

August 2019

Click title to go to article

- 1 AIAA LA-LV Apollo 11 50th Anniversary Special Event
- 2 AIAA LA-LV Wins AIAA National Awards
- 3 AIAA LA-LV Planetary Defense/Asteroid Exploration Mini-Conference
- 4 AIAA LA-LV Awards Dinner Part 2
- 6 Aerospace Summer Games
- 7 Edward McCullough
- 8 AIAA LA-LV Mars InSight
- 9 Satellite Educators Conference
- 15 B1-B Model Donation to AIAA
- 17-24 ANNOUNCEMENTS OF FUTURE EVENTS

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American Institute for Aeronautics and Astronautics,
Los Angeles-Las Vegas Section

AIAA Los Angeles-Las Vegas Section Hosts Apollo 11 Moon Landing 50th Anniversary And Lunar Exploration Special Event

By Sherry Stukes



Left to right – Dr. Jeffrey Puschell, James Anderson, Michelle Evans, Tommy Thompson, Carl Stechman, Rod Pyle, Hildreth Walker Jr.

Photo courtesy of Sherry Stukes

Where were you when Apollo 11 landed the first man on the moon? Well, I had just turned 13 years old a few days before the landing and I clearly remember all of the excitement, watching our trusted news reporter, Walter Cronkite, explain all of the details of the Apollo 11 mission and the first man to set foot on the moon. I was mesmerized watching a black-and-white tube TV with an analog dial (no remote control back then!) on the TV that changed the few channels that were available at the time. I never dreamed that I would end up working for NASA.

Fifty years later, I was excited to attend the AIAA Los Angeles-Las Vegas Section Apollo 11 Moon Landing event at the Santa Monica Public Library MLK Jr Auditorium. It was a perfect venue that had room to display space system models, components, paraphernalia and beautiful artwork along the front of the stage and side aisle ways.

(continued on page 10)



The AIAA Los Angeles-Las Vegas Section is grateful to Millennium for sponsoring the AIAA Los Angeles-Las Vegas business meetings!

AIAA Los Angeles-Las Vegas Section Among AIAA Section Awards Winners: Awards Honor Outstanding Section Programming in a Variety of Categories

July 31, 2019 – Reston, Va. – The American Institute of Aeronautics and Astronautics (AIAA) has announced its 2018–2019 Section Awards winners. The Section Awards honor particularly notable achievements made by member sections in a range of activities that help fulfill the Institute’s mission.

Section awards are given annually in five categories based on the size of each section’s membership. Each winning section receives a certificate and a cash award. The award period covered is 1 June 2018–31 May 2019. The Institute believes that vital, active sections are essential to its success.

The Los Angeles-Las Vegas Section is proud to announce that it has received several awards:

The Outstanding Section Award is presented to sections based upon their overall activities and contributions through the year.

- Very Large: Third Place: Los Angeles-Las Vegas, Robert Friend, section chair

The Communications Award is presented to sections that have developed and implemented an outstanding communications outreach program. Winning criteria include level of complexity, timeliness, and variety of methods of communications, as well as frequency, format, and content of the communication outreach. The winners are:

- Very Large: Third Place: Los Angeles-Las Vegas, Lisa Kaspin-Powell, communications officer

The Membership Award is presented to sections that have increased their membership by planning and implementing effective recruitment and retention campaigns.

- Very Large: Second Place: Los Angeles-Las Vegas, Chandrashekhar Sonwane, membership officer

The Public Policy Award is presented for stimulating public awareness of the needs of aerospace research and development, particularly on the part of government representatives, and for education section members about the value of public policy activities.

- Very Large: Second Place: Los Angeles-Las Vegas, Alan Shinkman, public policy officer

The Section-Student Branch Partnership Award recognizes the most effective and innovative collaboration between the professional section members and student branch members.

- Very Large: Second Place: Los Angeles-Las Vegas, Matt Mundy, STEM K-12 outreach officers

The Outstanding Activity Award allows the Institute to acknowledge sections that held an outstanding activity deserving of additional recognition.

- Very Large: Los Angeles-Las Vegas, Robert Friend, section chair. Sci-Tech vs Sci-Fi. This event was held at the Redondo Beach Public Library in commemoration of the Apollo 11 (49th) and Viking (42nd) anniversaries and featured a Q&A panel with retired engineers that had worked on Apollo and Viking during their careers as the introductory portion of the program, whose purpose was really stage-setting — discussing the accomplishments of the past in preparation for the main session, which was a give-and-take between panelists from current academic, engineering, and scientific careers (Sci-Tech) “debating” with an opposing group of panelists with a science fiction (Sci-Fi) background (authors, movie industry, and artists). The session was moderated by University of Southern California Professor Madhu Thangavelu. The primary purpose of the event was outreach and networking to connect with the local community and demonstrate the connections between what we used to think was “science fiction” and is now science fact, and that much of engineering takes imagination that is not that different from that used to visualize what “could be” if technology only enabled it.

AIAA 29 June 2019 Conference Outsider Review Planetary Defense and Asteroid Exploration Mini-Conference

By Avishai Melamed and Vered Mirmovitch



From left: Paul Chodas, Nahum Melamed (both from The Aerospace Corporation). "Overview and Summary of the 2019 IAA Planetary Defense Conference." *Photo courtesy of Kenneth Lui, Programs/Events Chair, AIAA Los Angeles-Las Vegas Section*

Avishai Melamed: An interdisciplinary approach is critical to modern research. With the rising interconnectedness of globalization, so too do academic fields find common ground when innovating and collaborating. AIAA's origins are clearly in Science and Engineering, and this foundation is evident in the selection of presentations. And yet the applications for my own field of study and personal interests are just as readily apparent. I am currently pursuing a double major, one in Political Science-International Relations and one in History, where my studies do trend towards theory and understanding the underlying framework of political structures and policymaking bodies. However, despite some theoretical emphasis, applied use and case studies for political science and history is hardly lacking from the university environment. Instead, AIAA presentations provide an unparalleled opportunity for outsiders such as myself to engage with the more practical applications of our field. This is not because Monte Carlo statistical simulations of projected asteroid impacts or plans for lunar infrastructure

provide some political insight that is lacking from university studies. Rather, because practical challenges of application are intrinsic to each of the presentations, inviting observers like me to supply our own expertise and bring a fresh perspective to this community should always benefit specialists to determine the requirements and ramifications of their work. This opportunity has been long observed within the sphere of space studies, with the realities of complex multi-decade project design in the second half of the twentieth century leading to grand international projects of much acclaim such as Spacelab, the Space Shuttle, and the International Space Station. Within many such programs, parallel studies conducted by prospective partners allowed national space programs to achieve the widest breadth of innovation, as each party employed their unique background, expertise, and outlook to determine requirements and prospects which invaluable added to the expansion of human knowledge. Much as in the same spirit, the openness of AIAA sessions is
(continued on page 11)

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AIAA Los Angeles-Las Vegas 2019 Awards Dinner, Part 2: Virgin Galactic SpaceShipTwo and Student Awards

On May 9, 2019, the AIAA Los Angeles-Las Vegas Section honored the Mars InSight Mission, Virgin Galactic SpaceShip Two, the 2018 Aerospace Art Design Contest winner, the AIAA Space Systems Technical Committee (SSTC) National Middle School Essay Contest Los Angeles-Las Vegas 2019 winners, the AIAA LA-LV High School Student STEM Award 2019 winners, and the James Wertz Scholarship 2019 Award winner. The Mars InSight presentation is in the July 2019 issue of the Newsletter (<https://bit.ly/2P5SHtk>).

Virgin Galactic received the AIAA LA-LV 2019 Technical Excellence Award for flying a test passenger for the first time, and in doing so reaching space for the second time. On February 22, 2019, SpaceShipTwo VSS Unity VF-01, piloted by Dave “Mac” McKay and co-piloted by Michael “Sooch” Masucci, brought along first commercial astronaut instructor Beth Moses on a flight up to 90 km, reaching Mach 3.04. All were awarded Commercial Astronaut Wings by the FAA for surpassing the altitude of 80 km. Mark “Forger” Stucky, the Chief Pilot of the first flight into space on December 13, 2018, in the VSS Unity VP-03, received the award on behalf of Virgin Galactic and gave a presentation. Also awarded was Rick “CJ” Sturckow, co-pilot of the 2018 flight.

The 2018 Aerospace Art Design Contest was held to select new artwork for AIAA LA-LV awards, such as plaques and paperweights. The winner was Sophia Leon, a student at the University of Nevada at Las Vegas and a member of the AIAA-LA-LV UNLV chapter. Her artwork was an update of past award artwork, representing past and present aerospace history. (An article about Leon’s work and award is in the April 2019 issue of the Newsletter <https://bit.ly/2HhSnBx>)

This year’s AIAA SSTC National Middle School Essay Contest theme was “President Donald Trump announced the idea of a Space Force. What are the key advantages and disadvantages of having a Space Force and an organizational restructuring within the Department of Defense?” The award winners representing the AIAA LA-LV region were David Ko, winning first place, and Audri Lee, winning second place; both were students at Palos Verdes Intermediate School.



Mark Stucky, Chief Pilot of the first SpaceShipTwo flight into space. *Photo: Kenneth Lui*

This year’s AIAA LA-LV High School Student STEM Awards were also presented. Akash Anand, a student at Palos Verdes Peninsula High School, won first place for “Optimal Phased Array Antenna Systems for Radio Astronomy.” Andrew Wang, a student at Palos Verdes High School, won second place for “Dusty Spacesuit Charging and Arcing: Implications for Human Exploration of the Lunar Terminator and Far Side.” Joshua Masuda, a student at Palos Verdes Peninsula High School, won third place for “The Effect of Tennis Strings on Ulnar Wrist Strain.”

The James Wertz Scholarship contributes to tuition and books for high school students showing aerospace ingenuity, collaboration, and achievement through an essay on a specified STEM subject, scholastic achievement, letters of recommendation, and participation in relevant extracurricular activities. This year’s award winner was Robert Peltekov, a student at Palos Verdes Peninsula High School, who wrote an essay on “Study and Developing Blockchains.”

Congratulations to all of the winners! The AIAA LA-LV Section looks forward to seeing everyone at next year’s awards dinner. Many thanks are due to Bob Friend, outgoing 2018-2019 LA-LV Section Chair, for his leadership of the Section, and to Kenneth Lui, 2018-2019 Programs/Events Chair for organizing the awards event.

More photos on next page and at these links:

<https://bit.ly/2zgH0VT>

<https://bit.ly/2ZiXEPk>

<https://bit.ly/2ZhwHM1>



Top from left to right: David Ko, 2018-2019 Section Chair Bob Friend; Andrew Wang; Bob Friend, Sophia Leon; Joshua Masuda. Bottom from left to right: Dr. James Wertz, Robert Peltekov; Akash Anand, Bob Friend, and 2019-2020 Section Chair Dr. Chandrashekhar Sonwane. *Photos: Kenneth Lui*



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Aerospace Summer Games 2019 and After-Party Saturday, July 20, 2019

By Kenneth Varghese (AIAA LA-LV Section Public Policy Chair), Aldo Martinez (AIAA LA-LV Section Volunteer), and Kenneth Lui (AIAA LA-LV Section Events/Program Chair / AIAA Space Colonization Technical Committee)



Above: Pre-game group photo. *Photo: Dr. Michael Belisle of the Northrop Grumman Corporation*

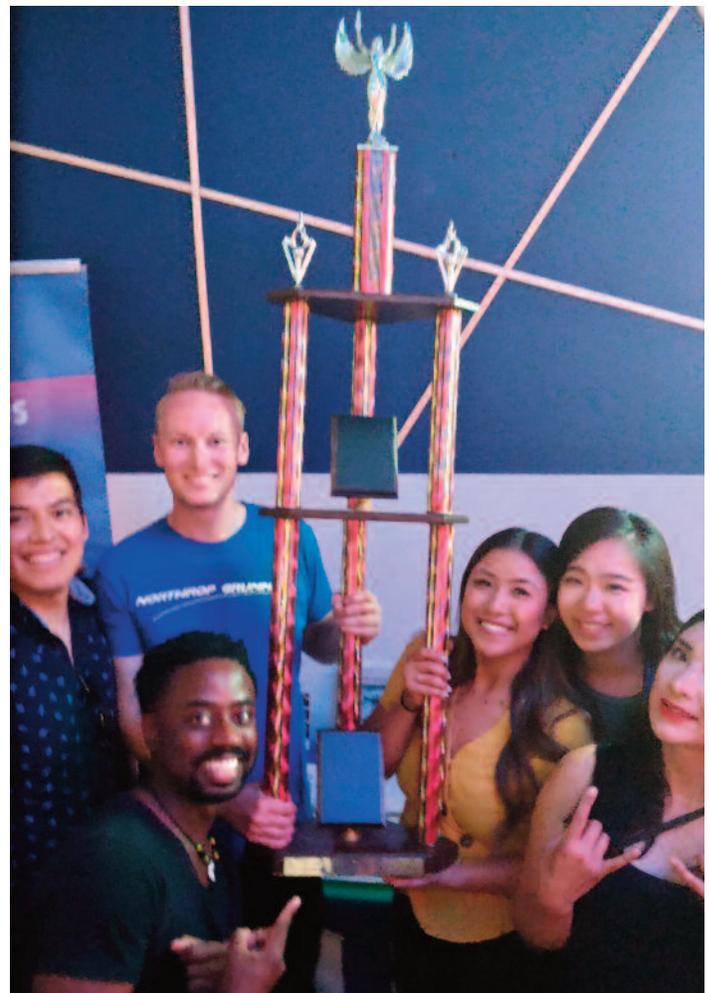
Below: Members of Northrop Grumman's winning team with their trophy, along with Aldo Martinez at far left..

Photo: Kenneth Lui

On Saturday, July 20, 2019, 4,000-6,000+ people from 35+ aerospace-related organizations gathered at Dockweiler Beach, Playa Del Rey, CA 90293 (near LAX) for the annual Aerospace Summer Games (ASG), to compete in various beach sports. Each organization participating in the games had their own T-shirts and tents. This year, the organizer was the Northrop Grumman Corporation, who kindly granted the AIAA LA-LV Section tent / exhibition space (not participating in the games), and supported the AIAA LA-LV-sponsored After-Party in nearby Hermosa Beach.

In the early cloudy morning on July 20, 2019, people started to gather at Dockweiler Beach. The parking lots were crowded with cars and people. The visitors and participants waited in long lines for getting parking tickets. With the professional coordination by the Northrop Grumman Corporation, all participants set up their tents quickly and got ready for the games. By mid-morning, the sky cleared up, and it was a beautiful sunny day with blue skies. Attendees cheered and clapped for the participating teams and individuals competing in the games with great sportsmanship.

(continued on page 12)



Edward D. McCullough (1946-2019)

By Seth Potter, Interorganizational Ambassador, AIAA Los Angeles-Las Vegas Section

Noted aeronautical engineer Edward McCullough passed away the weekend before last. I had the privilege of knowing and working with Ed at Boeing (Rockwell), as well as the American Institute of Aeronautics and Astronautics (AIAA) and the National Space Society (NSS). He was one of the most visionary aeronautical engineers I've known. His intelligence and knowledge showed great breadth as well as depth, cutting across many fields. At least as important was his enthusiasm, and confidence in his ideas, and in those of us who had the good fortune to work with him. How crucial this turned out to be in sustaining us through the inevitable hard times and dry spells in this challenging field. I will miss discussing ideas with him, as well as seeing him take new people under his wing as he met them at work and at technical society meetings and bring them into the fold of advanced concepts. I am confident that his work will benefit all of humanity.

Biography (from the National Space Society <https://space.nss.org/edward-d-mccullough-biography/>)

Edward D. McCullough was a retired principal scientist at The Boeing Company and former member of the NSS Board of Directors. He received his professional training in nuclear engineering through the U.S. Navy, and Bettis and Knowles Atomic Power Laboratories (gaining his Certification for Nuclear Engineering at Pearl Harbor Naval Shipyard in 1975).

Mr. McCullough focused on concept development, experimental chemistry, and advanced technology at Rockwell Space Systems Advanced Engineering and at the Boeing divisions of Phantom Works and Integrated Defense Systems. He researched innovative methods to reduce the development time of technologies and systems from 10 to 20 years down to 5 years. He experienced successes in the area of chemistry and chemical engineering for extraterrestrial processing and photonics for vehicle management systems, and integrated vehicle health management and communications. He led efforts for biologically inspired multi parallax geometric situational awareness for advanced autonomous mobility and space manufacturing.

Mr. McCullough developed several patents, including patents for an angular sensing system; a method for enhancing digestion reaction rates of chemical systems; and a system for mechanically stabilizing a bed of particulate media.

Mr. McCullough was Chair Emeritus of the AIAA Space Colonization Technical Committee, a member of the Board of Trustees for the University Space Research Association, a member of the Science Council for Research Institute for Advanced Computer Science, and a charter member of the AIAA Space Exploration Program Committee. He also served on the NRC Committee to Review NASA's Exploration Technology Development Programs, and the Planning Committee for the Workshop on Research Enabled by the Lunar Environment.

His other activities included sailing and playing the guitar, and he was a licensed pilot.

AIAA Los Angeles-Las Vegas Event: Mars InSight Presentation by Principal Investigator Dr. Bruce Banerdt

By Peter Landecker

On Saturday, July 6, 2019, there was an AIAA/LA-LV meeting at Mount Saint Mary's College during which the Mars InSight Mission was discussed in a very clear and interesting way. InSight is short for Interior Exploration using Seismic Investigations, Geodesy and Heat Transport.

The InSight mission placed a single stationary robotic lander on Mars to study its deep interior (core, mantle and crust) and address a fundamental issue of planetary science: understanding the processes that shaped the rocky planets of the inner Solar System (including Earth) more than four billion years ago. The InSight spacecraft was manufactured by Lockheed Martin and the program is managed by NASA's Jet Propulsion Laboratory (Dr. Banerdt's employer), with most of its scientific instruments built by European agencies. The mission launched on 5 May 2018 and successfully landed on Mars on 26 November 2018.

InSight's objectives are to place a seismometer on the surface of Mars to measure seismic activity and provide accurate information about the interior structure of Mars and estimate the size of Mars' core and whether the core is liquid or solid. In addition, there will be a measurement of the internal heat flow using a mole heat probe to study the rate at which heat escapes from the planet's interior and thus give insights into Mars' early geological evolution. This could bring a new understanding of how the Solar System's four terrestrial planets formed and evolved.



Above: Dr. Bruce Banerdt. Below left: How's the weather on Mars? Photos: Kenneth Lui

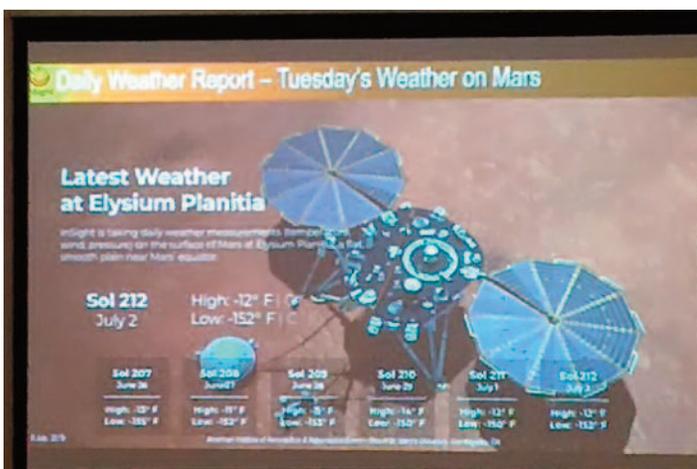
By reusing technology from the Mars Phoenix Lander, which successfully landed on Mars in 2008, mission costs and risks were reduced. It was this strategy which helped select this mission in 2010 from many others.

The first Mars Quake was detected (lasting much longer than quakes on Earth due to the dryness of Mars) and many more are expected.

Check out <http://mars.nasa.gov/insight> for more information about this fascinating current mission.

Dr. Peter Landecker was Principal Investigator on the P78-1 Solar X-Ray Spectrometer/Spectroheliograph. He was involved in a few scientific payload and spacecraft selection processes. He published many papers in fields such as X-Ray astronomy, neutrino physics, cosmic ray physics, radio astronomy on the back side of the moon, and asteroid mitigation. He worked at Cornell University, Columbia University, the University of California at Irvine, the Aerospace Corporation, Hughes, and TRW. He is currently a member of the International Astronomical Union and the American Physical Society. He published the AIAA Acronym Book.

Links to more photos:
<https://bit.ly/2Zi5ybU>
<https://bit.ly/2Nw9gwr>



AIAA Enriches STEM Education at the Satellite Educators Association Conference

On Friday and Saturday, August 2-3, 2019, Ken Lui (AIAA-LA-LV Programs/Events Chair) and Dean Davis (AIAA-LA-LV STEM/K-12 Chair) taught 65 teachers how to use real-world aerospace Science, Technology, Engineering and Mathematics (STEM) in the classroom to inspire students at the Satellite Educators Association (SEA) Conference at California State University at Los Angeles. Dean Davis and now Jeff Puschell, AIAA LA-LV Section leaders, have been actively engaged leading SEA as Vice President, for over a decade.

SEA informs teachers how to use National Oceanic and Atmospheric Administration (NOAA), National Aeronautics and Space Administration (NASA) and Air Force Global Positioning System (GPS) satellite information to teach meteorology, geology, oceanography, geography and astronomy.

Compressed-air powered stomp rockets, radio-controlled helicopters, infrared hand-controlled ducted fan UFOs and an unducted fan satellite were demonstrated to the educators and several students that came with them. AIAA flyers inviting teachers to join AIAA as Educator Associates were provided to the teachers, who were encouraged to join our Section.

Links to more photos:

<https://bit.ly/31QiWFH>

<https://bit.ly/30m7SQr>



Apollo 11 50th Anniversary Event

(continued from page 1)

To begin the program, a stellar group of speakers and panelists, moderated by Dr. Jeffrey Puschell, regaled us with stories of their roles and contributions to the space program, including:

- Carl Stechman - Aerospace Propulsion Systems Consultant, Aerojet-Rocketdyne / Marquardt Retired, Apollo, Space Shuttle, Orion Engineer
- Tommy Thompson. - Pilot, US Navy Retired, former colleague of Neil Armstrong;
- Michelle Evans - AIAA Distinguished Lecturer, OCSS, www.Mach25Media.com; Author of "The X-15 Rocket Plane: Flying the First Wings into Space"
- Rod Pyle - Space Author, Historian, Writer; www.pylebooks.com; Author of: "From First on the Moon to Space 2.0"
- Hildreth (Hal) Walker Jr. - Pioneer, Laser Technology, the first to successfully fire the Laser to the Moon during the Apollo 11 Moon Landing
- James Anderson - Historian at NASA's Ames Research Center in California's Silicon Valley

After the panel discussion, there was an opportunity for audience members that supported the Apollo program to come to the stage and participate in an informal presentation of their experiences. It was great to hear first-hand accounts of people that had contributed in various ways to Apollo and the space program in general.

There were also formal presentations made by a distinguished group of space professionals, leaders, and enthusiasts, who takes about the ongoing and future Lunar Exploration beyond Apollo, such as the new NASA Artemis and Moon2024 programs. These speakers /panelists included:

- Professor David Barnhart - USC SERC ISI
- Stefan Lamb - Masten Space Systems
- Dr. Jeffrey Puschell - Raytheon Space and Airborne Systems, AIAA Fellow
- Prof. Madhu Thangavelu - USC/ISU "Eve & Adam Project for Speedy Lunar Return"
- James Anderson - Historian at NASA's Ames Research Center in California's Silicon Valley

The program ended with a raffle drawing for a Saturn V model rocket that was won by a lucky attendee. The cover and insert artwork design of this Estes model was designed based on the masterpiece of an AIAA profes-

sional member who is also an aerospace engineer / renowned aerospace artist.

Sherry Stukes is a Software Systems Engineer at The Jet Propulsion Laboratory in Pasadena, California where she is responsible for a variety of software tasks. She worked on the Lunar Surface Systems software architecture for NASA's Constellation Program Strategic Analysis Team from 2008 until its cancellation in 2012. She hopes to support the Artemis "return of humans to the moon" program.

Links to more photos:

<https://bit.ly/31RQ1B4>

<https://bit.ly/30kZXTB>

<https://bit.ly/2NhjbWt>





Top left: NASA's programs to investigate near-earth objects. Top right: Dr. Niraj K. Inamdar (RAND Corporation) "Visitors from Our Solar and Galactic Neighborhood: 'Oumuamua and the Possibility of Visits by Rocks from Exoplanetary Systems'". Photos: Kenneth Lui

critical to facilitating wider involvement in one of the most exciting developing fields of our era, and providing access to participants from STEM backgrounds and beyond is simply the next step in harnessing the insights and innovative capacities of an eager generation just entering the workforce.

Vered Mirmovitch, PhD: It was a great way to spend the International Asteroid Day, listening to an impressive group of scientists and engineers who specialize in different aspects of space research in general, and more specifically in evaluating the threat to life on earth and the possible ways of defending life from an imminent threat. The experts each expanded our knowledge by building on the previous talks. I enjoyed observing the collaboration and the support among this emerging active community. What is obvious to the presenters—that the threat is real and needs to be addressed—is far less evident to the general public. It was reassuring to know that accomplished scientists and engineers are taking the threat seriously and are engaged in improving our capabilities of detection, calculating orbits (and chances of collision), and exploring the pros and cons of each deflection method. Simulations help us better understand how moving objects might collide and how we can move them off the course of collision. While the upcoming IMAX movie might give an additional dimension that allows it to reach a larger audience, it might also help laypersons observe the movements of cele-

tial objects including asteroids and comets, which are often hard to imagine. However, it is also clear that without public awareness, which in turn will increase political pressure to increase public spending on detection, orbit calculation, and building mitigation capacity, the threat will be far from being negated. Events like that held in the Palos Verdes Library are important to increase awareness and allow the public to make greater use of the knowledge being made available. However, these events should be better publicized in the locations where they are being held by contacting local STEM coordinators and public affairs functionaries in colleges and libraries to attain a larger audience if AIAA desires to have a truly significant impact.

Avishai Melamed is a senior at the University of California, San Diego, double majoring in Political Science-International Relations and History.

Vered Mirmovitch, PhD, is an associate professor of Biological Sciences who teaches various biology and environmental science classes at West Los Angeles College. She earned her PhD in Biology with emphasis on Ecology and Evolution from the University of California, Riverside.

Links to more photos:
<https://bit.ly/2TPwBKg>
<https://bit.ly/2KVWgx4>
<https://bit.ly/2NmUtnl>



Top: The AIAA Los Angeles-Las Vegas Section had a table at the event to mix and mingle with the participants.

Bottom left: Participants enjoy volleyball games. Bottom right (from left): Stanley Wong, Kenneth Varghese, Thai Tai.

Photos: Kenneth Lui (Story continues on page 13)





Top left (from left): Aldo Martinez, Kenneth Varghese, and Elmer Tse relax at the after party.

Top right: Participants gather by the ocean for a tug-of-war contest.

Bottom left: the JPL Team. Bottom right: The Aerospace Games trophy at the AIAA LA-LV Section's food and drink table, with the Section's information table further back.

Photos: Kenneth Lui



The AIAA LA-LV Section had a tent with exhibitions. AIAA-marked rubber wrist bands were handed to the tent visitors and they were very popular. The AIAA LA-LV 2018 Aerospace Art Contest-winning design by Sophia Leon also got attention. The banners attracted attention from people passing by and further away, increasing the visibility of AIAA. Some visitors were local and some were from other cities/areas just for the games, volunteering, or for summer work. They learned more about AIAA and engaged in interesting and fun conversations (aerospace past, current, future, opportunities, and life) with the AIAA LA-LV representatives. AIAA membership brochures, paper gliders, and

(continued on page 14)

Aerospace Summer Games

(continued from page 13)

other giveaways were also distributed to interested visitors. People signed up for membership, benefits, the event notice mailing list, or further information. Some game participants stopped by to rest in the shade of the AIAA LA-LV tent and chatted with the AIAA LA-LV representatives. Events and volunteering opportunities/related contacts were posted and explained. The After-Party was also advertised at the tent/table.

The beautiful white sands, blue sky, white waves on blue ocean water, colorful tents, cheers, and people of all ages made it a relaxed and fun day for beach sports, networking, and recreation. It was hot and sweaty, but lots of fun. Laughter and cheers could be heard all the time. It was a great occasion for aerospace workers to relax after a whole year of hard work. From the AIAA LA-LV tent, one could see the sand-bag games set up by the Moog company, the exciting beach volleyball games, and the intense tug-of-war competition, among other activities. People passed by the AIAA LA-LV tent while walking from one game to another. People in the neighboring tents of SpaceX, Aerospace Corporation, and Spaceport LA also exchanged excitement and conversations. AIAA LA-LV representatives mingled smoothly with the visitors/participants as part of the large aerospace community. Several AIAA Student Branch members stopped by and said hello to us, and some offered help with the tent setup. Also, some former AIAA Student Branch Officers who had worked with the AIAA LA-LV Section for events/programs and are now working in the aerospace industry came by and said hello. Several AIAA members also came by and happily chatted with the AIAA LA-LV representatives. AIAA is a great big family.

The After-Party was supported by Northrop Grumman Corporation. The AIAA LA-LV banner and table were set up, and a separate table with appetizers and non-alcoholic drinks was prepared as well. Some ASG participants arrived after 5:30PM and chatted with AIAA LA-LV representatives and fellow ASG participants. Interested partygoers were encouraged to visit the AIAA LA-LV table and learn more about AIAA membership and benefits, the AIAA LA-LV Section, volunteering opportunities/contacts, and upcoming events. People gathered and talked in a relaxing and upbeat/dynamic environment.

Just before 8 PM, more and more people arrived. The party reached its climax when the Northrop Grumman Championship Trophy was brought in for display and celebration, as they were the ASG champion for the second consecutive year. People at the party along with non-ASG people outside the room cheered for Northrop Grumman Corporation and chanted "NGC! NGC! NGC!" The party was crowded and the atmosphere was fun and vibrant, symbolizing the spirit of aerospace breakthrough and advancement, which are the keys to the success of those fantastic aerospace people. See you all next year!

The AIAA Los Angeles-Las Vegas Section was glad/proud to be part of the ASG 2019, and contributed to this exciting and fun After-Party. The AIAA LA-LV Section also thanks the Northrop Grumman Corporation for organizing the Aerospace Summer Games 2019, having the AIAA LA-LV participate, and supporting the AIAA LA-LV-sponsored After-Party, especially Dr. Michael Belisle, Ms. Kerry Nguyen, Ms. Evelyn Gutierrez, and Mr. Irvin Enchill.

More event photos are available for viewing and downloading on the AIAA LA-LV website:

<https://bit.ly/2NlLvqD>

<https://bit.ly/2HdS9LG>

Article Authors:

Kenneth Varghese (Project Manager, Boeing Commercial Airplanes / AIAA LA-LV Section Public Policy Chair) is an engineer at Boeing that graduated from Rensselaer Polytechnic Institute in 2017 with a BSAE and is interested in sustainable aviation. He lives in Cypress, CA, where he enjoys planting trees and running.

Aldo Martinez (Aerodynamics Engineer, Boeing Commercial Airplanes / AIAA LA-LV Section Volunteer) works in the Flight Sciences/Advance Concepts group in Boeing Commercial Airplanes as an aerodynamics engineer. He graduated from the University of Southern California, where he participated in student design teams.

Dr. Kenneth Lui, Ph.D. (Consultant / AIAA LA-LV Section Events/Program Chair / AIAA Space Colonization Technical Committee)

B1-B Model Donation to AIAA by the Family of Barbara Farr One of the First Women Aerospace Engineers



This B-1B model was donated to the American Institute of Aeronautics and Astronautics by Sherry Stukes, of the family of Barbara Farr (6/15/1933 – 1/10/2017). The model was presented to Barbara upon her retirement from Boeing in 1997.

Barbara was an incredible woman. She was an aerospace engineer in the 1950's at a time when there were not many women in the technical workforce. She graduated from the University of Vermont in 1954 with a BA in Mathematics. Barbara began work as a Reliability Engineer at North American Aviation in El Segundo CA in June of 1954. Barbara provided reliability analysis for an extensive list of programs and proposals, including the B-1A and B-1B programs. She always joked about the fact that she worked for a single employer for over 40 years, but it kept changing names – North American Aviation, Rockwell International, North American Rockwell, and finally, Boeing.

The Rockwell B-1 Lancer is a supersonic variable-sweep wing, heavy bomber used by the United States Air Force. It is commonly called the "Bone" (from "B-One"). It is one of three strategic bombers in the U.S. Air Force fleet as of 2018, the other two being the B-2 Spirit and the B-52 Stratofortress.

The B-1 was first used in combat in support of operations in Iraq during Operation Desert Fox in December 1998, employing unguided General Purpose weapons. B-1s have been subsequently used in Operation Allied Force (Kosovo) and, most notably, in Operation Enduring Freedom in Afghanistan and the 2003 invasion of Iraq. The B-1 has deployed an array of conventional weapons in war zones. At the height of the Iraq War, a B-1 was continuously kept airborne to provide rapid precision bombardment upon important targets as intelligence identified them.

AIAA Growth Area Domains: Call for Experts

The AIAA Standards committee is requesting the names of Domain Experts for following AIAA Growth Area Domains. You do not need to be an AIAA member to be a domain expert.

Please contact the Chair of the AIAA Los Angeles Las Vegas section, Dr. Chandrashekhar Sonwane, at cgsonwane@gmail.com

The roles of the Domain Experts are as follows:

- Recommend new standards projects
- Maintain a list of best practices
- Provide cutting-edge guidance and input
- Report on any current issues
- Maintain an ongoing list of possible new CoS members for their area

AIAA Growth Area Domains

Commercialization of Space (Space, Aviation)

- Architecture/Systems
- Operations
- Ground Systems

UAS (Aviation)

- Evolving technology certification
- Safety
- Operations

Cybersecurity (Information Systems)

- Digital assurance on aircraft

Manufacturing (Space, Aviation)

- Vehicle supply chain automation
- Additive manufacturing

Runway Independent Aircraft (Aviation)

Automation/Autonomy (Space, Aviation, Information Systems)

Big Data Analytics (Information Systems)

Communication Technology (Space, Information Systems)

- Terrestrial and space communication

Energy (Space, Aviation)

- Renewable fuels
- Propulsion

Training Simulation (Aviation, Information Systems)

- Modeling tools

AIAA Other Domains

Spacecraft Architecture

Space Systems

Space Operations

Launch Vehicles

Space Power and Propulsion

Safety

Ground Testing

Computational Fluid Dynamics

Atmospheric, Orbital and Space Environment Models

Systems Engineering and Project Management

Mission Assurance

Tuesday, October 1, 2019

**AIAA LA-LV Special Awards Banquet to Celebrate Achievement of Undergraduate Students from USC Rocket Propulsion Laboratory
(Launch Success on April 21st, 2019)**



USC Student Rocketry Groups including RPL and Liquid Propulsion Lab will have hardware exhibits to showcase the hands-on work on which USC students have been participating. Please join us on Tuesday, October 1, 2019, and celebrate / honor the USC RPL Team 2019 for their successful launch of their student rocket, passing the the Kármán line into space!

RSVP HERE:

<http://events.r20.constantcontact.com/register/event?oeidk=a07egjkkox3ba697d39&llr=p9tbt6cab>

(Event is free for all. Reception/Food buffet is included. You do not need to be a member of AIAA to attend the event. RSVP is required to get a headcount. (Ticket RSVP will end after Sunday, September 29, 2019, or whenever spaces are gone.)

Volunteers are needed for future AIAA LA-LV events. To volunteer, please contact Dr. Chandrashekhar Sonwane at cgsonwane@gmail.com



The Kármán line is defined as the boundary between Earth's atmosphere and outer space. While the original definition refers to the altitude at which the atmosphere becomes too thin to contribute enough lift to support aeronautical flight, the Kármán line now is internationally recognized to be located at an altitude of 100 kilometers, or 328,084 feet, above Earth's average sea level (AMSL). Beginning with the German V-2 rocket, the first rocket to cross that threshold, countries have been shooting for space for over half of the past century. Although private companies have been able to reach space and orbit for a few decades, a collegiate team has never independently designed, built and launched a rocket that went to space and was recovered intact. With that knowledge in mind, the USC Rocket Propulsion Lab was founded in 2005 with the goal of being the first student group to do exactly that. A space race arose from universities around the world, as many took incremental steps closer to reaching the Kármán line. Now, 14 years after RPL was created, the collegiate space race has ended; Traveler IV, the latest spaceshot vehicle from the USC Rocket Propulsion Lab, passed the Kármán line on April 21st, 2019.

PROGRAM SCHEDULE

4PM-6PM:

RPL (Rocket Propulsion Laboratory) and LPL (Liquid Propulsion Laboratory) Student Displays.
(Buffet food and non-alcoholic drinks will be provided.)

6PM-7PM:

View Hardware exhibits and posters; networking

7PM-8PM:

AIAA LA-LV Event Introduction
Speech by Dean of the Viterbi Engineering School
Student Video Presentations on Rocket Launch
Speech by Chair of the ASTE Department
AIAA LA-LV Presenting the Awards to the USC RPL Team 2019

LOCATION

University of Southern California

Main Campus

At The Vineyard in the Davidson Hall

3409 S. Figueroa Street

Los Angeles, CA 90089

For a map, please click here

<https://bit.ly/31J3PON>

Parking:

(First few registrants might be eligible for limited free parking spots)

Several pay parking options exist at USC:

USC Flower Street Parking Structure

3701 S Flower St, Los Angeles, CA 90007

USC Figueroa Street Parking Structure

3533 S Flower St, Los Angeles, CA 90089

USC McCarthy Way Parking structure

601 USC McCarthy Way, Los Angeles, CA 90007

Dress Code

Business Casual

Contact:

events.aiaalav@gmail.com or (949)426-8175 (phone/text ok) (AIAA LA-LV Events/Program Chair)

Call for Nominations/Volunteers

AIAA Call for Awards Nominations (deadlines for most categories October 1)

Nomination Packages are now being accepted for the following awards and must be received at AIAA Headquarters no later than the nomination deadline. The nomination package consist of the nomination form and the required endorsement letters. No extensions will be granted.

Awards are presented annually, unless otherwise indicated.

Any AIAA member in good standing may submit a nomination. Before preparing a nomination, nominators are reminded to read the award guidelines and verify that the nominee is eligible.

<https://www.aiaa.org/home/get-involved/honors-awards/awards/call-for-awards-nominations>

International Science and Engineering Fair 2020 Call for Judges

Since 1950, Society for Science & the Public has provided an international stage for the world's best and brightest young scientists. The International Science and Engineering Fair (ISEF), a program of the Society, is the world's largest pre-college science competition. Nearly 1,800 high school students from more than 80 countries, regions and territories — almost half of them girls — compete for nearly \$5 million in awards. Alumni have gone on to win many honors, found companies, create solutions and contribute to a more scientifically literate society around the world.

For more information on ISEF, visit the main website <https://www.societyforscience.org/ISEF2020>

Contact AIAA Los Angeles-Las Vegas Section STEM chair Dean Davis if interested: quarkstar13@aol.com

Wednesday, September 11, 2019

**The Case for Space
with**

Dr. Robert Zubrin

President and Founder of the Mars Society

AIAA Distinguished Lecturer

(You do not need to be a member of AIAA to attend the event.)



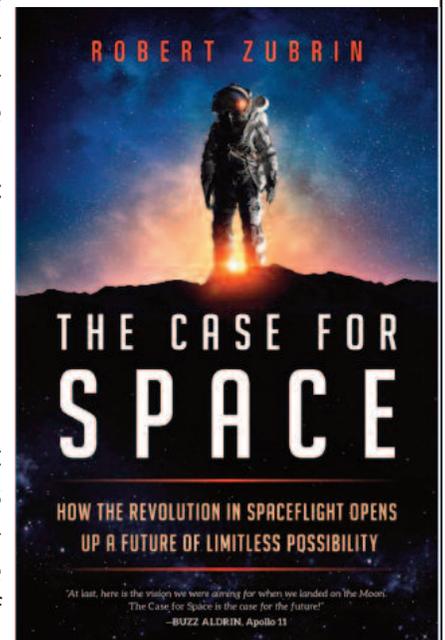
Robert Zubrin, formerly a Staff Engineer at Lockheed Martin Astronautics in Denver is now president of his own company, Pioneer Astronautics. He holds Masters degrees in Aeronautics and Astronautics and a doctorate in Nuclear Engineering from the University of Washington. He is the inventor of several unique concepts for space propulsion and exploration, the author of over 200 published technical and non-technical papers in the field, as well the non-fiction books "The Case for Mars: The Plan to Settle the Red Planet and Why We Must" (Simon and Schuster 1996), "Entering Space" (Tarcher Putnam 1999), "Mars on Earth" (Tarcher Penguin 2003) and "Energy Victory" (Prometheus Books, 2007), "Merchants of Despair" (Encounter Books, 2012), the novels "The Holy Land," (Polaris Books, 2003) and "First Landing," (Ace 2001), the science-humor immigrant guidebook, "How to Live on Mars" (Three Rivers Press, 2008), and most recently "The Case for Space: How the Revolution in Spaceflight Opens Up a Future of Limitless Possibility" (Prometheus Books, 2019). He is a Fellow of the British Inter-

planetary Society and former Chairman of the Executive Committee of the National Space Society. Most recently, he founded the Mars Society; an international organization dedicated to furthering the exploration and settlement of Mars by both public and private means. In that capacity, he personally led the construction and operation of a human Mars exploration training station on Devon Island, an uninhabited island in the Canadian Arctic 900 miles from the North Pole. Prior to his work in astronautics, Dr. Zubrin was employed in areas of thermonuclear fusion research, nuclear engineering, radiation protection, and as a high school science teacher.

What?

(Cited from Amazon.com)

A noted space expert explains the current revolution in spaceflight, where it leads, and why we need it. A new space race has begun. But the rivals in this case are not superpowers but competing entrepreneurs. These daring pioneers are creating a revolution in spaceflight that promises to transform the near future. Astronautical engineer Robert Zubrin spells out the potential of these new developments in an engrossing narrative that is visionary yet



grounded by a deep understanding of the practical challenges. Fueled by the combined expertise of the old aerospace industry and the talents of Silicon Valley entrepreneurs, spaceflight is becoming cheaper. The new generation of space explorers has already achieved a major breakthrough by creating reusable rockets. Zubrin foresees more rapid innovation, including global travel from any point on Earth to another in an hour or less; orbital hotels; moon bases with incredible space observatories; human settlements on Mars, the asteroids, and the moons of the outer planets; and then, breaking all limits, pushing onward to the stars. Zubrin shows how projects that sound like science fiction can actually become reality. But beyond the how, he makes an even more compelling case for why we need to do this--to increase our knowledge of the universe, to make unforeseen discoveries on new frontiers, to harness the natural resources of other planets, to safeguard Earth from stray asteroids, to ensure the future of humanity by expanding beyond its home base, and to protect us from being catastrophically set against each other by the false belief that there isn't enough for all.

Where?

Northrop Grumman Aerospace Systems
Building S-Cafeteria (S-Cafe)
Simon Ramo Drive (One Space Park)
Redondo Beach, CA 90278

When?

Wednesday, September 11, 2019, 5:30 PM - 9:30 PM

5:30 pm - 6:50 pm Check-in, Networking, Dinner

6:50 pm - 7:00 pm Introduction

7:00 pm - 8:30 pm Presentation and Q&A

8:30 pm - 9:30 pm Networking

Presentation starts at 7:00 PM.

(Seats/Tickets are limited. RSVP will end after Monday, September 9, 2019, or whenever all seats are filled.)

To register, visit

<http://events.r20.constantcontact.com/register/event?oeidk=a07eghk9pwwd5a10f0c&llr=p9tbt6cab>

Dress Code

Business Casual

Contact:

events.aiaalv@gmail.com or (949)426-8175 (phone/text ok)

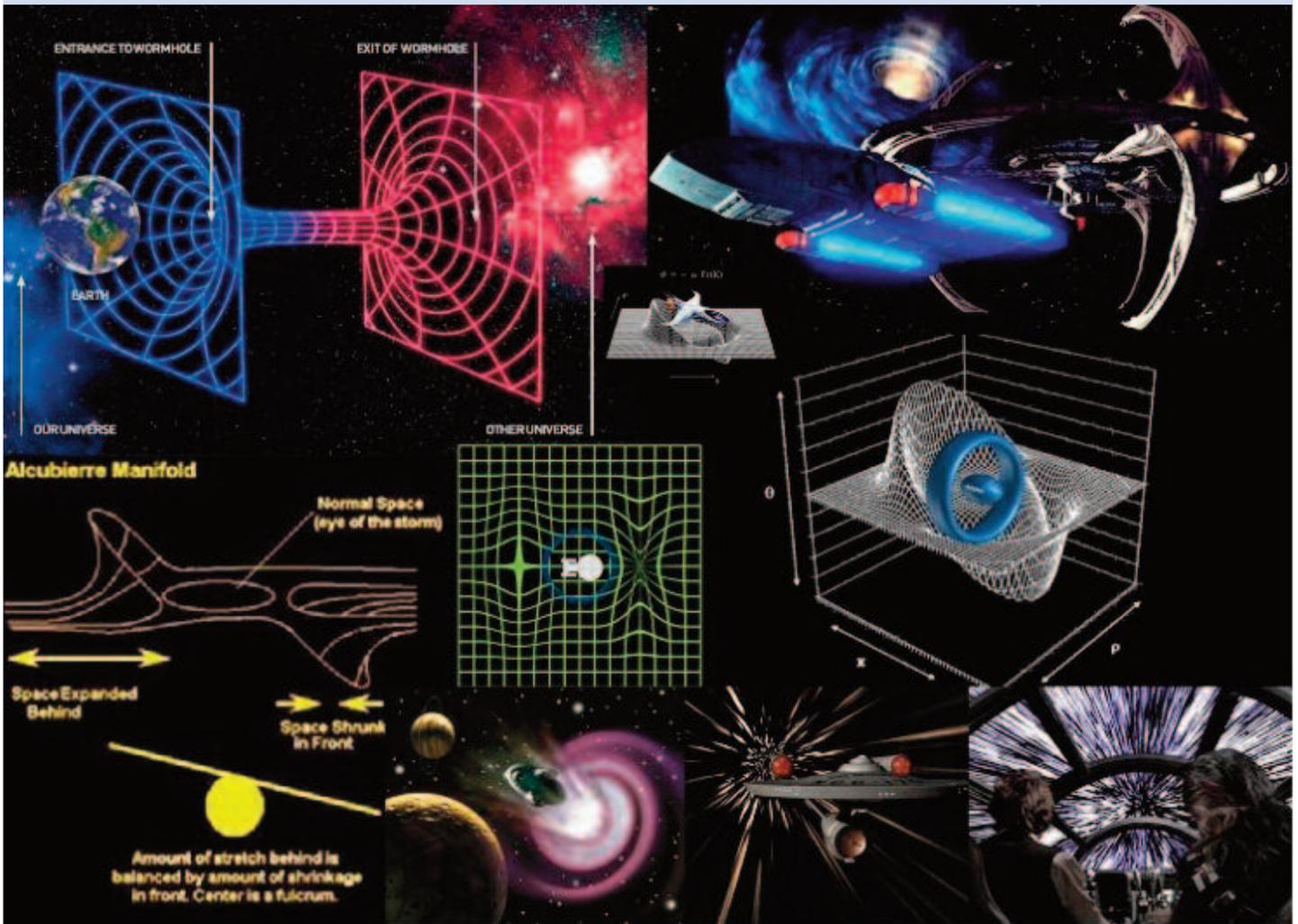
☎(AIAA LA-LV Events/Program Chair)

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Please contact Dr. Chandrashekhar Sonwane at cgsonwane@gmail.com

For event RSVP, please email events.aiaalv@gmail.com

AIAA Los Angeles-Las Vegas Evening Event
Wednesday, September 25, 2019
Advanced Space Propulsion Concepts for Interstellar Travel
with Greg Meholic
Senior Project Engineer (The Aerospace Corporation)
Associate Fellow & Distinguished Lecturer (AIAA)
Adjunct Professor (Loyola Marymount University)



(A free event. Please RSVP. Coffee / bottled water will be provided.(Dinner / Snacks will NOT be provided.)

(You don't need to be an AIAA member to attend the event.)

The presentation begins by examining just a few of the compelling reasons why humans should explore the heavens beyond the bounds of the solar system. Certain terms and issues are defined to clarify the requirements of such daunting journeys. The talk then centers around the key technology required to make such missions possible—propulsion. To start with, a brief discussion is given on the

state of the art of in-space chemical propulsion systems to develop a foundation of where engine technology is today. The talk then takes an evolutionary approach by exploring some of the more advanced engine systems intended for long-range solar system exploration, such as nuclear engines, antimatter engines and interstellar ramjets, which define the capability limits of chemical propulsion. After comparing the predicted performance of these advanced concepts to the requirements for interstellar journeys, the focus will then shift to describe a new paradigm of “propellantless” propulsion schemes that have their basis in modern theoretical physics and cosmology. If found attainable, concepts such as space-time manipulation, faster-than-light travel, wormholes, quantum drives, and so on, may provide the only viable propulsion options to enable reasonable trip times to distant stars. To show that these ideas are not merely the dreams of science-fiction, brief descriptions will be given on the latest, global, experimental efforts to explore the fundamentals behind some of these intriguing concepts.

The talk will end with some inspiring conclusions and hopefully instill the belief that mankind will someday move beyond the bounds of our solar neighborhood.

Mr. Meholic currently works as a senior project engineer for The Aerospace Corporation supporting space launch vehicle concept development and advanced propulsion system technology for the U.S. Government. Prior to his current position, he supported upper-stage cryogenic rocket engine launch activities, performance reviews, and hardware design assessments for most of the U.S. space launch systems, contributing to over four dozen successful missions. His work also included defining launch vehicle operational requirements, launch systems and designs, and leading numerous project teams for both NASA and DARPA-funded studies regarding the capabilities and testing of advanced engines.

Greg earned both his undergraduate and graduate degrees in aerospace engineering from Embry-Riddle Aeronautical University. He first worked at General Electric Aircraft Engines in gas turbine performance and preliminary design, component life analysis, mechanical design and advanced concept development. His work in pulse detonation engine (PDE) technology allowed him to obtain four patents on PDE valve concepts and applications. He also gained extensive experience with engine servicing, component production and testing. While at GEAE, Greg also began teaching within the company and eventually developed several classes for new employees on product familiarization. That interest has continued and he now is an adjunct professor at Loyola-Marymount University teaching a course in Propulsion Systems for aircraft and spacecraft.

Although Greg focused his graduate studies on propulsion systems and aerodynamics, he has always been fascinated by the possibility of faster-than-light (FTL) space travel. Ever since his early college days, he has developed many theories of his own that have evolved into a unique model of space-time and the universe bordering on a grand unified theory. Out of these ideas came a new proposal for the definition of gravity and inertia, possible applications of string theory, a suggested source of dark matter and the Trans-Space method of FTL travel, which is different from the traditional “warp drive” that has garnered public familiarity and science-fiction fame. Since 1998, he has published several papers on his work.

Greg is an Associate Fellow of American Institute of Aeronautics and Astronautics (AIAA) and is the current chair of the AIAA Nuclear and Future Flight Propulsion Technical Committee. He is the session organizer for that committee for the AIAA-sponsored Propulsion and Energy Forums and also chairs related sessions at other technical venues.

Greg is an instrument-rated private pilot and has flown all over the country in his Cessna 172. He and his wife are extremely active with their toddler son and can be found roller-blading, bicycling or hiking in the Los Angeles area.

When

Wednesday, September 25, 2019 from 6:00 PM to 9:00 PM PDT

06:00PM-06:35PM Check-in, Networking

06:35PM-06:45PM Introduction

06:45PM-08:15PM Presentation and Q&A

08:15PM-08:45PM Networking

08:45PM Adjourn

09:00PM Library Closes

Where

Palos Verdes Peninsula Center Library
Community / Meeting Room, 3rd Floor
701 Silver Spur Road
Rolling Hills Estates, CA 90274

For map and directions, please visit

<http://events.r20.constantcontact.com/register/event?oeidk=a07egiwthu5c9c06d72&llr=p9tbt6cab>

Visit here to register

<http://events.r20.constantcontact.com/register/event?oeidk=a07egiwthu5c9c06d72&llr=p9tbt6cab>

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Please contact Dr. Chandrashekhhar Sonwane at cgsonwane@gmail.com

For event RSVP, please email events.aiaalav@gmail.com

AIAA LA-LV 10/5 Saturday Event (Public Event)

Saturday, October 5, 2019

Space Tourism!

John Spencer

Founder, President,

Space Tourism Society (STS)

**Outer Space Architect Co-Founder and
Chief Designer: Mars World Enterprises,
Inc. (MWE)**

**Co-Founder and President: Red Planet
Ventures, Inc. (RPV)**



Prof. Madhu Thangavelu

Faculty Member and Director,

University of Southern California (USC)

& International Space University (ISU)

Board of Directors, National Space Society (NSS)

(More speakers/panelists TBD)

To register and for more information on the program, parking, and schedule, click here

<http://events.r20.constantcontact.com/register/event?oidk=a07egkix0a227fc87b2&llr=p9tbt6cab>

(You do not need to be a member of AIAA to attend the event. Volunteers are needed for all AIAA activities)

Where?

Lomita Library

Don Knabe Community Meeting Room (next to the Library Building)

24200 (24210 for the Meeting Room) Narbonne Ave.

Lomita, CA 90717

(Free Library Parking)

When?

Saturday, October 5, 2019, 9:30 AM - 3:00 PM (Check-in starts at 9:30AM)

Presentation starts at 10:00 AM.

(Seats/Tickets are limited. RSVP will end after Thursday, October 3, 2019, or whenever all seats are filled.)

Dress Code

No open-toe shoes

Volunteers are needed for AIAA events/activities including AIAA LA LV board positions.

Please contact Dr. Chandrashekhar Sonwane at cgsonwane@gmail.com

For event RSVP, please email events.aiaalav@gmail.com or (949) 426-8175 (phone/text ok)

(AIAA LA-LV Events/Program Chair)