

WASHINGTON STATE
Academy of Sciences
Science in the Service of Washington State

Trip Report – AAAS-AJAS Conference 2019

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March 7, 2019

WSAS Program Coordinator Devon Emily Thorsell and I accompanied our four selected students to the meeting of the American Junior Academy of Sciences (AJAS), held in conjunction with the 185th meeting of the American Association for the Advancement of Science (AAAS), Feb 13-17, in Washington DC. We stayed at the historic Omni Shoreham Hotel, across the street from the Marriott Wardman Park where the AAAS meeting was held. This trip was made possible by our corporate sponsors: Boeing and Vulcan and by donations from WSAS members. Thank You!

Over 150 high school students from 24 states were in attendance. Our students were Nikhil Devanathan Savitha Srinivasan, Verona Yue, and Ronit Jain, shown below along with a group photo of the 2019 AJAS Fellows in front of the Carnegie Institution for Science.



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 a 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 first hand. This [video](#) explains the event.

We arrived early Wednesday evening and attended the opening AJAS ceremony. Dr Alan Boss gave a presentation on "Universal Life: The Race to Discover Life Beyond Earth". Dr Boss is an astrophysicist and planetary scientist, and co-director of the Carnegie Astrometric Planet Search program.



On Thursday we headed out on tours. Devon, Nikhil, and Savitha joined the NASA Goddard Space Flight Center tour. I accompanied Ronit and Verona for the National Institutes of Health tour.

The NIH tour started at the NIH DNA sequencing center, where students toured the labs and viewed several interesting presentations. Students had lunch at NIH headquarters, where some prominent scientists joined them for lunch discussions. At our table we were joined by Dr. Vesna Kutlesic, Director of the NICHD's Office of Global Health. Then we were joined by Dr. Belen Hurlle of the National Human Genome Research Institute.



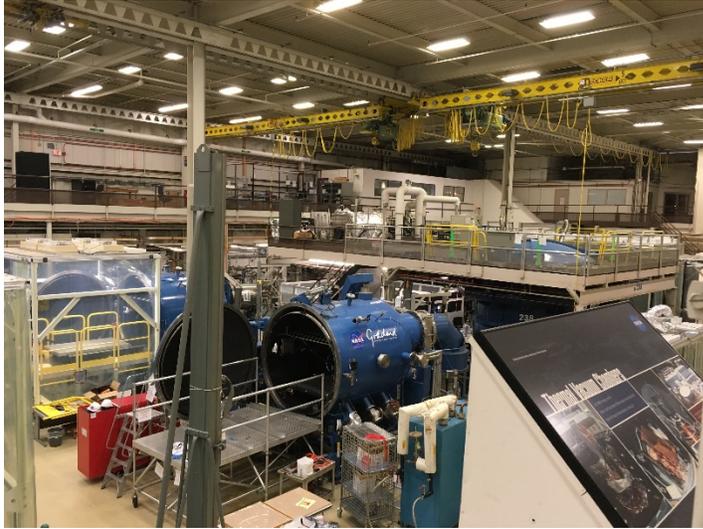
After lunch we attended a presentation by Dr Jeff Day. He received his MD from Case Western Reserve, but during his residency in pediatrics, it was obvious to him that as much as he loved children and medicine, clinical work wasn't for him. He enrolled in a medical art program at Johns Hopkins and is now a medical illustrator at NIH, combining his knowledge of medicine with his love of art.



The National Library of Medicine (NLM), is the world's largest medical library. We were shown to the rare books and artifacts room. The students were delighted to examine Marshall Nirenberg's Nobel Prize medal awarded in 1968 for "breaking the genetic code." A memorable book we were shown was one of the few existing copies of *Shadows from the Walls of Death*, published in 1874 by a Civil War surgeon; a collection of 86 samples of then commonly used wallpaper containing deadly arsenic-pigments. "The Victorians knew that arsenic was poisonous when eaten but most saw little risk in plastering their homes with the stuff." We now know that the wallpapers shed microscopic dust particles that can be inhaled or ingested.

Savitha and Nikhil attended the NASA Goddard Space Flight Center tour with Devon Emily Thorsell (WSAS Program Coordinator). The day started with a visit to NASA's famous "hyperwall" to learn about how NASA compiles data collected from satellites and earth observing missions around the world to model earth's systems (weather, currents, climate change trends, etc.). Scientists from NASA ate lunch with students and after lunch, the students were taken to tour some of the facilities where equipment headed to space goes for testing. In addition, students toured the earth observing mission center where the Aqua, Terra, and Aura satellites are monitored and programmed.





On Thursday evening, we attended the AAAS President's address. Dr. Margaret Hamburg asked the new AJAS fellows, seated as a group, to stand and be recognized by the AAAS community. Dr. Hamburg then shared her vision of science as it relates to this year's meeting's theme: *Science Transcending Boundaries*. The President's address was followed by an AAAS reception in the exhibit hall.



Friday morning the students attended the AJAS "Breakfast with Scientists" event at the Carnegie Institution for Science where they viewed a presentation by Dr. Francis Collins, the NIH Director. Dr. Richard Carlson of the Carnegie Institution also spoke of "Career Paths: In Praise of Not Being Too Targeted".



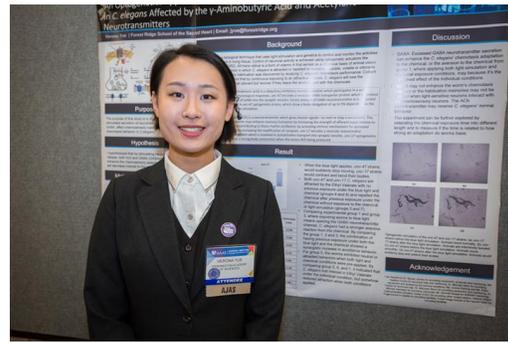
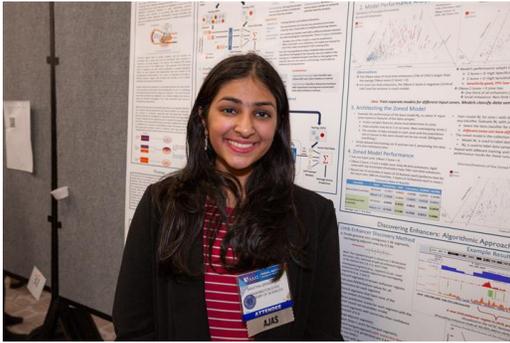
Then the students had breakfast with several dozen scientists, engaging them one-on-one.



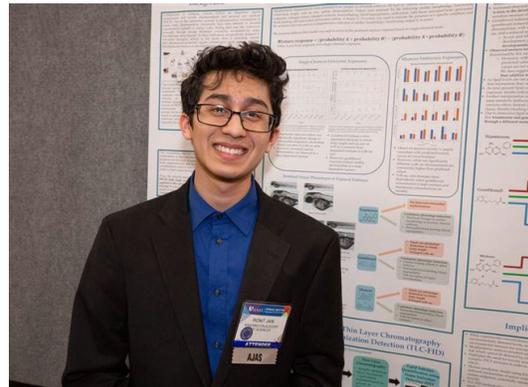
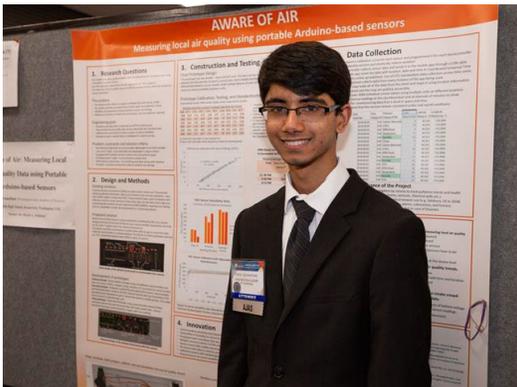
The woman in the photo below is Martha Darling, retired Boeing senior manager. She and her husband Gilbert Omenn MD, PhD are longtime supporters of AJAS and sponsors of this year's AJAS Breakfast With Scientists. Dr. Omenn is the Harold T. Shapiro Distinguished Professor of Internal Medicine, Human Genetics, and Public Health at the University of Michigan and director of the UM Center for Computational Medicine & Bioinformatics. He was formerly Dean of the School of Public Health and Professor of Medicine and Environmental Health at the University of Washington and a past president of the AAAS. He voices his support for AJAS [here](#).



On Friday afternoon, our students participated in the poster session, held in the AAAS exhibit hall.



Savitha's project was "Development of Semi-Supervised Machine Learning Models to Predict Enhancer Regions in Polygenic Developmental Diseases." Verona's project was "An Optogenetics Approach: The Formation of Chemosensory Habituation in *C. elegans* Affected by the γ -Aminobutyric Acid and Acetylcholine Neurotransmitters."



Nikhil presented "Aware of Air: Measuring Local Air Quality Using Portable Arduino-based Sensors." Ronit's poster was titled "Next Generation Morphological and Molecular Analysis of the Toxicity of Pharmaceutical-Derived Aquatic Contaminants (PPCPs)."

Late Friday afternoon we attended the AAAS plenary lecture where a panel of scientists discussed "Responding Faster and Smarter to New Problems." Friday evening a reception was held honoring the new AJAS Fellows in the U.S. Botanic Garden, near the Capitol Building.

Saturday morning the students were invited to attend AAAS presentations of their choice. Saturday afternoon they were given the choice of an oral presentation of their work in a traditional seminar format, or a roundtable discussion. The photos show the roundtable format. The students were encouraged to get acquainted at each table, and then asked to introduce each other:



Ronit and Savitha are shown giving their oral presentations:



Late Saturday afternoon we attended a plenary lecture by Dr. Fabiola Gianotti, the Director-General of CERN. She spoke about fundamental research at CERN, and international collaboration. Saturday evening, we attended the AJAS honors banquet in the Omni Shoreham Blue Room. The historic Blue Room was the location of presidential inaugural balls from Roosevelt to Clinton.

This photo shows the new 2018 AJAS fellows from 24 states.



For the final event of the conference, the new Fellows were treated to a magician and mentalist act back at the hotel. On Sunday we had some time before our late afternoon flight, so we took the metro to visit the Natural History Museum and the National Archives.

The National Association of Academies of Science (NAAS) is a not-for-profit organization whose mission is to promote the scientific and science education goals of state, regional and municipal academies of science. The NAAS consists of 47 state and regional academies of science, which are organized to encourage all facets of scientific inquiry and experiences. One of the most important functions of the NAAS is the sponsorship and parent organization of the American Junior Academy of Science (AJAS). WSAS member Pinky Nelson has been added to a distinguished list of "[Friends of AJAS.](#)"

A review of how our AJAS selection process works: we ask the State's science fairs and competitions to give us a list of their top award winners. We invite students, freshman thru junior, to apply for the AJAS award by submitting their research report, a personal essay, and their high school transcript. This year we had six applicants, from which we chose the top four.

In 2020 the AAAS-AJAS meetings will be coming to Seattle. We've been advised that our input will be solicited for recommendations regarding tours and sources for sponsorship and funding. We hope to sponsor more students from Washington than ever before.

Science competitions are a strong incentive for many students to immerse themselves and excel at science research and engineering. Some develop extraordinary skills which take them to the top. Last year, Dhruvik Parikh from Henry M. Jackson High School took second place in the world at the Intel International Science & Engineering Fair. It was just announced that 2018 WA AJAS Fellow, Eshika Saxena from Interlake High School, placed #10 out of 40 national finalists at the Regeneron Science Talent Search in Washington D.C. and will take home a \$40,000 prize. Known for its first 57 years as the Westinghouse Science Talent Search, the Regeneron Science Talent Search is "the nation's most prestigious science research competition for high school seniors." Over the years, thirteen participants have gone on to receive Nobel Prizes, two earned the Fields Medal, eleven have been awarded the National Medal of Science, eighteen received MacArthur Fellowships; three have won the Albert Lasker Award; five have won a Breakthrough Prize; 43 have been elected to the National Academy of Sciences; and eleven have been elected to the National Academy of Engineering. Our congratulations to Eshika on her accomplishment!