All times in Pacific Time, USA

5:30–6:45 am **Mini-Symposium 10.1: Plant Hormones**. *Chair: Anna Stepanova, North Carolina State University, USA*

1. Submission 378: M**echanism of fertilization-induced auxin biosynthesis in strawberry seed and fruit development.** Presenter: Zhongchi Liu
2. Submission 432: **Genome-wide analysis of EIN3 transcription factor binding sites guides engineering of new ethylene sensors**. Presenter: Elena Zemlyanskaya
3. Submission 63: **The crosstalk between plant regeneration and biotic stresses**. Presenter: Li Yang
4. Submission 78: **Auxin requirements for a meristematic state in roots depend on a dual brassinosteroid functio**n. Presenter: Michal Ackerman-Lavert
5. Submission 139: **EXO70D isoforms mediate selective autophagic degradation of Type-A ARR proteins to regulate cytokinin responses in roots**. Presenter: Atiako Kwame Acheampong
6. Submission 210: **AUX/IAA-mediated suppression of auxin signaling causes stem cell death in response to DNA damage.** Presenter: Naoki Takahashi
7. Submission 245**: Karrikins control seedling photomorphogenesis and anthocyanin biosynthesis through a HY5-BBX transcriptional module**. Presenter: Katharina Bursch

5:30–6:45 am **Mini-Symposium 10.2: Nutrient Signaling Nexus in Control of Plant Architecture.** *Chair: Franziska Fichtner and Milos Tanurdzic, The University of Queensland, Australia*

1. Submission 467: **A dual function of SnRK2 kinases in the regulation of SnRK1 and plant growth**. Presenter: Elena Baena-González
2. Submission 462: **Regulatory Network behind Systemic Nitrogen Signaling in Arabidopsis**. Presenter: Sandrine Ruffel
3. Submission 543: **Sucrose: The alpha component of stem branching.** Presenter: Bolaji Salam
4. Submission 232: **Trehalose 6-phosphate is a key signal in regulation of development.** Presenter: Franziska Fichtner
5. Submission 68: **Perturbations in plant energy homeostasis prime lateral root initiation via SnRK1-bZIP63-ARF19 signalling.** Presenter: Christoph Weiste
6. Submission 304: **The NIN-LIKE PROTEIN 7 (NLP7) transcription factor regulates root cap development through modulating auxin homeostasis**. Presenter: Narender Kumar

5:30–6:45 am **Mini-Symposium 10.3: Implications of the non-coding genome on chromatin signaling during plant gene expression** *Co-Chairs: Soichi Inagaki, The University of Tokyo, Japan; Sebastian Marquardt, University of Copenhagen, Denmark*

1. Submission 537: **The complexity of COOLAIR**. Presenter: Caroline Dean
2. Submission 223: **The long noncoding RNA FLAIL promotes plant development by regulating transcription of neighboring genes in Arabidopsis**. Presenter: Yu Jin
3. Submission 116: **The MARS lncRNA controls the expression of the marneral gene cluster by modifying its chromatin status.** Presenter: Thomas Roulé
4. Submission 377: **Chromatin-based mechanisms to coordinate convergent overlapping transcription**. Presenter: Soichi Inagaki

5. Submission 252: **Locus-specific proteomics of repressive transcription in Arabidopsis**. Presenter: Isabel Schwarz
6. Submission 538: **Pervasive non-coding transcription as a genome surveillance mechanism**. Presenter: Andrzej Wierzbicki
7. Submission 106: **The mechanism of RNA Polymerase V recruitment to new target loci to initiate DNA methylation**. Presenter: Andrea McCue

7:00 am- 8:00 am **NAASC (CONFERENCE ORGANIZERS) TOWN HALL MEETING**

8:30 am-9:30 am **Keynote Seminar 2**
Session Chairs: Liz Haswell, Washington University in St. Louis & Cris Argueso, Colorado State University, NAASC

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Submission 548
A mutation is a mutation is a mutation. Detlef Weigel, University of Tuebingen, Germany

10:00-11:30 am **Plenary 7: Translating Research Into Impact**
Session Chairs: Federica Brandizzi, MSU, NAASC & Roger Innes, Indiana University, NAASC

10:00-10:30 Submission 549
Later is now! - the vital need for innovative disease resistance solutions to reach the field.
Peter van Esse. The 2Blades Foundation/The Sainsbury Laboratory, UK

10:30-11:00 Submission 398
Enhancing Food Security through Rice Genetic Improvement. Pamela Ronald, UC Davis, USA

11:00-11:30 Submission 523
From Science to Solutions-On-Farm: Thoughts on How to Navigate the Translational Road to Impact. Vipula Shukla, The Bill & Melinda Gates Foundation, USA

12:00–1:15 pm **Mini-Symposium 11.1: Feeling Stressed? Environmental Adaptation in Extremophyte Relatives of Arabidopsis** *Co-Chairs: Maheshi Dassanayake, Louisiana State University, USA; Simon Barak, Ben-Gurion Univ. of the Negev, Israel*
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Agrisera
Antibodies

1. Submission 390: **Hyperaccumulation and hypertolerance of zinc and cadmium in Arabidopsis halleri**. Presenter: Ute Kraemer
2. Submission 440: **Stress management- a way of life for Eutrema salsugineum**. Presenter: Elizabeth Weretilnyk
3. Submission 445: **Surviving boron toxicity: insights from Arabidopsis extremophyte relative, Schrenkiella parvula**. Presenter: Guannan Wang
4. Submission 420: **Stress-ready or Stress-reactive? That is the extremophyte question!** Presenter: Nick Duppen
5. Submission 533: **Single cell transcriptomics shed light on the divergence of cell type specific responses to abiotic stress in extremophytes compared to Arabidopsis**. Presenter: Jiyoung Lee

12:00–1:15 pm **Mini-Symposium 11.2: Exploring the Single-cell Landscape of Arabidopsis**. *Co-Chairs: Travis Lee and Joseph Swift, The Salk Institute; Rachel Shahan, Duke University; Josh Cuperus, University of Washington-Seattle, USA*

1. Rachel Shahan, Duke University *(No abstract submitted)*
2. Kenneth Birnbaum, New York University *(No abstract submitted)*
3. Siobhan Brady, UC Davis *(No abstract submitted)*
4. Submission 251**: Flexible lineage trajectory dynamics within the developing leaf.** Presenter: Camila Lopez-Anido
5. Submission 191: **Single-cell resolution of plant response to bacterial infection.** Presenter: Jie Zhu

6. Submission 267: **Unveiling spatial host-microbe interactions in Arabidopsis thaliana leaves by Spatial MetaTranscriptomics.** Presenter: Sami Saarenpää

1:30–2:45 pm **Mini-Symposium 12.1: Taking an Equity Lens: Empowering Women in Computational Biology**
Co-Chairs: Aleksandra Beric, Danforth Center; Sarah Turner-Hissong, Bayer, USA
1. Kathleen Greenham, University of Minnesota *(No abstract submitted)*
2. Sanaz Jarolmasjed, Agnetix *(No abstract submitted)*
3. Sarah Turner-Hissong, Bayer *(No abstract submitted)*
4. Aleksandra Beric, Danforth Center *(No abstract submitted)*

1:30–2:45 pm **Mini-Symposium 12.2: Sensing the Cell Wall: Mechanical Signals and Downstream Responses**
Co-Chairs: Lauri Vaahtera, Norway; Nora Gigli Bisceglia, Wageningen University, The Netherlands
1. Julia Santiago Cuellar, University of Lausanne *(No abstract submitted)*
2. Submission 202: **Interactions between a mechanosensitive ion channel and the cell wall integrity signaling pathway influence pollen germination in Arabidopsis thaliana**. Presenter: Yanbing Wang
3. Submission 126: **From mechanosensing to robustness of morphogenesis**. Presenter: Arezki Boudaoud
4. Julien Gronnier, ZMBP, University of Tübingen *(No abstract submitted)*
5. Submission 182: **Using Brillouin Microscopy to investigate cell wall integrity and controlled cell wall alterations in Arabidopsis thaliana**. Presenter: Laura Bacete
6. Submission 330: **Plant-wide calcium defense signaling**. Presenter: Masatsugu Toyota
7. Submission 255: **Fortifying the plant cell wall under stress: 7TM proteins promote CSC trafficking.** Presenter: Heather E. McFarlane

3:00–4:15 pm **Mini-Symposium 13.1: Using Evolutionary Novelty to Understand General Principles of Plant Biology**
Chair: Daniel Kliebenstein, University of California, Davis, USA
1. Submission 294: **Genome-wide association study reveals a novel locus in regulation of vegetative phase change.** Presenter: Erin Doody
2. Submission 190: **Natural variation of the REDUCED POLLEN NUMBER1 (RDP1) gene studied by the quantitative complementation test using the CRISPR/Cas9 system.** Presenter: Kentaro K. Shimizu
3. Submission 79: **A complex immune response to flagellin epitope variation in commensal communities.** Presenter: Nicholas Colaianni
4. Submission 308: **Rapid evolution in globally-distributed field experiments of Arabidopsis thaliana**. Presenter: Moises Exposito-Alonso
5. Submission 542: **The role of gene duplication in the origin and diversification of the MAM/IPMS gene family**. Presenter: R. Shawn Abrahams
6. Submission 60: **Arabidopsis and crops: a molecular tool to increase protein content, broad disease resistance and early maturation.** Presenter: Ling Li

3:00–4:15 pm **Mini-Symposium 13.2: Impact and Application of Basic Research to Sustainable Agriculture Improvement**
Session chairs: Huachun Larue and Xiaoyu Liu, Bayer Crop Science, USA
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1. Submission 177: **Biotech Traits and Gene Editing Products: From Idea to Market.** Presenter: Christine Shyu
2. Submission 84: **cis-Cinnamic acid as a promising natural plant growth-promoting compound for use in sustainable agriculture**. Presenter: Ilias El Houari
3. Submission 64: **How to develop a biotech product: Engineering a biotech herbicide tolerance trait as an example.** Presenter: Clayton Larue
4. Submission 114**: Bud and bloom: biological mechanisms and agricultural outlook**. Presenter: Yang Zhu

4:30-6:30 pm **Free Time, Informal Networking, Poster Browsing**

6:30–7:30 pm ***Replay of Morning Keynote***

8:00-9:30 pm ***Replay of Morning Plenary VII***

Friday, 25 June, 2021

All times in Pacific Time, USA

5:00-6:30 pm **Poster Session: Europe Focus**

6:45–8:15 am **Mini-Symposium 14.0: Hot Papers in Plant Science** *Chairs: NAASC/ICAR 2021 Organizers: Roger Innes (Indiana University) and Anna Stepanova (NCSU)*

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Papers to be presented and discussed during live Q&A /discussion following the talks:

1. **Introduction:** Joanna Friesner- NAASC Executive Director, ICAR 2021 Lead Organizer
2. **An isoleucine residue acts as a thermal and regulatory switch in wheat Rubisco activase.** *The Plant Journal.* Authors: Gustaf E Degen, Dawn Worrall, and Elizabete Carmo-Silva (Lancaster University, UK)
3. **The Ethylene Precursor ACC Affects Early Vegetative Development Independently of Ethylene Signaling.** *Frontiers in Plant Science*. Authors: Lisa Vanderstraeten, Thomas Depaepe, Sophie Bertrand, and Dominique Van Der Straeten (Ghent University, Belgium)
4. **Auxin fluxes through plasmodesmata modify root-tip auxin distribution.** *Development.* Authors: Nathan L. Mellor, Ute Voß, George Janes, Malcolm J. Bennett, Darren M. Wells, Leah R. Band. (University of Nottingham, UK)
5. **Breaking the impasse: Towards a forward-looking governance framework for gene editing with plants.** *Plants, People, Planet.* Authors: Phil Macnaghten (Wageningen Univ. Netherlands), Michelle G.J.L. Habets (Rathenau Institut, the Hague, Netherlands)
6. **PHYTOCHROME INTERACTING FACTOR 7 is important for early responses to elevated temperature in Arabidopsis seedlings.** *New Phytologist.* Authors: Anne-Sophie Fiorucci, Vinicius Costa Galvão, Yetkin Çaka Ince, Alessandra Boccaccini, Anupama Goyal, Laure Allenbach Petrolati, Martine Trevisan, Christian Fankhauser. (University of Lausanne, Switzerland)
7. **Overexpression of Arabidopsis microRNA167 induces salicylic acid-dependent defense against Pseudomonas syringae through the regulation of its targets ARF6 and ARF8**. *Plant Direct*. Julie C. Caruana, Nikhilesh Dhar, and Ramesh Raina (Syracuse University, USA)
8. **In Vivo NADH/NAD+ Biosensing Reveals the Dynamics of Cytosolic Redox Metabolism in Plants**. *The Plant Cell.* Authors: Steinbeck, Janina; Fuchs, Philippe; Negroni, Yuri L.; Elsaesser, Marlene; Lichtenauer, Sophie; Stockdreher, Yvonne; Feitosa-Araujo, Elias; Kroll, Johanna B.; Niemeier, Jan-Ole; Humberg, Christoph; Smith, Edward N.; Mai, Marie; Nunes-Nesi, Adriano; Meyer, Andreas J.; Zottini, Michela; Morgan, Bruce; Wagner, Stephan; Schwarzlaender, Markus

6:30-8:15 am **Workshop: Career Panel- A diversity of careers for plant scientists.**

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Organized by: Dr. Jennifer Nemhauser (NAASC, ICAR 2021 co-organizer, University of Washington, Seattle) and an Early Career Researcher committee: Mohammad Salehin (UNC Greensboro, UNCG); Ruth Ndathe (Louisiana State); Jeongim Kim (U. Florida); Leiyun Yang (Cornell); Mahdis Zolfaghar (U. Tehran); Sonal Yadav (IISER Mohali); Clara Williams (UC Berkeley).

6:30-8:15 am **Workshop: 'Our Lab': Building a community.** Organized by Dr. Siobhan Braybrook (NAASC, ICAR 2021 co-organizer, and UCLA), and lab members.

8:30–9:45 am **Mini-Symposium 14.1: The Cell Cycle in Plant Growth, Development and Stress Responses**
Co-Chairs: John Larkin, Louisiana State University; Adrienne Roeder, Cornell University, USA

1. Submission 333: **Chromatin-level regulation of endoreplication onset**. Presenter: Hirotomo Takatsuka
2. Submission 463: **Shedding light on the meiotic spindle assembly checkpoint.** Presenter: Kostas Lampou
3. Submission 287: **Ploidy, endopolyploidy and salt-tolerance in Arabidopsis thaliana**. Presenter: Jeremy Coate
4. Submission 321: **DNA checkpoint control in Arabidopsis versus maize**. Presenter: Lieven De Veylder
5. Submission 452: **Synthetic Regulation of Plant Development**. Presenter: Edith Pierre-Jerome
6. Submission 307: **Investigating Plant Meristem Development by Studying A Suppressor of TSO1 Mutants**. Presenter: Fuxi Wang

8:30–9:45 am **Mini-Symposium 14.2: Circadian Signatures of Fitness** *Co-Chairs: Xiaodong Xu, Henan University, China; Antony Dodd, John Innes Centre, UK*

1. Submission 421: **BBX19 fine-tunes the circadian rhythm by interacting with PSEUDO-RESPONSE REGULATOR proteins to facilitate their repressive effect on morning-phased clock genes**. Presenter: Xiaodong Xu
2. Submission 385: **Integration of circadian and environmental signals**. Presenter: Antony Dodd
3. Submission 424: **Dynamic epigenetic networks in plant circadian system**. Presenter: Pil Joon Seo
4. Submission 268: **The role of TOC1 phosphorylation in the molecular mechanism of photoperiodic hypocotyl growth**. Presenter: Jiapei Yan
5. Submission 265: **A Comprehensive Interactome for the Arabidopsis Circadian Clock Reveals a Connection Between the Clock and Cold Temperature Regulation**. Presenter: Maria Sorkin
6. Submission 273: **Variation in cold response and temporal regulation of brassinosteroid signaling across diverse Brassica rapa morphotypes**: Presenter: Madeline Oravec

8:30–9:45 am **Mini-Symposium 14.3: RNA Modifications-mechanism and Biology.** *Co-Chairs: Xuemei Chen, University of California, Riverside, USA; Yiji Xia, Hong Kong Baptist University, China*

1. Submission 332: **N6-Methyladenosine RNA Modification Underlies Plant Development.** Presenter: Hao Yu
2. Submission 384: **The m6A-assisted polyadenylation pathway (m-ASP): insights from plants and beyond.** Presenter: Thierry Lagrange
3. Submission 99: **Functional Interactions of Nuclear RNase P in Arabidopsis**. Presenter: Mathieu Bruggeman
4. Submission 331: **SPAAC-NAD-seq, a sensitive and specific method to profile NAD+-capped RNAs**. Presenter: Xuemei Chen *&* Submission 431: **Genome-wide analysis of NAD-capped RNAs using NAD tagSeq** II. Presenter: Yiji Xia
5. Submission 314: **Reversible RNA methylation in Plant Biological Regulation**. Presenter: Guifang Jia
6. Submission 231: **m6A enhances RNA 3'-end processing for R-loop removal in co-transcriptional silencing**. Presenter: Congyao Xu
7. Submission 204: **An arabidopsis RNA exosome subunit mediates cell-to-cell trafficking of a homeobox gene mRNA through plasmodesmata**. Presenter: Munenori Kitagawa

10:00–11:15 am **Mini-Symposium 15.1: Stress Granules in Plants as Novel Mechanism in Stress Signaling** *Chair: Monika Chodasiewicz (Kosmacz), King Abdullah University of Science and Technology, Saudi Arabia*

1. Submission 83: **TSN is a docking platform for stress granule components and is essential for SnRK1 activation** Presenter: Emilio Gutierrez-Beltran
2. **Composition of processing bodies (PBs) and stress granules (SGs) in plants.** Presenter: Siou-Luan He, The Ohio State University *(No abstract submitted)*
3. Submission 74: **The Arabidopsis thaliana G3BP Family: Friend or Foe of Plant Viruses?** Presenter: Hendrik Reuper
4. Submission 137: **The eEF1B complex localises to heat-induced stress granules and influences plant development.** Presenter: Julia Lohmann

10:00–11:15 am **Mini-Symposium 15.2: Social Media and Science Communication** *Co-Chairs: Javier Brumos, North Carolina State University, USA; Eva Hellmann, Sainsbury at Cambridge University, UK*

1. Submission 478: **Social media and science communication**. Presenter: Javier Brumos
2. Submission 324: **ASPB's social media journey to support, amplify, nurture and connect plant scientists**. Presenter: Mary Williams
3. Submission 335: **Science communication and community building as an ECR**. Presenter: Sessen Daniel Iohannes

4. Detlef Weigel, *No abstract submitted*
5. Submission 428: **Social Media to Build & Broaden the Plant Biology Community**. Presenter: Elizabeth Haswell

10:00–11:15 am **Mini-Symposium 15.3: Arabidopsis Informatics** *Co-Chairs: Nicholas Provart, University of Toronto and Tanya Berardini, TAIR*

1. Sylva Donaldson, University of Toronto (*no abstract submitted)*
2. Submission 340: **The Arabidopsis Information Resource (TAIR): a key part of your scientific toolbox**. Presenter: Tanya Berardini
3. Submission 535: **The Broader Picture: Profiling of Epigenetic to Translational Regulation Reveals Novel Patterns of Nuclear Regulation in Response to Hypoxic Stress**. Presenter: Travis Lee
4. Arthur Korte, University Würzburg (*no abstract submitted)*
5. Submission 168: **A global cis-regulatory code for Arabidopsis inferred with deep learning**. Presenter: Daphne Ezer
6. Submission 215: **Genome-Wide Identification of Splicing Quantitative Trait Loci (sQTLs) in Diverse Ecotypes of Arabidopsis thaliana**. Presenter: Muhammad Waqas Khokhar
7. Submission 291: **CLIMtools 2.0: Phenotypic and genome-wide association with the local environment of Arabidopsis**. Presenter: Ángel Ferrero-Serrano

11:30 am-12:00 pm **ICAR 2021 CLOSING & ANNOUNCEMENT OF NEXT ICARS**

12:30 - 5:00 pm **Free time for exhibits, posters, informal networking**

END ICAR 2021

Recorded sessions (Keynotes, Plenaries, and Mini-symposia), & posters (if presenters leave them up) will be available online, for on-demand viewing by registered attendees at the ICAR 2021 portal for 6 weeks post ICAR (through August 6)

We hope to see you next year at ICAR 2022- Belfast!

June 20-24, 2022

http://icar2022.arabidopsisresearch.org