

Washington State Academy of Sciences
2021 Annual Members' Meeting

2021 Members' Meeting Agenda

Thursday, September 16, 2021 | 2:00—4:00 PM, virtual

	Where We've Been
2:00 PM	Call to Order, Welcome, and President's Report <i>Roger Myers, President</i>
2:15 PM	Treasurer's Report <i>Allison Campbell, Treasurer</i>
2:25 PM	Acknowledgement of the Service of Officers and Board Members <i>Roger Myers, President</i>
2:30 PM	Introduction of New Officers and Board Members <i>Ronald Thom, Past President</i>
2:40 PM	WSAS Members' Program Committee Reports Skagit Water Supply Committee <i>Michael Goodchild, chair</i> PFAS Committee <i>Elaine Faustman, chair</i> Governor's Salmon Recovery Plan Committee <i>Robin Waples, committee member</i> Underwater Acoustics and Disturbance Committee <i>Ronald Thom, chair</i>
3:00 PM	Induction of New WSAS Members <i>Roger Myers and Ronald Thom</i>
3:25 PM	WSAS 2021 Annual Symposium <i>Ann Bostrom, Symposium Panel Moderator</i>
3:35 PM	2022 AJAS Student Delegates <i>John Roll, Education Committee chair</i>
3:40 PM	New Projects <i>Yasmeen Hussain, Program Officer</i>
	The Future
3:45 PM	Open Discussion with Members Moderated by <i>Roger Myers</i>
3:55 PM	Closing Remarks <i>Rogers Myers</i>
4:00 PM	Adjourn

From: Roger Myers, President

Dear Members,

FY 2021 (July 2020 – June 2021) was one for the record books. As the pandemic swirled around us, we stayed on course working towards the goals laid out in our strategic plan. As described briefly below, we continued to increase engaging our members in many kinds of activities (all virtual), make progress improving and codifying our organizational policies, implement business practices, and most notably, grow our funded programs. In addition, while our outreach to legislators and state agencies was limited due to covid-19 related restrictions, we were still able to interact virtually and secure important new projects for FY22-23, and for the first time in our history, landed a grant from the National Science Foundation. I would like to highlight the Treasurer's report, as well as the reports on the various state-funded projects, which describe the significant progress we have made toward achieving our mission of "Science in Service of Washington State". We continue to improve our position for future opportunities. To the scores of members who have been involved with us this past year, please accept the WSAS's deepest thanks. We could not do what we do without you.

Below is a snapshot of our accomplishments in FY 21.

The WSAS Executive Director and two full-time staff are doing an excellent job managing operations and programs. When needed and if funds are available, they are augmented by contractors and graduate student fellows who are interested in science policy. We also successfully and smoothly managed the staff transition from our prior Operations Manager, Devon Thorsell, to Elizabeth Jarowey, demonstrating the robustness of our policies and well-documented procedures.

You will hear during the Annual Meeting from Officers and Board Committee chairs about progress in a number of programmatic areas. Reports from projects by Officers, Committee chairs and members are included in this meeting package.

Strategic Planning – WSAS is making measurable progress towards its goals through 2023:

1. Become the go-to organization in the state for unbiased science and engineering expertise.
2. Achieve a sustained annual funding level of \$1 million.
3. Expand WSAS's network of partnerships and collaborations.
4. Increase staffing to meet state needs both reactively and proactively.

Business Processes – WSAS is implementing the processes it developed last year, including financial recordkeeping and project forecasting, and collection of annual membership dues. 210 members are currently paying dues, representing 62% of members. Nonpaying members will become inactive at the end of September if dues are not paid.

Policies and Procedures – WSAS is documenting its policies and procedures to build a strong infrastructure that enables growth and continuity.

Committee Charters - We are defining charters and supplementing membership for all WSAS standing and ad hoc committees. Below are some highlights; more information about all committees is forthcoming on our website.

Nominations – We continue to ensure there are more candidates for Board of Directors positions than openings, and we solicit candidates for all officer positions.

Membership – We welcomed 36 new members in 2021. The committee is actively discussing ways to enhance the nominations and review processes and incorporate appropriate elements of our DEI initiatives.

Diversity, Equity, and Inclusion – The committee is advising on how to incorporate our new policy into all our activities and will begin advising other committees this year.

Education – This committee is responsible for the administration of the WSAS's affiliation with the American Junior Academy of Sciences and for the oversight of all K-12 educational programming associated with WSAS.

New: Tribal Communications – This committee will develop a plan for WSAS's mutually beneficial engagement with tribal entities. We have recognized the importance of this effort as our projects impact various state sectors of importance to the tribes.

New State-Funded Projects – We continued to build strong working relationships with several state agencies and the Legislature, securing one recurring and four new projects to advise state policy in FY21: 1) annual review of PSP Science Panel nominations; 2) underwater acoustics and disturbance related to southern resident killer whales; 3) PFAS in food packaging; 4) the Skagit River water supply, and 5) salmon recovery. The Committee chairs or members will give brief descriptions later in the meeting. We also successfully worked to secure projects for FY22: this is a significant and on-going effort by the staff to ensure continued growth toward our strategic objectives. We are well positioned financially for FY22.

COVID-19 – We continued the work of this ad-hoc committee, which contributed to the planning of this year's Annual Symposium. Most notably, we received our first federal grant, from NSF, to conduct two community dialogues on the impacts of the pandemic in our state.

14th Annual Symposium – **COVID-19: Science and Society**, organized by Board Member **Howard Frumkin**, will be held on Thursday, September 23, and will focus on what we have learned about the pandemic thus far, paying particular attention to the implications for Washington, and on how scientific insight can help crystallize the lessons learned, inform the recovery process, and build resilience against future disasters. Members **Celestina Barbosa-Leiker** and **Jill McCluskey** will speak during the Community and Opportunity panels, respectively. <https://washacad.org/2021-symposium/>

We will continue to keep you up to date about our work via our website – washacad.org—and through our quarterly newsletter. We welcome your feedback, so please let us know what you think. And as always, THANK YOU for your ongoing commitment and involvement with WSAS.



Roger M. Myers

From: WSAS Treasurer, Allison Campbell

This report covers the fiscal year 2021 (FY 21), July 1, 2020 – June 30, 2021.

Finance Committee: Finance committee members in FY 21 were Treasurer Allison Campbell, former Treasurer Cathryn Booth-LaForce, Mick Smerdon, and Jonathan Yoder.

FY 2021 Funding Sources: Funding sources are state funding, project funding, donations, and as of FY 21 member dues. Total approved budget revenue for FY 21 was \$530,428 (presuming, at the time, a best-case scenario) but was reduced to \$405,796 due to a 10% cut in core funding during the summer of 2020 and the loss of an anticipated new contract. Total approved budget expenses were \$554,811, but were reduced to \$420,657 due to the expected loss of revenue.

By the end of the fiscal year, our revenues from projects, donations, and membership dues exceeded reduced expectations, so as of June 30, our revenue was \$529,777. This amount includes receipt of funds in mid-late June from the NSF grant and dues revenue that posted in FY 21. Expenses were \$438,342, which was on track with the budget approved in May 2020.

State Funding: Core funding supports core operations – some staff salaries, office leasing, IT support, Board expenses, staff travel, and professional development. We cut back significantly in all these areas to preserve as much funding as possible for staff salaries and professional development that directly reinforces WSAS goals. State funded projects comprise the balance of state funding. In FY 21, state funded projects were Skagit water supply, underwater acoustics and disturbance, PFAS, and review of the Governor's salmon recovery policy. All except for the Skagit water supply project were completed by the end of the fiscal year. We were not able to carry forward more than 5% of any accrued OH (either WSU or WSU), so we spent out as much of those balances as possible by June 30.

Private Funding: These funds are used to pay for expenses not covered by core or state-funded project funds, e.g., consultants, some goods and services, travel, K-12 activities, and professional development. We transferred \$33,000 from our private funds to a WSAS gift account in the WSU Foundation as a reserve to be used if we fell short of funds for staff salaries. We used some of those funds to cover the Executive Director's salary at the end of the fiscal year, but expect to replenish most of those funds when outstanding invoicing issues are resolved.

Investments: Our Vanguard investment accounts grew from \$54,880 on June 30, 2020 to \$78,148 on June 30, 2021, an increase of 30%.

Support for K-12 Activities: We budgeted revenues of \$10,000; due to the cancellation of the in-person annual AAAS meeting in February 2021, we incurred expenses of only \$1,125. A generous donation by a Board member covered the registration fees for students in FY 21.

Donation Report—FY 2021

July 1, 2020—June 30, 2021

Up to \$249

Nathan Baker
 P. Dee Boersma
 Douglas Call
 Bruce Finlayson
 Dennis Hartmann
 Maxine Hayes
 Patricia Ann Hunt
 Akira Ishimaru
 Joel Kaufman
 Donald Liu
 David Lomet
 Amy Person
 Daniel Schwartz
 Jud Virden, Jr.
 Robin Waples
 Judith Wasserheit

\$250—\$499

Peter Bethell
 R. James Cook
 Trisha Davis
 Donna Gerardi Riordan
 Lee Huntsman
 Steve Kramer
 Marc Mangel
 Anne McCoy
 Guy Hughes Palmer
 Buddy Ratner
 Michael Smerdon
 Dennis Tilley*
 Qin Zhang

\$500—\$999

Donald Baer
 Cathryn Booth-LaForce
 Dianne Chong
 Caroline Harwood
 Laura Griner Hill
 Samson Jenekhe
 Lai-yung "Ruby" Leung
 Pamela Mitchell
 Bruce Montgomery
 Earll M. Murman
 Roger Myers
 Ronald Thom
 James Winton

\$1,000—\$4,999

Brian Atwater
 Anjan Bose
 Ann Bostrom
 Allison Campbell
 Richard Catalano, Jr.
 Christina Koons*

*non-member

2021-22 Leadership

Board of Directors

WSAS is governed by a Board of Directors comprised of four officers and twelve members. Terms begin and end at the end of the annual meeting in September.

2021-22 Officers

Position	Name	Affiliation	End of Term
President	Roger Myers	Aerojet Rocketdyne (retired)	2022
President-Elect	John Roll	Washington State University	2022
Treasurer	Allison Campbell	Pacific Northwest National Laboratory (retired)	2023
Secretary	Donald Baer	Pacific Northwest National Laboratory, Emeritus	2023

2021-22 Board of Directors

Name	Affiliation	End of Term
Brian Atwater	University of Washington/U.S. Geological Survey	2022
Celestina Barbosa-Leiker	Washington State University	2024
Suresh Baskaran	Pacific Northwest National Laboratory	2024
Ann Bostrom	University of Washington	2023
Richard Catalano, Jr.	University of Washington, Emeritus	2022
Douglas Call	Washington State University	2024
Howard Frumkin	University of Washington, Emeritus	2023
Patricia Hunt	Washington State University	2023
Lee Huntsman	University of Washington, Emeritus	2023
Ruby Leung	Pacific Northwest National Laboratory	2023
Ron Mittelhammer	Washington State University	2022
John Stark	Washington State University	2024

Standing Committees

WSAS standing committees are chaired by members of the Board of Directors. If you are interested in joining any of the following committees, please contact the chair of the committee or the WSAS office.

Communications Committee	Brian Atwater, <i>chair</i> Donald Baer Shirley Beresford Roger Myers
Education Committee	Terry McElwain, <i>chair</i> Douglas Call Gary Foss, non-member John Roll
Finance Committee	Allison Campbell, <i>chair</i> Cathryn Booth-LaForce Michael Smerdon Jonathan Yoder
Nominations Committee	John Roll, <i>chair</i> John Stark
Study Oversight Committee	Roger Myers, <i>chair</i>
COVID-19 Steering Committee, ad hoc	Ronald Thom, <i>chair</i> Philip A. Bernstein Ann Bostrom Richard Catalano, Jr. Dianne Chong Howard Frumkin Lee Huntsman Lai-yung "Ruby" Leung Clifford F. Mass Ron Mittelhammer Guy Hughes Palmer
Diversity, Equity, and Inclusion Committee, ad hoc	Celestina Barbosa-Leiker, <i>chair</i> Nathan Baker Shirley Beresford Cathryn Booth-LaForce Dianne Chong Katrina Mealey John Roll Jud Virden
Tribal Communications, ad hoc	Patricia Hunt, <i>chair</i>

From: Communications Committee (Atwater, *chair*, Baer, Beresford, Myers)

The Board in June approved revision to WSAS communication policies. A September 2 op-ed elicited interest. Among usual communications channels, both the quarterly newsletter and the website continue to hold steady overall in usage, and the website has undergone further changes for accessibility. WSAS presence on Twitter and LinkedIn has grown.

Communications Policy

The meeting packet contains the revised Communications Policy, prepared by the Committee and Devon Thorsell with input from the Board. This revised policy, condensed from its predecessor, summarizes how communications serve the WSAS missions and states who is authorized to communicate on the Academy's behalf. It was approved by the Board through an email vote in June of 2021, and it has been posted on the internal WSAS Policies webpage.

***The Seattle Times* OpEd Article**

On September 2, 2021, *The Seattle Times* published "Let's Thank, Not Vilify Scientists," an essay by current Board President **Roger Myers** and President-Elect **John Roll**. Readily available measures of public interest, as of September 8, 2021, include the posting of the op-ed by 11 separate Twitter accounts. These 11 posts accrued 14 retweets, 27 likes, and one comment. Six of the posts were tweeted by individual accounts and five were tweeted by accounts associated with a unique professional organization including WSU Medicine, *The Seattle Times*, and the Washington State Medical Association. 58 comments on The Seattle Times website. Several respond thoughtfully to the op-ed and 38 reactions, 24 comments, and 1 share on The Seattle Times Facebook page

Newsletter

Staff maintains, for internal use, a list of external contacts. Included are state leaders, non-profit partners, science policy professionals, and external donors. Also included are all members of the state legislature and their legislative assistants. The quarterly newsletter goes out to all on this list, and anyone can join the WSAS mailing list by subscribing online to the newsletter. Staff will be asking the Communications Committee to review current practices for opting in and protecting privacy.

Social Media

WSAS currently maintains a social media presence on Twitter and LinkedIn. The greatest activity and engagement are on Twitter, with 253 followers, an increase of 63 followers since September 2020. We currently have 33 followers on LinkedIn, an increase of 12 followers since September 2020. Partnerships with other organizations, including PNNL, have increased social media engagement through the cross-promoting of events and activities.

Website

Though the website www.washacad.org retains design from 2016, staff have been making the site easier to navigate, particularly to highlight the work of study committees and members, and to help members engage in WSAS activities and with the Academy's staff, officers, and Board. Upcoming

changes include improving display on cellphones. Visits have risen overall across the past 24 months. The highest daily number of single views occurred on July 16, 2021, with 377 unique visitors. This record coincided with the press release the newly elected WSAS members and Board Members and associated publications by professional partnerships like PNNL and WSU.

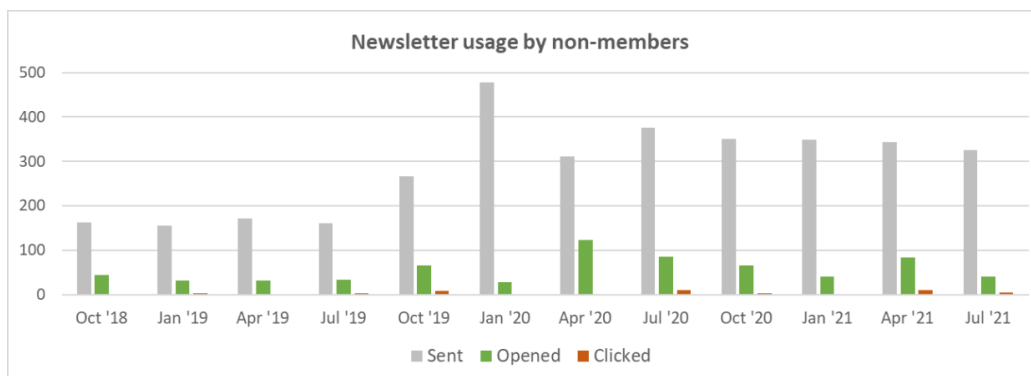
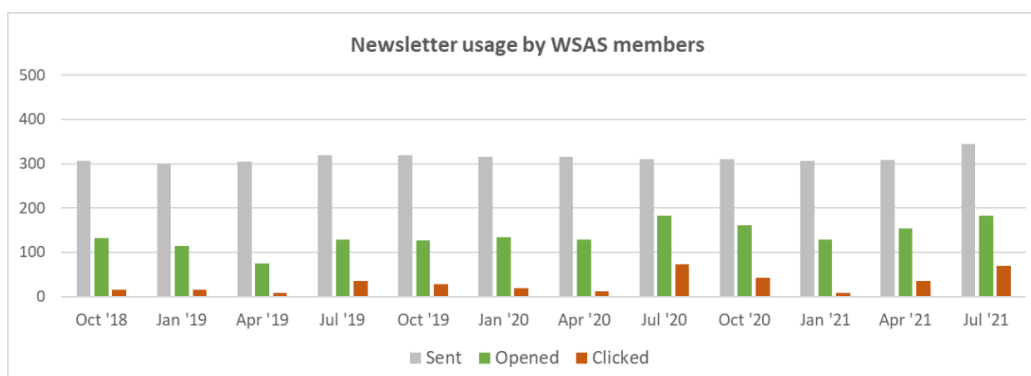
Upcoming Plans

- ◆ Review website design and update
- ◆ Survey members to learn how they would like to hear about and from WSAS. Questions to include: What is the best way for the Academy to contact you? How often do you want to hear from WSAS?
- ◆ Prepare brief WSAS description (1-2 pp) and slide deck for communications with external groups by ED, board members and staff.

Communication Metrics

Newsletter

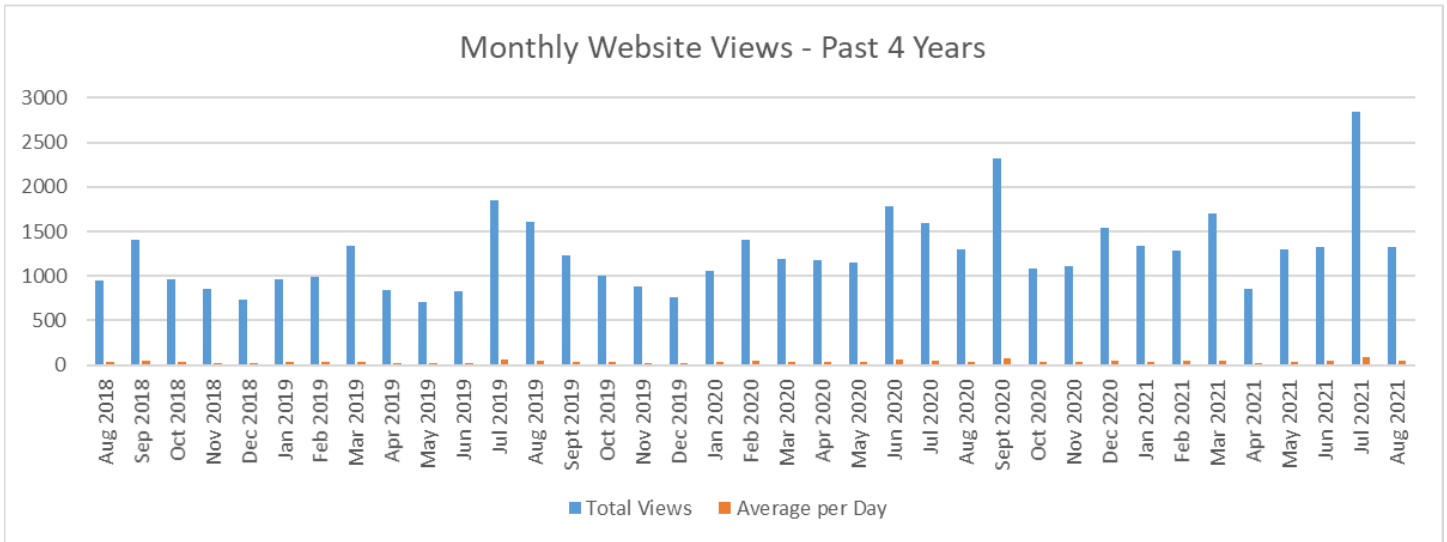
Fall 2018 through Summer 2021



Website

Our website is www.washacad.org

We have been tracking statistics on our website since August 2018. The chart shows the number of website visits per month, as well as the average daily visits, between August 2018 through August 2021.



From: Education Committee (Roll, *chair*, Foss, McElwain)

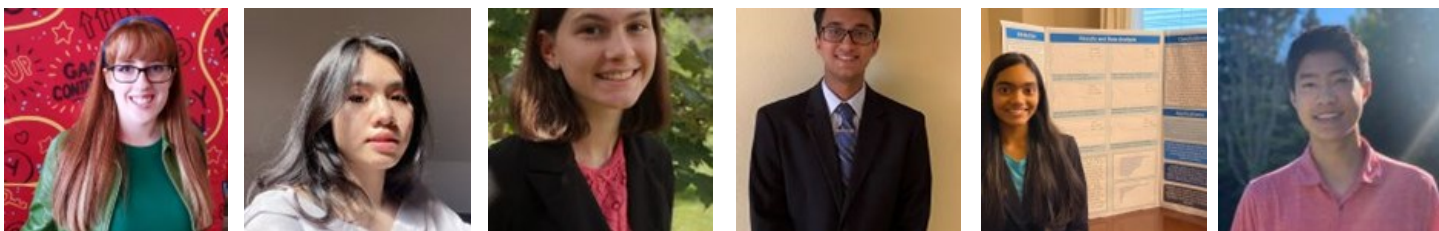
AAAS-AJAS Conference 2021, Virtual

Trip Report prepared by Gary Foss

WSAS Program Operations Manager Devon Emily Thorsell and Gary Foss accompanied six students from Washington State to the virtual meeting of the American Junior Academy of Sciences (AJAS). AJAS was held in conjunction with the 187th meeting of the American Association for the Advancement of Science (AAAS), also a virtual event.

This year's national class of AJAS Fellows, including 200 pre-collegiate students presenting 190 research projects, was the largest in AJAS history. AJAS Director Lee Brogie noted "This past year they have faced many unforeseen obstacles and persevered. Upon viewing their posters, I'm sure you will agree that our future is in good hands."

Since we didn't have airfare costs to the virtual event this year, we selected all six Washington student applicants. Our students were Bridgette Bromell, An Doan, Audrey Gruian, Samarjit Kaushik, Ankita Menon, and Thomas Yim (below from left to right). In addition, 2020 Washington AJAS Fellows Christine Ye and Aditi Subramanyam joined the meeting as alumni.



Bridgette Bromell, Columbia River High School, ["Examining and Comparing Diabetes Mellitus and Obese BMI as Risk Factors for Alzheimer's Disease and Vascular Dementia through Meta-Analysis"](#)

An Doan, Tesla STEM High School, ["Autonomous Drones for Search and Rescue Missions"](#)

Audrey Gruian, Eastlake High School, ["ALV+IN: An Intelligent Stereoscopic Olfactory System for Autonomous Localization of Volatile Organic Compounds"](#)

Samarjit Kaushik, Tesla STEM High School, ["Investigating the Effect of Fibulin-2 on NF- \$\kappa\$ B Pathway Activity and Proliferation of Pediatric Gliomas"](#)

Ankita Menon, Tesla STEM High School, ["Survival Analysis of Pediatric Neuroblastoma Patients using Gene Expression Data: Identification of Novel Neural-Related Biomarkers"](#)

Thomas Yim, Lakeside School, ["Automatic Translation of American Sign Language"](#)

The AJAS activities and presentations took place over about five weeks, beginning in late December with a film screening of "[Jim Allison: Breakthrough: The true story of one man's visionary quest to find a cure for cancer.](#)" Shortly after the filming of the movie, Dr. Allison received the Nobel Prize in Physiology or Medicine for discovering the immune system's role in defeating cancer. On December 30, Dr. Allison and Padmanee Sharma, MD, PhD, made themselves available for a conversation with the AJAS delegates.

In January, AJAS events included the following keynotes:

- ◆ "From Star Wars to Science: Building Your Story" with scientist turned film-maker [Randy Olson](#)
- ◆ "Comedy, Science, and Communication: Telling Your Story" with actor, science communicator, comedian, author, and improv teacher [Brian Palermo](#)
- ◆ AJAS Opening Ceremonies with Dr. Francis Collins, Director of the National Institutes of Health

On February 4, the AJAS poster session opened. All the posters can be found [here](#), organized by category. Also available at this link is the welcome message by AJAS Director Lee Brogie and AAAS CEO Sudip Parikh. On February 6, delegates shared their research with their peers at the AJAS Research Round Table - a creative and dynamic small group setting.

AAAS began on February 8 and the delegates attended the AAAS President's Address with Dr. Claire Fraser, a pioneer and global leader in genomic medicine. Students also attended the following AAAS Plenary Lectures:

- ◆ Dr. Anthony Fauci, "COVID-19 in 2021: Lessons Learned and Remaining Challenges"
- ◆ Dr. Ruha Benjamin, "Race to the Future? Reimagining the Default Settings of Technology & Society"
- ◆ Dr. Mary Gray, "Our Oppenheimer Moment: When Big Tech, Research Ethics, and Human Rights Collide"
- ◆ Dr. Sethuraman Panchanathan, "The Future of Competitiveness: Strengthening the Symbiosis of Exploratory and Transitional Research @ Speed & Scale"

Washington State delegates were required to attend at least two scientific sessions and write up short reviews of each. Our students met twice during the AAAS conference as a group to debrief the sessions together. During the conference, between events, students had the opportunity to virtually gather with Fellows from other states, make friends, and network at the "The AJAS Café."

The final events of the AJAS conferences included the ever-popular "Meet the Scientists," which was organized this year by the National Academy of Sciences Director, Marcia McNutt. AJAS Fellows met with scientists in four sessions for small-group discussions. AJAS closed with a keynote from Dr. Cathy L. Pederson titled "The Mystery Illness Affecting Millions: Postural Orthostatic Tachycardia Syndrome." Dr. Pederson is the Endowed Professor of Biology at Wittenberg University, and founder of Standing Up to POTS. Her daughter became ill with postural orthostatic tachycardia syndrome in 2012, beginning a journey into illness and our healthcare system that few experience.

AJAS is organized by the National Association of Academies of Science (NAAS), a not-for-profit organization whose mission is to promote the scientific and science education goals of state academies of science. The NAAS consists of 47 state and regional academies, which are organized to encourage all facets of scientific inquiry and experiences. AJAS is America's only research honor society for high school scientists. Each affiliated state's Academy of Science selects the premier high school researchers from their state to be lifetime AJAS fellows, inducted and honored at the yearly conference.

The AJAS mission is to introduce, encourage and accelerate pre-college students into the world of science, engineering and technology by enabling their participation in the social, cultural and scientific activities of the annual meeting of the AAAS. It does this primarily through science activities that allow students to experience the world of scientific research firsthand. This [video](#) explains the event.

Looking Ahead

In 2021 the science fair season was impacted by the COVID pandemic. Washington regional and state fairs were held virtually via Zoom. At the state science fair, about 350 students and 200 judges participated over several weekends. From all Washington fairs, twenty-five finalists have been selected to attend the Regeneron International Science & Engineering Fair, to be held virtually May 16-21, 2021.

The 2022 AAAS conference will be hosted in-person in Philadelphia, PA and online. All plenary sessions and talks will be virtually accessible, and AAAS anticipates a much smaller physical footprint, including the elimination of the exhibit hall and transition of the poster sessions to e-posters only. AJAS and its governing organization, NAAS, is currently negotiating with AAAS regarding its involvement. Executive Director, Donna Gerardi Riordan, serves on the NAAS Board of Directors.

The Education Committee of WSAS voted to modify the AJAS selection process for 2022 and has set into motion a new process by which science fair directors nominate up to two students for the AJAS award. Nominating instructions were sent to all the regional fair directors and will be due over the summer. The Education Committee requested that fair directors consider putting forward nominees that would most benefit from an AJAS Fellowship. As a result of our efforts to increase institutional and geographical diversity, we were able to cover a significant portion of the state that was previously under- or unrepresented. We will continue to modify our nominations process and educational programming to increase accessibility and representation for the children in the state of Washington.

On August 13th, 2021, 15 candidates were presented to the Education Committee members. Due to decreased financial strain from the virtual conference, the committee unanimously approved the decision to allow all of the candidates to be named as 2022 AJAS Delegates for the state of Washington.

See the table below for a list of 2021-22 student delegates. You can view their presentations on our website at: <https://washacad.org/2022-ajas-awardees/>

Student Name	Science Fair	Title of Research Paper
Anna Armstrong	Spokane Regional	Composting Plant Starch Biomass Products Used as an Alternative to Plastics
Aiden Bai	Southwest Washington	Lucia (High performance JavaScript Library)
Saketh Dhulipalla	Washington State	Predicting Wildfires in Washington
Jacob Gannon	Eastern Washington	The Impact of the Gut Microbiome on Personality in Canines
Anika Halappanavar	Mid-Columbia	Analysis of COVID-19 Misinformation Origin and Cure Narratives
Jennifer Hu	Washington State	Identification of Genes for Depressive Disorder as Biomarkers
Nidhi Krishna Kumar	South Sound	MUSR: Low-Cost Multipurpose Sterilization Robot
Yuchen Li	Central Sound	Atlantic Meridional Overturning Circulation Weakening
Conan Lu	Central Sound	ComposeGAN: A Multi-GAN Approach to Symbolic Music Style Transfer
Gabriella Lui	Central Sound	Apply Machine Learning to Predict Rheumatoid Arthritis
Uma Paul	Washington State	Determining the Prognostic Value of Genes in Lung Adenocarcinoma
Alexis Schallock	Eastern Washington	The Impact of the Gut Microbiome on Personality in Canines
Emily Scrapps	Spokane Regional	Customized 3D Printing of Live Cells for Novel Bio-Circuitry
Kevin Shen	South Sound	The Variable Sweep Flying Wing: Investigating a Novel Concept for UAVs
Chloe Winkler	Spokane Regional	TiO ₂ /UV Based Photocatalytic Pretreatment of Post-Harvest Canola Stalks for Cellulosic Ethanol Production

From: Membership Committee (Mittelhammer, chair, Baer, vice chair, Campbell, Baskaran, Hilborn, Heitkemper, Meltzoff, Bose, De Yoreo, Dillman, Virden)

WSAS oversaw its twelfth annual election cycle during the Spring of 2021, resulting in 27 new members for the ballot. An additional ten members were offered membership by virtue of their election to one of the National Academies in 2020-21. One of these members was unable to accept his membership in WSAS due to a busy schedule. In 2021, WSAS received 38 total nominations from which 27 new member candidates were selected. 67 members and non-members participated in the nominations process by acting as primary and secondary nominators for potential new member candidates. Please see the table below for a comparison of the 2021 membership cycle to previous years.

Section	2021 Membership	Nominations by year				
		2017	2018	2019	2020	2021
1	65	5	12	6	9	8
2	87	8	8	9	5	6
3	60	3	9	8	10	8
4	90	5	6	6	6	10
5	37	2	3	5	8	6
Total	339	23	38	34	37	38

Section	2021 Membership	New Ballot-Elected Members by year				
		2017	2018	2019	2020	2021
1	65	2	3	4	4	7
2	87	4	4	4	3	5
3	60	0	3	1	4	4
4	90	3	3	4	2	7
5	37	2	3	4	4	4
Total	339	11	16	17	17	27

Section Committees

1 – Physical and Mathematical Sciences

Charlie Campbell, *chair*, Allison Campbell, Bradley Colman, Daniel Gamelin

2 – Engineering and Technology

Suresh Baskaran, *chair*, Michael Bragg, Dianne Chong, Radia Perlman

3 – Biological Sciences

Ray Hilborn, *chair*, Jim Fredrickson, Patricia Hunt, John Reganold, Robin Waples

4 – Health Sciences

Margaret Heitkemper, *chair*, Maxine Hayes, George Martin, John Roll

5 – Social and Behavioral Sciences

Andrew Meltzoff, *chair*, Alexes Harris, Tom Marsh, Robert Plotnick

DEI Implementation

The Membership Committee has drafted a letter to the DEI Committee to ask for the following three actions items:

1. A membership-wide data summary of self-reported gender and ethnicity to support sharpening WSAS goals for increasing diversity within our membership pool.
2. Recommendations on amendments to the current nomination and evaluation policies and procedures for membership that will promote DEI initiatives within WSAS.
3. Recommendations on training, expert-led discussions, and additional actions or activities that the Membership Committee may participate in to examine internal, external, and organizationally specific biases and practices for successful implementation of the WSAS DEI Statement throughout the Membership Committee's processes and actions.

Areas of further discussion for the 2022 Nominations Cycle:

- ◆ Provide more guidance to section committees on the criteria for service and accomplishment to differentiate between levels
- ◆ Prioritize efforts to increase nominations from institutions outside UW, WSU, and PNNL
- ◆ Working with the DEI committee to improve DEI outcomes and implementation in the membership nomination and election process
- ◆ Create process to provide feedback to nominators
- ◆ Make changes to nomination forms to better reflect nominee diversity

2021 NEW MEMBERS

New members are elected directly by the WSAS membership and are offered membership by virtue of election to the National Academy of Sciences, Engineering, or Medicine.

Section 1—Physical and Mathematical Sciences

Joel Baker

Professor of Chemistry and Port of Tacoma Chair in Environmental Science, University of Washington

Dr. Joel Baker has led internationally-recognized research campaigns tracking the environmental behavior of anthropogenic organic chemicals, especially PCBs, throughout North America and around the world. His work develops and adapts sensitive analytical techniques to quantify micropollutants in remote environments and utilizes deterministic transport models to understand the sources and ultimate fate of these toxic chemicals. He has authored more than 100 peer-reviewed publications and has mentored a large number of doctoral and masters students. During his 30+ year academic career, he has shifted his focus from fundamental environmental chemistry to translational work that provides integrated and synthesized scientific information to regional and national decision makers, including his current position as Director of the UW Puget Sound Institute.

Brandi Cossairt

Professor of Chemistry, University of Washington

Brandi Cossairt's research at the University of Washington examines the nucleation, growth, surface chemistry, and reactivity of nanoscale materials to enable next-generation technologies in the diverse areas of displays, lighting, catalysis, quantum information, and hybrid matter. She has received a number of awards for her work including a Sloan Research Fellowship, a Packard Fellowship, an NSF CAREER Award, a Dreyfus Teacher-Scholar Award, and the National Fresenius Award from the American Chemical Society. Outside of the lab Brandi is an Associate Editor at the ACS journal Inorganic Chemistry and is the co-founder of the Chemistry Women Mentorship Network (ChemWMN).

Daniel Jaffe

Professor of Environmental Chemistry and Chair, Physical Science Division, , University of Washington -Bothell

Professor Jaffe has been sought out as an expert to serve on numerous national and international task forces and panels on global pollution, by organizations including the Hemispheric Transport of Air Pollutants (HTAP) program, NASA, NSF, NAS, AMAP, EPA and the Columbia River Gorge Commission. He was named the Fulbright Distinguished Chair in Environmental Sciences and received the first UW-Bothell Distinguished Research, Scholarship, and Creative Activity Award (DRSCA). He has published over 200 papers and reports with an h-index of 66 and served as the Principal Investigator on more than 31 projects (total >\$9 million) with funding from NSF, EPA, NOAA, NASA, USGS and industry groups. He continues to make significant contributions to the development of new analytical methods to quantify and track the effects of pollution and natural disasters on the environment, with a particular focus in recent years on wildfire smoke.

Munira Khalil

Leon C. Johnson Professor and Chair of Chemistry, University of Washington

Munira Khalil is a renowned experimental physical chemist whose research program is focused on developing a microscopic understanding of how coupled electronic, vibrational, and solvent degrees of freedom optimize charge and energy transfer pathways in molecular photochemistry. Her scholarship and research and teaching accomplishments have been broadly recognized by the scientific community. Her honors include the Dreyfus New Faculty Award, Packard Fellowship in Science and Engineering, National Science Foundation CAREER Award, Alfred P. Sloan Research Fellowship, and the Camille-Dreyfus Teacher-Scholar Award. Khalil was named a Kavli Frontiers of Science Fellow, selected for the American Chemical Society Journal of Physical Chemistry Lectureship, and is a Fellow of the American Physical Society.

Richard Kouzes

Laboratory Fellow Emeritus, Materials Sciences, Pacific Northwest National Laboratory

Richard T. Kouzes works in the areas of neutrino science (Majorana, SNO and SAGE), neutron and gamma ray detection, homeland security, and non-proliferation. His work on homeland security has been for the development and deployment of radioactive material interdiction equipment at U.S. borders, and he was the Principal Investigator and Technical Lead for the U.S. Customs and Border Protection's Radiation Portal Monitor Project, the largest single project at PNNL. His recent Safeguards projects deal with neutron detection for material accountability. One of his solar neutrino projects (SNO) was awarded the 2016 Breakthrough Prize in Fundamental Physics. Dr. Kouzes is a Fellow of the Institute of Electrical and Electronics Engineers (IEEE) and the American Association for the Advancement of Science (AAAS). He has received the Richard F. Shea Distinguished Member Award of the IEEE Nuclear and Plasma Sciences Society and the PNNL Lifetime Achievement Award. He is an author of over 180 peer-reviewed papers and over 540 reports and conference proceedings.

Ondrej Krivanek

President, Nion Company

Ondrej L. Krivanek is the president of Nion Co. And an Affiliate Professor at Arizona State University. He was born in Prague and has worked in academia and industry on a global scale. In 1997, he co-founded the company Nion – a maker of advanced electron microscopes based in Kirkland, WA. Ondrej is well known for developing several new instruments that have endowed electron microscopes with revolutionary new capabilities. These include an aberration corrector that has allowed electron microscopes to reach sub-Å spatial resolution for the first time, and an electron monochromator that has opened up the field of vibrational spectroscopy with high spatial resolution and enabled new experiments such as recording the "sound" of a single silicon atom embedded in graphene. Ondrej's work has been cited over 12,000 times and honored with several prizes, most recently the 2020 Kavli Prize for Nanoscience.

Victoria S. Meadows

Professor of Astronomy and Director, Astrobiology Graduate Program , University of Washington

Victoria Meadows leads the massively interdisciplinary NASA Nexus for Exoplanet System Science - Virtual Planetary Laboratory team. The overarching goal of her research is to determine how to recognize whether a distant extrasolar planet can or does support life. Her specific research interests include theoretical modeling of terrestrial planetary environments to understand their habitability, the generation and detectability of planetary biosignatures and their false positives, and solar system planetary observations of Venus and Earth. She has provided scientific support for the Hubble Space Telescope Wide Field and Planetary Camera-2, and the Spitzer Space Telescope. She has contributed as a member of the Science and Technology Definition Teams for several NASA mission concepts and is the recipient of several NASA Group Achievement Awards, the SETI Drake Award, and was a National Academy of Sciences (NAS) - Frontiers of Science Kavli Fellow. She has served on the NAS Committees for Astrobiology and Exoplanets, and was the Chair of the Exoplanets, Astrobiology and Solar System Science Panel of the National Academies' Astro 2020 Decadal Survey.

National Academy of Sciences Inductee**Randall LeVeque**

Professor Emeritus of Applied Mathematics, University of Washington; NAS

Randall J. LeVeque is a lead developer of the open source Clawpack and GeoClaw software packages for the solution of wave propagation problems and his current research interests are focused on algorithm and software development, particularly for tsunami modeling and overland flooding. He also works on the development of probabilistic hazard assessment techniques and machine learning approaches to real-time tsunami warning. As part of the UW Tsunami Modeling Group, he has worked on numerous hazard assessment projects for Washington State, including simulations used in recent inundation maps and in support of the design of vertical evacuation structures. LeVeque is a Fellow of the Society for Industrial and Applied Mathematics (SIAM), the American Mathematical Society (AMS), and the National Academy of Sciences (NAS).

Section 2—Engineering and Technology**Kristi Morgansen**

Professor and Chair of Aeronautics and Astronautics, University of Washington

Kristi Morgansen joined the William E. Boeing Department of Aeronautics and Astronautics in 2002 and also serves as co-Director of the UW Space Policy and Research Center (UW SPARC) and Director of the Washington NASA Space Grant Consortium. She has received a number of awards, most recently Fellow of AIAA. Her research interests focus primarily on guidance, navigation and control for autonomous systems, particularly nonlinear systems where sensing and actuation are integrated. Applications include both traditional autonomous vehicle systems such as fixed-wing aircraft and underwater gliders as well as novel systems such as bio-inspired underwater propulsion, bio-inspired agile flight, human decision making, and neural engineering.

Alshakim Nelson

Associate Professor of Chemistry, University of Washington

Alshakim Nelson is a highly respected scientist and scholar with >70 publications and >30 issued patents and is widely recognized for his expertise in polymer synthesis and self-assembly for 3D printing and nanomanufacturing. As an active member of several scientific societies, and he has chaired and organized symposia for regional and international meetings. He is highly sought for his expertise, and his service to the scientific community includes panels, scientific and editorial advisory boards, and committees. Prof. Nelson has mentored over 60 postdoctoral fellows, graduate, undergraduate, and high school students, and he is currently the Director of Education for the Molecular Engineering and Sciences Institute.

Ljiljana Pasa-Tolic

Laboratory Fellow, Functional and Systems Biology, Pacific Northwest National Laboratory

Ljiljana Paša-Tolić is an internationally recognized pioneer and leader in high throughput and top-down proteomics and is known for her scientific leadership in analytical chemistry and mass spectrometry, including the development of transformative instrumentation and methods for biological and environmental research. Dr. Paša-Tolić has authored more than 250 peer-reviewed publications and presented at more than 100 seminars, conferences, and workshops. Widely recognized as a forward-thinking scientist, she is highly sought by numerous editorial and advisory committees and is serving on the Board of Directors for the American Society for Mass Spectrometry and Consortium for Top-down Proteomics. She has mentored more than 40 post-doctoral researchers, professionals, graduate, undergraduate, and high school students and has acted as an organizer for the Mass Spectrometry in Biology and Medicine Summer School in Dubrovnik, Croatia since 2007. In 2019, she was one of the top scientists selected for the Analytical Scientist Top 100 Power List, recognizing her pioneering contributions to ultra-high resolution mass spectrometry for applications ranging from environmental ecology to medicine. Dr. Paša-Tolić is passionate about advancing technologies needed to answer questions central to biology, the planet, and people.

Noel Schulz

Edmund O. Schweitzer III Chair in Power Apparatus and Systems and Interim Director, PNNL/WSU Advanced Grid Institute, Washington State University

Noel Schulz is internationally known for her scientific leadership in the electrical engineering area of modeling and simulation of power system planning, control and operations including AI techniques. Dr. Schulz has authored over 200 papers and secured over \$40M in external research funding from federal agencies and industry. She has graduated 45 MS and 13 PhD students during her faculty career. Her service to the scientific community includes leadership in the IEEE Power & Energy Society, serving as President in 2012 and 2013, and numerous activities and programs to support women in STEM including faculty, students and professionals across multiple universities and the world. She is a Fellow of IEEE and the American Society for Engineering Education (ASEE).

Jon Schwantes

Senior Research Scientist and Lead, Nuclear & Radiochemistry Team, Pacific Northwest National Laboratory

Jon Schwantes is a nuclear and radiochemist, applying his expertise to a wide variety of R&D related to aqueous environmental radiochemistry, super-heavy element chemistry and physics, astrophysical nucleosynthesis, science-based stockpile stewardship, and nuclear material science. He has authored or coauthored 115 (72 peer-reviewed) publications in these areas of study, was part of the confirmatory team for the discovery of element 111 (subsequently named Roentgenium) and led a team of researchers in 2009 that identified the oldest known reactor-produced plutonium in the world. He is internationally recognized for his leadership in nuclear forensic science and has contributed in major ways to several well-known nuclear forensic investigations over the past decade (including, the Fukushima Daiichi nuclear accident, the 2014 contamination of the Waste Isolation Pilot Plant), most recently leading the forensic examination of a 3,000 Ci radioactive sealed source that was breached in 2019 at the University of Washington's Harborview Medical Facility.

National Academy of Engineering Inductees**Russell J. Allgor**

Chief Scientist, Global Delivery Service, Amazon; NAE

Russell Allgor leads a team of mathematical modeling experts and has demonstrated outstanding accomplishments in Practice, Management, and Research of OR/MS at Amazon. He is one of the most influential scientists in the field of logistics and fulfillment systems for e-commerce. He and his team focus on using data analysis, modeling, simulation, and optimization methods to improve the efficiency of Amazon's operations. He has focused on problems including network design and facility location, inventory planning, order assignment, equipment and process design, vehicle routing, and process control within and across facilities. Ideas and algorithms developed by Allgor have returned billions of dollars to Amazon's bottom line.

Lili Cheng

Corporate Vice President, Corporate Vice President and Distinguished Engineer, Microsoft AI and Research, Microsoft Company

Lili Cheng joined Microsoft in 1995 and her work there has impacted hundreds of millions of users, and millions of developers, and she has co-authored over 100 patents. In her over 20 years with Microsoft, she has developed countless platforms and products and was instrumental in the foundations of what is currently Microsoft Windows. Some of her products include Kodu, an educational programming environment used by over 10 million students and conversation AI tools for Microsoft Azure. She also created the FUSE lab, a development group focused on real-time, media rich virtual experiences. As part of a long-term focus on STEM education for all students, Lili created two annual symposiums to expand the impact of technology to social scientists (Social Computing Symposium) and design schools (Design Expo).

Julio A. Navarro

Senior Technical Fellow, Boeing Research and Technology, The Boeing Company; NAE

Julio Navarro is a subject matter expert in radio frequency circuits, antennas and heterogeneously-integrated electronics. He provides technical leadership of critical radio frequency and microwave technologies for Boeing's advanced aerospace development organizations and develops phased array antenna sensors for aircraft, ships, submarines, satellites and missiles. Over 20 years, he has helped Boeing develop new communications and radar phased array products used in missiles, satellites and unmanned aerial vehicles. He's the holder of 12 patents relating to low-cost phased array antennas, an Associate Technical Fellow and a Ph.D. who's authored some 30 technical articles and a textbook. Dr. Navarro was the key innovator in the design, development cutting edge phased-array antennas (PAAs) applied to compact radar sensors and directional line-of-sight communication networks.

Vickie VanZandt

President, VanZandt Electric Transmission Consulting, Inc.; NAE

Vickie A. VanZandt is a Board Director of the ISO New England, the Chair of their System Planning and Reliability Committee; and the owner of an electric transmission consulting business. She managed the Western Interconnection Synchrophasor Program (WISP) for the Western Electricity Coordinating Council (WECC), served on the Secretary of Energy's Electricity Advisory Board, and participated in the Bi-Partisan Policy Center's Initiative on Delivering Electric System Reliability and Clean Technology. She served as the Vice-Chair of the WECC Board of Directors, and co-chaired the Operations Team of the Electric System Investigation of the August 14, 2003 power outage – working with the North American Electric Reliability Council, DOE, and Canadian governmental representatives. She is a professional director, a registered professional engineer, a Life Member of the IEEE, a member of Tau Beta Pi, and has been inducted into the National Academy of Engineering.

National Academy of Sciences Inductee**Anna Karlin**

Bill and Melinda Gates Chair in Computer Science & Engineering, University of Washington; NAS

Anna Karlin is a theoretical computer scientist whose research focuses primarily on the design and analysis of algorithms and algorithmic game theory. The latter addresses the question of how to merge algorithm design and optimization with strategic and game theoretic considerations. Another topic of recent interest is the quest to obtain algorithms that are efficient and produce near-optimal solutions to NP-complete problems in polynomial time. She and her team have made recent progress with examinations of the famous Travelling Salesperson Problem. Karlin is coauthor of the book "Game Theory, Alive" published by the American Mathematical Society, a co-winner of the 2021 Paris Kanellakis Theory and Practice Award, a member of the American Academy of Arts and Sciences and a member of the National Academy of Sciences.

Section 3 – Biological Sciences

Lisa Graumlich

Dean, College of the Environment, University of Washington

Lisa Graumlich is the Mary Laird Wood Professor in the School of Environmental and Forest Sciences at the University of Washington. She has devoted her career to studying the causes and impacts of climate change, with a special focus on using paleoecological records such as tree-rings to understand the magnitude of human impacts. She is passionate about science communication, and she speaks frequently on climate change impacts and adaptation. She has testified before the U.S. House of Representative Select Committee on Energy Independence and Global Warming on long-term climate variability and is the president-elect of the American Geophysical Union. Lisa served as the inaugural dean of the UW College of the Environment from 2010 to 2021.

Scot Hulbert

Associate Dean and Director, Agricultural Research Center, Washington State University

Scot Hulbert has spent most of his illustrious career studying plant pathogen co-evolution and designing genetic approaches to controlling diseases of plants. He has characterized events that generate novel alleles at pathogen-recognition genes in plants and the function of fungal and bacterial disease-effectors that the resistance genes recognize to initiate resistance. His approaches to develop plant varieties with resistance that is more difficult for pathogens to overcome have included resistance mechanisms that are not based on pathogen recognition, as well as methods to interfere with pathogen gene regulation. Most recently, Dr. Hulbert has characterized the utility of plant genetics to recruit beneficial microbial communities to sustainably reduce disease pressures.

John Peters

Professor and Director, Institute of Biological Chemistry, Washington State University

John Peters is internationally known for his scientific leadership and contributions in the area of biological electron transfer. His work spans ecology, evolution, physiology, and biochemistry of these systems where the intersection of these approaches have led to important advances in biotechnological developments ranging from production of biofuels to greener agricultural practices. His work has been recognized by numerous awards, most recently the Cozzarelli Prize, and he has served on many prestigious panels and committees for organizations like NASA, NSF, and DOE. He is the director of the longest continuously funded NIH Protein Biotechnology training program in the country and is a Fellow at PNNL, the American Academy of Microbiology, and the American Association for the Advancement of Science. Dr. Peters has authored nearly 200 peer-reviewed publications and is an internationally acclaimed speaker, with nearly 200 seminars, conferences, and workshops.

Katrina Waters

Director, Biological Science Division Pacific Northwest National Laboratory

Katrina Waters is internationally known for leadership and innovation in data integration and its application to biomarker discovery, infectious disease, and toxicology. She has authored more than 130 publications and is currently studying of health effects of chemicals at Superfund sites and personal environmental exposure assessment for disadvantaged communities. She also led a Department of Energy research program focused on airborne and environmental transmission of COVID-19. Her service to the scientific community includes two National Academy of Sciences Committees, numerous advisory boards and several grant review panels. Dr. Waters holds a joint faculty appointment with the School of Comparative Medicine at the University of Washington.

National Academy of Sciences Inductees**Juliet Theriot**

Professor of Biology, University of Washington; NAS

Julie Theriot is currently the Benjamin D. Hall Endowed Chair in Basic Life Science, a continuing Howard Hughes Medical Institute Investigator, and the Chief Scientist at the Allen Institute for Cell Science. Her experimental research group focuses on quantitative measurement of the dynamic and mechanical behavior of structural components in living cells, exploring the molecular and biophysical mechanisms of various forms of cell motility and shape determination across a variety of eukaryotic and bacterial cell types. Julie has won numerous awards for her research, including the David and Lucile Packard Foundation Fellowship for Science and Engineering and the John D. and Catherine T. MacArthur Foundation Fellowship and has received multiple teaching awards from M. D. and Ph. D. students at Stanford. She is a coauthor of the textbook "Physical Biology of the Cell."

Rachel Wong

Professor of Biological Structure, University of Washington; NAS

Rachel Wong is a neurobiologist recognized for her work on the developmental mechanisms underlying the proper assembly of neuronal circuits. Her work underscores the interplay between activity-dependent and activity-independent cues in shaping circuit patterns of the visual system, particularly those of the vertebrate retina. Wong was born in Kuala Lumpur, Malaysia and obtained her postgraduate training at the National Vision Research Institute (Australia), Stanford University and the Vision, Touch and Hearing Research Center (Australia), before joining the faculty at Washington University in St. Louis. Wong was a Paul Allen Distinguished Investigator and is a Fellow of the National Vision Research Institute, a recipient of the ARVO Friedenwald award and the B.B. Boycott Prize, and a member of the National Academy of Sciences.

Section 4 – Health Sciences

Glen Duncan

Professor and Chair, Department of Nutrition and Exercise Physiology, Washington State University

Glen Duncan has studied the effects of physical activity and nutrition on community health throughout his scientific career spanning two decades, situating these phenomena in the context of social and built environments. Dr. Duncan has developed unparalleled expertise in research designs using data on monozygotic and dizygotic twins to assess unique environmental effects on lifestyle behaviors and served as the Director of the Washington State Twin Registry. His current work pioneers the use of novel methods to assess the lifestyle behaviors undertaken by community-dwelling adults in their daily lives, and the effects of these behaviors on cardio-metabolic and fitness-related measures.

Kristie Ebi

Professor, School of Public Health, University of Washington

Kristie Ebi has been conducting research and practice on the health risks of climate variability and change for nearly 25 years, focusing on understanding sources of vulnerability; estimating current and future health risks of climate change; designing adaptation policies and measures to reduce risks in multi-stressor environments; and estimating the health co-benefits of mitigation policies, and has supported multiple countries around the world. She has edited four books on aspects of climate change, has more than 200 publications, and has been an author on multiple national and international climate change assessments, including the fourth U.S. National Climate Assessment, and multiple IPCC Special Reports. Dr. Ebi's currently serves as the Chair of the NASEM/NRC Board on Environmental Change and Society, the Vice-Chair of the NASEM/NRC Committee to Advise the U.S. Global Change Research Program (USGCRP), the Earth League, the Earth Commission, and Co-Chair of the Future Earth Health Knowledge Action Network and the International Committee on New Integrated Climate Change Assessment Scenarios.

Jonathan Himmelfarb

Director, University of Washington

Dr. Jonathan Himmelfarb is an internationally recognized Nephrologist who has served on numerous study sections and grant review committees, scientific advisory boards for organizations including the U.S. FDA, VHA, and Centers for Medicare & Medicaid Services. He has held leadership positions in many national and international nephrology societies as a member of the American Board of Internal Medicine Subspecialty Board on Nephrology and served as a Councilor and former President of the American Society of Nephrology. Dr. Himmelfarb has served on numerous editorial boards including the Journal of the American Society of Nephrology (JASN), Clinical Journal of the American Society of Nephrology (CJASN), Kidney International, BMC Medicine, among others, and is the author of over 300 peer-reviewed publications. His current research interests include developing a wearable artificial kidney; development of a human 'kidney-on-a-chip', development and evaluation of risk biomarkers in acute kidney injury and studies of Kidney Precision Medicine.

Kathryn Meier

Professor and Interim Chair, College of Pharmacy and Pharmaceutical Sciences, Washington State University

Kathryn ("Kay") Meier's research in cellular signal transduction, resulting in 87 peer-reviewed publications, has been funded by grants from NIH, NSF, DOD, Ferring Research Institute, and the American Society for Pharmacology and Experimental Therapeutics (ASPET). Dr. Meier serves as a reviewer for multiple government agencies (VA, DOD, NSF, NIH) and is particularly active as a member of ASPET, where she has served as an officer in the Division of Molecular Pharmacology, member of the Board of Publication Trustees, Associate Editor for the Journal of Pharmacology and Experimental Therapeutics, and currently as Editor-in-Chief of Molecular Pharmacology. As a fellow of American Physiological Society (APS), she has served on the editorial board of the American Journal of Physiology (Cell Physiology) and as a member of the APS Science Policy Committee. Dr. Meier is also a Fellow of the American Association for the Advancement of Science (AAAS) and has been honored with awards for her efforts in mentoring and promoting STEM diversity.

Tueng Shen

Grahan & Brenda Siddall Endowed Chair and Associate Dean, Medical Technology Innovation, University of Washington

Tueng Shen is an expert in medical and surgical management of corneal disorders, cataract surgeries and refractive surgeries. Dr. Shen established the first artificial cornea program in the Pacific Northwest, now one of the world's premier centers for the implantation of artificial cornea, providing care and improving the quality of lives of many of patients with severe corneal blindness. Her research is supported by grants from NIH, NSF, Research to Prevent Blindness (RPB), Lions Foundation, Coulter Translational Research Fund as well as Washington Research Foundation. Shen is a fellow of The American Institute for Medical and Biological Engineering (AIMBE) and the inaugural holder of the Graham and Brenda Siddall Endowed Chair. Her work focuses on building bridges between engineers and physicians to facilitate the translation of innovative engineering technology into creative clinical solutions to treat global blindness.

Wesley Van Voorhis

Professor of Medicine and Director, Center for Emerging and Re-emerging Infectious Diseases, University of Washington

Wes Van Voorhis began his career at Cornell Medical College and Rockefeller University (RU), where he was the first to discover and characterize human dendritic cells (antigen presenting accessory cells). His advisor, Dr. Ralph Steinman, was awarded the 2011 Nobel Prize for Medicine for Dr. Steinman's discovery of dendritic cells. For the past 25 years, Wes has worked on pre-clinical drug development for malaria, trypanosomes, leishmania, cryptosporidium, and SARS-CoV-2. In recent years, his focus has been pandemic virus detection research, leading the United World Antivirus Research Network, with international partners in Brazil, Pakistan, Senegal, South Africa, and Taiwan. He has published over 280 peer-reviewed papers and won numerous academic awards.

Monica Vavilala

Professor of Anesthesiology, Pain Medicine, and Pediatrics, and Director, Harborview Injury Prevention and Research Center, University of Washington

Monica Vavilala is a leading neuroanesthesiologist in her field and has devoted the past 20 years of her professional career to attempting to understand and improve clinical care and outcomes for TBI patients. Dr. Vavilala is a member of the working group and an author of the Brain Trauma Foundation adult and pediatric TBI Guidelines. She serves on multiple NIH study section and holds leadership positions in numerous professional societies. Dr. Vavilala has mentored over 30 fellows and faculty, most of whom are in academic medicine. She has launched new programs at the UW, including the INSIGHT summer student program, and the Injury and Health Equity in Injury program.

National Academy of Medicine Inductees**Patrick Heagerty**

Professor of Biostatistics and Director, Center for Biomedical Statistics, University of Washington; NAM

Dr. Patrick Heagerty is a renowned biostatistician who has developed fundamental methods for longitudinal studies with a focus on prognostic model evaluation and structural longitudinal models, and detailed rigorous methods for the design, analysis, and interpretation of cluster-randomized trials conducted within health care delivery systems. Dr. Heagerty has co-authored two leading texts on biostatistics, is an elected Fellow of the American Statistical Association and has received the Snedecor Award and an award from the International Biometrics Society for his contributions. He directs the Center for Biomedical Statistics (CBS), a core partially funded by the NIH Clinical and Translational Science Award (CTSA) with responsibility for coordination of biostatistical collaboration in Seattle and the greater Northwest region (Wyoming, Alaska, Idaho, Montana). He is the Director of the Biostatistics and Research Design Core for the NIH Health Care Systems Research Collaboratory, for the NIH Mental Health Research Network, and a member of the Executive Committee for the FDA Sentinel Innovation Center.

Section 5 – Social and Behavioral Sciences**Sapna Cheryan**

Professor of Psychology, University of Washington

Sapna Cheryan's research investigates the role of cultural stereotypes in causing and perpetuating racial and gender disparities in U.S. society. She has published numerous articles on these topics in journals such as Psychological Science, Journal of Personality and Social Psychology, and Psychological Review. Her work has been cited widely in media outlets, including in The New York Times, NPR, and The Washington Post. Dr. Cheryan has received numerous awards and recognition for her work including the National Science Foundation CAREER Award. She has been a visiting scholar at the Russell Sage Foundation in New York City and was a Lenore Annenberg and Wallis Annenberg Fellow in Communication at the Center for Advanced Study in the Behavioral Sciences at Stanford University.

Brian French

Berry Family Distinguished Professor in Educational Psychology, Washington State University

Brian French serves the Director of the Learning and Performance Research Center at Washington State University. He has published over 160 peer-reviewed articles, books, published tests, and software addressing both applied and methodological research questions about how assessment scores are developed and used to make fair and accurate decisions about individuals. He serves on various editorial boards, technical advisory committees (e.g., ETS-GRE), review panels for funding agencies (e.g., IES, NSF) and has held leadership positions in national organizations. He currently teaches courses in quantitative research methods and psychometrics.

Rita Fuchs Lokensgard

Professor and Director, Alcohol and Drug Abuse Research Program (ADARP), Washington State University

Rita Fuchs is a Fellow of the American College of Neuropsychopharmacology (ACNP), and an elected member of the College on Problems of Drug Dependence. Dr. Fuchs's research program has been funded by the National Institutes of Health/National Institute on Drug Abuse continuously for the past 16 years. Her most recent research explores the role of endocannabinoids in drug-memory maintenance and drug relapse using animal models. In addition to research, she mentors students through the undergraduate and graduate Neuroscience Programs at Washington State University. She serves on several committees in the College of Veterinary Medicine, including the Faculty Executive Committee and the Promotion and Tenure Committee. She served as chair of the Neurobiology of Motivated Behavior NIH study section and is an active member of several journal editorial boards and professional society leadership committees.

Cheryl Kaiser

Professor and Chair, Department of Psychology, University of Washington

Cheryl Kaiser is internationally recognized for her contributions to the study of the psychological aspects of prejudice, stereotypes, identity, and diversity, and the intersection of these topics with law, politics, and policy. Kaiser has served on the editorial board of seven journals, as Associate Editor of *Journal of Personality and Social Psychology*, and on executive boards and leadership roles in her field. Kaiser is the recipient of the Sage Young Scholar Award, the James McKeen Cattell Sabbatical Award, the Gordon Allport Intergroup Relations Prize, the Erskine Fellowship, and she is a Fellow of the Association for Psychological Science, the Society for Personality and Social Psychology, the Society of Experimental Social Psychology, and the Society for the Psychological Study of Social Issues. Kaiser's research been supported by the National Institute of Mental Health, the National Science Foundation, and the Russell Sage Foundation and explores . Her current projects explore the unintended consequences of organizational diversity initiatives and the detrimental role of stereotypes in the laws, organizational response, and perceptions of victims of sexual harassment against women.

State Funded Projects Completed in FY 21

Bold names denote WSAS members

Underwater Acoustics and Disturbance

For: Joint Legislative Task Force on Water Supply – Washington State Legislature

Sponsor: Washington Department of Ecology (ECY)

Timeline: December 2019 - November 2020

A WSAS committee completed a project advising the Washington Department of Fish and Wildlife about the scientific and technical aspects of disturbance and noise impacts to Southern Resident Killer Whales from small vessels and commercial whale watching. This was requested by the state legislature to inform WDFW rulemaking for a commercial whale watch licensing program. During the course of the project, the WSAS committee held a virtual workshop to engage additional researchers in April 2020 and a virtual workshop to hear from stakeholders in May 2020. In June 2020, the WSAS committee answered scientific and technical questions from WDFW's rulemaking advisory committee, and in July 2020 the WSAS committee reviewed the scientific and technical components of two proposed sets of draft regulations. In August 2020, the WSAS committee produced an overarching review of the science regarding impacts to Southern Resident Killer Whales due to disturbance and noise from small vessels and commercial whale watching, including from presence, density, and activities of these vessels. In September 2020, the WSAS committee submitted guidance on adaptive management of the whale watch licensure program regulations. WDFW used the committee's scientific and technical advice to inform its rulemaking, and included the committee's work on its rulemaking [website](#). This project is now complete, and the rules will be going into effect this year.

Committee: Peter Dahl (UW), Marla Holt (NOAA), David Lusseau (Technical University of Denmark), Dawn Noren (NOAA), Susan Parks (Syracuse University), **Ron Thom** (chair, PNNL Emeritus), Dom Tollit (SMRU Consulting)

PFAS in Food Packaging

For: Washington State Legislature as per ESHB 2658 / RCW 70.95G

Sponsor: Washington Department of Ecology (ECY)

Timeline: January 2020 - December 2020

A WSAS committee completed a project conducting an independent third-party review of a Washington State Department of Ecology report identifying safer alternatives to per- and polyfluoroalkyl substances (PFAS) in plant fiber-based food packaging. In 2018, Washington State passed a law to prohibit PFAS in plant fiber-based food packaging. The ban takes effect two years after a safer alternative is identified – the assessment of alternative products must follow the Interstate Chemicals Clearinghouse (IC2) Alternatives Assessment Guide and consider chemical hazard, exposure, performance, cost, and availability. Ecology prepared a report documenting the identification and assessment of potential alternatives.

The WSAS committee completed an independent third-party peer review of Ecology's report in October 2020 and provided an addendum clarifying the peer review findings upon request by Ecology. The WSAS committee's feedback will be included with Ecology's report to the Washington State Legislature. Ecology will make the final decision as to whether safer alternatives to PFAS food packaging are available, and will publish the findings and feedback from the peer review in the Washington State Register. Ecology will be publishing updates on its project [website](#).

Committee: Simona Balan (California DTSC), **Elaine Faustman** (chair, UW), Lauren Heine (ChemForward), **Patricia Hunt** (WSU), Donatien Pascal Kamdem (Michigan State), **Michael Skinner** (WSU), and Huqiu Zhang (SME Engineers).

Salmon Recovery

For: Governor's Salmon Recovery Office as per RCW 77.85

Sponsor: Governor's Salmon Recovery Office (GSRO), part of the Washington Recreation and Conservation Office (RCO)

Timeline: April 2020 - June 2021

A WSAS committee is conducting an independent third-party review of the scientific and technical aspects of GSRO's policy review of salmon recovery efforts for the Governor. The Governor's Statewide Salmon Strategy Update is being updated for the first time since 1999 with recommendations from recovery documents and public and stakeholder outreach. This document articulates the state's commitment and strategy for salmon recovery, and the committee is providing feedback on scientific and technical strengths, gaps, and areas of concern in the document.

In the fall, the committee completed Phase I of its review of the scientific and technical components of an initial update containing a summary of stakeholder input and options for the Salmon Strategy's recommendations. The project timeline was extended to accommodate shifts in the GSRO's report-writing process. On April 12th 2021, the committee completed Phase II of its scientific review of the draft Salmon Strategy Update. The committee provided a report of key findings of the Salmon Strategy Update's key scientific weaknesses and priority science gaps to address in order to successfully implement the strategies. The committee's review will inform the science plan for the Strategy moving forward. The committee's reviews are complete and we are awaiting any further follow-up from the GSRO.

Committee: **Ray Hilborn** (UW), Terrie Klinger (UW), George Pess (NOAA), **Daniel Schindler** (chair, UW), **Robin Waples** (NOAA), **James Winton** (USGS)

PSP Science Panel Review**For:** Puget Sound Partnership**Timeline:** April 2021 - May 2021

WSAS conducts an annual review of nominees for the PSP Science Panel. This year, the WSAS's review panel reviewed six nominees and recommended three for approval by the PSP Leadership Council at its meeting in June, for terms beginning July 1. In addition, the review panel made suggestions to the PSP about improvements in the process and criteria used to both solicit and review candidates.

Committee: **Virgina Armbrust** (UW), **Chris Bretherton** (UW), **Andre Punt** (UW), **John Stark** (WSU), **Ron Thom** (PNNL Emeritus), **Usha Varanasi** (UW), **Jonathan Yoder** (WSU)

State Funded Projects in FY 22

Bold names denote WSAS members

Skagit River Basin Water Supply

For: Joint Legislative Task Force on Water Supply – Washington State Legislature

Sponsor: Washington Department of Ecology (ECY)

Timeline: January 2020 - July 2021

A WSAS committee advised the Joint Legislative Task Force on Water Supply on scientific and technical issues relating to the Skagit River Basin by facilitating two peer reviews on studies related to the Basin. The WSAS committee completed an independent third-party review of the estuary study portion of a 1999 Duke Engineering 'Final Technical Report: Lower Skagit River Instream Flow Studies,' which has informed the Skagit Instream Flow Rule, but which was not peer-reviewed. The committee reviewed the Duke study's data collection techniques, statistical analysis and modeling methodologies, and assumptions and thresholds used. The committee also outlined the current methodologies, techniques, technologies, datasets, and conceptual and analytical tools that would be employed if an estuary study were to be conducted today. That report can be [viewed here](#). Committee chair **Michael Goodchild** briefed the Joint Legislative Task Force on Water Supply on the review on June 29, 2021.

The WSAS committee also conducted an independent third-party review of a Supply and Demand Analysis of the Skagit Basin by the Water Research Center at Washington State University and Climate Impacts Group at the University of Washington. The committee conducted a careful review of the scientific and technical aspects of the draft Analysis and submitted their comments in June 2021. The final product is [available here](#).

Although the contracted project work is complete, the committee is remaining empaneled for now. The Joint Legislative Task Force on Water Supply will be meeting twice in October to discuss next steps for this area of work. We anticipate consulting with the committee about the scope of additional work that WSAS may be asked to do. We would then form a new committee with a new mandate to complete the additional work.

Committee: **Michael Goodchild** (*chair*, UCSB Emeritus), Rebecca Flitcroft (USDA), Eric Grossman (USGS), Se-Yeun Lee (Seattle University), John Rybczyk (WWU, left 03/21), Mark Wigmosta (PNNL)

COVID-19 Community Dialogues

Sponsor: National Science Foundation

Timeline: May 2021 - November 2021

WSAS received National Science Foundation funding to host two dialogues with scientists and local communities about key issues identified by community leaders related to the COVID-19 pandemic response and recovery. We are co-designing and co-creating virtual workshops with local decisionmakers, community leaders, and participating scientists in two communities around

Washington State. A key part of this project is applying community engagement principles to respond directly to local needs for scientific discourse about COVID-19, applying and advancing knowledge in participatory design and public engagement around science for policy.

We have been meeting with community members in (1) the Clallam/Jefferson/San Juan County region and (2) in Spokane. The community dialogue in Spokane will be focused on building for healthy communities. During the pandemic, there have been changes in the way people have interacted with the built environment – parks, roads, homes, social spaces, and so on. With Spokane also growing quickly, bringing its own challenges, we have an opportunity to discuss how growth moving forward can support healthy communities. The dialogue moderator will be **John Roll** and the conversation will be on the afternoon of October 20 or 21, 2021.

The community dialogue in Western Washington will be focused on housing challenges that have been exacerbated by the COVID-19 pandemic and looking at these challenges through a multidisciplinary lens can be an opportunity to help communities thrive going forward. This affects the community in multiple intersecting ways: economic stability and growth, health and wellbeing in the community, shifting demographics, and local workforce capacity to provide essential services. The dialogue moderator will be **Celestina Barbosa-Leiker** and the conversation is scheduled for October 20, 9:30am-11am.

This project is involving the WSAS COVID-19 steering committee, which has been guiding all of our efforts to provide scientific and technical advice on Washington State's management of and recovery from the COVID-19 pandemic.

Steering Committee: **Ronald Thom** (chair, PNNL emeritus), **Phil Bernstein** (Microsoft), **Ann Bostrom** (UW), **Rico Catalano** (UW), **Dianne Chong** (Boeing, retired), **Howard Frumkin** (UW emeritus), **Lai-yung 'Ruby' Leung** (PNNL), **Cliff Mass** (UW), **Ron Mittelhammer** (WSU), and **Guy Palmer** (WSU)

Pinniped Predation on Salmonids

Sponsor: Washington Department of Fish and Wildlife (WDFW)

Timeline: July 2021 - December 2021

The Washington Department of Fish and Wildlife has asked WSAS to conduct a review of the science of pinniped predation on salmonids, with an emphasis on Washington's portion of the Salish Sea and Washington's outer coast.

We will be forming a committee of 5-8 members to review the existing science and data around pinniped predation, engage with salmon co-managers, stakeholders, and scientists beyond the WSAS committee, and produces a report describing the science of pinniped predation, including assessment of scientific and technical aspects of potential management actions.

The project started mid-July 2021 and will run through December 2022. We have met with the sponsor and tribal co-managers (led by the Northwest Indian Fisheries Commission) to refine the specific questions guiding the committee's scope of work. **Daniel Schindler** is the committee chair.

Topical Working Groups

Timeline: April 2021—July 2021, Ongoing

Each of the three topical working groups convened a meeting this spring.

The **Jobs, Infrastructure, and Economic Environment** TWG met on Monday, May 24, 2021, 11am-12pm and was led by chair **Dan Schwartz** and vice chair **Jun Liu**. Participants discussed green infrastructure (buildings, transportation, water, energy, physical, cyber, etc.) with an equity perspective. The focus of this conversation was the role of WSAS in the science and metrics that are used to equitably advance the benefits of public infrastructure while also equitably sharing the burden that infrastructure can place on communities. The TWG showed interest in a WSAS roundtable to engage state and community actors around energy equity – WSAS graduate student fellows may be able to assist in putting together such an event.

The **Environmental Quality, Sustainability, and Climate Change** TWG met on Wednesday, June 2, 2021, 1pm-2:30pm and was led by **Ron Thom** and **Robin Waples**. Participants discussed net ecological gain (that is, moving beyond 'no net loss' in development that affects ecological systems), particularly focused on the (at that time) likely incoming WSAS project on using science to inform the state's understanding of definitions and metrics for net ecological gain. The input received at this conversation is informing the refinement of scope and formation of the committee for the Net Ecological Gain project (described above).

The **Quality of Life, Health, Education, and Workforce Preparedness** TWG met on Monday, June 21, 2021, 1pm-2:30pm and was led by **Nancy Woods**, **John Roll**, and **Bobbie Berkowitz**. This discussion was focused on scoping priority issue areas for WSAS to take a proactive role in contributing its expertise to address challenges in Washington State. Participants discussed housing, education, criminal justice, substance abuse, healthcare workforce, and immigration issues, as well as assessment tools such as mapping. The issues discussed in this conversation will assist WSAS in connecting member expertise to issues of interest to the state legislature.

Graduate Student Science Policy Fellows

Timeline: June 2020 - Ongoing

WSAS has been developing an internal fellowship program to leverage the capabilities of graduate students and postdoctoral scholars and guide these students in developing their skillsets in science policy.

Last academic year, WSAS worked with 12 graduate fellows, most through the UW Clean Energy Institute's Torrance Science Policy Analysis program, and one through the UW Graduate and Professional Student Senate Science and Policy Committee. This year, WSAS is working with one fellow through the National Science Policy Network Scholars-in-Residence program (6-month commitment) and has six incoming CEI/Torrance fellows, starting in late September 2021 for 20-hour