

July 2019

IN THIS ISSUE:

- 1 AIAA LA-LV May 2019 Awards Banquet Part 1
- 2 New Space Mini-Conference
- 3 Remotely Piloted/ Unmanned Aircraft; Flying Drones
- 4 Astrophotography: The Dark Arts
- 13 Apollo 11 Anniversary Events

ANNOUNCEMENTS OF
FUTURE EVENTS ON PAGES
12-17

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Los Angeles-Las Vegas Section

AIAA Los Angeles-Las Vegas Awards Banquet Part 1 Sanford Krasner's Guest Presentation on The InSight Mission

By Andrea Diamond, with Bradley Bobbs



Left to right: Andrea Diamond ("Your Martian Next Door"), Sanford Krasner.
Photo courtesy of Andrea Diamond

Soon after he started his presentation, I was already really looking forward to meeting the man who was captivating a large room full of AIAA members and their guests. Sanford "Sandy" Krasner was the end-to-end "appetizer to dessert" Information System Engineer and Mission Communications Lead for the InSight mission's EDL, i.e., Entry, Landing and Descent onto the surface of Mars.

What makes this NASA mission so unique is that it's the first mission to explore the Martian interior. We have explored Mars so far with eleven missions, and currently have orbiters, landers and rovers exploring the Martian atmosphere

(continued on page 11)



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

New Space 2019 Mini-Conference - AIAA Los Angeles-Las Vegas Section

By Alan Arslan

Chief Engineer – Creative Aero Engineering Solutions (CAES)



Space Debris Control and Cleaning panel session. From left: Daniel Oltrogge (Director, Center for Space Standards and Innovation, Analytical Graphics, Incorporated), Kim Aaron (Chief Engineer, Global Aerospace Corporation), Christianna Taylor (Founder/CEO, Intelligent Space), and William Ailor (Technical Fellow, The Aerospace Corporation). *Photo courtesy of Kenneth Lui, Programs/Events Chair, AIAA Los Angeles-Las Vegas Section*

The AIAA Los Angeles-Las Vegas Section's New Space Mini-Conference took place on April 6, 2019 at the Hawthorne Memorial Center (Venus Room), 3901 W. El Segundo Blvd. Hawthorne, CA 90250. Morning sessions were followed by lunch and exhibition sessions and the Conference was concluded by afternoon sessions and panel discussions.

The morning sessions highlighted historical and current topics, and featured interactive lectures and sessions about Space Simulations. The historical topics were covered in several key presentations and were initiated by the accomplished space historian Rod Pyle. Topics included James French's (JRF Consulting) impressive war stories about Rocketdyne's engine tests in Santa Susanna (1958-1963). This presentation highlighted tremendous accomplishments—both suc-

cesses and failures—in rocket testing, which eventually led to the development of current rocket engines. Col. Charlie Vono's presentation offered a unique perspective on inventions (detailed coverage of the first US Patent) and direct application to Space Systems. Alan Chan's presentation about the Red Rover simulator, along with its direct link with gaming controls, offered a very fascinating perspective of Mars Rover simulators. Dr. Roberta M. Ewart (Chief Scientist, Space & Missile Systems Center, US Air Force Space Command) was featured as a keynote speaker and presented novel ideas about the use of a "Space Laboratory" to extend the Technology Readiness Levels (TRL) of several technologies vital to the conquest of space. This Space Lab will prove itself to be extremely valuable for space technologies that are stuck below

(Photos on page 8; story continued on page 9)

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Remotely Piloted/Unmanned Aircraft: A Pilot's Perspective of Flying Drones

AIAA Los Angeles-Las Vegas Event

By Alan Shinkman

Former Co-Chair of Public Policy

AIAA Los Angeles-Las Vegas Section

Colonel Mark Pestana, USAF (ret), presented a short history and recent developments in the revolution of remotely piloted, or unmanned, aircraft systems (UAS). He served as a NASA research pilot in collaboration with the FAA, and helped develop and test advanced drone capabilities for safe and efficient flight in the National Airspace System. His presentation on Thursday, May 23rd, 2019 was at the Katy Geissert Civic Center Library, next to Torrance City Hall.

Mark's extensive experience as a pilot in many different kinds of aircraft has served him well as a drone pilot. A photo showing him at a control console in his own Mission Control demonstrates just how complex it is to operate these vehicles of the future. Mark mentioned that the FAA, which has specified in detail the certification and operating rules for operating multi-rotor drones, has yet to specify the corresponding certification and operating rules for the miniature jet drones that he is an expert at operating and showed in detail in his presentation.

Among the topics he presented were the following:

- What is a drone? It is an aircraft without a human pilot on board.

- FAA expectations and requirements - In order to fly your drone under the FAA's Small UAS Rule (Part 107), you must obtain a Remote Pilot Certificate from the FAA. This certificate demonstrates that you understand the regulations, operating requirements, and procedures for safely flying drones.

- Pilot-vehicle interfaces

- Defining pilot in the UAS world - Pilot-in-command. The pilot designated by the operator, or in the case of general aviation, the owner, as being in command and charged with the safe conduct of a flight.

- NASA and DOD UAS research - The Department of



Mark Pestana.

Photo: Kenneth Lui

Defense has requested approximately \$9.39 billion for unmanned systems and associated technologies in the FY 2019 budget. NASA's Unmanned Aircraft Systems Integration in the National Airspace System works on identifying, developing and testing the technologies and procedures that will make it possible for UAS to have routine access to airspace occupied by human-piloted aircraft.

He showed photos of a Ground Control Station and it was obviously a very complex operation. He mentioned that there are two nose-mounted cameras – color visible and black and white infrared. There was even some humor in the presentation with a cartoon showing a drone arresting a robot-driven car. There were no humans in the cartoon. He presented quotes from another agency describing their enthusiasm for drone operations.

(continued on page 10)

Astrophotography: The Dark Arts, AIAA Los Angeles-Las Vegas Dinner Meeting, June 18, 2019

By Veronica Brooks, M.A. Computer Resources and Information Management
Investigator, researcher, artist and writer

The Manhattan Beach Library was the site of a special AIAA presentation on astrophotography sponsored by the AIAA's Los Angeles-Las Vegas section on June 18, 2019. The presentation, "Astrophotography: The Dark Arts," was given by Mr. Marc Leatham, a space systems engineer at Booz Allen Hamilton working on modeling the Gateway space station for NASA. His biography states that his "true love for science and space stems from the unique hobby of taking photos of nebulae and galaxies with his backyard telescope. Marc travels the western states presenting the story of finding a love for engineering through discovering the cosmos and how you can too." His amazing photos and artwork have been featured on National Geographic magazine and sold worldwide.

Mr. Leatham spoke to an excited and curious audience of AIAA members and guests interested in astrophotography and all things space related. This amazing and informative presentation was truly a unique opportunity for those interested in getting into the hobby of astrophotography.

Marc Leatham sent the audience on a journey through time, presenting a brief history of the telescope, making recommendations while sharing his amazing collection of images. His collection included photos of spiraling galaxies of stars and eclipses of the moons and of dazzling constellations; each image was like peering into a time machine. He compared it to a Pensieve, a magical cauldron or basin filled with a substance like smoke or liquid gas in the Harry Potter series. The Pensieve was used to review stored memories as well as making it easier to spot patterns and links.

He explained that the art of astrophotography was made possible after several inventions, starting with the invention of the optic lens, and then the telescope. Hans Lippershey, an eyeglass maker, attempted to patent the first telescope. Many famous scientists and inventors including Newton, Galileo and Hubble used the telescope for many observations and data collec-



"The best way to improve skills in the art of deep sky astrophotography was to practice, practice, practice."
All article photos: Kenneth Lui

tion, which improved our scientific knowledge. Newton calculated the motions of the heavenly bodies, and Galileo observed the moon, Jupiter, and the rings of Saturn. Later, the American astronomer Edwin Hubble showed evidence that there was more beyond our Milky Way. Hubble was able to determine that there were other galaxies, thus changing the way we looked at the universe forever. Light capture had improved using mirrors, and the apochromatic lens (apo) joins the light of three frequencies into a common focus, correcting chromatic and spherical aberration for sharper images. This is important because chromatic aberration (ca) cannot be fixed during post processing.

(continued on page 6)



Fifty years ago, we walked on the Moon but very few people know that an artist named Chesley Bonestell helped get us there, not with technology, but with a paint brush. His mesmerizing paintings have inspired many to conquer “The Final Frontier.”

The multiple award-winning documentary *Chesley Bonestell: A Brush With The Future* will be shown in four Southern California Laemmle theaters in July.

Where: The Laemmle Royal in West Los Angeles
The Laemmle Playhouse 7 in Pasadena
The Laemmle Town Center 5 in Encino
The Laemmle Claremont 5 in Claremont

When (for all theaters):
Monday, July 15 at 7:30 pm
Tuesday, July 16 at 1:00 pm

Link to tickets: <https://www.laemmle.com/films/45869>
25% discount for AIAA members (for Monday evening on-line ticket purchases only): Type in the word MOON
Website for film: <http://www.chesleybonestell.com>



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Today, the technology is improving even more rapidly and now includes telescopes spanning the spectrum far outside the range of the early optical telescopes.

Mr. Marc Leatham then described how to take super crisp images of the night sky. Although he used a Celestron CGZ SCT 925 and the Sony A7 for wide field astrophotography, he recommended more portable, lightweight equipment that could easily be moved from one location to another, a high quality camera, a telescope mount for sky tracking, a tripod and other equipment to minimize shaking, and software such as Photoshop for image processing.

Practicing astrophotography may be an enjoyable hobby that could easily start with a digital camera and by simply joining an astronomy club. However, the initial cost for amateur photography can easily range through several thousands of dollars and can quickly spiral upwards, so it pays to do your homework. Read and watch online tutorials, such as <http://www.stellarium.org>, which is an excellent educational tool to learn about the night sky since it catalogs stars. It turns your computer into a planetarium! Stellarium.org also calculates distances of celestial objects. This free open source project is used by amateur astronomers as an observation guide, providing a chart of which planets are visible for each night. Stellarium can be used on

the web or downloaded by selecting the right one for your operating system from their home page. Stellarium Mobile Sky Map can also be downloaded from Google Play or the App Store. Learn about the interface and other plug-ins from the user's guide. Ask questions of those in the astronomy club or online forums and make comparisons of equipment before making an investment.

Here are more tips and key elements to getting started on astrophotography:

1) Get the right equipment: First, research the reviews, key features, and specifications on equipment. Paying extra for higher light capture and quality images may be necessary, and one recommendation was the Orion ED80, a triplet apochromatic refractor, on an astrophotography mount. This refractor permits better focusing and brilliant high-contrast images with a built-in auto-guiding system that can be turned on once alignment to a chosen celestial target is made. Learn about how to improve your configuration by using attachments such as OAG (Off-Axis Guiding), which also helps decrease the weight of your gear, or tools such as a sky-tracker like Celestron Sky Align, which aligns computerized telescopes by using three celestial objects, like stars or planets, to triangulate its position, instantly allowing you to locate other objects in the sky.

(continued on page 7)

Astrophotography: The Dark Arts

(continued from page 6)

2) Use correct settings: A great way of capturing clear deep sky images is to use the correct exposure time by using the 500 Rule. This rule refers to the camera settings for shutter speed. This setting prevents star trails, or the movement of the stars as the earth rotates.

For example: Start with 500 then divide by the focal length. For example, if you are using a 50 mm lens, the shutter speed is 10 ($500/50 = 10$).

3) Avoid light pollution: When collecting data, a dark sky is beneficial for deep sky astrophotography. Since dark skies are the best, that usually means away from cities. Get in the "green zones" by checking online light pollution maps. Also, check Astronomy Stargazing Forecasts such as Clear Sky Charts, available on the link below, as well as weather conditions in advance.

The Clear Sky Charts website is a weather forecast model for a specific observing site at <https://www.cleardarksky.com> (then click on the link "Clear Sky Charts" from the homepage).

4) Stacking raw image data- The key for clear, sharper images is raw stack photography: the superimposing of one photo on top of another for noise reduction during the processing phase. This increases the light signal and decreases noise by stacking and aligning stars of lossless photos and then using editing software such as Photoshop or Lightroom to filter and add color. Photo capture could take as little as a few minutes; however, some of the best images were the results of combining long exposure times and stacking images, which could take up to 3 hours of integration or longer. You can find out more about raw stacking and introductory lessons on astrophotography by watching YouTube videos.

He encouraged the crowd to have fun and enjoy the experience, and explained that the best way to improve skills in the art of deep sky astrophotography was to practice, practice, practice.

At the end of his presentation, the crowded room sat mesmerized, stunned at the huge cluster of stars sweeping across the sky on the large screen in front of

them, some pondering in private reflection. The audience waited for more, like an encore at a concert. Marc Leatham kindly shared more photos from his collection. We gazed upon the Lagoon Nebula with pink hydrogen gas clouds; a whirlpool galaxy consuming another galaxy; the Horse Nebula with twinkling stardust and red gas clouds showing the presence of hydrogen gas; a dazzling pink Rosette Nebula, which looked like a rose blooming in the sky; and photos of mysterious gray, blue and red moons. There were images of a dark spiraling Milky Way and stars spattered on a dark background containing the Orion, just to name a few. Each photo of the glowing night sky reminded us of our interconnectedness with the stars, as all life is made up of energy, water and carbon.

Astrophotography, a form of space art and science, is an important and entertaining topic since "a picture is a thousand words" and can also "launch a thousand careers" in STEM. It communicates a message instantly while capturing the interest of the public. The cosmos can not only make others fall in love with engineering, but can also inspire future visionaries to dream the impossible. It could influence future scientists or engineers to discover new resources and energy in space, break the codes of nature and the secrets of the universe.

To view more beautiful photographs of the cosmos by Marc Leatham, his featured collection can be seen by visiting his website at <https://marcleatham.com>, or on Instagram and Twitter.

Article author Veronica Brooks holds a M.A. in Computer Resources and Information Management, received degrees in Business Administration and Business Management as well as certificates in E-Commerce, law enforcement investigative techniques, cyber investigations, and studied data science. She enjoys learning and is interested in all things related to science, art, design, technology, and space. Currently, she is taking courses in fine art, oil painting and sculpture, designs space jewelry and space art, and volunteers her time to several non-profit organizations including STEAM and space exploration outreach, while working to complete her own website at <http://www.i-steam.org>.



Top: James French speaks on Rocketdyne's engine tests in Santa Susanna.

Bottom left: Space historian Rod Pyle Bottom right: Roberta Ewart.

Photos: Kenneth Lui

Story continued on page 9



the TRL 4-7 range and that need more advanced testing in microgravity environments.

The Lunch and Exhibition sessions featured an hour of networking, where several exhibitors were available to answer questions about their unique products. Among the exhibitors were sponsors ranging from small businesses to large businesses and universities; for example, the AIAA USC Student Branch, the USC Space Engineering Research Center, aerospace arts, The Aerospace Corporation, robotics/robots/artificial intelligence, Mars City Design, STEAM Enrichment, Boeing, Caltech, and the Mars Driving Simulator. The early afternoon sessions featured an interesting presentation by Marty Waldman about Space Port Las Vegas and related aerospace advances in Clark County. Other presentations addressing topics of relevance and significance included topics involving an STK simulation of the destruction of an Indian communication satellite

along with the resulting, potentially dangerous, debris. The presenter was Daniel Oltrogge, director of the Center for Space Standards and Innovation, Analytical Graphics, Inc. A team from The Aerospace Corporation presented their project concerning the use of Artificial Intelligence to improve network coverage, along with validation testing that was conducted on ground models. Their presentation showed how AI data processing, which typically runs on the ground, can now run on satellites.

After lunch, sessions that focused on the scientific aspect of space included noteworthy presentations such as the one by Dr. Kim Aaron concerning the use of Area Time Product (ATP) calculations for the use of large drag devices for de-orbit. Dr. William Ailor and Dr. Christianna Taylor also presented about different topics relating to space debris.

(continued on page 10)

Delivering AI to Space panel. From left: Mikhail B. Tadjikov, Samuel M. Dietrich, Stephen C. Snow (Engineering for Embedded and Specialized Computing Department, The Aerospace Corporation).

Photo: Kenneth Lui



After the last presentations, panel discussions featured several presenters and were open to all participants. Topics of main interest included regulatory issues for the commercialization of space and space debris control and cleaning. A range of suggestions (including pros and cons) were discussed and key environmental issues were addressed concerning space tourism and interplanetary travel.

In conclusion, we would like to thank the AIAA LA-LV Section Chair, Robert Friend, for moderating the event and bringing up several interesting points. This AIAA/LA-LV New Space event showed stronger presence and support for New Space activities, business, technology, sciences, arts, and education than previ-

ously seen.

Alan Arslan is Chief Engineer with Creative Aero Engineering Solutions (CAES), where he has been responsible for program execution on government contracts for the last 5 years. He also successfully supervised the development of the company's first composite 3D printer along with all associated parallel programming software for aeroelastic model manufacture applications. During the 18 years prior to his current assignment, he held positions ranging from analyst to Program Manager/Chief Engineer at Boeing Phantom Works, Lockheed Martin Skunk Works, and Northrop Grumman Aerospace. He has authored over 50 technical articles including 14 utility patents relating to supersonic aircraft design. He is an associate fellow for AIAA, where he chaired subcommit-

A Pilot's Perspective of Flying Drones

(continued from page 3)

Quotes from Fire Commanders included "...fire fighting resources [drones] effectively applied..." "...I've seen the future and it is here..." and "...10,000 residences saved today, thanks to NASA..." Mark concluded with a wonderful video describing the future of drone operations. His entire presentation was very well received.

By Anders Olsen
Mira Costa High School rising senior
Northrop Grumman Summer Intern

On May 23, Colonel Mark Pestana, USAF (ret), presented the history and recent advancements of remotely piloted aircraft systems at the Katy Geissert Civic Center Library in Torrance. Colonel Pestana served as a NASA research pilot in collaboration with the FAA, and helped develop and test advanced unmanned aircraft systems (UAS) capabilities for safe and efficient flight in the National Airspace System.

Colonel Pestana described the obstacles and benefits of UAS's, or drones. While many aspects of flying an unmanned drone are very similar to piloting

an aircraft, it was surprising to learn that in many ways, it is more difficult to fly a drone than an aircraft. Because drone pilots aren't physically located in the cockpit, they are handicapped in some important ways because they lose senses including sound, smell, feeling and taste. The UAS also have embedded safety precautions that do not allow the aircraft to fly at certain angles. Finally, I anticipated more visibility for the remotely piloted aircraft, but the opposite is actually the case. UAS's usually have only two nose-mounted cameras, one color visible and one black and white infrared, because of communication bandwidth limitations.

It was also interesting to learn of the successes using drones to fight fires and save thousands of homes. The IKHANA UAS is able to aid fire fighters more effectively than satellites because the drone imaging is so much better. The IKHANA is able to see fire or hot spots and combine this infrared data with GPS locations and 3-D images to anticipate where the fire may move next. We are still at the beginning stages of UAS usage, and the sky's the limit to the many benefits.

AIAA Los Angeles-Las Vegas Awards Banquet Part 1: Sanford Krasner's Guest Presentation on The InSight Mission

(continued from page 1)

and surface. Yet these missions have only scratched the surface, literally, in offering us 'insight' on what we know about our celestial neighbor. The InSight mission will be ground-breaking in more ways than one!

The InSight (short for "Interior Exploration using Seismic Investigations, Geodesy and Heat Transport") mission goals are to collect data on the geomorphology, seismology and volcanic history of the planet. The mission's suite of instruments is like no other Martian lander or rover: seismometer, RADAR, and a burrowing probe affectionately called "The Mole". This suite will be the most complex, unique, and sensitive ever deployed on a mission. Yet they must also be extremely robust, to withstand the rigors of interplanetary flight and extreme radiation as well as enormous Martian temperature fluctuations.

The six-axis seismometer (Try saying that six times in rapid succession!) SEIS (Seismic Experiment for Internal Structure) instrument collects data on Mars quakes from the interior, as well as from meteorite strikes on the surface. Such strikes are common, due to the thin Martian atmosphere in comparison to Earth's. The fact that the first Mars quake was detected April 23rd, just a few days before Sandy presented at our meeting, made it all the more interesting and relevant.

Two RISE (Rotation and Interior Structure Experiment) RADAR (Radio Detection And Ranging) antennas work in conjunction to precisely track the location of the lander, and thus determine just how much Mars's rotation axis wobbles as it orbits the sun. These wobbles depend on the Mars interior, in particular begging the question "Does Mars have a liquid core?" The inference on interior composition is much like a physics demonstration I do in the classroom on Newton's 1st Law of Motion and conservation of angular momentum. Here I spin first a hard-boiled chicken egg and then a raw egg. Students observe that spinning the raw egg shows a wobble due to its center of gravity shifting as its liquid interior spins, as opposed to the hard-boiled egg with its fixed interior.

The Mole, a self-hammering spike and penetrometer, will bore deep into the interior of Mars, carrying its Heat and Physical Properties Package (HP3) to measure heat flow, both physical and chemical, and so determine thermal conductivity and geothermal gradients within Mars. The HP3 had to be lifted off the Mole's deck onto the Martian surface by a claw-like grapple arm that looks very much like that arcade game where you try to lift a plush toy out of a pile (always unsuccessfully, at least in my case!)

When scientists were deciding on the best place to land the InSight vehicle, they looked for a dull, boring Kansas-like (sorry, Dorothy!) surface near the equator. In the end, InSight landed just 300 meters from the Curiosity Rover. That's when dull and boring (at least as an adjective) ended. We eagerly look forward to hearing from InSight as more data are collected to assist us as we continue to change our models on what we know about Mars.

For more information on InSight, go to <https://mars.nasa.gov/insight/> At <https://bit.ly/2L9U9YY> you can download "Be A Martian" to follow current and future Martian Missions.

See you at the next AIAA Meeting!
Your Martian Next Door

Andrea Diamond is an Earth & Space Physics Education Specialist based in the greater Los Angeles area. For more information on her award-winning STEAM Curriculum, you can find "Queen STEAM" on LinkedIn at <https://bit.ly/2YM1gdc> or on Twitter at @MartianNextdoor

Dr. Bradley Bobbs holds Ph.D. and B.S. degrees in Physics from UCLA and Harvey Mudd College, respectively. He has a long career researching lasers and electro-optics at various Los Angeles companies. You can find him on LinkedIn at <https://www.linkedin.com/in/bradley-bobbs-5311039/>

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

Apollo 50th Anniversary Events: All Are Welcome! Also, call for volunteers!

Amazingly, the Apollo 11 Lunar landing was 50 years ago this month! There are many events in the LA area to celebrate our accomplishment and explore future opportunities in space as well as all that has been done since then. Here are announcements of a few of these events.

Everyone is invited.

If you are an engineer who contributed to that history, you are invited to recall, relive and re-count your experiences in these venues whether your career spans more than those 50 years or just the most recent programs. If none of these are convenient, your local library or civic clubs may welcome your presentation.

July 1-31, Columbia Memorial Space Center, Downey, CA, events calendar for July. This includes many opportunities at LA City Libraries in addition to CMSC events.

<https://www.columbiaspacescience.org/calendar?view=calendar&month=07-2019>

July 13, Santa Monica Public Library, AIAA

Includes separate room for individuals and panels who worked on Apollo programs.

July 13, CMSC, Downey, CA, between 10am-5pm. Kick-off of 50th Anniversary displays.

July 16, Launch Day, CMSC, Downey, CA, anytime between 10am-5pm

We need people who worked on the Saturn booster, launch systems, and launch escape tower

July 16, CMSC marks the launch of Apollo 11 with a day focused on rockets that includes a speaker who worked on the gigantic Saturn V rocket that took astronauts to the moon 50 years ago.

- o Saturn V Presentation (time subject to speaker's availability): 11am
- o *Need some Apollo Program vets for this.*

July 17, Space Theater CMCS, Downey, CA, TBD pm

Performance of space-themed plays by the Denali Theater group.

July 17, AIAA Aero-Alumni, Western Museum of Flight, Torrance, CA, 11am-noon-with lunch to follow. (Maybe Torrance Library)

Apollo's young engineers will discuss their experience with this seminal project of the space race.

July 18, Pub crawl & "fluid dynamics workshops" at vintage watering holes of Apollo engineers.

- o Stox Restaurant 5:30pm-7:00pm 9518 Imperial Highway, Downey, CA 90242, (562) 803-4004
- o Stardust Club (formerly Stardust Cocktail Lounge): 7:30pm-9:00pm 7643 Firestone Blvd, Downey, CA 90241
- o *Need some Apollo Program vets for this (at least one per location, can be different people)*

Apollo 50th Anniversary Events (continued)

July 19, CMSC, Downey, CA, several times between 10am-5pm

- o Join NASA and the Space Center as part of the national commemoration of the mission on NASA TV and Discovery Science. NASA filmed students in the Center a couple of weeks ago to use in the broadcast this day. Also, enjoy hands-on activities and seeing the final projects of the Space Center's Apollo-themed summer camp for students.
- o Noon, Downey City commemoration of Apollo contributions featured on NASA TV
- o Panel discussions of engineers' recollections of the Apollo program, times & participants TBD.

July 20, Lunar landing day, CMSC, Downey, CA, between 10am-5pm. Includes separate room for individuals and panels who worked on Apollo programs.

July 20, California Science Center, Los Angeles, CA anytime between 10am-5pm. Link to the Apollo 11 Celebration: <https://californiasciencecenter.org/headlines/apollo-11-celebration>

July 24, Splashdown day, CMSC, Downey, CA, between 10am-5pm

Celebrate 50 years since the splashdown of Apollo 11 by making and testing parachutes and hearing from the retired engineers who made all of the Apollo parachutes.

Need docents or panelists on the re-entry, parachute and recovery systems or lunar discoveries.

July 27th, West Valley Regional Library (branch of Los Angeles Public Library) 1:00pm-2:00pm

Need one Apollo Program vet for this who can speak 45-60 mins about their experiences working on the Apollo programs

If you want to volunteer to help at these activities, please email gary.moir@ingenuir.com or call Rick O'Connor at CMSC, 562-231-1200. Columbia Memorial Space Center, 12400 Columbia Way, Downey, CA 90242.

Saturday, July 13, 2019

Apollo 11 Moon Landing 50th Anniversary and Lunar Exploration Special Event

SEATS ARE BOOKED: Please contact events.aiaalav@gmail.com or (310)742-4212 / (949)426-8175 (phone/text ok) (AIAA LA-LV Events/Program Chair)

(No Membership required. Volunteers Needed. Please contact:

AIAA LA-LV Section Chair, Dr. Chandrashekhar Sonwane (cgsonwane@gmail.com)

(Lunch / Snacks / Water will NOT be provided. No food/water allowed in the Auditorium)



Apollo 11 Moon Landing 50th Anniversary Sessions

Carl Stechman (Aerospace Propulsion Systems Consultant, Aerojet-Rocketdyne / Marquardt Retired; Apollo, Space Shuttle, Orion Engineer)

Robert Norcross Jr. (Boeing Retired; Apollo, Space Shuttle Engineer)

Michelle Evans (AIAA Distinguished Lecturer, OCSS, <http://www.Mach25Media.com>;

Author: "The X-15 Rocket Plane: Flying the First Wings into Space")

Rod Pyle (Space Author, Historian, Writer; www.pylebooks.com)

Author: "From First on the Moon to Space 2.0")

Hildreth (Hal) Walker Jr. (Pioneer, Laser Technology, the first to successfully fire a laser to the Moon during the Apollo 11 Moon Landing)

and

A brief separate session for individuals sharing their excitement/inspiration from the Apollo era

Lunar Exploration Sessions

Prof. David Barnhart (USC SERC ISI)

Stefan Lamb (Masten Space Systems)

Dr. Jeffrey Puschell (Raytheon Space and Airborne Systems, AIAA Region VI, AIAA Fellow)

Prof. Madhu Thangavelu (USC / ISU)

"Eve & Adam Project for Speedy Lunar Return"

(Additional speakers/panelists TBD)

Please come and join us to celebrate the 50th Anniversary of the Apollo 11 Moon Landing and remember this ground-breaking historical event and the great American experience! Let's keep the momentum going for the American space programs and support space exploration.

NASA recently announced the Moon 2024 and the Artemis Lunar Program, responding to the initiative/call by Vice President Mike Pence. Several commercial space companies/businesses also announced their Lunar Exploration plans and lunar modules. What's the future of the American Lunar/Space Program, and the future of mankind on the Moon and in the Space? Please join us and have sincere and fun discussions for a great relaxing Saturday afternoon that will be remembered for years to come.

Santa Monica Public Library
MLK Jr. Auditorium (First Floor)
601 Santa Monica Blvd.
Santa Monica, CA 90401

Saturday, July 13, 2019, 12:00 PM - 5:00 PM

Presentation starts at 12:30 PM. (Please join us after your lunch)

(Seats/Tickets are limited. RSVP will end after Friday, July 12, 2019, or whenever all seats are filled.)

Dress Code

No open-toe shoes

AIAA LA-LV 8/21 Dinner Meeting

Wednesday, August 21, 2019

Exoplanets! In Search of Habitable Worlds

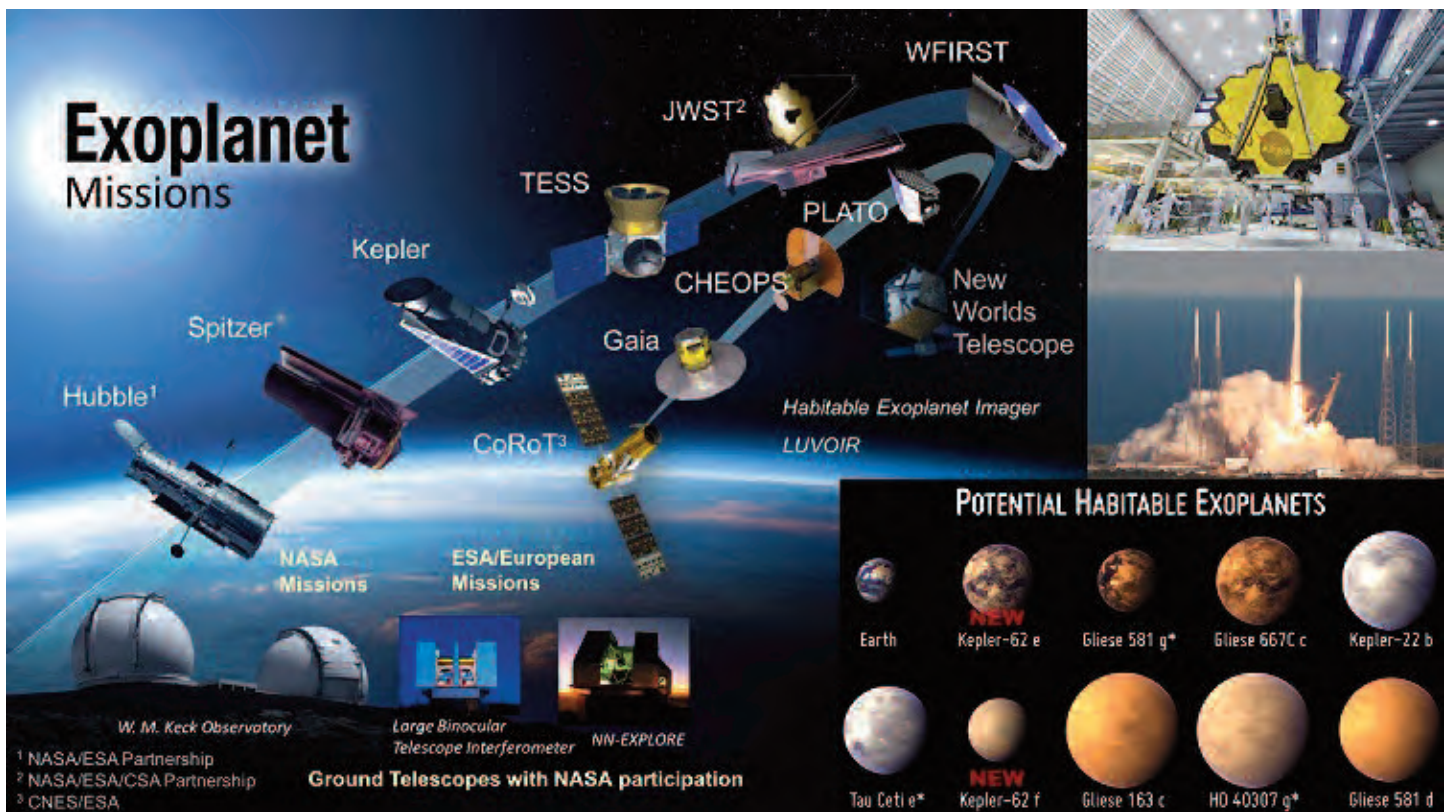
Dr. Jessie Christiansen

Research Scientist, Deputy Science Lead, Caltech/IPAC-NASA Exoplanet Science Institute

and

Dr. Niraj K. Inamdar

Senior Principal Systems Engineer, Raytheon Airborne and Space Systems
(You do not need to be a member of AIAA to attend the event.)



Dr Jessie Christiansen is an astrophysicist with the NASA Exoplanet Science Institute at Caltech, where she searches for, characterises and catalogues planets orbiting other stars. In 2018 she was awarded the NASA Exceptional Engineering Achievement Medal for her role with the successful NASA Kepler Mission, which discovered thousands of exoplanets and revealed that rocky planets are common throughout the galaxy. She now works on the NASA Transiting Exoplanet Survey Satellite (TESS) to find the nearest planetary systems to Earth – systems that will be ripe for further study with the next generation of ground- and space-based telescopes.

Dr. Niraj Inamdar is a Senior Principal Systems Engineer at Raytheon. Over the past decade, Dr. Inamdar has worked in fields as varied as exoplanetary science and planet formation theory; X-ray spectroscopy; mechanical design and analysis; spacecraft attitude dynamics and control; and bioengineering and microfluidics. Before joining Raytheon, he was a physical scientist at RAND Corporation, where his work focused on technical challenges related to national security and defense. Prior to that, he was a space systems architect at The Aerospace Corporation, while as a graduate student, he was an engineer and Science Lead on the Regolith X-ray Imaging Spectrometer (REXIS) instrument flying on NASA's OSIRIS-REx asteroid sample return mission. He received his doctorate from the Massachusetts Institute of Technology (MIT) in planetary sciences in 2016, his master's degree from MIT in mechanical engineering in 2011, and his bachelor's degree in mechanical engineering from the University of Pennsylvania in 2008.

Manhattan Beach Library
1320 Highland Avenue
Manhattan Beach, CA 90266
(South of 105 Hwy and West of 405 Hwy/Pacific Coast Hwy (1))

Parking

<http://www.citymb.info/home/showdocument?id=7678>

(Lot 8 - Free - 10 hour limit, Lots 5, 6, 14, & 15 - \$.75 per hour - 2 hour limit)

Wednesday, August 21, 2019, 5:00 PM - 9:00 PM (Library Closes at 9 PM)
Introduction/Presentation starts at 6:30 PM.

Click here to register: <https://conta.cc/2S15cUY>

(Ticket sales will end after Monday, August 19, 2019 or whenever tickets are sold out.)
(No Refund Within 7 Days of the Event Date or Afterwards)

Dress Code - Business Casual

Contact: events.aiaalav@gmail.com or (310)742-4212 / (949)426-8175 (phone/text ok) (AIAA LA-LV Events/Program Chair)

*Volunteers are needed, please contact:

AIAA LA-LV Section Chair, Dr. Chandrashekhar Sonwane (cgsonwane@gmail.com)

Future AIAA LA-LV Section Events - Please Stay Tuned!

Saturday, August 17, 2019, 9:30 am - 3:00 pm

Space Architecture and Robotic Construction/Manufacturing

Melodie Yashar (Design Architect, Researcher and co-founder of Space Exploration Architecture (SEArch+))

Prof. Boris Fritz (Adjunct Professor, USC)

Dr. Behrokh Khoshnevis (President and CEO, Contour Crafting Corporation)

Prof. Madhu Thangavelu (Faculty Member and Director, USC / ISU)

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

24200 (24210 for the Meeting Room) Narbonne Ave.

Lomita, CA 90717

(Free Library Parking)

Click here to register <https://conta.cc/2S6kTu9>

(Seats/Tickets are limited. RSVP will end after Thursday, August 15, 2019, or whenever all seats are filled.)

*Volunteers are needed, please contact:

AIAA LA-LV Section Chair, Dr. Chandrashekhar Sonwane

(cgsonwane@gmail.com)

Wednesday, September 11, 5:30 - 9:30 pm

The Case For Space

Dr. Robert Zubrin, President, The Mars Society, AIAA Distinguished Lecturer

S-Cafe, Northrop Grumman, One Space Park, Redondo Beach, CA 90278

Registration link is coming soon! Please check the announcement on the AIAA

LA-LV Section website <https://bit.ly/30lvUul>