31st SATELLITES & EDUCATION CONFERENCE

And
17th Concurrent Annual Meeting of M.Y. S.P.A.C.E.
International Collaborative K-12 Research Teams
July 17-21, 2018

Multinational Youth Studying Practical Applications of Climatic Events

Conference Program

July 20-21, 2018

Presented By

SATELLITE EDUCATORS ASSOCIATION

a 501 (c)(3) nonprofit corporation

Hosted by the Charter College of Education at

CAL STATE LA

SATELLITES & EDUCATION

Conference XXXI

July 20-21, 2018

The Satellite Educators Association wishes to expres its profound gratitude to our sponsors without whom the Satellites & Education Conference would not be possible:

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EARTH SPEAKS

WE LISTEN

Continental Breakfast, 8:00 - 9:00 am
U-SU, Los Angeles Rooms

Opening Session
Friday, July 20, 2018
9:00 am, University-Student Union

Welcome & Introductions: Mark McKay

President, Satellite Educators Association

Dr. Cheryl Ney, Dean

Charter College of Education

Cheryl Ney earned her Ph.D. in biochemistry from the University of Chicago, her M.S. in chemistry from Baylor University, and her B.S. in chemistry from Arizona State University. She has served as a professor of chemistry, associate provost, associate vice president, and National Science Foundation Distinguished Visiting Professor of Women in Science in the University of Wisconsin system. January 2017 she was named Dean of the Charter College of Education. Dr. Ney is a strong advocate for STEM education and has been a valuable supporter of this conference.

Robert (Bob) Friend
Chief Engineer, Boeing
Phantom Works Space Systems

Bob Friend is chief engineer of space systems for Phantom Works, a business within Boeing Defense, Space & Security (BDS). In this capacity, he oversees the technical integrity and engineering execution of all organizational space products and programs. Friend ensures technological development, supports future business and technology plans across BDS. He also leverages external development efforts to integrate Boeing products.

Prior to this position, Friend held chief engineering roles for advanced space and intelligence systems, and small satellite programs, where he developed spacecraft designs, avionics, software, and demonstrated autonomous satellite refueling.

Friend began his 31-year aerospace career with Rockwell Aerospace and Defense, which was later acquired by The Boeing Company. During that time, he has held a variety of program management and engineering roles of increasing responsibility. He was also one of two U.S. engineers selected to incorporate engineering into the national Next Generation Science Standards, which was published in 2013.

Friend holds a bachelor's degree in aerospace engineering from Northrop University, and is an Americian Institute of Aeronautics and Astronautics (AIAA) associate fellow.

Plenary Session 1

10:50 – 11:50 am
Remain in Los Angeles Rooms for SEA Panel Discussion

Ron Gird	National Weather Service (retired)
Ed Murashie	ProEngineered Solutions LLC
Monica Maynard	The Aerospace Corporation, STEM Coordinator
Paula Arvedson	Conference Coordinator/Developer of M.Y. S.P.A.C.E.

LUNCH & EXHIBITS
Noon - 1:30 pm
Los Angeles Rooms, U-SU

Concurrent Session 1 - King Hall
1:50 pm – 2:50 pm

Mark McKay, SEA President	***Strategies for Teaching Climate, Weather, & Climate Change***	KH B1009
Ed Murashie, Engineer	***Engineering for Mars***	KH B1010

Strategies for Teaching Climate, Weather, & Climate Change by Mark McKay, SEA President and PhD Candidate. This session will provide successful instructional strategies that help students discern the difference between Weather and Climate. Also covered is an overview of current and past Earth climate patterns, and how scientists use proxy evidence to better understand current and past climate patterns. Information on the use of stable isotopes, microfossils, and sedimentology will be presented and how each is used for reconstructing past climate records. Instructional materials for use in a classroom will also be provided.

Engineering for Mars by Ed Murashie, Engineer at ProEngineered Solutions LLC. Step through the history of Mars exploration and the role that Mars InSight Mission will have while you are having fun participating in two hands-on lessons that highlight engineering skills. Participants will walk away with complete NGSS-based lesson plans in anticipation of the Mars InSight landing.

Concurrent Session 2
3:10 pm – 4:10 pm

Steve LaDochy and *Pedro Ramirez*, Professors, Cal State LA	***Climate Kit Part II***	KH B1009
Pete Arvedson, Science Teacher (retired)	***Accessing Satellite Data and Making Sense of the Images***	KH B1010

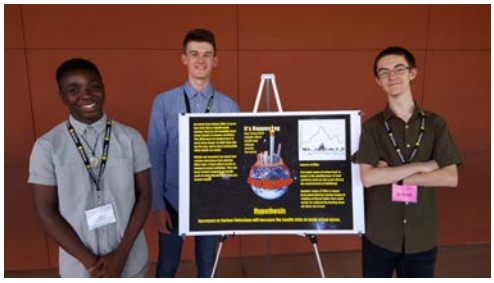
Climate Kit Part II: Experiments and Data Diving by Steve LaDochy, PhD, and Pedro Ramirez, PhD, Cal State LA, Geosciences & Environment Department. In this workshop we will show the progress made on the Climate Stewards: "It's Fun to Save the World" project. We will discuss teachers that have used the Climate Kit in their classrooms and some of the lesson plans included with the kit: sustainable light bulbs, sea level rise, carbon footprint calculators, urban heat islands and the new UV beads (which will be given to attendees).

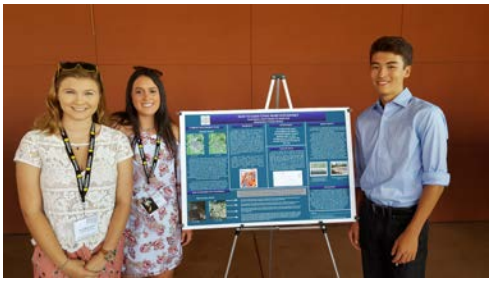
Accessing Satellite Data and Making Sense of the Images by Pete Arvedson, Retired Science Teacher. Ever wondered where we get those images of the Earth from space -- especially the ones that highlight specific events like a forest fire, a major hurricane, changes in land use, or a volcanic eruption? Once the image is in view, how do we really know anything about it like how big is that hurricane's cyclonic cloud formation, or how far does that volcanic ash cloud travel, or what percent of the crop in a specific agricultural field is healthy or not? This session will (1) introduce you to several online tools for easily accessing and visualizing remote-sensing data and (2) introduce you to several high-quality, no-cost, easy to use tools for analysis and interpretation. Online access tools include NASA's Giovanni, NOAA's NOAAView, GloVis Next from USGS, and Live Access Servers used by My NASA Data and NASA JPL's Physical Oceanography archive. Participants will take-home tutorials for ImageJ, MultiSpec, and ArcGIS Online. Each attendee will walk away with new knowledge and a pocket full of resources for applying that new knowledge. If desired, bring your WiFi enabled laptop for a hands-on experience.

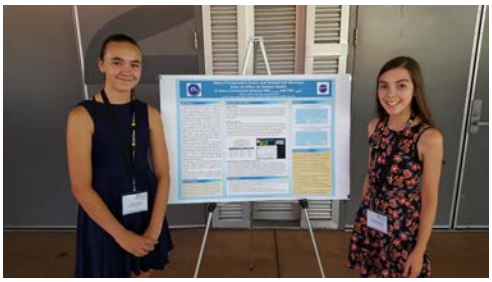
Reception & Posters

4:30 pm – 6:00 pm
Golden Eagle Patio (No-Host Bar)

Beginning at 5:00 pm: Talk with the middle and high school students about their research posters! See pictures of last year's posters below.







Conference Banquet
Beginning at 6:00 pm, Golden Eagle Ballroom #3

Keynote Speaker:

John Bloomer, Raytheon

Engineering Fellow

What's My Motivation?
(Why Work in Science, Technology, etc?)

Dr. Bloomer will discuss his perspective on motivation for studying and working in science and technology fields. He will draw on his educational trajectory from liberal arts through astronomical research, professional experience working in space system and technology development at Raytheon, and insights gleaned from small space entrepreneurs and futurists.

John Bloomer is an Engineering Fellow with over 19 years of experience in aerospace engineering and system architecture at Raytheon. He has worked on a variety of space and airborne EO sensor systems, across mission areas including missile defense; scientific earth imaging; intelligence, surveillance and reconnaissance; and space situational awareness. He has spent much of his career specializing in performance analysis and algorithm development at the "front end" of the business, working on original concept definition, business capture, and detailed system design. He served as Raytheon Corporate Technology Area Director for electro-optical systems, tracking enabling electro-optical technologies across all four major business units within Raytheon, sponsoring innovation and R&D activities, and fostering cross-business unit collaboration. He was one of the first 60 Raytheon Certified Architects in the worldwide corporation, and regularly functions as a lead engineer and technologist on key development projects. Dr. Bloomer holds a PhD in Physics and Astronomy and a BA in Physics.

Saturday, July 21, 2018

Continental Breakfast, 8:00 - 9:00 am

Plenary Session 3 - Los Angeles Rooms, U-SU

Focus on Exhibitors - Highlights from Each Exhibit

9:00 am – 10:00 am

Monica Maynard, STEM Coordinator, The Aerospace Corporation
Ron Gird, Outreach Program Manager, NOAA National Weather Service
Matt Mundy, STEM K-12 Coordinator, AIAA
Darrell Warren, Retired Teacher, ARISS
Robert Black, Author, Royal Fireworks Publisher
Alex Kim, Chief System Engineer, Science Systems and Applications Inc.

Concurrent Session 3 - **King Hall**

10:20 am – 11:20 am

Robert Black, Author	***STEM Through Storytelling***	KH B1009
Monica Maynard, STEM Coordinator, Aerospace	***Rain-Induced Landslide Forecasting***	KH B1010

STEM Through Storytelling by Robert A. Black, Author. Creative author Robert Black combines his engineering background with storytelling to create books that present STEM concepts to middle grade readers. His novel, *Lunar Pioneers,* has been featured at previous Satellites & Education Conferences, as has his "Mathematical Nights" trilogy (*Night of the Paranormal Patterns, Night of the Frightening Fractions,* and *Night of the Eerie Equations*). The first volume in his Mathematical Biography series, *Pascal and Fermat: The Probability Pen Pals,* is currently in production. Robert Black previously wrote for the Nickelodeon cable series, "You Can't Do That On Television." He also has a degree in mechanical engineering and mathematics from Vanderbilt University, and has spent 20 years in manufacturing as a lab test engineer, project manager, engineering manager, and quality assurance manager. Pick up copies of his books, for yourself or anyone who enjoys reading.

Rain-Induced Landslide Forecasting in Recently Fire-Ravaged Areas by Monica Maynard, STEM Coordinator for The Aerospace Corporation, Earth Science Teacher at Bell Gardens High School, with student co-presenters Leslye Villalobos, Ashley Mendez, Siena Gomez and Citlalli Pontaza. Landslides have a wide variety of effects on society. The goal of the project is to identify the location of the next landslide in California based on recent wildfires and annual rainfall in a specific area. As a result, an area of concern was identified and monitored. The model created demonstrates what is bound to occur within the area based on a type of terrain, annual rainfall averages, actual rainfall and burn activity.

EXHIBITS and Lunch
Los Angeles Rooms, U-SU
11:40 am – 1:05 pm

Keynote Speaker: Joseph Lucey

Using Satellite Data to Model Surface Inundation

In this talk, Mr. Lucey will be discussing the use of satellites, the importance of math, how to make a research poster, and some of his research. Within his research, he utilized the Global Precipitation and Climatology Project (GPCP), the Gravity Recovery and Climate Experiment (GRACE), and the Surface WAter Microwave Product Series (SWAMPS) data which are all measurements made by satellites. He relates these measurements by using statistics and creating mathematical relationships between the variables.

Mr. Lucey recently graduated from Cal State LA with a BS in Civil Engineering. The goal of his research was to improve flood prediction and flood risk assessment by creating a general model of predictability of extreme runoff generation using these various NASA products. He is currently an intern at UC Berkeley and will begin a PhD program at UCLA in the fall.

Concurrent Session 5 - King Hall
1:25 pm – 2:25 pm

Robert Trout, NASA Solar System Ambassador	***New Horizons for Students: Pluto and Beyond***	KH B 1009
Ron Gird, National Weather Service, NOAA	***Internet-Based Education Resources for Teachers and Students***	KH B 1010

New Horizons for Students: Pluto and Beyond by Robert Trout, NASA Solar System Ambassador and retired chemistry teacher. JPL launched the New Horizons spacecraft in 2006, to explore Pluto! It flew by Pluto on July 14, 2015, sending back to Earth pictures and data about Pluto, its moons, and the environment of the Kuiper Belt. Aptly named, New Horizons reached the horizon of our Solar System and opened our eyes and instruments where no man has gone before. Re-targeted after passing Pluto, New Horizons will reach 2014 MU69 January 1, 2019, which will be the most primitive and distant object ever explored by humankind. We are all students of our Solar System! Students face new horizons every day in the learning process. What will we learn about our Solar System, the birthplace of our kind, and ourselves? Come and see!

Internet-Based Education Resources for Teachers and Students by Ron Gird, NOAA National Weather Service Outreach Manager (retired). Internet-based education resources are available from the National Oceanic and Atmospheric Administration (NOAA), the National Weather Service (NWS), and the American Meteorological Society (AMS). Education material is available, free to teachers, students, and the general public. Material is suitable for classroom studies, sources of funding as well as safety preparedness information. This presentation will access and explore a variety of educational activities on the internet from the three organizations. A list of education internet sites will be provided to those attending this session. There will be time for the audience to suggest education internet sites to share with those attending.

Closing Session - King Hall Lecture Hall 2
2:45 pm – 4:30 pm
Mark McKay, President of SEA
Introduction of the 2018 M.Y. S.P.A.C.E. Team

M.Y. S.P.A.C.E. TEAM

(**M**ultinational **Y**outh **S**tudying **P**ractical **A**pplications of **C**limatic **E**vents)

The Multinational Youth Studying Practical Applications of Climatic Events (M.Y. S.P.A.C.E.) Program is an international collaboration of K-12 students engaged in self-selected research projects on the local impact of global environmental issues. Students work with their own, trained, Teacher-Leaders at their school sites using both locally generated and satellite-based data with support from the National Oceanic and Atmospheric Administration (NOAA) and the National Aeronautics and Space Administration (NASA). Teams from each school meet at the annual Satellites & Education Conference to discover global perspectives from their collected local data and present their findings. Students learn and practice techniques of scientific investigation and engineering design; methods of data processing, analysis, interpretation and design optimization; teamwork and leadership; and effective communication. The program is supported by NOAA, NASA, and the U.S. Navy. It is aligned with NASA DIRECT-STEM mission and vision and NOAA goals of building excitement about careers in science, technology, engineering and math (STEM).

M.Y. S.P.A.C.E Program Director: Pete Arvedson - Pasadena, California
M.Y. S.P.A.C.E. Student Coordinators: Mark McKay, Texas; Michael Holst, Washington

The 2018 M.Y S.P.A.C.E. student presenters are:
From California: Israel Carillo, Javier Martinez, Daniel Nogal, Amy Martinez, Melany Ramirez, Jasmine Medina, John Brooks, Jae'lyn Phillips, Luis Hernandez, Marcus Beal-Crouch
From England: Emily Higham, Joshua Ollive, Joshua Bradley
From New Jersey: Shelby Deibler, Jessica Cerasaro, Henry Powell, Ali-eren Canturk, Miles Owens, Emily Fania, Mira Stocker

Present M.Y. S.P.A.C.E. teachers attending in 2018 are:

England	California		NewJersey
Mr. SimonCracknell	Ms. Jan Barber-Doyle	Ms. Richelle Brooks	Ms. Vanessa van Sciver
	Ms. Patricia Jimenez		Mr. John Trunkwalter

M.Y. S.P.A.C.E. Team 2017

OUR EXHIBITORS

Satellite Educators Association
Contact: Mark McKay (mmckay95376@gmail.com)

The Satellite Educators Association was established in 1989 as a professional society to promote the innovative use of satellite technology in education and disseminate information internationally to all members. Membership includes master educators who are orchestrating the learning process for their students. We have the ability to connect teachers with the appropriate discipline. We can teach the technology skills needed to study practical questions and problems. The Satellite Educators Association contributes to the perspective and expertise of our membership in K-16 education to help students understand Earth Systems and space science. Teacher resources, curriculum and hands-on activities are developed in accordance with the current national standards. Services to educators include providing resources and materials, offering support, training, networking and continuously updating curriculum. The Satellite Educators Association presents the annual Satellites & Education Conference. Staffing the booth is Duane Laursen, founding member of SEA.

NASA/Jet Propulsion Laboratory
Contact: Annie Richardson (Annie.H.Richardson@jpl.nasa.gov)
NASA DEVELOP National Program
Contact: Erika Higa (Erika.Y.Higa@jpl.nasa.gov)

The Jet Propulsion Laboratory, managed by the California Institute of Technology, is NASA's lead center for robotic exploration of the solar system. Their spacecraft have visited all the planets in the solar system except Pluto. JPL telescopes are observing distant galaxies in the universe to study how the solar system was formed. They also manage the worldwide Deep Space Network, which communicates with spacecraft and conducts scientific investigations from its complexes in California's Mojave Desert near Goldstone; near Madrid, Spain; and near Canberra, Australia. JPL cameras and sensors are aboard satellites circling Earth to study the ozone, oceans and other Earth sciences. To support continued exploration, JPL is making advances in technology with new instruments and computer programs to help our spaceships travel father and our telescopes see farther than ever before.

DEVELOP, part of NASA's Applied Sciences Program, addresses environmental and public policy issues by conducting interdisciplinary feasibility projects that apply the lens of NASA Earth observations to community concerns around the globe. Bridging the gap between NASA Earth Science and society, DEVELOP builds capacity in both participants and partner organizations to better prepare them to address the challenges that face our society and future generations. With the competitive nature and growing societal role of science and technology in today's global workplace, DEVELOP is fostering an adept corps of tomorrow's scientists and leaders. Erika is assisted by Nick Rousseau.

National Oceanic and Atmospheric Administration (NOAA)
NESDIS, NWS, and Education Coordinated by NESDIS
Contact: Ron Gird (rsgird@gmail.com) Staffing assisted by Ed Murashie

The National Oceanic and Atmospheric Administration's (**NOAA**'s) mission is to understand and predict changes in the Earth's environment and conserve and manage coastal and marine resources to meet our nation's economic, social, and environmental needs. **NESDIS:** National Environmental Satellite, Data and Information Service is dedicated to providing timely access to global environmental data from satellites and other sources to promote, protect, and enhance the nation's economy, security, environment and quality of life. To fulfill its responsibilities, NESDIS acquires and manages the nation's operational environmental satellites, provides data and informational services and conducts related research. **NWS:** The National Weather Service is the primary source of weather data, forecasts and warnings for the United States. Television weathercasters and private meteorology companies prepare their forecasts using this information. The NWS is the sole United States official voice for issuing warnings during life-threatening weather situations.

The Aerospace Corporation
Contact: Monica Maynard (Monica.I.Maynard@aero.org)

The Aerospace Corporation has a longstanding dedication to education. The Aerospace Institute offers opportunities for both our employees and our customers to expand their knowledge through a wide variety of courses related to our work in support of national security space efforts. The corporation sponsors a number of technical workshops each year designed as educational resources for space professionals, including the Space Power Workshop, the Ground System Architectures Workshop, the Aerospace Testing Seminar, and the Mission Assurance Improvement Workshop.

In addition, Aerospace is strongly committed to inspiring the next generation of engineers and scientists by supporting science, technology, engineering, and math (STEM) projects and programs in a number of ways.

One of the company's primary goals is to provide volunteer role models to demonstrate the value of a strong emphasis in science and math education. Students who excel in math and science are often unaware of the exciting career opportunities available to them. Our employees enhance the image of those exciting careers by working directly with K-12 students, supporting science and math teachers, and partnering with local schools to support STEM outreach programs.

American Institute of Aeronautics & Astronautics
Contact: Ken Lui (kcons2014@kensconsulting.net)

The American Institute of Aeronautics & Astronautics is the world's largest technical society dedicated to the global aerospace profession. The Los Angeles/Las Vegas Section of the American Institute of Aeronautics & Astronautics (AIAA) is providing a booth showcasing its pre-college Science, Technology, Engineering, and Mathematics (STEM) educational outreach capabilities, tools, and resources available to teachers and students, several keynote speakers, and career information. The Los Angeles/Las Vegas Section of AIAA is also the co-host for the Friday evening banquet. We are seeking students for a new student chapter at Cal State LA.

Along with information on AIAA hands-on, interactive, STEM educational outreach programs, free AIAA Educator Associate Membership Applications will be available at this booth. Also helping at the booth are Sherry Stukes, JPL, and Matt Mundy, STEM Outreach.

Science Systems and Applications, Inc.
Contact: Alex Kim (alex.kim@ssaihq.com)

Science Systems and Applications, Inc. (SSAI) is a leading provider of scientific, engineering, and IT support for customers seeking new frontiers in science and technology. For more than 40 years, we have been by their side, aligning with their vision and goals to provide research and technical support. We support pioneers in science and engineering—such as NASA and NOAA—and we've made significant contributions to more than 150 Earth and space science missions. SSAI's services are built on our genuine passion for research and innovative solutions. Our expert scientists, engineers, and IT professionals share a commitment to providing solutions for the unique needs of each customer. Staffing assisted by David Overoye, Jessica Beeli, and Ashwin Ravindran.

Amateur Radio on the International Space Station
Contact: Darrell Warren (dgwarren@verizon.net)

Amateur Radio on the International Space Station (ARISS) inspires students, worldwide, to pursue interests and careers in science, technology, engineering and math through amateur radio communications opportunities with the International Space Station (ISS) on-orbit crew. Students learn about life on board the ISS and explore Earth from space through science and math activities. ARISS provides opportunities for the school community (students, teachers, families and community members) to become more aware of the substantial benefits of human spaceflight and the exploration and discovery that occur on spaceflight journeys. Students have the opportunity to learn about space technologies and the technologies involved with space communications through exploration of amateur radio.

Darrell Warren is a retired teacher from Los Angeles Academy Middle School (LAUSD). Last February, his students and he spoke with Astronaut Joseph Acaba in the ISS by direct radio contact using amateur radio. Pete Arvedson also attended the event. This was done in association with the Cal State LA Charter College of Education. Students from Cal State LA and Dr. Mario Castaneda worked with students from LA Academy in their "Space Academy" and were video taped. Mr. Warren has information regarding ARISS, the organization that coordinates with NASA for such contacts. He will display lots of pictures and answer questions.

Copernica Institute *and* IEEE
Contact: Brian Hagerty (bjhagerty@gmail.com)

Copernica Institute is the lead for the GeoSTEM Alliance, which is a new partnership between after-school educators in Southern California. Brian Hagerty is the President of Copernica Institute and Regional Director for IEEE. IEEE and its members inspire a global community to innovate for a better tomorrow through highly cited publications, conferences, technology standards, and professional and educational activities. IEEE is the trusted "voice" for engineering, computing, and technology information around the globe. IEEE's core purpose is to foster technological innovation and excellence for the benefit of humanity. IEEE will be essential to the global technical community and to technical professionals everywhere, and be universally recognized for the contributions of technology and of technical professionals in improving global conditions. Also helping is Cory Hague.

Our deepest gratitude to our many supporters!