

2023 MARCH | EL SEGUNDO, CA

# AIAA LA-LV



SPRING  
SPECIAL

## Newsletter

Our monthly communication gives  
the updates in AIAA LA-LV and  
aerospace communities.

AIAA LA-LV University  
Student Branches  
mini-Conference  
2023 (March II)

To protect or avenge  
— 40 years of the  
Strategic Defense  
Initiative, by Prof.  
Mike Gruntman

NASA's Webb  
Telescope Receives  
Michael Collins  
Trophy





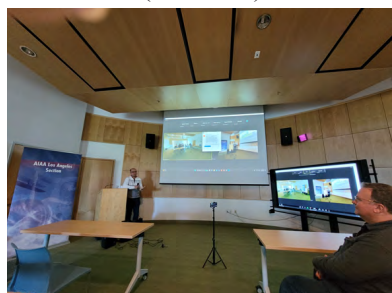
4

To protect or avenge -- 40 years of the Strategic Defense Initiative  
(Prof. Mike Gruntman)



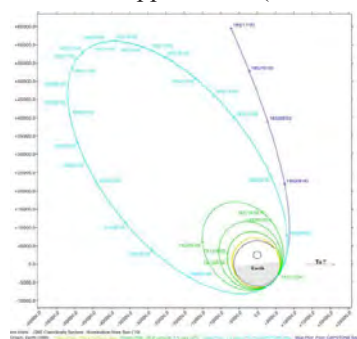
8

AIAA LA-LV University Student Branches mini-Conference 2023  
(March 11)



22

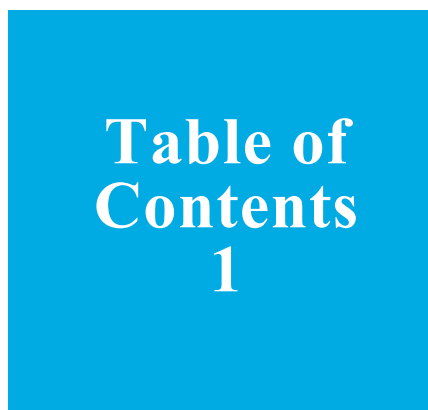
Supply Chain and Traceability in Space Production Applications (March 18)



29

CAPSTONE Reaches NRHO (Daniel R. Adamo)

To send comments or submissions, or to purchase advertising, please contact: AIAA LA LV Newsletter Editor, editor-newsletter@aiaa-lalv.org  
Copyright © 2022-2023 American Institute of Aeronautics and Astronautics, Los Angeles-Las Vegas Section



16

A magic beagle and the stars  
(by Dr. David H. Levy)



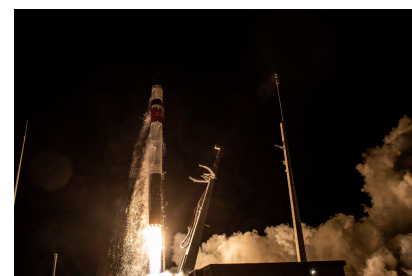
25

AIAA LA-LV Aero Alumni Meeting  
(March 8)



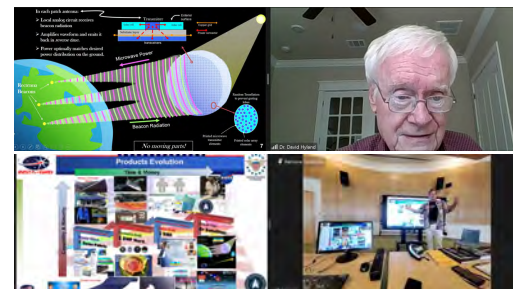
38

AIAA LA-LV Outreach to FIRST Robotics Competition High School Regional Session in the Da Vinci Schools (March 19)



6

Mission Success! Rocket Lab's Latest Electron Launch From Virginia  
(March 24)



19

Aerospace Clean & Sustainability Energy - Power-Star (March 4)



26

AIAA LA-LV Outreach to Bell Garden School District Science Fair, Judging and Exhibition Table (March 8)



43

AIAA LA-LV Outreach Judging in Torrance School District K-12 Invention Competition (March 20)





48

AIAA LA-LV Educators (K-12 STEAM) Meeting (March 25)



51

Robert R. Sandusky Jr. obituary



57

NASA Awards Grants to Support Research, Technology Development



62

Aerospace News Digest

## Table of Contents

2



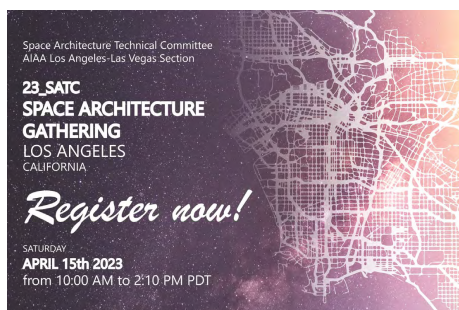
53

NASA's Webb Telescope Receives Michael Collins Trophy (March 23)



59

AIAA LA-LV 2023 Elections Announcement



64

Upcoming AIAA / LA-LV Events



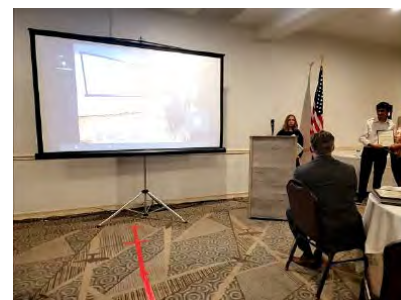
49

Photo Gallery: Venus and Jupiter making a close approach (2023 March 2) (Michelle Evans)



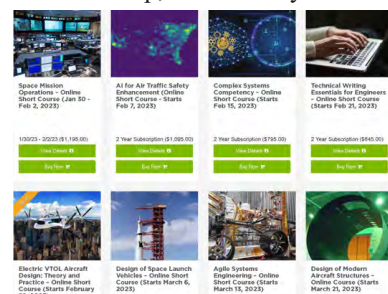
56

Chandra Determines What Makes a Galaxy's Wind Blow



60

AIAA LA-LV K-12 STEAM Awards, Scholarship, SSTC Essay Contest



70

AIAA On-line short courses in the first half of 2023



**American Institute of Aeronautics and Astronautics**  
**Los Angeles - Las Vegas Section**

# Newsletter



## To protect or avenge -- 40 years of the Strategic Defense Initiative

by Mike Gruntman, Professor of Astronautics at USC (2023 March 24)

<https://www.linkedin.com/pulse/protect-avenge-40-years-strategic-defense-mike-gruntman/>

(This op-ed first appeared in *Aerospace Daily & Defense Report*, *Aviation Week & Space Technology* on March 24, 2023.)



Forty years ago in an address to the nation, President Ronald Reagan challenged the country to develop missile defenses where “we could intercept and destroy strategic ballistic missiles before they have reached our own soil or that of our allies.”

Within a few days, the program acquired the name of the Strategic Defense Initiative. Its “ultimate goal of eliminating the threat posed by strategic nuclear missiles,” would include an essential defensive layer in space, in addition to land-based components.

During the last few years, thousands of mass-produced, affordable commercial satellites began operating in orbit. This demonstrates that deploying a constellation of several thousand interceptor satellites for missile defense, as envisioned by the Strategic Defense Initiative (SDI), has become feasible and realistic.

SDI transformed the U.S.-Soviet competition in the Cold War. It shifted it from the offensive strategic forces based on rockets and nuclear technologies, the areas of the traditional strength in the Soviet Union, to the uncertainty of futuristic defensive systems of extraordinary complexity that relied heavily on rapidly advancing precision guidance, microelectronics and computers.

**Disclaimer: The views of the speakers do not represent the views of AIAA or the AIAA Los Angeles-Las Vegas Section. Advertising space is available in the AIAA Los Angeles-Las Vegas Newsletter: Business card, quarter page, half page, and full page, non-AIAA LA-LV business/issues**

The newsletter has over approx. 8,500 subscribers, which is growing.  
 To inquire about purchasing advertising, email Newsletter Editor at [editor.aiaalav@gmail.com](mailto:editor.aiaalav@gmail.com), or, [editor-newsletter@aiaa-lalv.org](mailto:editor-newsletter@aiaa-lalv.org)



**American Institute of Aeronautics and Astronautics**  
**Los Angeles - Las Vegas Section**

[aiaa-lalv.org](http://aiaa-lalv.org) | [aiaa-lasvegas.org](http://aiaa-lasvegas.org)  
[engage.aiaa.org/losangeles-lasvegas](http://engage.aiaa.org/losangeles-lasvegas)





## To protect or avenge -- 40 years of the Strategic Defense Initiative

by Mike Gruntman, Professor of Astronautics at USC (2023 March 24)

<https://www.linkedin.com/pulse/protect-avenge-40-years-strategic-defense-mike-gruntman/>

The USSR harshly criticized the Strategic Defense Initiative. Following a quick denunciation by its supreme leader Yuri Andropov, many heads of Soviet academic and industrial research and development organizations signed the anti-SDI “appeal to all scientists of the world” to undermine the Reagan initiative. Characteristically, some among them had been advocating and leading similar weapon development programs for years.

Before the announcement of SDI, the U.S. concentrated primarily on research and development of technologies, after a brief, five-month operation in 1973 of the Safeguard system protecting a cluster of strategic missile silos. In contrast, the Soviet Union had deployed a permanent nuclear-armed land-based missile defense system around Moscow and was working on the next generation that stands on duty today. The USSR poured enormous resources into the development of missile defense. As Nikita Khrushchev famously bragged to visiting U.S. newspaper editors in 1962, “I know what antimissile systems are since we have them... Our missile, one can say, hits a fly in space.”

In the 1980s, the Soviet response to SDI became, to a significant degree, “symmetric” mirroring U.S. programs, despite the “asymmetric” rhetoric. The Soviet Union accelerated existing weapons programs and initiated new ones.

The country collapsed and disintegrated less than 10 years later. Another 10 years after, former deputy minister of defense of Russia Nikolai Mikhailov summarized the SDI impact, observing that the “name of U.S. President Reagan is linked with ‘the beginning of the end’ of our country, the USSR.”

Fewer than 10 countries possessed ballistic missiles in the 1980s. Today, more than two dozen boast such weapons. Some adversaries combine them with radical political views and ideologies and pursuits of weapons of mass destruction. Despite being so consequential for the survival of the nations, missile defense remains highly politicized, as it had been since its early days in the 1950s.

The opponents believe that defense against strategic missiles does not have technical solutions and focus on arms control. At the same time, others strive to develop realistic technical solutions to these security challenges. During the last decade, Israel’s missile defense spectacularly demonstrated its capabilities against smaller, tactical missiles and provided vital policy options to national leaders for response against existential threats.

The original SDI concept of a nonnuclear defensive space layer evolved to a constellation of interceptor satellites, Brilliant Pebbles. Several programs such as Delta180/181/183, MSX, and Clementine tested some related technologies. With the end of the Cold War in the early 1990s, the SDI was reorganized and faded away. However, some continued to advocate for -- without success -- the importance of space-based defense.

The improved sensor and guidance technologies enabled direct hit-to-kill intercepts of warheads. During the last decade, the United States deployed land-based interceptors in Alaska and California as part of the mid-course defense segment against a limited strike by strategic ballistic missiles from North Korea. Positioning such interceptors on the East Coast and perhaps in Europe is needed to defend against missiles from Iran. The mid-course intercepts in space would have been a primary task for the SDI’s space-based layer, and not limited, in contrast to land-based systems, to defense against ballistic missile attacks from particular geographic directions.

As life goes on and new threats emerge despite the fantasies of the end of history, the eternal competition between the sword and the shield continues. And the main question, encapsulated by Reagan in 1983 remains: “Wouldn’t it be better to protect the American people rather than avenge them?”

It is time to build a space-based missile defense layer.

## Rocket Lab Successfully Launches 35th Electron Seven Days After Previous Launch, Sets New Company Record for Fastest Launch Turnaround *(with permission)*

---



- Just seven days after a successful Electron mission from Launch Complex 2 in Virginia, Rocket Lab has completed another successful mission from the other side of the planet at Launch Complex 1 in New Zealand, demonstrating responsive launch capability from two hemispheres.
- The mission also saw Rocket Lab successfully splash down Electron's first stage in the ocean as part of the Company's plan to make Electron a reusable rocket.

**Long Beach, Calif. March 24, 2023** – Rocket Lab USA, Inc. (Nasdaq: RKLb) (“Rocket Lab” or “the Company”), a leading launch and space systems company, today announced it has successfully launched its 35th Electron rocket from Mahia, New Zealand, deploying two multi-spectral Gen-2 satellites to low Earth orbit for BlackSky (NYSE: BKSy) through launch services provider Spaceflight, Inc. The mission took place just seven days following the Company's previous Electron mission from Launch Complex 2 in Virginia, setting a new company record for fastest turnaround between Electron missions.

The mission, named “The Beat Goes On,” lifted off at 09:14 UTC, 24 March 2023 from Pad B at Launch Complex 1, Rocket Lab's private launch site on New Zealand's Mahia Peninsula.



## Rocket Lab Successfully Launches 35th Electron Seven Days After Previous Launch, Sets New Company Record for Fastest Launch Turnaround *(with permission)*

---



“The Beat Goes On” was Rocket Lab’s seventh launch for BlackSky since 2019, helping to build out BlackSky’s growing real-time geospatial intelligence constellation.

In addition to delivering BlackSky’s satellites to orbit, Rocket Lab accomplished a successful ocean splashdown of Electron’s first stage in an effort to make Electron the world’s first reusable orbital small launch vehicle. The first stage will now be transported back to Rocket Lab’s production complex for assessment, testing and requalification to inform future recovery missions. Pending the outcome of these assessments Rocket Lab may choose to proceed with marine operations as the primary recovery method, opting to transition away from helicopter use.

Rocket Lab is on track this year to surpass its launch record of nine launches set in 2022 with 15 planned launches. Upcoming disclosed Electron missions in 2023 include two launches for the NASA TROPICS constellation, the first of five dedicated missions for Internet-of-Things (IoT) connectivity provider Kinéis; several launches for Capella Space, and the launch of a mission to demonstrate space debris removal technology by Astroscale Japan.

## (2023 March 11) AIAA LA-LV University Student Branches mini-Conference 2023

<https://www.aiaa-lalv.org/blogs/2023-blogs/2023-march/2023-march-11>



*Dr. Paul Bevilaqua gave the Keynote Address on the F-35 Joint Strike Fighter and the Lockheed Martin Skunk Works.*



*Dr. Paul Bevilaqua was awarded 2018 AIAA Daniel Guggenheim Medal and he is very happy to help and inspire the young generations.*



*Mr. Luis Cuevas (AIAA LA-LV Education Chair) thanked Dr. Bevilaqua and presented the LA-LV appreciation certificate and a special gift plaque.*



## (2023 March 11) AIAA LA-LV University Student Branches mini-Conference 2023



AIAA LA-LV Section exhibition table with F-35A and F-35B models and AIAA membership brochures.



(Left) Mr. Luis Cuevas leading the Q&amp;A Session; (Middle) Dr. Bevilacqua answering questions; (Right) Mr. Carson Morgan at the ES Aero table.



(Left) Mr. Shawn Boike asking questions; (Right) folks listening to the questions and sharing from on-line attendees.



**(2023 March 11) AIAA LA-LV University Student Branches mini-Conference 2023**

*AIAA CSULB Student Branch members presenting their AIAA efforts and activities.*



*AIAA UCLA Student Branch members presenting their efforts in AIAA activities.*



*The AIAA UNLV Student Branch members presenting their AIAA activities and making a drone demo. They drove for long hours in heavy rains to join the event!*





## (2023 March 11) AIAA LA-LV University Student Branches mini-Conference 2023

### AeroDesign Team (AIAA Design, Build, Fly)

- Founded in 1991
- 2022 Competition - Placed top 5% (4th place) in April
- In-house PLANETOOLS design and optimization software suit in MATLAB
- Composite, additive, and subtractive manufacturing techniques
- Modeling supplements test/build emphasis (Slightly different competition rules every year)



(Left) The AIAA USC Student Branch could not make it due to spring break, but shared a pre-recorded video. (Right) Speakers and AIAA LA-LV Section Council Members listening to student presentations.



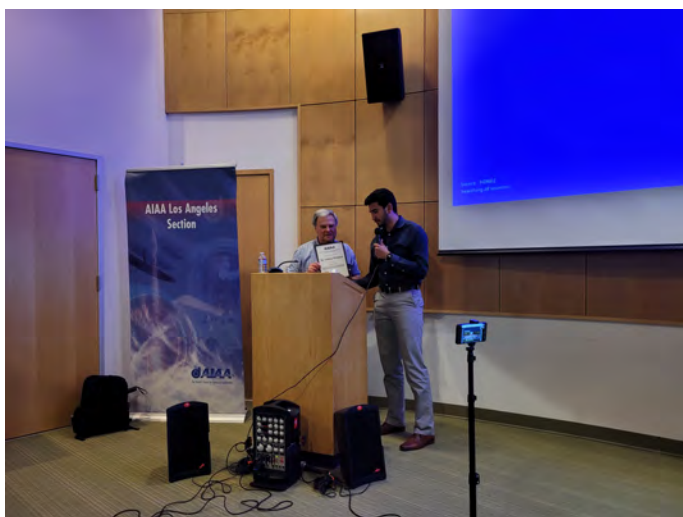
(Left) Mr. Ian Clavio passed the UNLV drone to Dr. Bevilacqua; (Right) Dr. Nahum Melamed talked about Planetary Defense & The Aerospace Corp.



Dr. Melamed explained the possible threats from NEOs and the way to defend and mitigate the risks.



## (2023 March 11) AIAA LA-LV University Student Branches mini-Conference 2023



Mr. Luis Cuevas thanked Dr. Nahum Melamed and presented the Section appreciation certificate and a paperweight with LA-LV art design.



Mr. Dennis Leung talked "What is Integration, Test and Launch for space products" and shared his program management experiences.



(Left) Mr. Dennis Leung shared fun and inspiring stories working in aerospace; (Right) Mr. Luis Cuevas presented the LA-LV appreciation certificate and paperweight to Mr. Leung.



**(2023 March 11) AIAA LA-LV University Student Branches mini-Conference 2023**

(Mr. Shawn Boike shared his exciting project "Power-star" w/ Prof. David Hyland developed; (Right) Exhibitor Mr. Carson Morgan was thanked.



(Left) Mr. Luis Cuevas making the conclusion remarks; (Right) Ms. Dawn Murphy (JPL) shared her thoughts and experiences.



Students and attendees stayed and networked among each other during the networking session.



**(2023 March 11) AIAA LA-LV University Student Branches mini-Conference 2023**

*(Left) Well done, Luis! (Right) Attendees enjoyed the event and had fun till the end.*



*Group photo. It's wonderful and fun with all together in the AIAA family! Stay in touch! Wish all the best and successes in your career and life!*



**(2023 March 11) AIAA LA-LV University Student Branches mini-Conference 2023**

*Group photo in front of the SpaceX Falcon exhibition in the SpaceX Hawthorne Facility after the pre-mini-Conference tour.*

*(Websites or Social Media links for the AIAA LA-LV Student Branches and AIAA LA-LV Section)*

*CSULB Student Branch: [www.csulbaiaa.org](http://www.csulbaiaa.org)*

*UCLA Student Branch: [aiaa.seas.ucla.edu](http://aiaa.seas.ucla.edu)*

*UNLV Student Branch: [involvementcenter.unlv.edu/organization/unlvaiaa](http://involvementcenter.unlv.edu/organization/unlvaiaa)*

*USC Student Branch: [www.facebook.com/USCAIAA/](http://www.facebook.com/USCAIAA/)*

*LA-LV Section: [www.aiaa-lalv.org](http://www.aiaa-lalv.org)*

*Donation link: [www.paypal.com/donate/?hosted\\_button\\_id=QTN5D6G64RZGA](http://www.paypal.com/donate/?hosted_button_id=QTN5D6G64RZGA)*

*(Your generous donation will help us to help the branches and more students / next generations.)*

## A magic beagle and the stars

by Dr. David H. Levy, Comet and Asteroid Hunter, Co-Discoverer, Shoemaker-Levy 9 (2023 April article)

---



(Left) Multiple beagles on the Moon  
(Artwork by Joan-Ellen Rosenthal);  
(Right) Clipper as an older beagle.



It is my honor to introduce you, dear readers, this month to my latest book, “Clipper, Cosmos, and Children: Finding the Eureka moment.” It is a book specially designed to inspire young people to enjoy the night sky. Whether you are physically young, or even just young at heart, this new book is meant to inspire you to reach for the stars.

This book’s genesis was one day a few years ago. As I strolled into the office in the east wing of our home, I saw Wendee engrossed in the reading of an old book entitled Clipper. “When did you write this book?” she inquired.

“I wrote it when I was ten. Around 1958.” Not a word about the stars in it.

“David, this is the best book I have ever read of yours. In fact,” she laughed, “all your other books have gone downhill since this one.” She asked me that day to rewrite Clipper as an astronomy book. I did, and the book is now published by RJI publishing in 2022 and is available from Amazon for about \$20.

As I wrote and revised the book during these recent years, my mind frequently wandered back to the simple, carefree time of my youth. The original Clipper was a Bar Mitzvah present for my older brother, Richard. Perhaps my fondest memory of this



## A magic beagle and the stars

by Dr. David H. Levy, Comet and Asteroid Hunter, Co-Discoverer, Shoemaker-Levy 9 (2023 April article)

---

little beagle dates back to the cloudy evening of December 17, 1965. That was the night

I had planned to begin my search for comets. At around 11 pm I took Clipper for a walk up the hill near our house. As I ambled up the streets nearby, I began to notice a small clearing to the west. I quickly decided to hurry home. Clipper had other ideas. As I headed south, Clipper tried to go north. Our tug-of-war lasted a few unforgettable seconds until a quick jerk on the leash persuaded him who was boss. (He was, but he turned around anyway.) At 11:50 that evening, I began my comet search program through a break in the clouds that lasted less than ten minutes. Now, 58 years later, I am still searching for comets.

Each chapter of my book begins with a passage from the original Clipper. In the story, a young boy named Stephen (the original name, now termed for my grandson Matthew Stephen) goes on a nightly adventure with a magic beagle who, with an equally enchanted telescope, takes him on a frolic through the cosmos, seeing the planets, comets, and asteroids, then the stars of our galaxy, and finally to the massive filaments of galaxies that mark the edges of our known universe. Stephen is soon joined by Kaia, a young girl student named in honor of my granddaughter Summer Kaia.

There is also a strange extraterrestrial girl named Tania who lives on the Moon. Tania comes from a dream I enjoyed decades ago, at the height of the appearance of my brightest comet in 1990, when I encountered a creature shaped like a box, with four feet and four hands and a small head. "I do not have the power to send comets your way," Tania told me, "but I can change their orbits just a bit so there is a greater chance that

## A magic beagle and the stars

by Dr. David H. Levy, Comet and Asteroid Hunter, Co-Discoverer, Shoemaker-Levy 9 (2023 April article)

---

you might find them.” There is even a chapter about nothing, in which Clipper takes the children on a tour across the great voids, bereft of galaxies, that are an integral part of our cosmos.

You are likely all familiar with Peter, Paul, and Mary’s wonderful song about a magic dragon, and how it describes how “a dragon lives forever, but not so girls and boys.” The book’s closing chapter explores what happens when the children grow up and pursue their lives.

The book might be fun, but actually, every telescope, from the tiniest department store telescope to the Webb Space Telescope, is charmed. All it takes is a single, thoughtful gaze that launches you on your own life’s journey across the endless wonder of space and time.

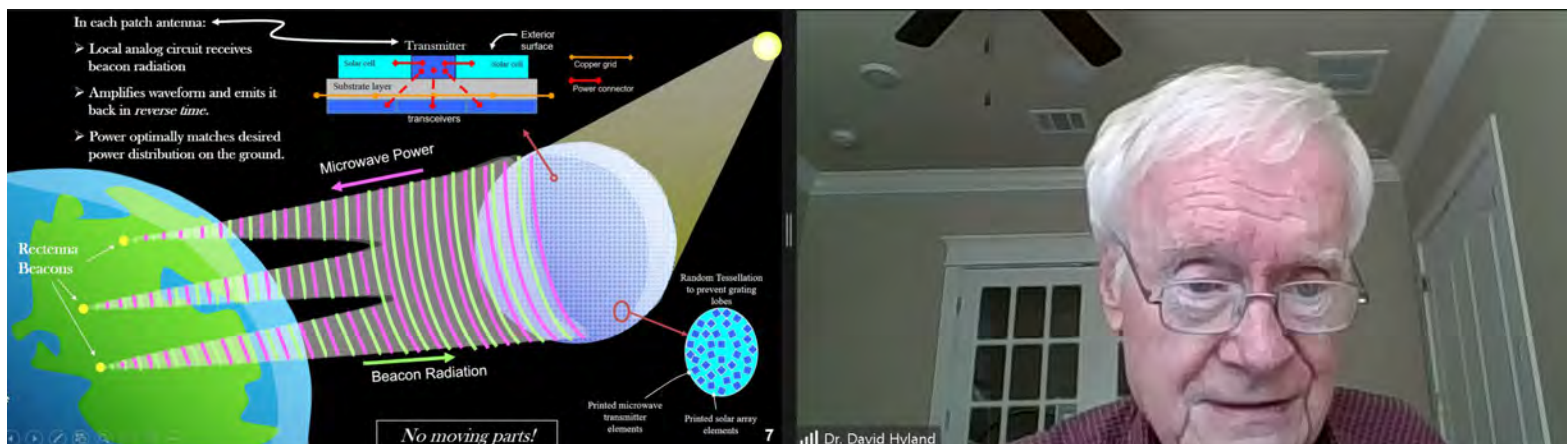


(Right) Clipper puppy.

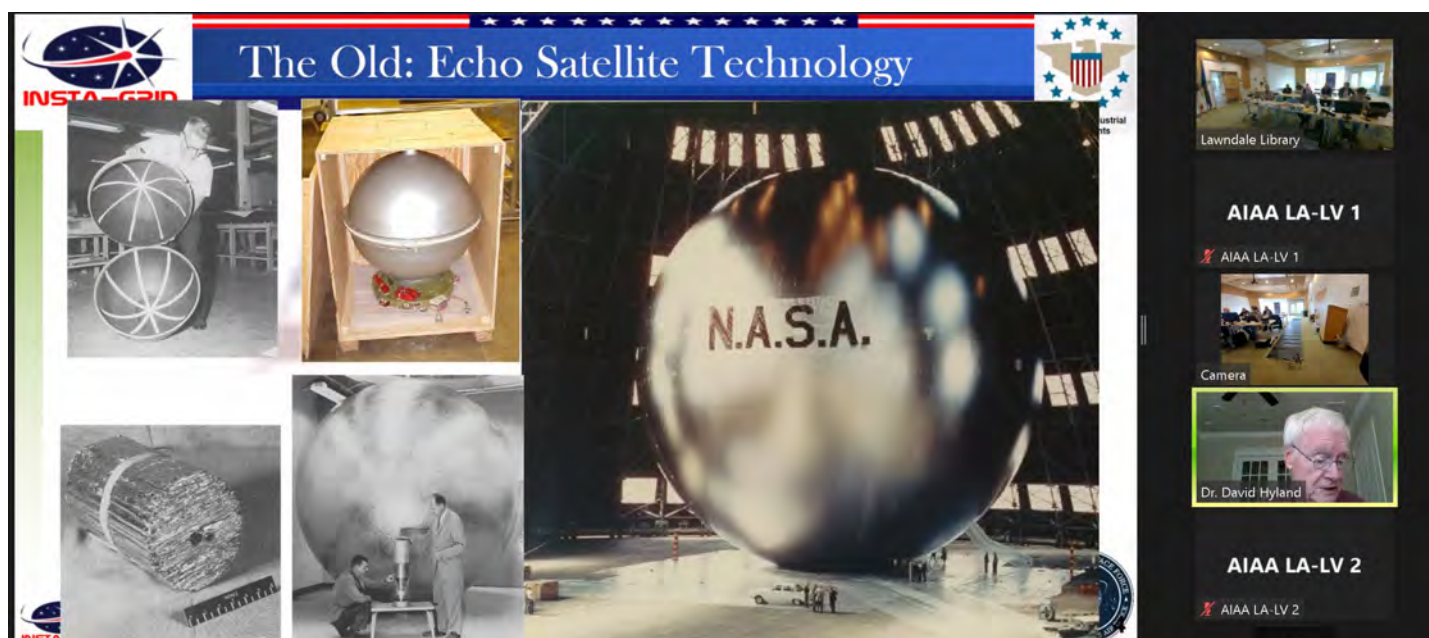


## (2023 March 4) Aerospace Clean & Sustainability Energy - Power-Star

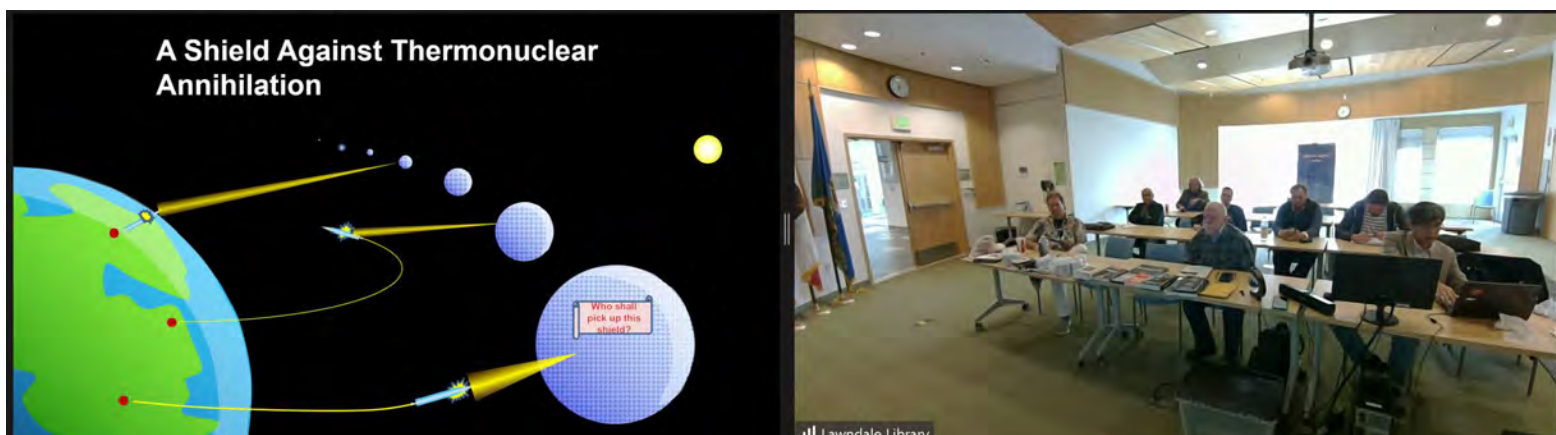
<https://www.aiaa-lalv.org/blogs/2023-blogs/2023-march/2023-march-4>



Prof. David Hyland gave the overview of the Power-Star concept and his studies / research.



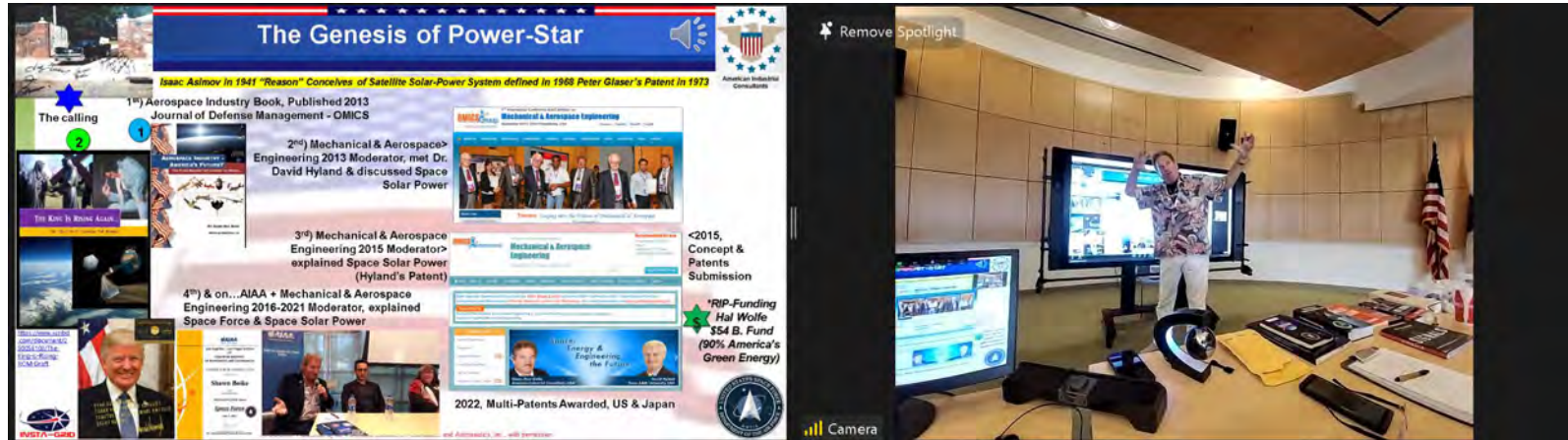
Prof. David Hyland pointed out that the Power-Star is an assembly of several matured/known/proven technologies, including the Echo Satellite.



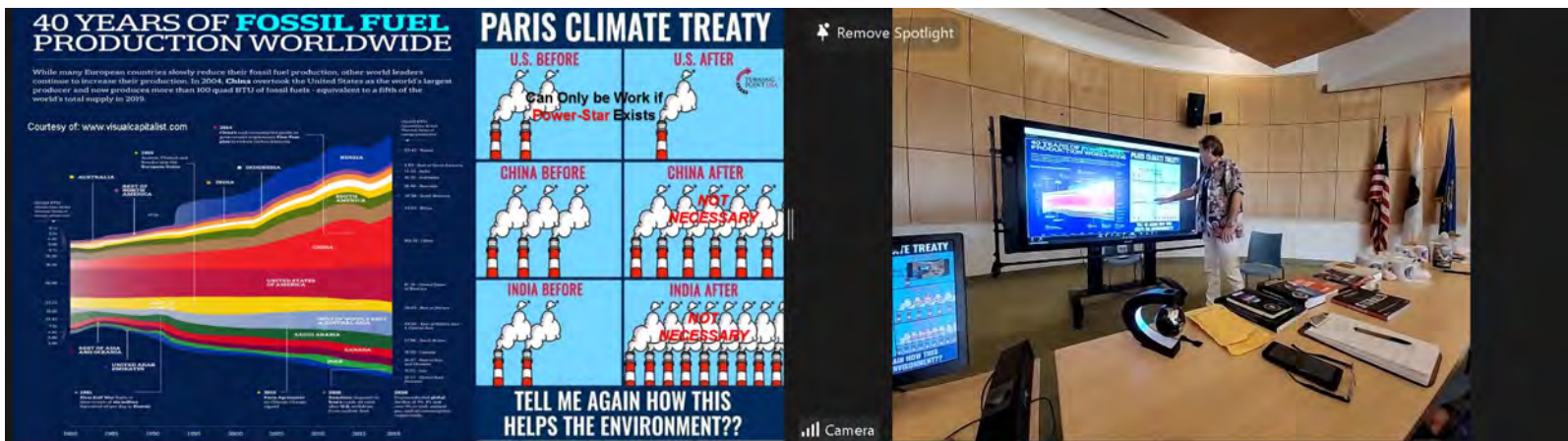
The proposed Power-Star has many applications, including serving as a shield against thermonuclear annihilation.



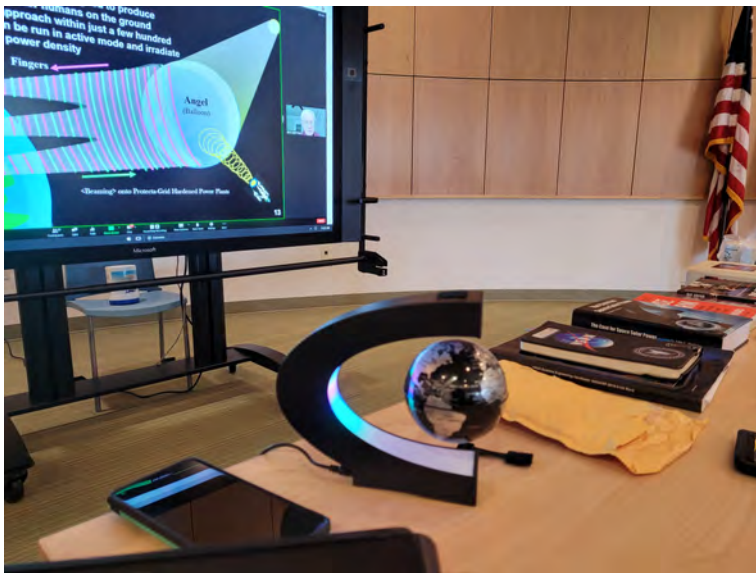
## (2023 March 4) Aerospace Clean &amp; Sustainability Energy - Power-Star



Mr. Shawn Boike explained the Genesis of Power-Star.



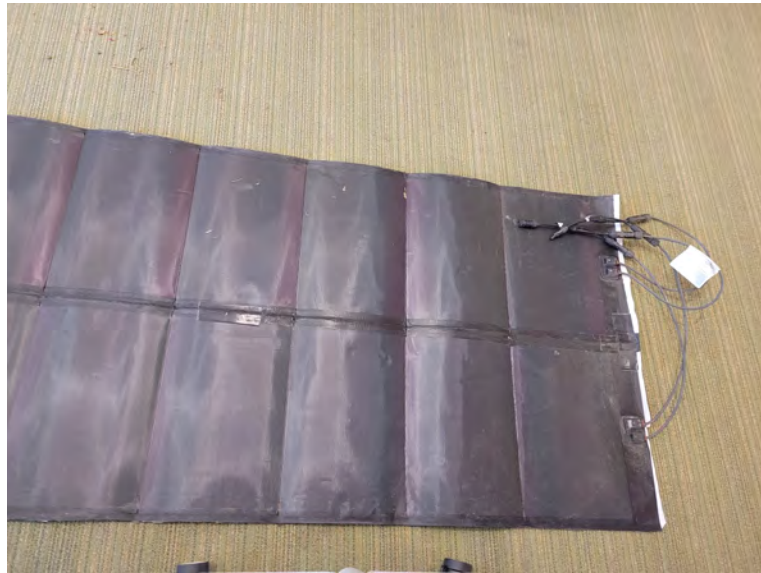
The Power-Star has great potential of clean and sustainable energy using aerospace technologies.



(Left) A rotating Earth model with no direct attachment from the base. (Right) Mr. Shawn Boike made comments during Prof. Hyland's talk.



## (2023 March 4) Aerospace Clean & Sustainability Energy - Power-Star



*The demo solar panel brought and explained by Mr. Shawn Boike.*



*(Left) Mr. Shawn Boike was passionate in the proposal and the concept for helping the Power-Star in to a viable business as well for a wide variety of important applications and usages. (Right) Dr. Ken Lui presented the appreciation certificates for both speakers.*

## (2023 March 18) Supply Chain and Traceability in Space Production Applications

<https://www.aiaa-lalv.org/blogs/2023-blogs/2023-march/2023-march-18>



*Mr. Dennis Leung gave an insightful overview about the supply chain and traceability in space production applications.*

### Early Decisions Affect Overall Supply Chain

- Design Considerations
  - Mission
  - Risk
  - Cost & Schedule
  - COTS or Make Items
- Supplier
  - Capability
  - Reputation
  - Availability



*The decisions made in early stage of design considerations affect overall supply chain. In-person and on-line attendees enjoyed it very much.*



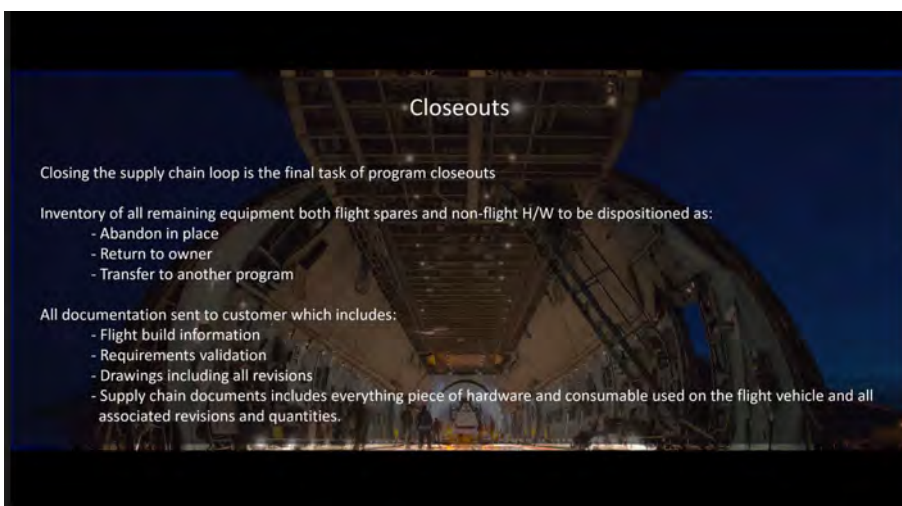
## (2023 March 18) Supply Chain and Traceability in Space Production Applications



*Various types of suppliers and the relations with the Prime Contractors.*

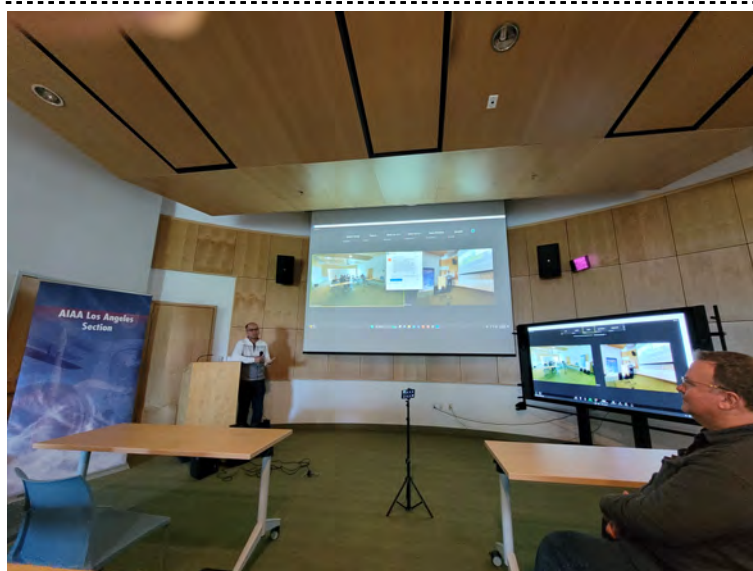


*Using Non Flight HW in test flight operations is a common occurrence.*



*Take-aways and summary from Mr. Dennis Leung's presentation.*

## (2023 March 18) Supply Chain and Traceability in Space Production Applications



*Attendees listened to the presentation with great interests and also engaged in delightful conversations and discussions during networking.*

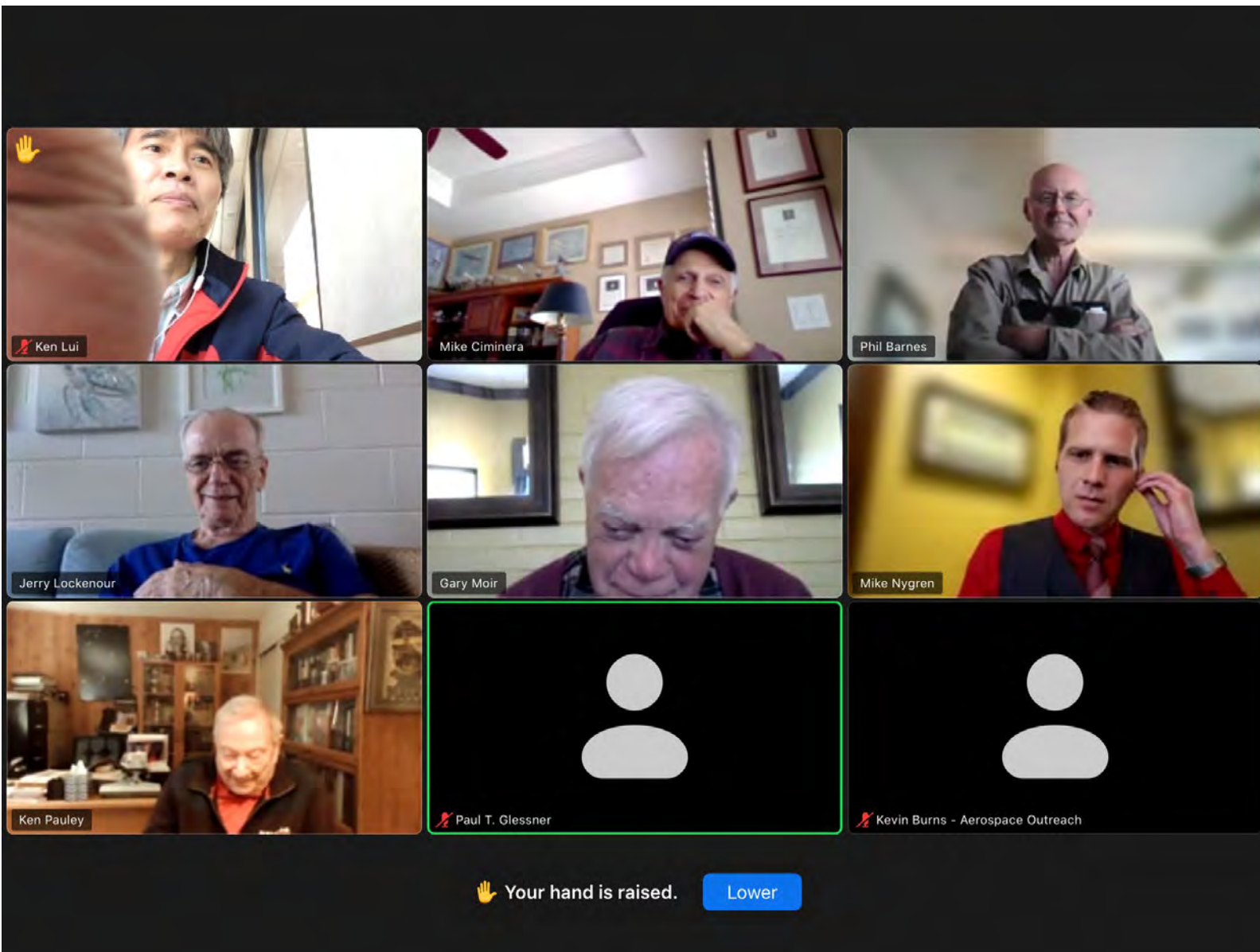


*The LA-LV Section really appreciates Mr. Dennis Leung's effort and will continue to work with him.*



## (2023 March 8) AIAA LA-LV Aero Alumni Meeting

(screenshots only) <https://www.aiaa-lalv.org/blogs/2023-blogs/2023-march/2023-march-8-am>



Aero Alumni and attendees gathered together on March 8 and listened to the briefing by Mr. Mike Nygren (Middle Right) on the radio program "The last supper": How a 1993 Pentagon dinner reshaped the defense industry", and discussed a variety of topics including the new AIAA book by Mr. Mike Ciminera in the final review process, as well as the situation in Ukraine.

## (2023 March 8) AIAA LA-LV Outreach to Bell Garden School District Science Fair, Judging and Exhibition Table <https://www.aiaa-lalv.org/blogs/2023-blogs/2023-march/2023-march-8-pm>



Thanks to our AIAA Educator Member, Ms. Monica Maynard, our LA-LV Section Exhibition Table was right next to the entrance.



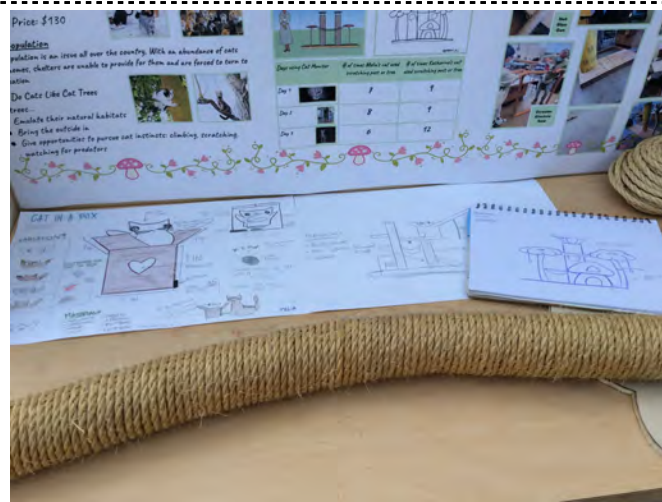
A K-12 Student project on a motorized car. The students tried to find the weights (coins) that would stop his small truck.



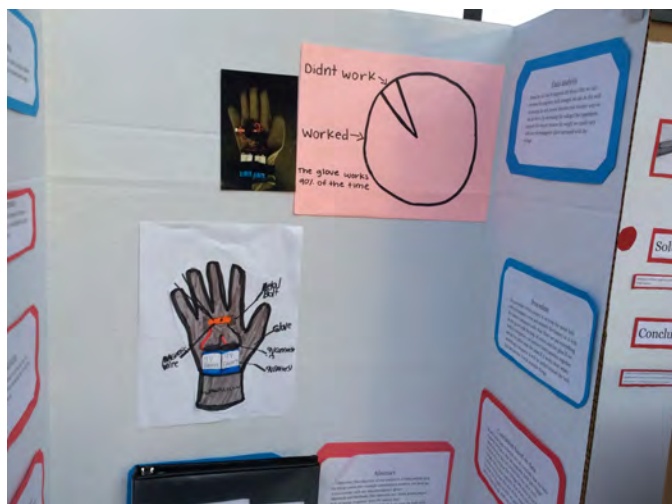
A student project on an automated guided vehicle, with parts assembly and simple coding. And it worked quite well with a motion sensor.



## (2023 March 8) AIAA LA-LV Outreach to Bell Garden School District Science Fair, Judging and Exhibition Table



A fun business project to build a playground for cats for fund-raising for helping stray or abandoned cats.



An interesting projecting making a magnetic glove to pickup magnetics wastes like nails, bolts etc, from trashes.



The LA-LV Section table is at the entrance to the judges' room and the student project display area, easy for attracting visitors.



## (2023 March 8) AIAA LA-LV Outreach to Bell Garden School District Science Fair, Judging and Exhibition Table



*Judges gathered in the room to finalize the scoring process.*



*Trust, Respect, and Responsibility, are the 3 pillars in education and cultivating a wholesome personality.*



*AIAA LA-LV Section displayed membership brochures and interesting aerospace project pamphlet like the RS-25 engine, as well as small models of E2C, V-22 Osprey, and B-2 Spirit, which attracted attention and potential members and inspired many who passed by and visitors.*

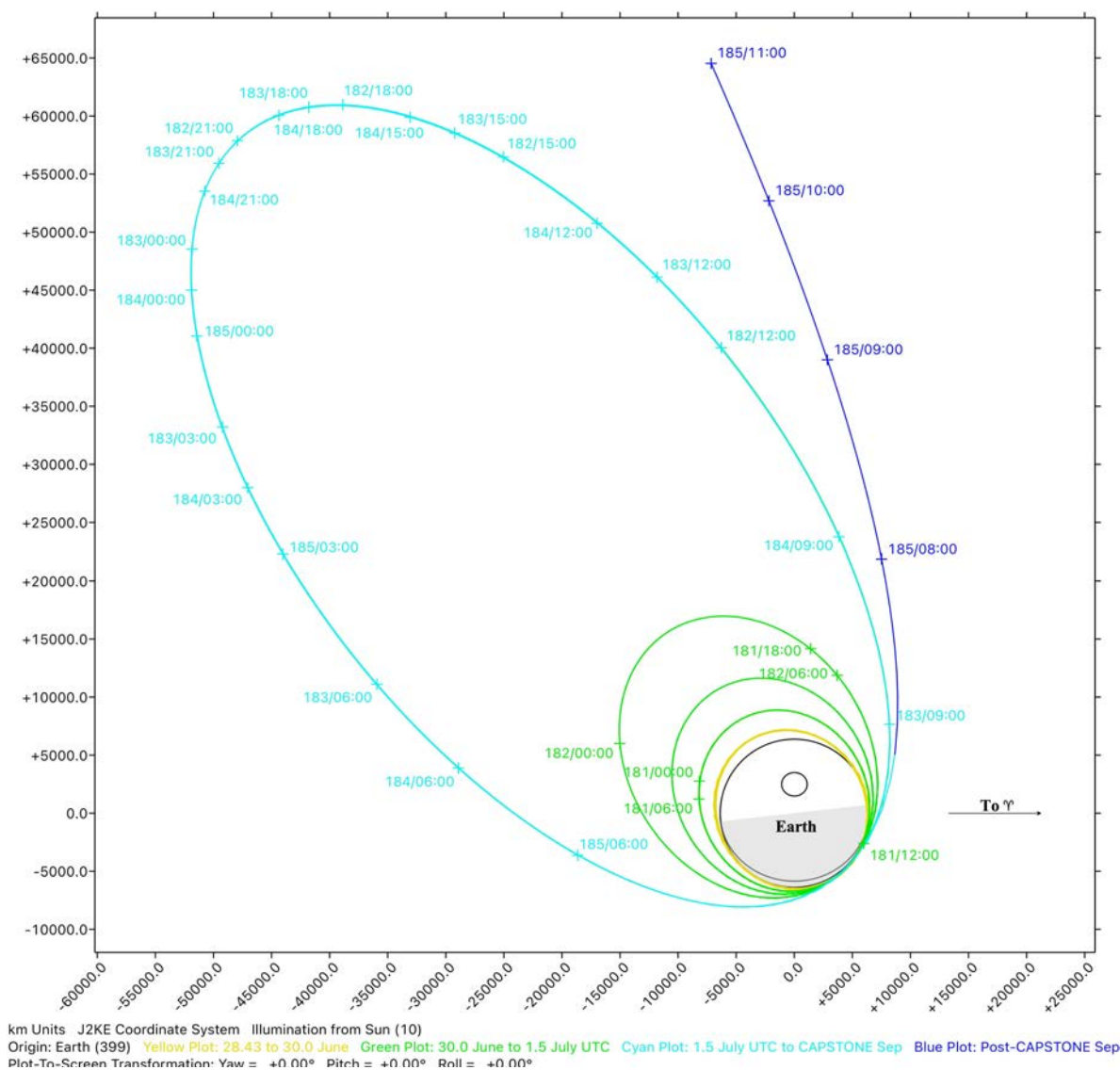




## CAPSTONE Reaches NRHO

Daniel R. Adamo, AIAA Associate Fellow, AIAA Distinguished Speaker (adamod@earthlink.net)

The Cislunar Autonomous Positioning System Technology Operations and Navigation Experiment (CAPSTONE) is a 25 kg CubeSat flying a pathfinder mission for NASA's Artemis Gateway station. In this capacity, it will demonstrate trajectory operations in a nearly rectilinear halo orbit (NRHO) about the Moon.<sup>1</sup> Launched by Rocket Lab's Electron rocket from New Zealand into low Earth orbit on 28 June 2022, CAPSTONE first underwent a series of seven apogee-raising burns provided by Electron's Lunar Photon upper stage.<sup>2</sup> Figure 1 illustrates this process using trajectory data imported from JPL's *Horizons* ephemeris server.<sup>3</sup>



**Figure 1. Geocentric inertial ecliptic plane motion of CAPSTONE is illustrated from 28 June (DOY 179) into 4 July (DOY 185) in 2022 during apogee-raising operations. Time ticks ("+" markers) are annotated by UTC in DOY/hh:mm format. The area shaded gray is Earth's nightside.**

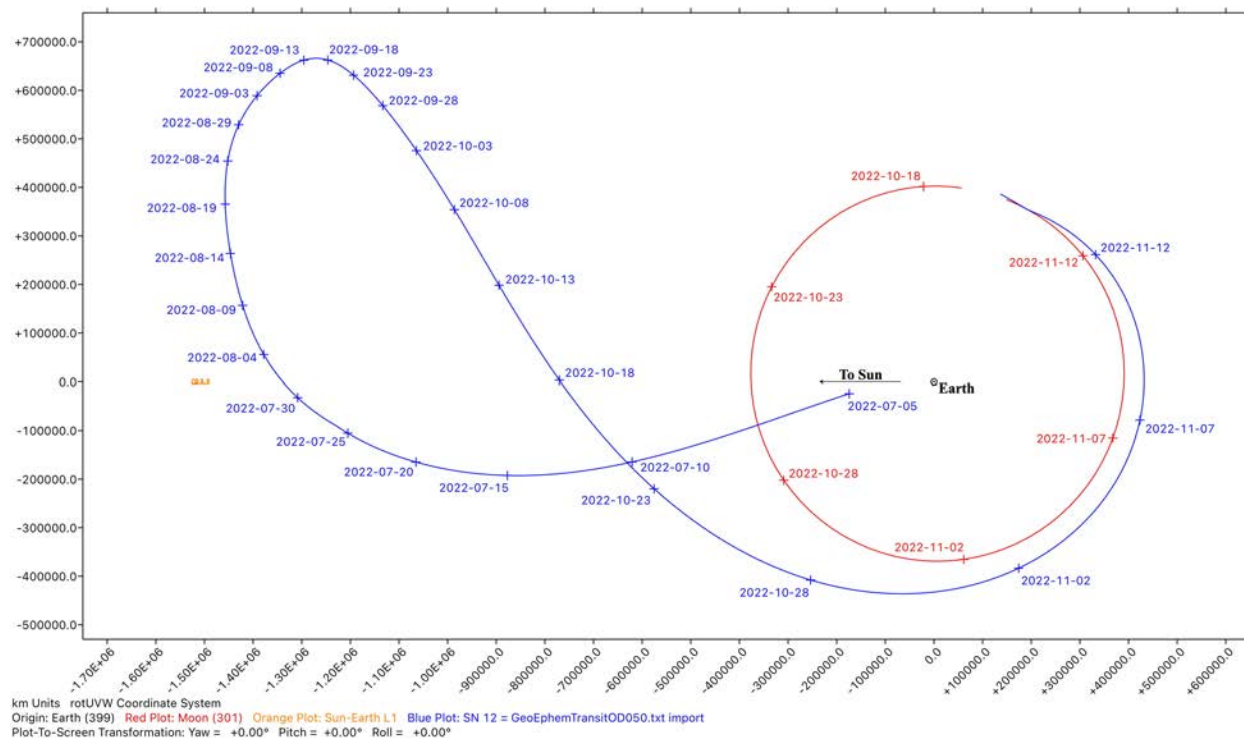
<sup>1</sup> Reference [https://www.nasa.gov/directorates/spacetech/small\\_spacecraft/capstone](https://www.nasa.gov/directorates/spacetech/small_spacecraft/capstone) (accessed 20 December 2022).

<sup>2</sup> Reference <https://spacenews.com/capstone-heads-to-the-moon/> (accessed 20 December 2022).

<sup>3</sup> Reference <https://ssd.jpl.nasa.gov/horizons/> and Object ID -1176 (accessed 20 December 2022). These data are as-flown through 6 December 2022 and predicted thereafter.

## CAPSTONE Reaches NRHO

Shortly after the seventh apogee-raising burn, CAPSTONE separated from its Lunar Photon stage on 4 July 2022 at 07:18 UTC. With only minor subsequent trajectory corrections, CAPSTONE was then on a circuitous course to intercept the Moon as illustrated in Figure 2.



**Figure 2. Motion in the ecliptic plane with respect to the Sun-Earth line is plotted for CAPSTONE (blue), the first Sun-Earth Lagrange point (SEL1, small orange loops at left) and the Moon (red). Time ticks ("+" markers) are annotated with dates in YYYY-MM-DD format at 00:00 UTC. The CAPSTONE plot ends at its insertion into a lunar NRHO on 14 November 2022 at 00:39 UTC.<sup>4</sup>**

During its transit to lunar intercept and NRHO insertion, CAPSTONE has suffered multiple loss-of-control incidents.<sup>5</sup> Although these mishaps posed relatively benign impacts to mission success, control outages extending over multiple days may be intolerable during NRHO operations. Contrary to statements such as "The lunar NRHO is thought to be highly stable",<sup>6</sup> small CAPSTONE orbit adjustments are necessary every few weeks to avert crashing into the Moon or departing the Moon's vicinity altogether. As illustrated by Figure 3 using *Horizons* ephemeris data, CAPSTONE apocynthion distance in NRHO is near 70,000 km. This places CAPSTONE in the Moon's *weak stability boundary*, where strong perturbations from Earth gravity can act for days at a time and render the NRHO dynamically unstable.

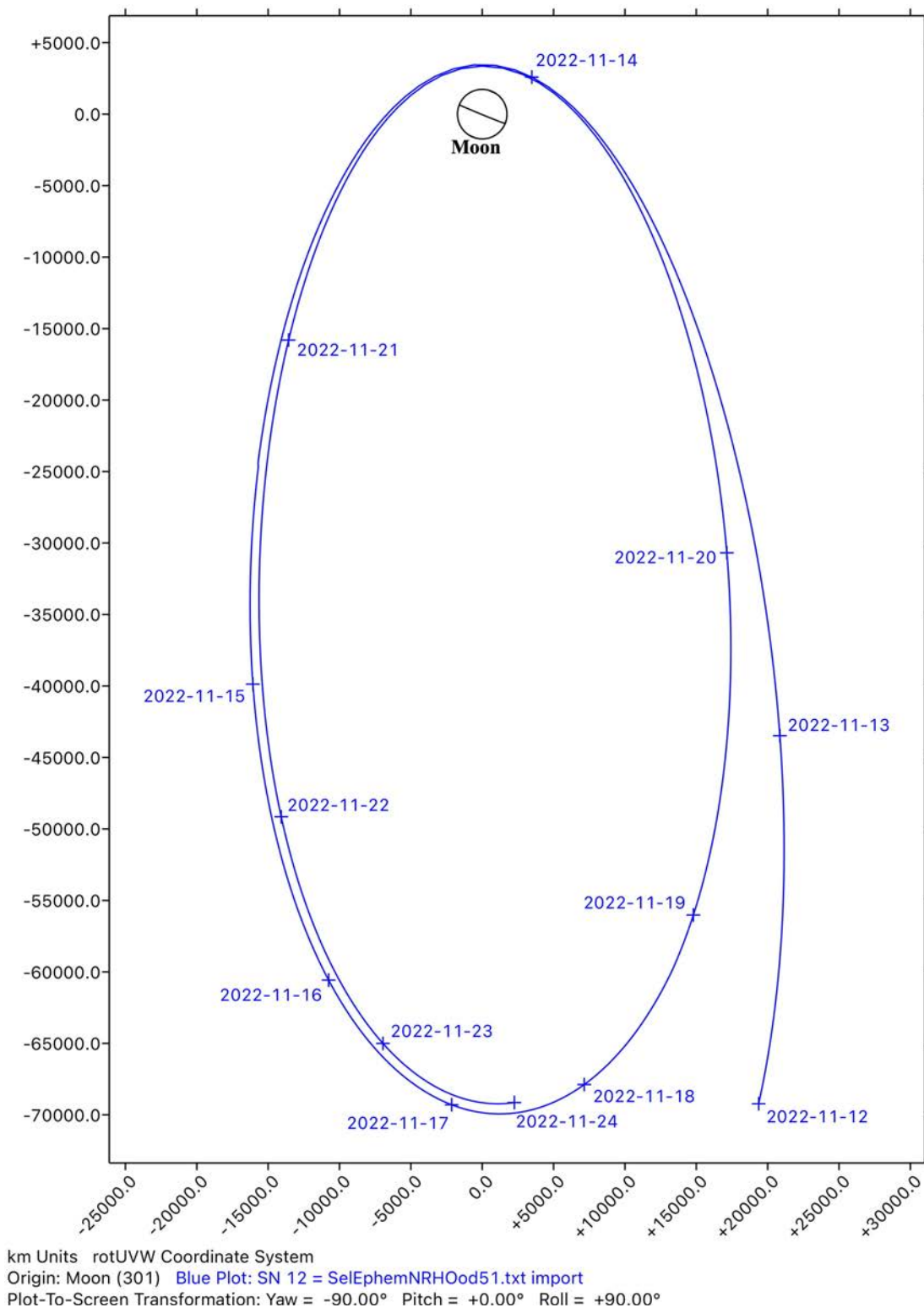
<sup>4</sup> Reference <https://blogs.nasa.gov/artemis/author/sfrazie2/> (accessed 21 December 2022).

<sup>5</sup> The latest such incident is documented at <https://www.space.com/nasa-capstone-overcomes-glitch-targets-moon-arrival> (accessed 20 December 2022).

<sup>6</sup> Reference <https://www.space.com/nasa-capstone-moon-cubesat-first-engine-burn> (accessed 21 December 2022).



## CAPSTONE Reaches NRHO

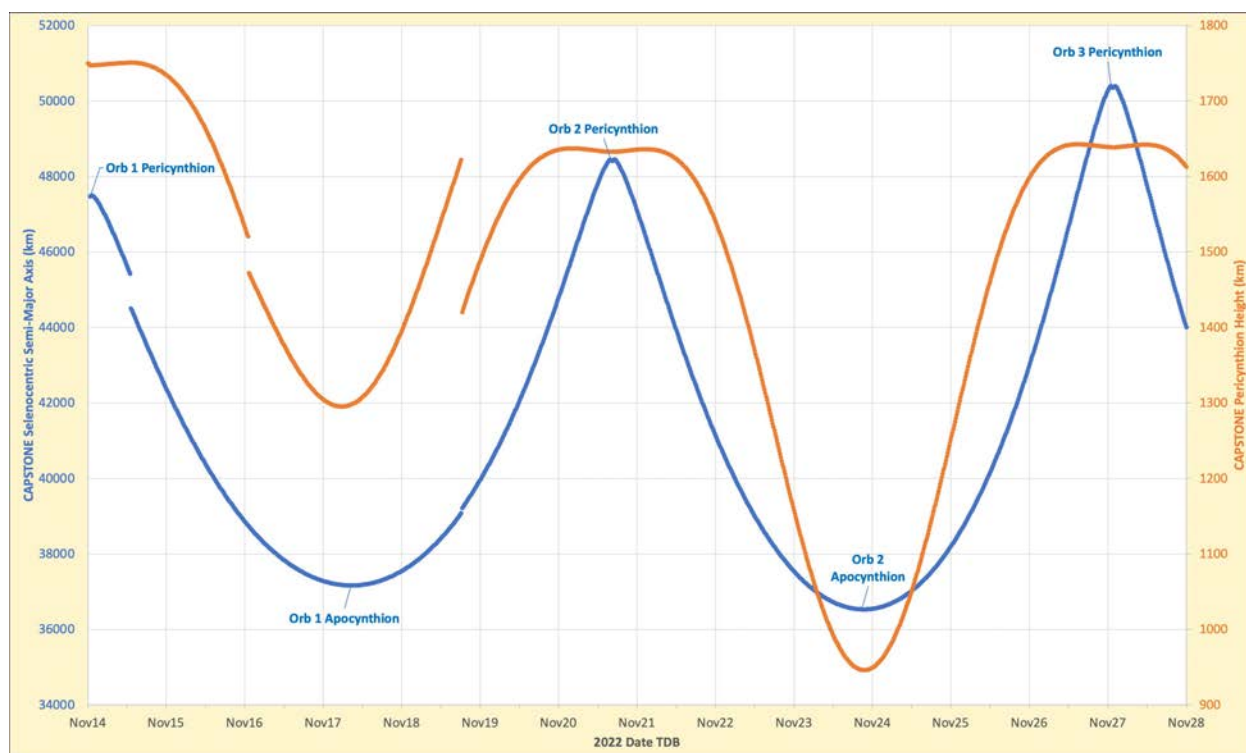


**Figure 3. As-flown CAPSTONE final approach to the Moon and near-pericynthion NRHO insertion at 14.0 November 2022 UTC are plotted in Moon-centered coordinates rotating with the Earth-Moon line. Perspective is approximately perpendicular to the NRHO plane. Time ticks ("+" markers) are annotated with dates in YYYY-MM-DD format at 00:00 UTC. The Moon's north pole is near one o'clock with respect to "up".**

## CAPSTONE Reaches NRHO

A noteworthy feature of CAPSTONE's NRHO evident from Figure 3 is pericyynthion at high northern latitudes. This geometry would *not* facilitate propellant-efficient landings originating at Gateway and targeting hypothesized water-rich sites near the Moon's south pole.<sup>7</sup>

Several orbit adjustments during CAPSTONE's first NRHO<sup>8</sup> are evident as gaps in Figure 4 data. The absence of noticeable gaps after 19.0 November 2022 TDB suggests coasting the *Horizons* CAPSTONE state vector from that epoch forward in time to estimate when Earth gravity perturbations would evolve the NRHO into a lunar impact or departure. This coast is performed with the WeavEncke trajectory predictor<sup>9</sup> using a 300 s fixed integration step and modeling only Sun, Earth, and Moon Newtonian gravity accelerations. Figure 5 illustrates this coast's Moon-centered motion using coordinates and scaling consistent with Figure 3. To assess stabilizing effects of the NRHO correction performed on 18 November, a second coast is initialized immediately beforehand at 18.0 November 2022 TDB and plotted in Figure 6. These two coasts indicate the 18 November correction preserves NRHO motion for an additional month.



**Figure 4.** During CAPSTONE's first two NRHOs, osculating semi-major axis (blue) and pericynthion height (orange) are plotted versus barycentric dynamical time (TDB, about 69 s ahead of UTC). Smooth variations in these loci arise chiefly from Earth gravity perturbations, while gaps in them are attributable to propulsive orbit adjustments.

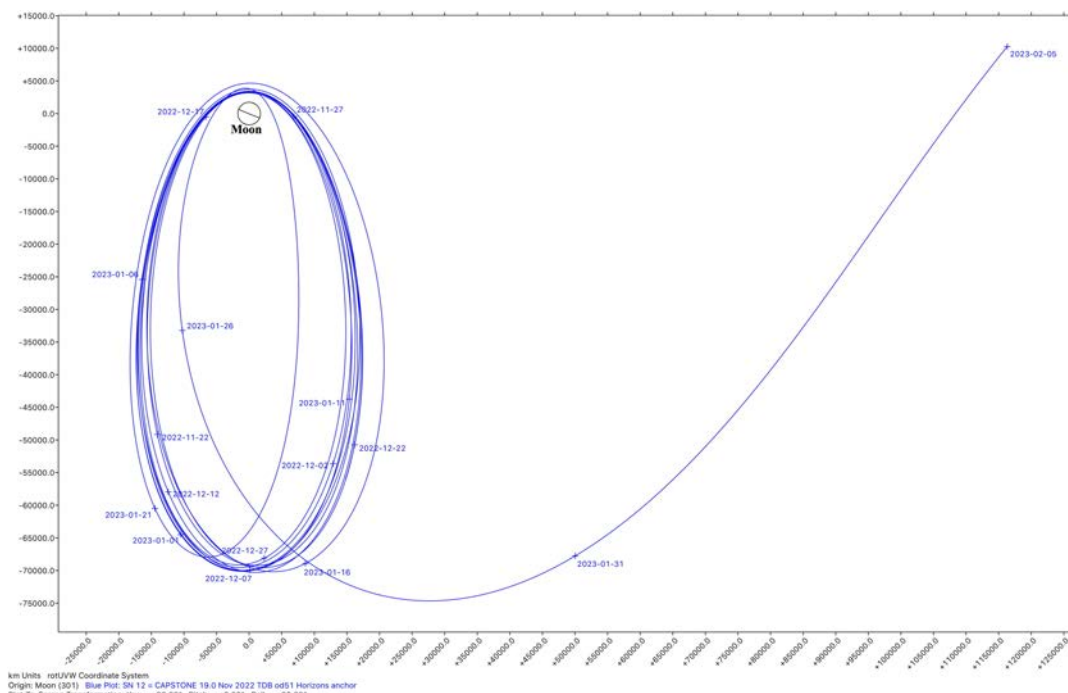
<sup>7</sup> Reference <https://www.nasa.gov/feature/a-lunar-orbit-that-s-just-right-for-the-international-gateway> (accessed 25 December 2022).

<sup>8</sup> Upon entering NRHO, CAPSTONE is defined to be in its first orbit (Orb 1). This tally is incremented thereafter each time CAPSTONE crosses the Moon's equatorial plane moving northbound.

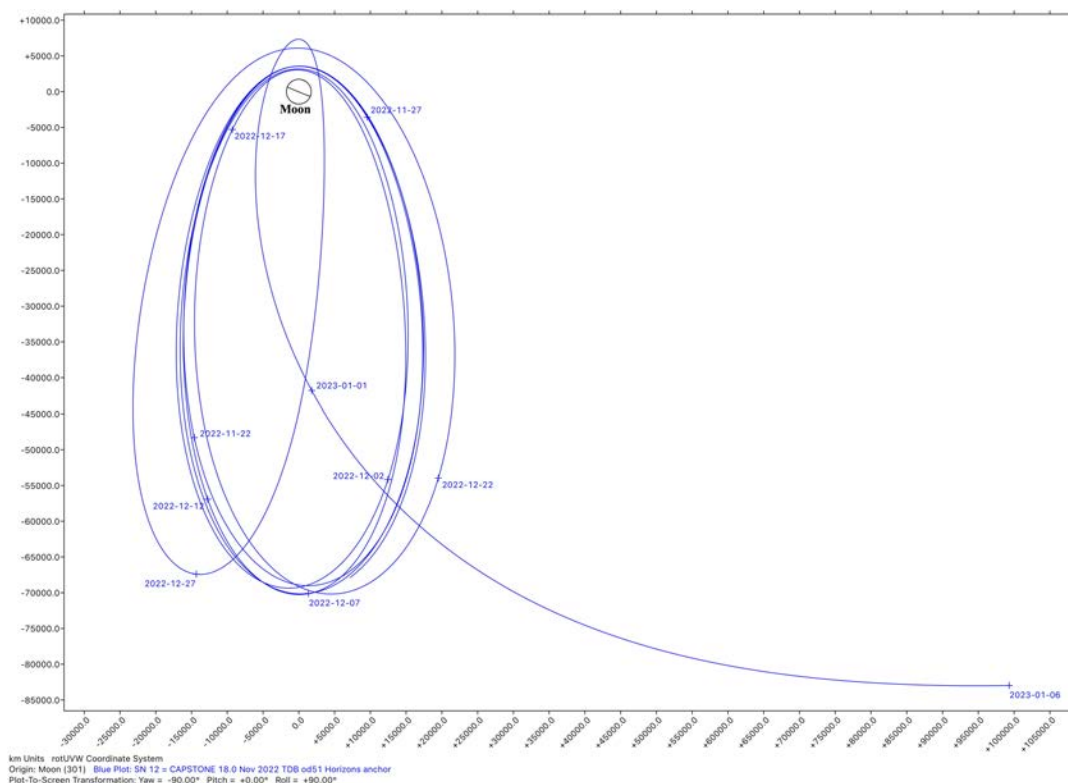
<sup>9</sup> WeavEncke is documented in D. R. Adamo, "A Precision Orbit Predictor Optimized For Complex Trajectory Operations", AAS 03-665, Volume 116 of *Advances in the Astronautical Sciences*, Univelt, 2003, pp. 2567-2586.



## CAPSTONE Reaches NRHO



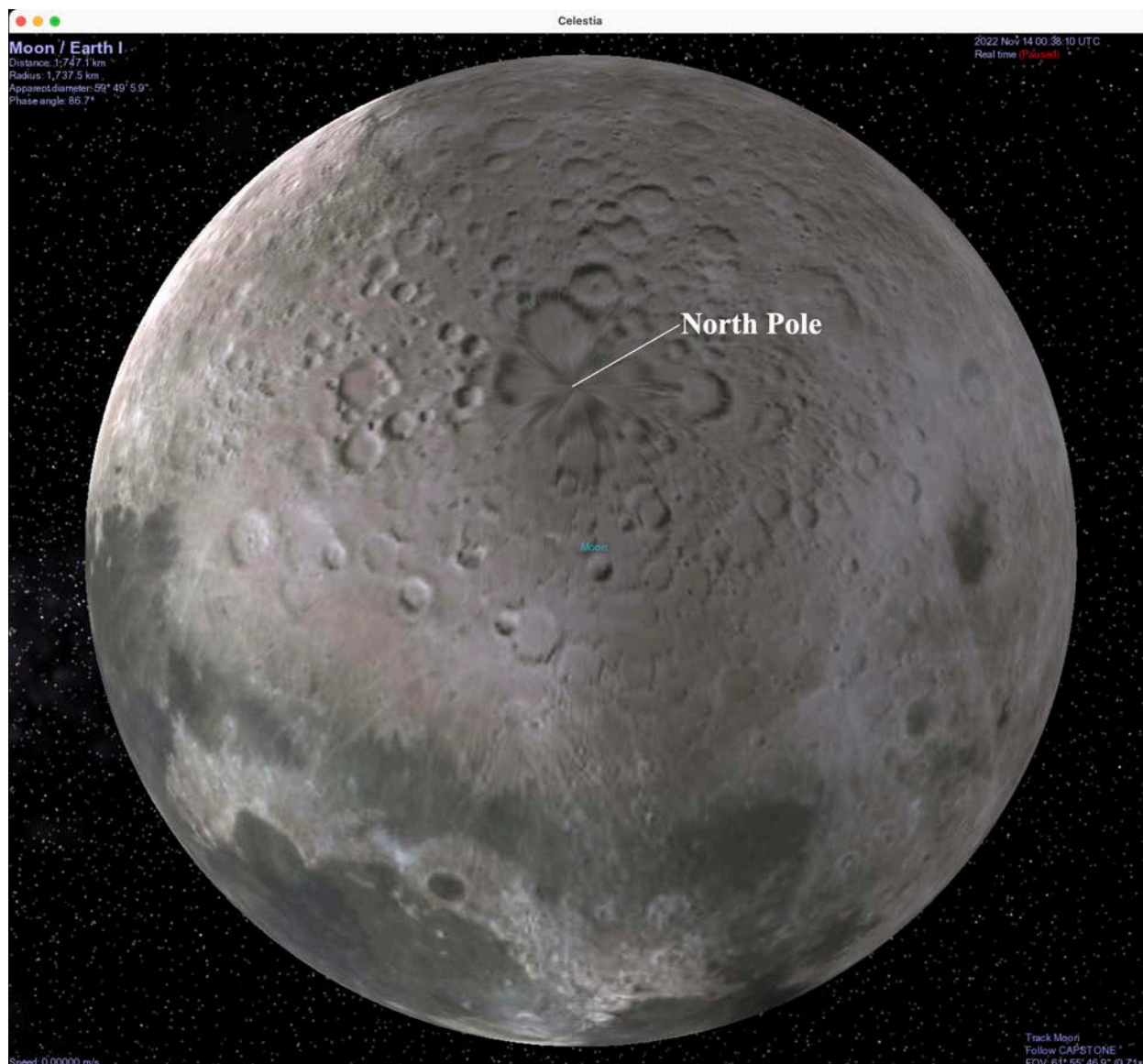
**Figure 5.** Hypothetical Moon-centered coasted motion is plotted following initialization from CAPSTONE's as-flown *Horizons* ephemeris at 19.0 November 2022 TDB. The associated NRHO degrades by late January 2023 on Orb 12.



**Figure 6.** Hypothetical Moon-centered coasted motion is plotted following initialization from CAPSTONE's as-flown *Horizons* ephemeris at 18.0 November 2022 TDB. The associated NRHO degrades by early January 2023 on Orb 8.

## CAPSTONE Reaches NRHO

Pericyynthions falling at high northern latitudes in CAPSTONE's NRHO are confirmed by importing *Horizons'* CAPSTONE ephemeris into a *Celestia* 3D visualization simulation.<sup>10</sup> Figure 7 is a snapshot of this simulation near NRHO insertion and Orb 1 pericynthion.



**Figure 7. The Moon as seen by CAPSTONE at Orb 1 pericynthion and NRHO insertion is rendered by *Celestia*. Earth and the lunar nearside hemisphere are downward from the Moon's apparent center. Motion across the Moon's surface in NRHO is roughly right-to-left.**

Motion noted in Figure 7's caption, where CAPSTONE's NRHO ground track is never far from the Moon's nearside/farside boundary, is well preserved during a *Celestia* simulation from 14 November 2022 until 5 January 2023. Throughout this interval, no Earth occultations by the

<sup>10</sup> Reference v1.6.2 at <https://celestia.space> (accessed 27 December 2022).



## CAPSTONE Reaches NRHO

Moon are evident from CAPSTONE's perspective. With selenocentric longitude of CAPSTONE's ascending node never far from 90° E in Table 1, Earth occultations cannot arise.

**Table 1. Selenographic geometry for CAPSTONE's *Horizons* ephemeris is tabulated at its first eight NRHO ascending nodes on the Moon's equator (passage through the Orb 0/1 node is 88 minutes before NRHO insertion).**

| Orb | 2022 UTC     | ° Longitude | ° Inclination |
|-----|--------------|-------------|---------------|
| 0/1 | 13 Nov 23:11 | 90.1 E      | 101.1         |
| 1/2 | 20 Nov 14:44 | 84.1 E      | 96.4          |
| 2/3 | 27 Nov 00:02 | 91.5 E      | 85.6          |
| 3/4 | 03 Dec 11:36 | 99.2 E      | 90.9          |
| 4/5 | 10 Dec 03:21 | 90.7 E      | 100.4         |
| 5/6 | 16 Dec 20:53 | 82.5 E      | 98.7          |
| 6/7 | 23 Dec 07:53 | 88.7 E      | 86.1          |
| 7/8 | 29 Dec 16:20 | 98.3 E      | 89.2          |

In the absence of perturbations, one would expect Table 1's longitude of ascending node values to decrease at a rate near 13.176° per day, as the Moon rotated eastward under the inertially fixed NRHO plane. Instead, CAPSTONE's orbit plane is quite dynamic in inertial space. Figure 8 illustrates these dynamics by plotting selenocentric inclination  $i$  and right ascension of the ascending node  $\Omega$  in CAPSTONE's *Horizons* ephemeris as functions of TDB. Note how  $\Omega$  increases with TDB, cycling through a full 360° from 8.302 December 2022 UTC to 4.198 January 2023 UTC, an interval of 26.896 days. The inferred average eastward rate of  $360/26.896 = 13.385^\circ$  per day matches the Moon's inertial rotation rate to within 1.6%.

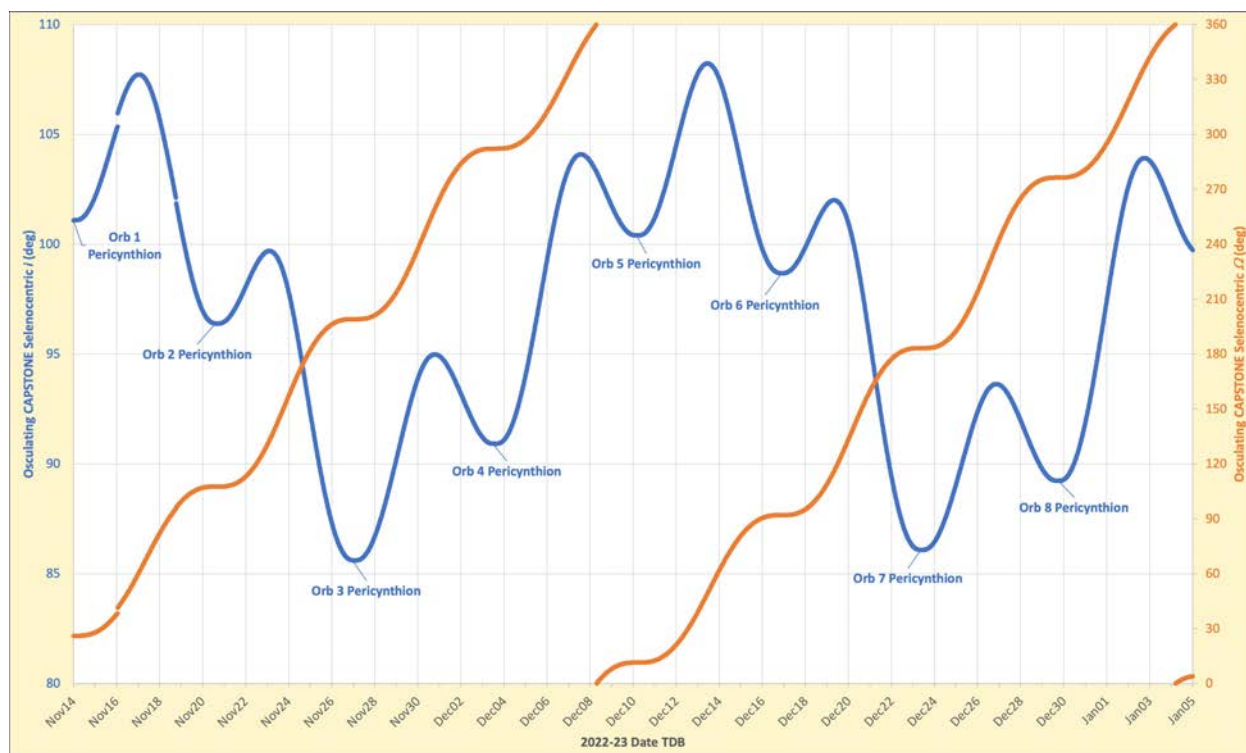
Closer examination of Figure 8's  $\Omega$  plot indicates the rate of increase is greatest near apocynthion when Earth gravity perturbations are also greatest. To verify Earth gravity is indeed responsible for  $\Omega$  increases in CAPSTONE's NRHO, two WeavEncke coasts initialized with the *Horizons* ephemeris state vector at 19.0 November 2022 are made. The first coast models gravity accelerations from the Moon, Earth, and Sun, while the second excludes Earth gravity. Table 2 presents Orb 7/8 longitude results from these NRHO trajectory sources.

**Table 2. Deviations ( $\Delta$ , in the sense "trajectory source minus *Horizons*") in Orb 7/8 ascending node selenocentric longitude are presented for three trajectory sources.**

| Trajectory Source          | UTC              | ° Longitude | ° $\Delta$ |
|----------------------------|------------------|-------------|------------|
| <i>Horizons</i>            | 29.6803 Dec 2022 | 98.319 E    | +0.000     |
| WeavEncke (Moon/Earth/Sun) | 29.6703 Dec 2022 | 96.969 E    | -1.350     |
| WeavEncke (Moon/Sun only)  | 09.3253 Jan 2023 | 140.779 E   | +42.460    |

The  $\Delta$  value associated with Table 2's WeavEncke coast excluding Earth gravity is much larger in magnitude if longitude "wrapping" is taken into account. Indeed, the Moon has rotated 676.273° during this 51.3261-day coast. Assuming the two wraps suggested by Figure 8's  $\Omega$  plot, a more appropriate value for Table 2's "no Earth gravity" WeavEncke coast would be  $\Delta = 42.460 - 720 = -677.540^\circ$ . This deviation's magnitude matches the Moon's rotation during the coast to within 0.19%.

## CAPSTONE Reaches NRHO



**Figure 8. Variations in selenocentric inclination ( $i$ , blue) and right ascension of the ascending node ( $\Omega$ , orange) are plotted versus TDB over the first 52 days of NRHO motion in CAPSTONE's *Horizons* ephemeris.**

The foregoing analysis indicates CAPSTONE's NRHO apocynthion has been carefully targeted to achieve and maintain a "halo" orbit about the Moon as seen from Earth. Communication outages are thus averted over an extended period of time.

In contrast to continuous communications with Earth, the previously described *Celestia* simulation detects two CAPSTONE entries into the Moon's shadow as cast by the Sun during Figure 8's time interval. Circumstances for these eclipses are detailed in Table 3.

**Table 3. During the second half of December 2022, two solar eclipses in NRHO are detected with a *Celestia* simulation using CAPSTONE's *Horizons* ephemeris.**

| Orb | Ingress UTC  | Egress UTC   | Eclipse Duration (min) |
|-----|--------------|--------------|------------------------|
| 5/6 | 16 Dec 20:24 | 16 Dec 21:34 | 70                     |
| 8   | 29 Dec 18:28 | 29 Dec 19:40 | 72                     |

The 16 December eclipse occurs with CAPSTONE orbiting northbound over the Moon's eastern hemisphere, as illustrated by Figure 9, and the 29 December eclipse occurs with CAPSTONE orbiting southbound over the Moon's western hemisphere, as illustrated by Figure 10.

Even at this early stage of its planned half-year in NRHO, the CAPSTONE mission is providing useful information on the contemplated Gateway station's orbit stability. However successful CAPSTONE may be in maintaining its NRHO, inferring similar results for Gateway should be

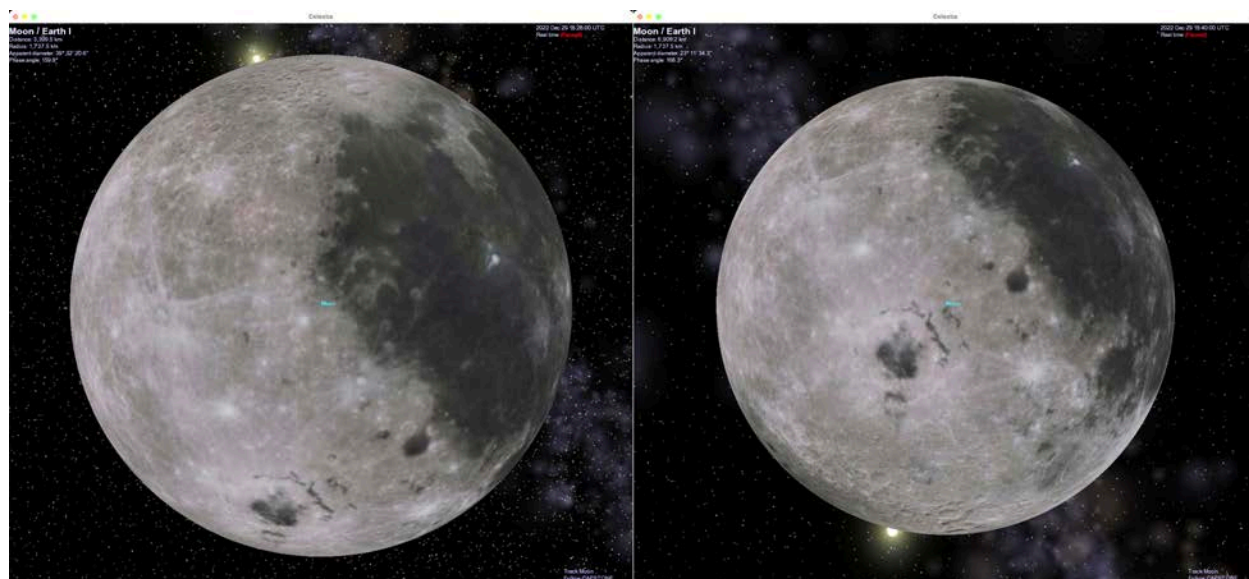


## CAPSTONE Reaches NRHO

tempered by stark differences between a crew-tended space station and a CubeSat. Gateway must cope with greater mass (on the order of 20,000 kg as estimated from advanced planning illustrations), long appendages, asymmetric structure, and additional perturbations from its habitat venting and dumping consumables overboard. These differences will likely equate CAPSTONE's NRHO maintenance experience with a Gateway best case during uncrewed operations.



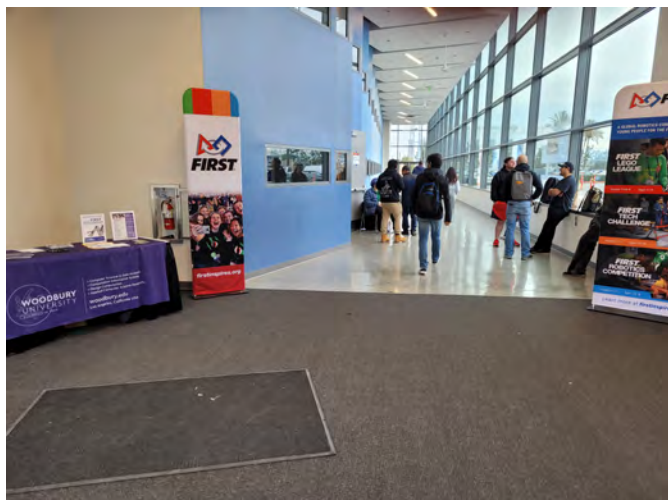
**Figure 9.** The view from CAPSTONE at ingress (left) and egress (right) from the Moon's shadow cast by the Sun during a northbound, eastern hemisphere, 16 December 2022 solar eclipse in NRHO as rendered by *Celestia*.



**Figure 10.** The view from CAPSTONE at ingress (left) and egress (right) from the Moon's shadow cast by the Sun during a southbound, western hemisphere, 29 December 2022 solar eclipse in NRHO as rendered by *Celestia*.



## (2023 March 19) AIAA LA-LV Outreach to FIRST Robotics Competition High School Regional Session in the Da Vinci Schools <https://www.aiaa-lalv.org/blogs/2023-blogs/2023-march/2023-march-19>



*The Da Vinci Schools hosted the FIRST Robotics High School Students Regional Contest in this area.*



*(Left) An AIAA High School member, Miss Valeria Santoyo, was in one of the student team; (Middle) Dr. Ken Lui, Section Chair of the AIAA LA-LV Section; (Right) Ms. Joan Horvath (AIAA Professional Member) was a judge for 21+ years.*



## (2023 March 19) AIAA LA-LV Outreach to FIRST Robotics Competition High School Regional Session in the Da Vinci Schools *(photos only)*



*Students preparing for the competition and also sitting on the bleachers cheering for their teams.*



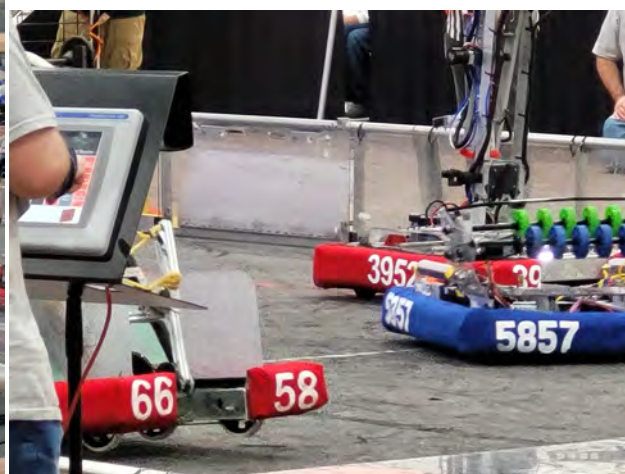
*Students monitoring their robots and also maneuvering them for some parts of the competition.*



## (2023 March 19) AIAA LA-LV Outreach to FIRST Robotics Competition High School Regional Session in the Da Vinci Schools *(photos only)*



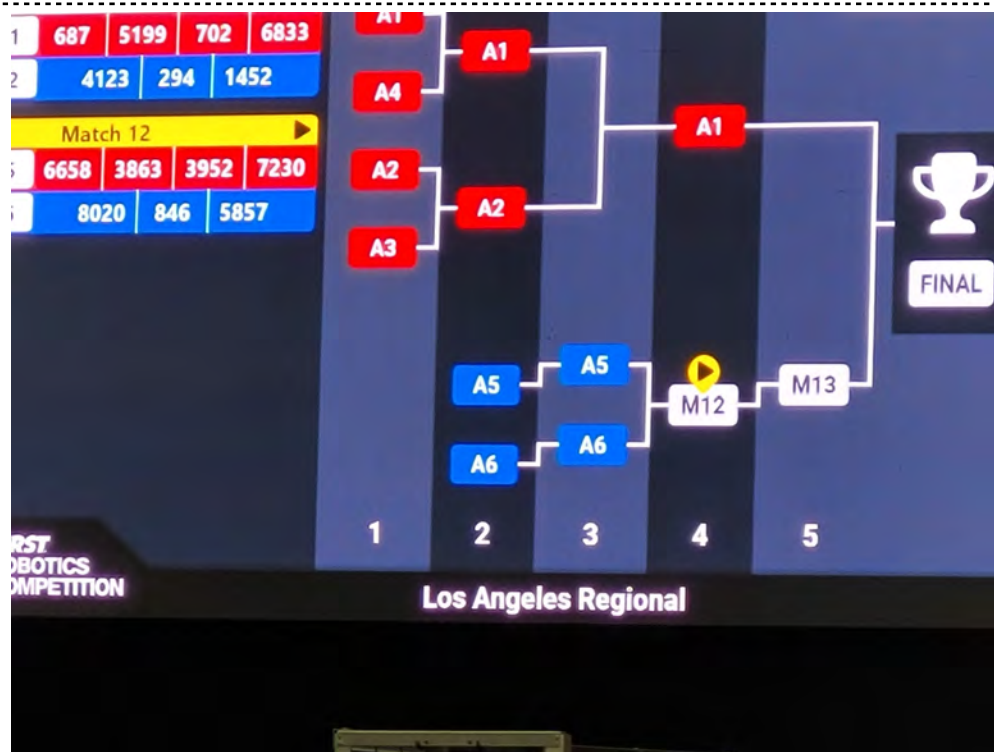
*The students and their robot for the Student Robotics Team of the Da Vinci Schools.*



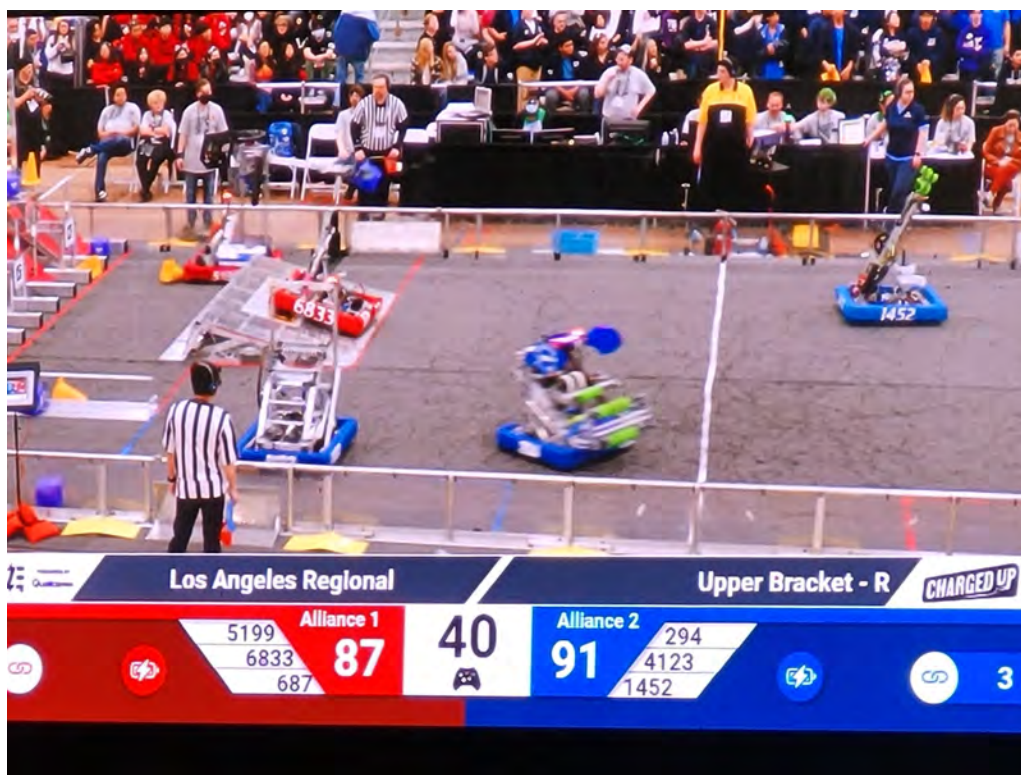
*(Left) Referees monitoring the readiness of the teams and their robotics; (Right) A zoom-in shot of the robots in fierce competitions, sometimes even colliding with each other.*



## (2023 March 19) AIAA LA-LV Outreach to FIRST Robotics Competition High School Regional Session in the Da Vinci Schools *(photos / screenshots only)*



*The competition is like a sports game, with tournaments and matches*

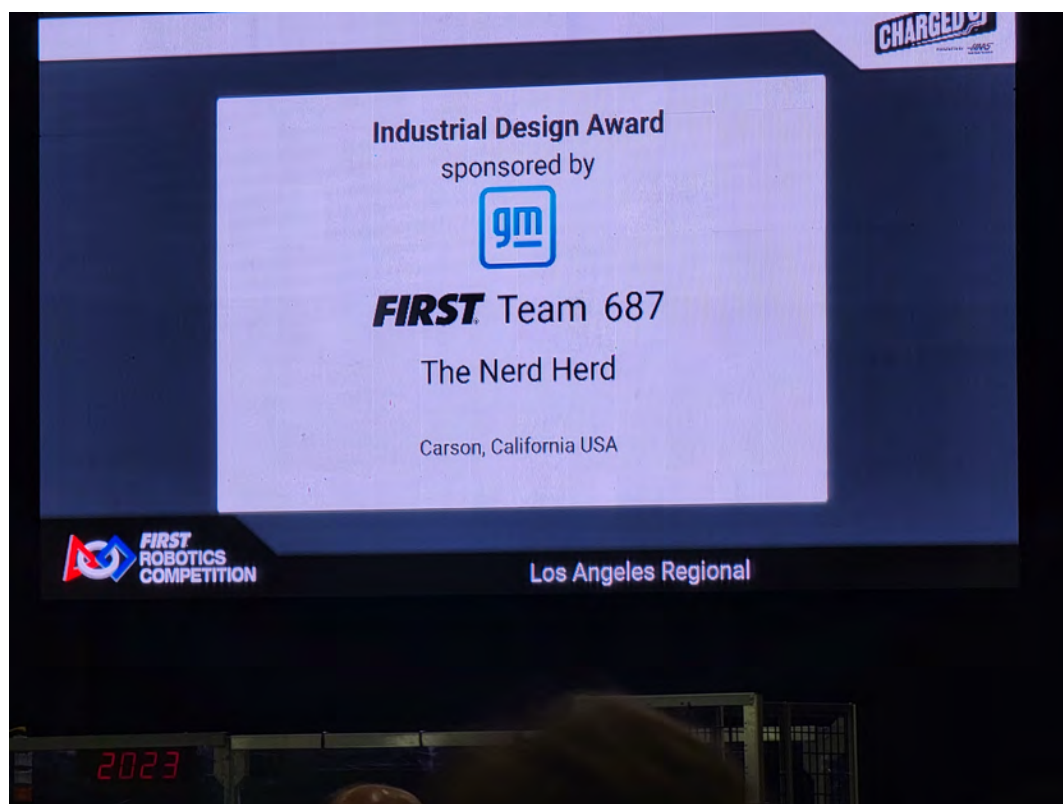


*The games in the playoffs were very evenly matched. All games were also broadcast on-line.*

## (2023 March 19) AIAA LA-LV Outreach to FIRST Robotics Competition High School Regional Session in the Da Vinci Schools *(photos only)*



The booth and mobile shop of the winning team 687 from the CAMS (The California Academy of Math and Science) of Long Beach, CA.



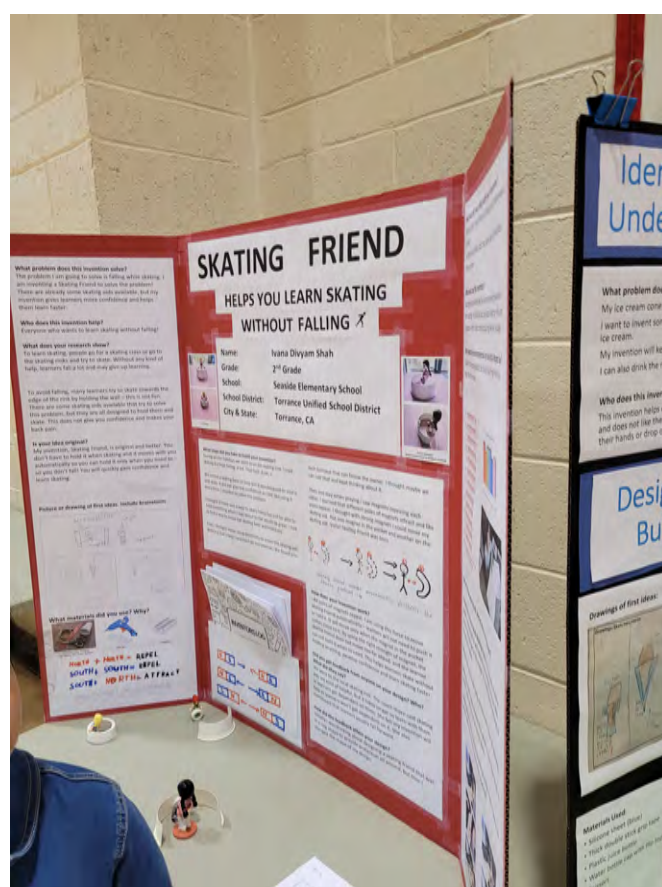
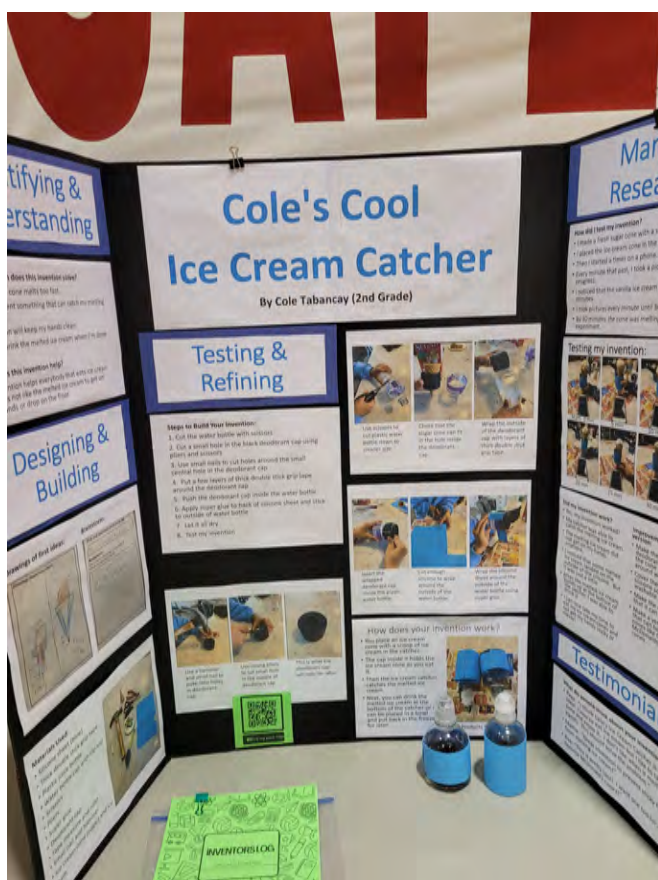
(Left) Team 687 won multiple awards; (Upper Right) The mentor and the team advisor of Team 687; (Lower Right) Team 687 Students on the bleachers cheering for their team.



## (2023 March 20) AIAA LA-LV Outreach Judging in Torrance School District K-12 Invention Competition (photos only) <https://www.aiaa-lalv.org/blogs/2023-blogs/2023-march/2023-march-20>



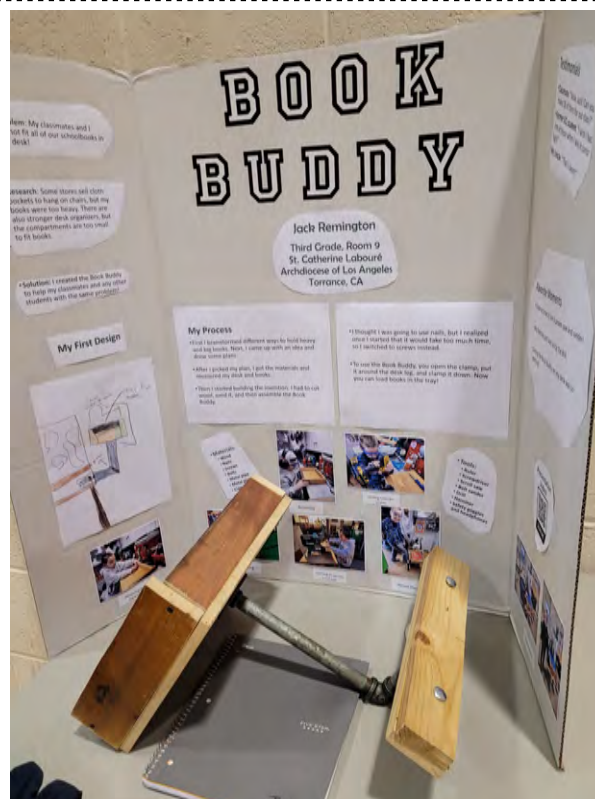
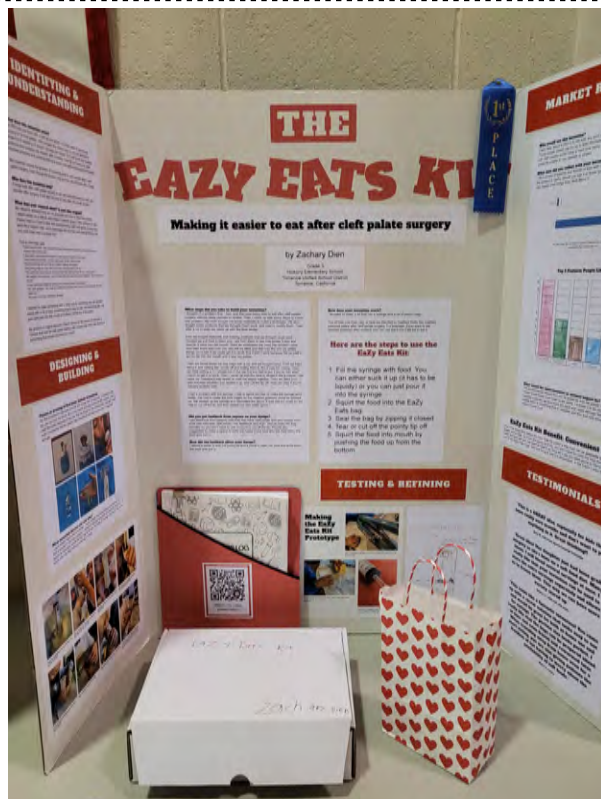
Judges gathered for a briefing from the organizing teachers about the flow and criteria for judging.



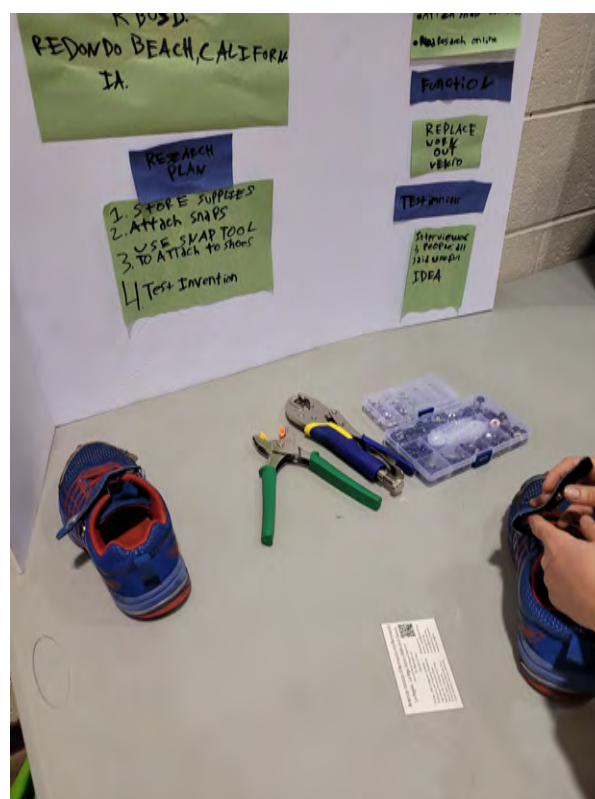
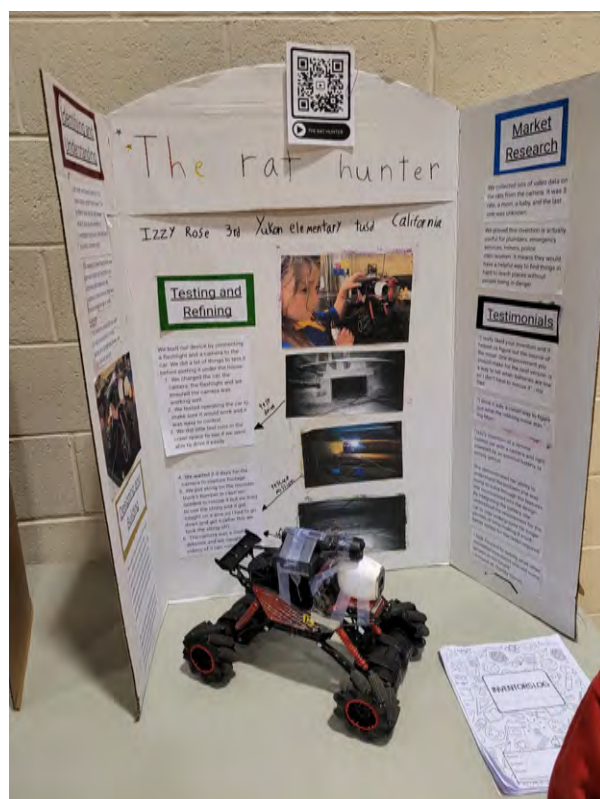
(Left) A student invented a cup that could collect the melted ice cream from the cone during hot days; (Right) A student loved skating and invented a magnetic moving fence to prevent falling.



## (2023 March 20) AIAA LA-LV Outreach Judging in Torrance School District K-12 Invention Competition *(photos only)*



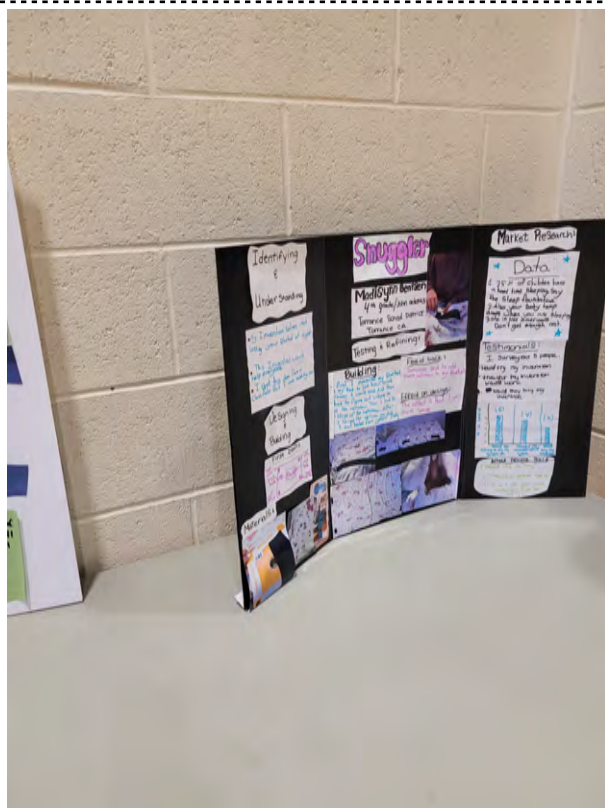
(Left) A student made a prototype for liquid food for patient after cleft palate surgery; (Right) An invention for auxiliary book holder.



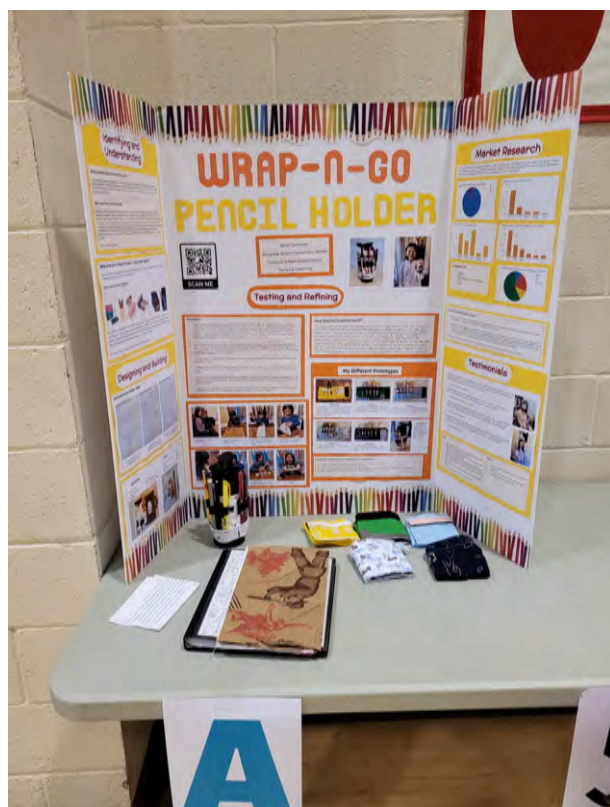
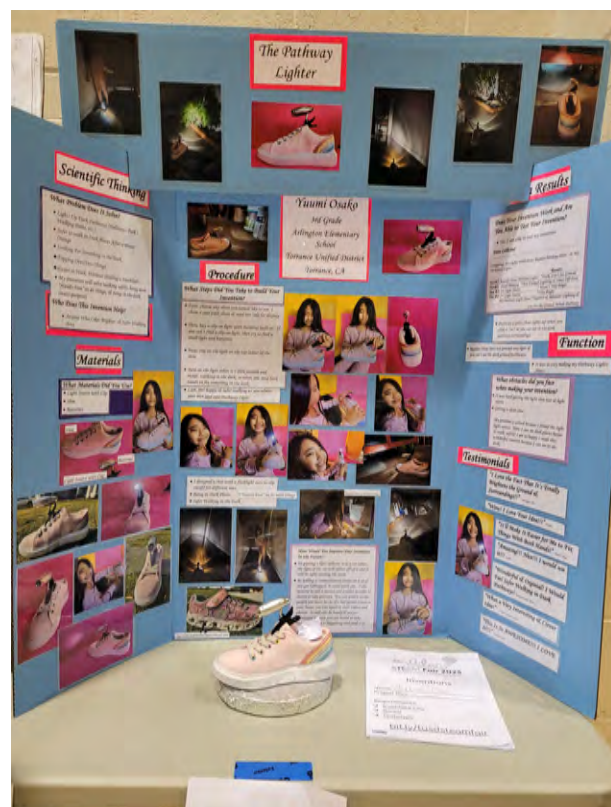
(Left) A student made a rover to find rats and potentially for rescue missions; (Right) A student put a snap on the shoes to extend Velcro life.



## (2023 March 20) AIAA LA-LV Outreach Judging in Torrance School District K-12 Invention Competition *(photos only)*



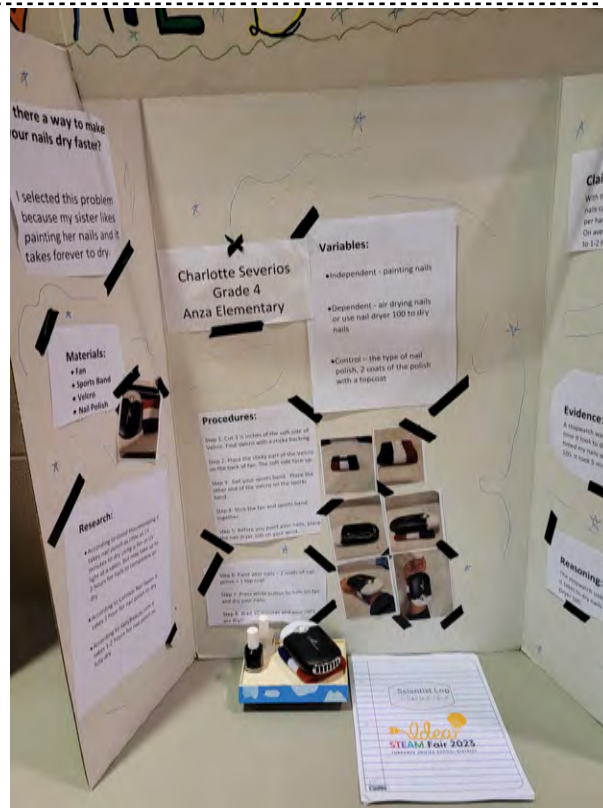
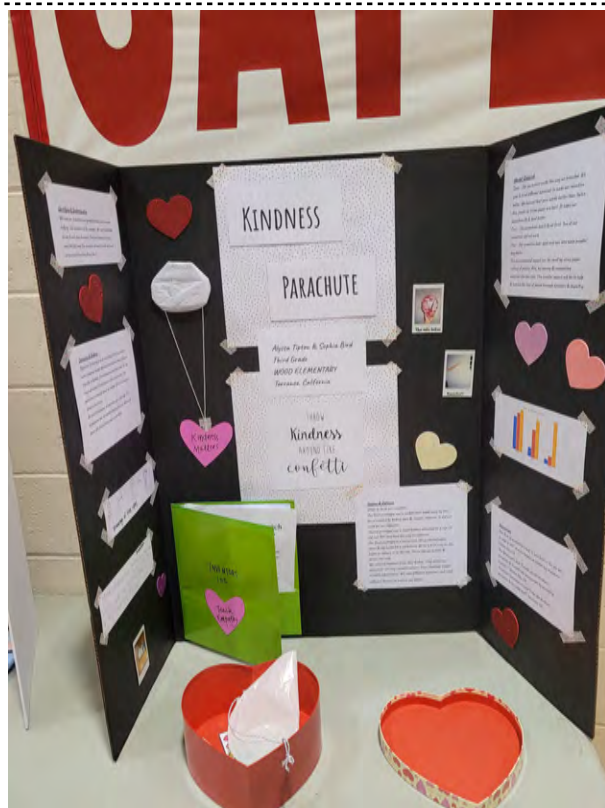
(Left) A student came up an idea using Velcro to keep the blanket from moving during sleep; (Right) A mobile music composing machine.



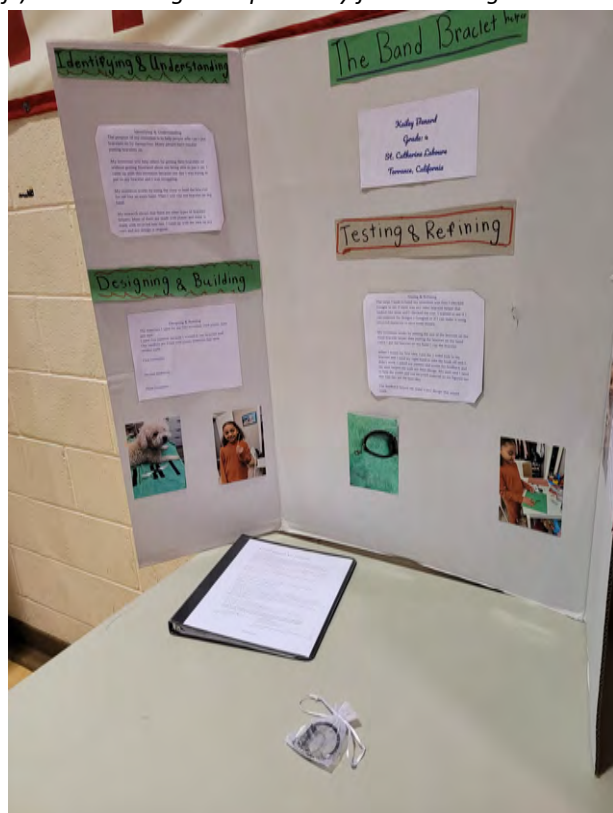
(Left) A student put a small LED light on the shoes; (Right) Revisions of improvement for a cloth pencil holder - need a sewing machine!



## (2023 March 20) AIAA LA-LV Outreach Judging in Torrance School District K-12 Invention Competition *(photos only)*



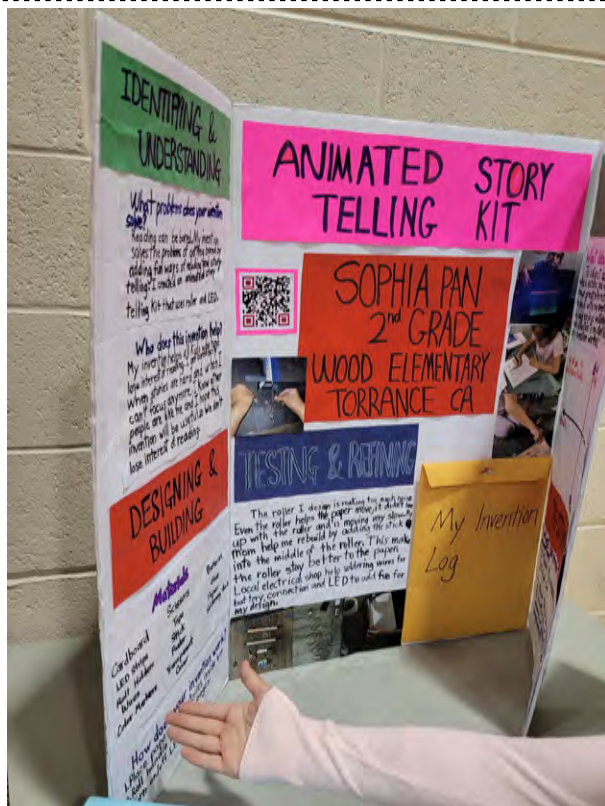
(Left) An interesting aerospace way for delivering love to bullies and introverts; (Right) A nice nail dryer with quick combinations of tools.



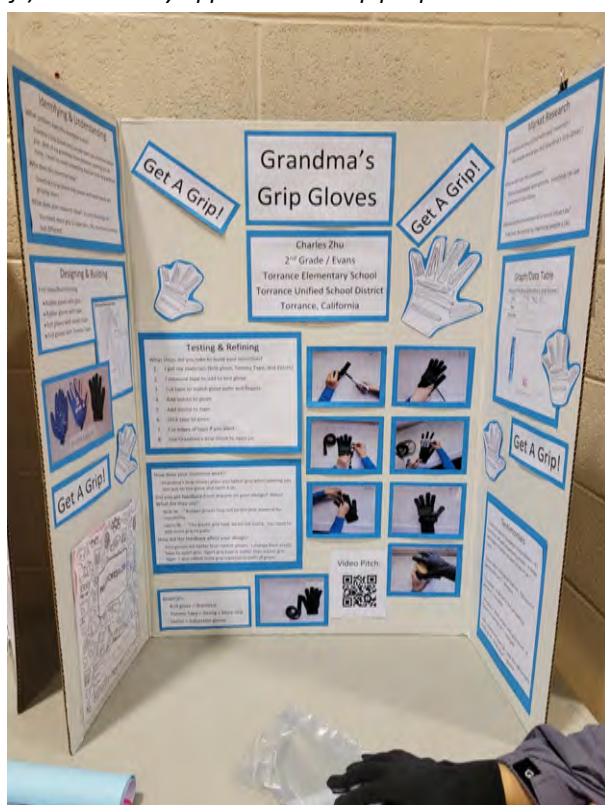
(Left) A student converted a daily approach to easily put on the bracelets; (Right) Using electrostatics to pick up the glitter residues.



## (2023 March 20) AIAA LA-LV Outreach Judging in Torrance School District K-12 Invention Competition *(photos only)*



(Left) A kind lovely apparatus to help people not to stare at mobile devices for too long; (Right) A gadget that help kids pouring milk.



(Left) A glove designed to help grandma to open tight lids with ease; (Right) A nice LEGO collector for LEGO lovers.



**(2023 March 25) AIAA LA-LV Educators Meeting (K-12 STEAM)** *(screenshots only)*

<https://www.aiaa-lalv.org/blogs/2023-blogs/2023-march/2023-march-25>

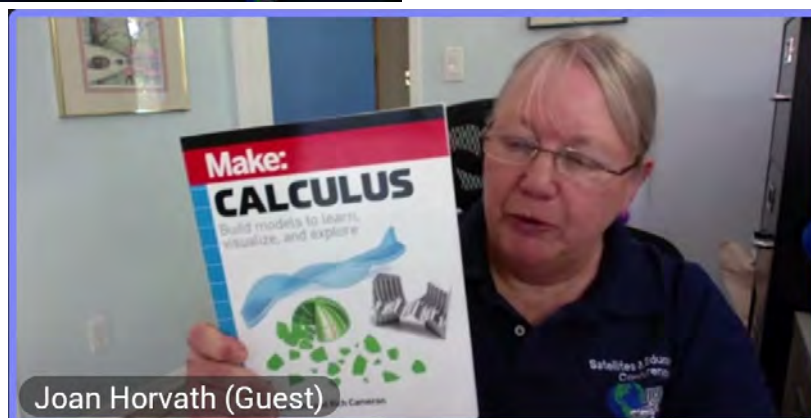


Ms. Arpie Ovsepyan, the K-12 STEAM Outreach Chair of the AIAA LA-LV Section in a pre-recorded video message, as she had to teach and could not join the meeting.



(Left) Some attendees turned on their camera and chatted about their needs and thoughts in K-12 STEAM Outreach, self-introduction, networking, and understanding what the AIAA LA-LV Section is up to for this important area, as well as sharing the possible K-12 resources in this area.

(Right) Ms. Joan Horvath showed her book using 3D Printing to help students in learning Calculus, and shared her thoughts and experiences in K-12 STEAM.





## Venus and Jupiter making a close approach (2023 March 2) (Photo Gallery by Ms. Michelle Evans)

*(Ms. Michelle Evans: AIAA Distinguished Speaker, also Book Author on a best-seller on X-15)*

---



This picture was taken at 7:19 pm on March 2. Jupiter is on the left and Venus is on the right. (1/60/sec at 70mm) (the dot at the lower right to the planets is an airplane passing by)

## Venus and Jupiter making a close approach (2023 March 2) (Photo Gallery by Ms. Michelle Evans)

*(Ms. Michelle Evans: AIAA Distinguished Speaker, also Book Author on a best-seller on X-15)*

---



*This is a close-up image of the conjunction of Jupiter and Venus from the previous page, with Jupiter on the left and Venus on the right.*



## Obituary

### Robert R. Sandusky Jr.

---

(Thanks to Vijay Ram, AIAA Member)

AIAA Fellow and award winner Robert R. Sandusky Jr., died on January 11, 2023 in Virginia, due to a pulmonary condition. Known as “Bob” to his colleagues and friends, Sandusky dedicated his professional life to the aerospace industry, culminating in his role as Chief Engineer of the YF-23A “Black Widow II,” the groundbreaking Northrop-McDonnell Douglas Advanced Tactical Fighter prototype.

Bob’s first seven years in the aerospace industry were at Boeing in Seattle where he played a key role in the aerodynamic and configuration design of Boeing’s entry to the Light Weight Fighter (LWF) competition, the Model 908-909, which came close to winning the competition. The LWF program inspired the designs which went on to become the F-16 and the F/A-18. Following Boeing’s loss of the LWF competition, Bob joined Northrop in the Los Angeles area in 1972, starting with aerodynamic and performance analysis of the YF-17 Cobra LWF prototype. He was involved with the YF-17 program until it transitioned into the F/A-18 Full-Scale Development program. Bob then transferred into Advanced Design, progressing to become the department’s Manager, and spearheading the single-engine F-20 Tigershark configuration.

During the classified Tacit Blue program, Northrop pioneered continuous curvature low observable (“stealth”) aircraft technologies. The B-2 stealth bomber was designed around these technologies. To create an analogous class of fighter aircraft, Bob started a small “carve out” program from Tacit Blue, integrating Northrop’s stealth technologies with supercruise capability. This became Northrop’s program office for their entry into the U.S. Air Force’s Advanced Tactical Fighter program. Bob was Chief Engineer of Northrop’s Advanced Tactical Fighter program, a position he held throughout the program’s ten years. He was a founding member of the “Pioneers of Stealth” society, as one of the engineering leaders who helped usher in the dawn of the fifth-generation tactical aircraft.

Bob is the first named inventor on the design patents for the F-20 and YF-23A.

Following his retirement from Northrop Grumman in 1995, he was appointed Professor of Engineering and Applied Science at George Washington University’s NASA Langley Research Center in Virginia, where he performed research in multidisciplinary design and taught aircraft design at the graduate level. After retirement from teaching in 2003, Bob led an active third career phase, first as President of Belcan Corporation’s engineering services Aerospace Division, then as a consultant to DARPA’s Experimental Spaceplane program, and finally as Chief Engineer for Exosonic, a commercial supersonic aircraft startup.

Bob was awarded the Society of Automotive Engineer’s Wright Brothers Medal in 1999, and was named a Fellow of the American Institute of Aeronautics and Astronautics (AIAA) in 1992, from which he later received the 2006 Aircraft Design medal. He was also a Fellow of the Institute for the Advancement of Engineering from which he received the Chuck Yeager Distinguished International Aeronautical Achievement Award. From 1998 to 2003, the graduate students he advised always placed in the top three, and often won, the AIAA’s annual Graduate National Aircraft Design Competition.

## Obituary

### Robert R. Sandusky Jr.

---

Bob was not only an accomplished and creative aircraft designer, widely recognized for his love of the proverbial “blank sheet of paper,” but deeply enjoyed teaching and mentoring. He had an active life away from his design desk, with passions for flying, scuba diving, skiing, and traveling with his beloved wife and family. He was able to combine his loves of flying and teaching as a Certified Instrument Flight Instructor with over 2700 flight hours, and a Commercial Rotorcraft – Helicopter rating as well.





## NASA's Webb Telescope Receives Michael Collins Trophy

by NASA (2023 March 24) <https://www.nasa.gov/feature/nasa-s-webb-telescope-receives-michael-collins-trophy>



*Mark Clampin, director of the Astrophysics Division at NASA Headquarters, accepts the 2023 Michael Collins Trophy for Lifetime and Current Achievements from Christopher Browne, John and Adrienne Mars Director of the Smithsonian's National Air and Space Museum. The trophy was awarded to the team behind NASA's James Webb Space Telescope in a ceremony at the museum's Steven F. Udvar-Hazy Center in Chantilly, Virginia, on March 23, 2023. Credits: Smithsonian's National Air and Space Museum*

NASA's James Webb Space Telescope team has been selected to receive the 2023 Michael Collins Trophy for Lifetime and Current Achievements. This annual award from the Smithsonian's National Air and Space Museum honors outstanding achievements in the fields of aerospace science and technology, and their history.

"The James Webb Space Telescope team's dedication and ingenuity is an inspiration to the world," said NASA Associate Administrator Bob Cabana. "The partnerships that make this mission possible represent the best of humanity and are critical to enabling us to use Webb to understand our universe better."

The award was presented during a ceremony at the museum's Steven F. Udvar-Hazy Center in Chantilly, Virginia, on March 23.

## NASA's Webb Telescope Receives Michael Collins Trophy

by NASA (2023 March 24)

“The 2023 Collins Trophy recipients have helped humans understand their place on this Earth,” said Chris Browne, the John and Adrienne Mars Director of the museum. “The James Webb Telescope has likewise given us new perspectives on the universe.”

Launched Dec. 25, 2021, Webb is the largest and most powerful space science telescope ever built. In July 2022, the Webb team officially began Webb's mission to explore the infrared universe.

“Congratulations to the James Webb Space Telescope team for pushing the boundaries to reveal our history through the earliest, most distant galaxies that shine in the cosmos,” said Nicola Fox, associate administrator for the Science Mission Directorate at NASA Headquarters. “The awe-inspiring images and spectra are already delivering on Webb's promise to unlock a new era of science.”

With its optics performing nearly twice as well as the mission required, Webb is discovering some of the earliest galaxies ever observed, peering through dusty clouds to see stars forming, and delivering a more detailed view of the atmospheres of planets outside our solar system than ever before. Webb has also captured new views of planets within our solar system, including the clearest look at Neptune's rings in decades. The Collins Trophy award recognizes the extraordinary accomplishments and significant contributions of the team members who designed, developed, and now operate the Webb mission.



*The luminous, hot star Wolf-Rayet 124 (WR 124) is prominent at the center of the James Webb Space Telescope's composite image combining near-infrared and mid-infrared wavelengths of light from Webb's Near-Infrared Camera and Mid-Infrared Instrument.*

*Credits: NASA, ESA, CSA, STScI, Webb ERO Production Team*



## NASA's Webb Telescope Receives Michael Collins Trophy

by NASA (2023 March 24)

---

“The James Webb Space Telescope is allowing us to study a time when the first stars and galaxies formed in the universe. This amazing achievement has been made possible over many years by the dedication of the thousands of people on the team, who have pushed the boundaries of technology to deliver this spectacular space telescope,” said Mark Clampin, director of the Astrophysics Division for the Science Mission Directorate at NASA Headquarters. Clampin delivered remarks after accepting the 2023 Collins Trophy on March 23, on behalf of the Webb team.

Winners receive a trophy featuring a miniature version of the “Web of Space” sculpture, which was created by John Safer from Washington, D.C. The award was established in 1985 and was renamed in honor of Apollo 11 astronaut Michael Collins in 2020.

Webb, an international mission led by NASA with its partners ESA (European Space Agency) and CSA (Canadian Space Agency), is the world's premier space science observatory. Its design pushed the boundaries of space telescope capabilities to solve mysteries in our solar system, look beyond to distant worlds around other stars, and probe the mysterious structures and origins of our universe and our place in it.

Recently, the Webb mission's accomplishments also have been recognized by organizations including the Space Foundation, National Space Club and Foundation, Aviation Week, Bloomberg Businessweek, Popular Science, and TIME.

For more information about the Webb mission, visit:

<https://www.nasa.gov/webb>

## Chandra Determines What Makes a Galaxy's Wind Blow

by NASA (2023 March 29) [https://www.nasa.gov/mission\\_pages/chandra/images/chandra-determines-what-makes-a-galaxys-wind-blow.html](https://www.nasa.gov/mission_pages/chandra/images/chandra-determines-what-makes-a-galaxys-wind-blow.html)



A composite closeup of the bright center of spiral galaxy NGC 253. Credits: X-ray: NASA/CXC/The Ohio State Univ/S. Lopez et al.; H-alpha and Optical: NSF/NOIRLab/AURA/KPNO/CTIO; Infrared: NASA/JPL-Caltech/Spitzer/D. Dale et al; Full Field Optical: ESO/La Silla Observatory.

On Earth, wind can transport particles of dust and debris across the planet, with sand from the Sahara ending up in the Caribbean or volcanic ash from Iceland being deposited in Greenland. Wind can also have a big impact on the ecology and environment of a galaxy, just like on Earth, but on much larger and more dramatic scales.

A new study using NASA's Chandra X-ray Observatory shows the effects of powerful winds launched from the center of a nearby galaxy, NGC 253, located 11.4 million light-years from Earth. This galactic wind is composed of gas with temperatures of millions of degrees that glows in X-rays. An amount of hot gas equivalent to about two million Earth masses blows away from the galaxy's center every year.

NGC 253 is a spiral galaxy, making it similar to our Milky Way. However, stars are forming in NGC 253 about two to three times more quickly than in our home galaxy. Some of these young stars are massive and generate a wind by ferociously blowing gas from their surfaces. Even more powerful winds are unleashed when, later in their relatively short lives, these stars explode as supernovae, and hurl waves of material out into space.

NGC 253 gives astronomers a keyhole through which to study this important phase in the stellar life cycle. The material that the young stars send out into intergalactic space across hundreds of light-years is enriched with elements forged in their interior. These elements, which include many responsible for life on Earth, are folded into the next generations of stars and planets.

A new composite image of NGC 253 in the inset includes Chandra data (pink and white) showing that these winds blow in two opposite directions away from the center of the galaxy, to the upper right and lower left. Also shown in this image is visible light data (cyan) and emission from hydrogen (orange), both from a 0.9 meter telescope at Kitt Peak Observatory, and infrared data from NASA's Spitzer Space Telescope (red). From Earth's vantage point, NGC 253 appears nearly edge-on, as seen in the wider image in the graphic, which shows an optical image from the European Southern Observatory's La Silla Observatory in Chile.

(More click [here](#))



## NASA Awards Grants to Support Research, Technology Development

by NASA (2023 March 20) <https://www.nasa.gov/press-release/nasa-awards-grants-to-support-research-technology-development>

---



*NASA Awards Grants to Support Research, Technology Development*

NASA has announced the recipients of its annual Established Program to Stimulate Competitive Research (EPSCoR) grants, providing a total of more than \$10.8 million across 15 institutions over three years to support scientific and technical research. This research aligns with agency' priorities, including understanding our changing environment and advancing long-term exploration on the Moon through Artemis.

The program, based at the agency's Kennedy Space Center in Florida, focuses on 25 states and three territories (Guam, U.S. Virgin Islands, and Puerto Rico).

NASA selected the projects based on their merit and alignment with NASA missions. Each grantee will focus on a range of high-priority research needs, including deep space exploration, sustainable manufacturing in space, and advancements in technology and science that will also benefit humanity here on Earth.

## NASA Awards Grants to Support Research, Technology Development

by NASA (2023 March 20)

---

The grantees and their three-year award amounts are:

Brown University - \$749,662.96

Iowa State University, Ames - \$661,362

Nevada System of Higher Education - \$747,791

New Mexico State University - \$749,999.22

Oklahoma State University - \$750,000

South Dakota School of Mines and Technology - \$750,000

University of Alaska, Fairbanks - \$750,000

University of Delaware - \$750,000

University of Idaho, Moscow - \$749,995

University of Kentucky, Lexington - \$750,000

University of North Dakota, Grand Forks - \$470,368

University of Vermont, Burlington - \$750,000

University of Wyoming - \$749,696

West Virginia University - \$748,564

Wichita State University - \$750,000

The grantees include Oklahoma State University, which will receive funding to pursue development of a simple way to build solar panels directly on the surface of the Moon. This is a capability that could further NASA's goal of supporting a lunar base camp and longer expeditions. Researchers plan to explore a solar panel technology using vacuum-processed perovskite solar cells that are lightweight, have high-power generation potential, and are tolerant to radiation, making them excellent candidates for space applications.

The University of Wyoming is granted funding for research development that seeks to improve our understanding of how changes in global climate impact regional water availability in the western United States. Water scarcity is becoming an increasingly pressing issue in many parts of the world, and this project could have important implications for agriculture, tourism, and quality of life.

The South Dakota School of Mines and Technology will look to create a new lithium-sulfur battery technology that is superior to existing lithium-ion batteries. Improving the power capacity and life of batteries could help NASA power rockets, spacecraft, and habitats on the Moon, and eventually, Mars.

Universities and schools from across the country submitted proposals for the EPSCoR grants, with each jurisdiction eligible to submit one proposal per year. The three-year period of performance for each project will be accompanied by a requirement to share 50% of the cost.

These grants not only support research and development in areas critical to NASA's mission, but also contribute to the overall research infrastructure, science, and technology capabilities of higher education and economic development in the jurisdictions receiving funding.

The NASA EPSCoR program is a vital component of the agency's strategy to foster collaboration and stimulate growth in research and development across the country. By providing resources to support cutting-edge research in these areas, NASA is helping to create a stronger and more vibrant scientific community that will drive innovation and push the boundaries of what is possible in space exploration for the benefit of all.

For more information on the NASA's EPSCoR program, please visit:

<https://go.nasa.gov/3n6bu9e>



## AIAA LA-LV Section Council / Board 2023 Elections Announcement - Nominations (Deadline April 20, 2023, 11 PM PDT)

### American Institute of Aeronautics and Astronautics Los Angeles - Las Vegas Section 2023 Council Elections - Nominations

Calling All AIAA Members affiliated with the LA-LV Section - It's Election Time for the 2023-2024 Council

The Los Angeles-Las Vegas Section of the AIAA will be holding elections soon. Please consider being an integral part of our section and participate in the nomination process. Current nominees include:

#### Officers:

Chair: Dr. Ken Lui

Vice-Chair: (No Nominees)

Treasurer: Mr. Lynn Jenson

Secretary: Ms. Courtney Best

#### Council Members:

Technical Chair: Mr. Gary Moir

Membership Chair: Ms. Sherry Stukes

Young Professionals Chair: Mr. Luis Cuevas

Education Chair: Mr. Ian Clavio

STEAM K-12 Outreach Chair: Ms. Arpine Ovsepyan

Public Policy Chair: Mr. Daniel Robert Scalese

Career and Workforce Development Chair: Mr. Jeremy Robins

Programs: (No Nominees)



If you would like to nominate a Los Angeles/Las Vegas Section Member in good standing to fill any of the Council Positions, please forward your nomination, including the member's name, contact information and proposed position to the Nominating Committee by **11:00pm PDT on April 20, 2023** to the nominating committee at [elections@aiaa-lalv.org](mailto:elections@aiaa-lalv.org). You may also contact the nominating committee if you have any questions concerning these Council positions or the nomination process. Thank you for your participation in our election process!

Thank you very much,

Secretary, AIAA LA-LV Section  
Jennifer Fleming Perdigao

Please click here to get the attachment:

(AIAA LA-LV 2023 Regular Council Chair Positions (with responsibilities of each position))

<https://drive.google.com/file/d/1zII5SrGnbMSgYGSfZ8ftHrmxy9nHXKzo/view?usp=sharing>

## AIAA LA-LV James Wertz Scholarship, High School STEAM Awards, AIAA Space Systems Technical Committee (SSTC) National Middle School Essay Contest

---

### AIAA LA-LV James Wertz Scholarship 2023

#### Application Deadline: 2023 March 30

(Please contact AIAA LA-LV K-12 STEAM Outreach Chair, Ms. Arpie Ovsepyan: aovsepyan@icloud.com, or k-12\_steam\_outreach\_chair@aiaa-lalv.org)

The James Wertz Scholarship Dr. James Wertz is a former AIAA Los Angeles Section Chair and current President of Microcosm, Inc. The Los Angeles-Las Vegas Section Scholarship is in his name to recognize that he has positively impacted the local aerospace community for over 41 years.

(Scholarship will be presented during the AIAA LA-LV Annual Awards Dinner on 2023 May 11.)

#### Scholarship Objective

The Dr. James Wertz Scholarship for Aerospace Ingenuity, Collaboration and Achievement will provide an award to contribute to tuition and books for high school students who have these characteristics and have articulately conveyed them to the Scholarship Selection Committee through an essay on a specified STEM subject, scholastic achievement, letter(s) of recommendation, and relevant extracurricular activities. The objective is to encourage high school students to pursue a career in aerospace STEM fields.

### AIAA LA-LV High School STEAM Awards 2023

#### Application Deadline: 2023 March 30

(Please contact AIAA LA-LV K-12 STEAM Outreach Chair, Ms. Arpie Ovsepyan: aovsepyan@icloud.com, or k-12\_steam\_outreach\_chair@aiaa-lalv.org)

(Awards will be presented during the AIAA LA-LV Annual Awards Dinner on 2023 May 11.)

#### Prizes:

- 1 Student for General STEAM: \$80
- 1 Student for Aeronautics Award: \$80
- 1 Student for Astronautics Award: \$80

(Additional qualifying students might be recognized without prizes during the Awards Dinner.)

Winners are publicly announced in the Monthly Newsletter of the AIAA LA-LV Section.

#### Eligibility:

Any student enrolled in an accredited high school in the AIAA LA-LV Section area (or equivalent) recommendation will be from the teacher in the same school.



# AIAA LA-LV James Wertz Scholarship, High School STEAM Awards, AIAA Space Systems Technical Committee (SSTC) National Middle School Essay Contest

## AIAA Space Systems Technical Committee (SSTC) National Middle School Essay Contest 2023

### Application Deadline: 2023 April 30

(Please contact AIAA LA-LV K-12 STEAM Outreach Chair, Ms. Arpie Ovsepyan:  
aovsepyan@icloud.com, or k-12\_steam\_outreach\_chair@aiaa-lalv.org)

**THEME: “Choose one aspect of the James Webb Space Telescope, describe how it works, and explain why it leads us to new discoveries and to answer important questions about the universe.”**

(Qualified LA-LV Section entry/entries will be recognized in the AIAA LA-LV Annual Awards Dinner on 2023 May 11 (not the final National Award(s).)

### Requirements:

- \*Typewritten essay, double-spaced, Times New Roman, 12 pt. font, in 1,000 words or less
- \*Include student name, teacher name, grade, and school name printed at the top of the essay
- \*Submit essay to your local section, with student and teacher's: name, phone, e-mail, and mailing address for notification and awards in the body of the email

### Deadline:

Final submission deadline to local AIAA section officers is April 30, 2023. Local winners and their teachers will be notified in May 2023. National winners and their teachers will be notified in June 2023.

### Judging Criteria:

- Originality of ideas presented (30%)
- Soundness of logic used to develop ideas (30%)
- Realism of ideas presented (20%)
- Quality of composition & clarity of expression (20%)

### National Prizes:

- 1st place will be awarded \$125,
- 2nd place will be awarded \$75, and
- 3rd place will be awarded \$50.

Winners are publicly announced in the September 2023 issue of Aerospace America magazine.

### Eligibility:

Any seventh or eighth grader (or equivalent)

# AIAA LA-LV Aerospace News Digests by Dr. Ken Lui, AIAA LA-LV Section



(Mar. 22) Relativity Space launches 3D-printed Terran 1 rocket but falls short of orbit



(Mar. 20) NASA Connects All Five Major Structures of Artemis II Moon Rocket Core Stage



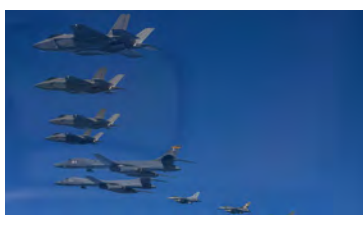
(Mar. 23) U.S. to Send Aging Attack Planes to Mideast and Shift Newer Jets to Asia, Europe



(Mar. 23) Scientists offer 'non-alien explanation' for interstellar visitor known as 'Oumuamua'



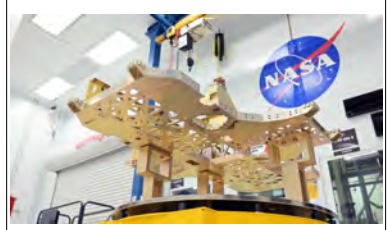
(Mar. 16) North Korea's Kim says Hwasong-17 ICBM launch will 'strike fear into the enemies'



(Mar. 17) US-South Korea drills deter North Korea, Pentagon claims hours after North Korea launches ICBM



(Mar. 7) SOFIA Makes First Detection of Heavy Oxygen in Earth's Upper Atmosphere



(Mar. 14) NASA Begins Building its First Robotic Moon Rover



(Mar. 24) 'Blue Origin Completes NS-23 Investigation, Releases Finding



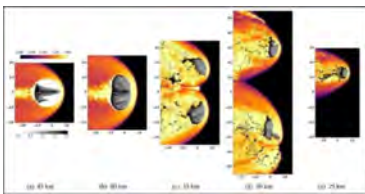
(Mar. 10) Minuteman III replacement, the Sentinel, has completed a critical rocket test



(Mar. 5) First SC-made F-16 fighter jet set for delivery after successful test flight



(Mar. 10) F-35s scrambled as pair of anti-sub aircraft appeared north of Finnmark



(Mar. 9) High-fidelity simulation offers insight into 2013 Chelyabinsk meteor



(Mar. 17) Pentagon chooses Australian firm to build hypersonic test aircraft



(Mar. 6) Sixth-Generation Aircraft: How The B-21 Raider Will Transform Air Warfare



(Mar. 15) US forces downed its MQ-9 Reaper drone in the Black Sea. Here's why



(Mar. 1) NASA's DART Data Validates Kinetic Impact as Planetary Defense Method



(Feb. 28) First ispace mission on track for April lunar landing



(Mar. 3) NASA Prepares To "Take the Plunge" and Explore Venus With DAVINCI



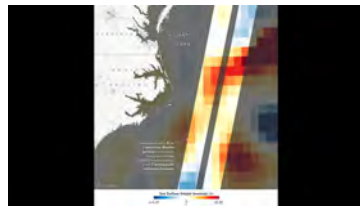
(Mar. 2) A Chinese spacecraft has been checking out US satellites high above Earth



# AIAA LA-LV Aerospace News Digests by Dr. Ken Lui, AIAA LA-LV Section



(Mar. 24) North Korea tests underwater attack drone that can generate 'radioactive tsunami'



(Mar. 24) Joint NASA, CNES Water-Tracking Satellite Reveals First Stunning Views



(Mar. 22) Impulse Space Moves Headquarters To Redondo Beach, Prepares For Orbit



(Mar. 21) On National Security | Space Force and commercial industry taking relationship to the next level



(Mar. 24) THE U.S. AIR FORCE AND DARPA SUCCESSFULLY FLY LOCKHEED MARTIN'S HYPERSONIC HAWC SCRAMJET



(Mar. 20) The epic quest to build a permanent Moon base



(Mar. 22) Space Force grows with new delta, faces challenges in Colorado Springs around facilities, child care



(Mar. 24) First crewed Starliner launch slips again



(Mar. 16) The U.S. Navy is Developing F/A-XX: The Key to Air Supremacy?



(Mar. 24) China loses UAE as partner for Chang'e-7 lunar south pole mission



(Mar. 14) Lockheed Martin hints at existence of aircraft faster than SR-71 Blackbird



(Mar. 16) Virgin Orbit pauses all operations



(Mar. 4) World's First Crewed Flying Car Unveiled



(Mar. 6) China hints at carrier-borne airpower breakthrough



(Mar. 11) Four astronauts fly SpaceX back home to end 5-month mission



(Mar. 13) SpaceX Set To Test Starlink To Cell Service This Year With T-Mobile



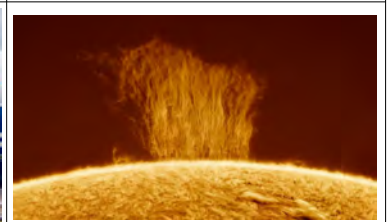
(Mar. 15) Spacesuit for NASA's Artemis III Moon Surface Mission Debuts



(Mar. 15) Study Reveals Map of Moon's Water Near Its South Pole



(Mar. 15) The Impact Of Boeing's Most Recent 787 Dreamliner Orders



(Mar. 15) 60,000-mile-tall 'plasma waterfall' snapped showering the sun with impossibly fast fire

## AIAA LA-LV 4/12 Section Aero Alumni (hybrid) Meeting

Wednesday, April 12, **11:15 AM - 1 PM PDT** (GMT -0700) (US and Canada)

# Aero Alumni Meeting

*Hybrid in-person luncheon and Zoom on-line meeting*

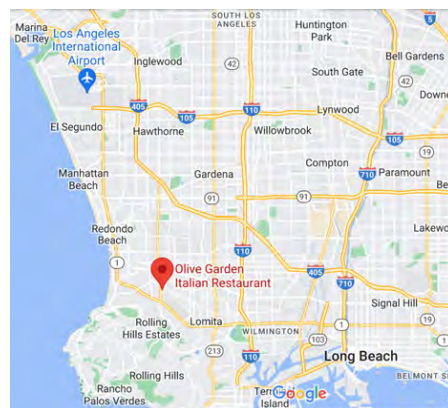
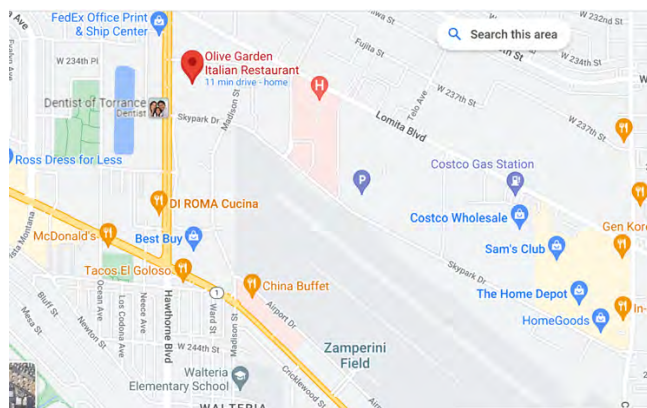
Our monthly Aero Alumni Zoom meeting is at 11 am PDT (on-line) / 11:15 am PDT (in-person) on April 12 (The 2nd Wednesday of April) It will be a hybrid meeting (both in-person there and on-line) at the Olive Garden in Torrance, 23442 Hawthorne Blvd., Torrance, CA 90505. COVID is again allowing a hybrid meeting. If you can, please join me at the Olive Garden. I'll meet you there. If you can't, you can use the Zoom link below. It will take a few minutes to set up the link. You can chat among yourselves until it's ready.

### In-Person in:

*Olive Garden in Torrance*

*23442 Hawthorne Blvd., Torrance, CA 90505*

*(South of 105/405 Hwy, West of 101 Hwy, North of Pacific Coast Hwy (1))*



### Online on Zoom:

**Join Zoom Meeting: <https://aiaa.zoom.us/j/86222790846?pwd=cjBJRkNSQTBCVk9pK21FWlRGZmhyQT09>**

**Meeting ID: 862 2279 0846**

**Passcode: 283373**

One tap mobile +16694449171,,86222790846# US +17207072699,,86222790846# US (Denver)

Dial by your location +1 669 444 9171 US +1 720 707 2699 US (Denver)

+1 253 205 0468 US

+1 253 215 8782 US (Tacoma)

+1 346 248 7799 US (Houston)

+1 719 359 4580 US

+1 507 473 4847 US

+1 564 217 2000 US

+1 646 558 8656 US (New York)

Meeting ID: 862 2279 0846

+Find your local number: <https://aiaa.zoom.us/u/kwJHCxpSX>

+1 646 931 3860 US

+1 689 278 1000 US

+1 301 715 8592 US (Washington DC)

+1 305 224 1968 US

+1 309 205 3325 US

+1 312 626 6799 US (Chicago)

+1 360 209 5623 US

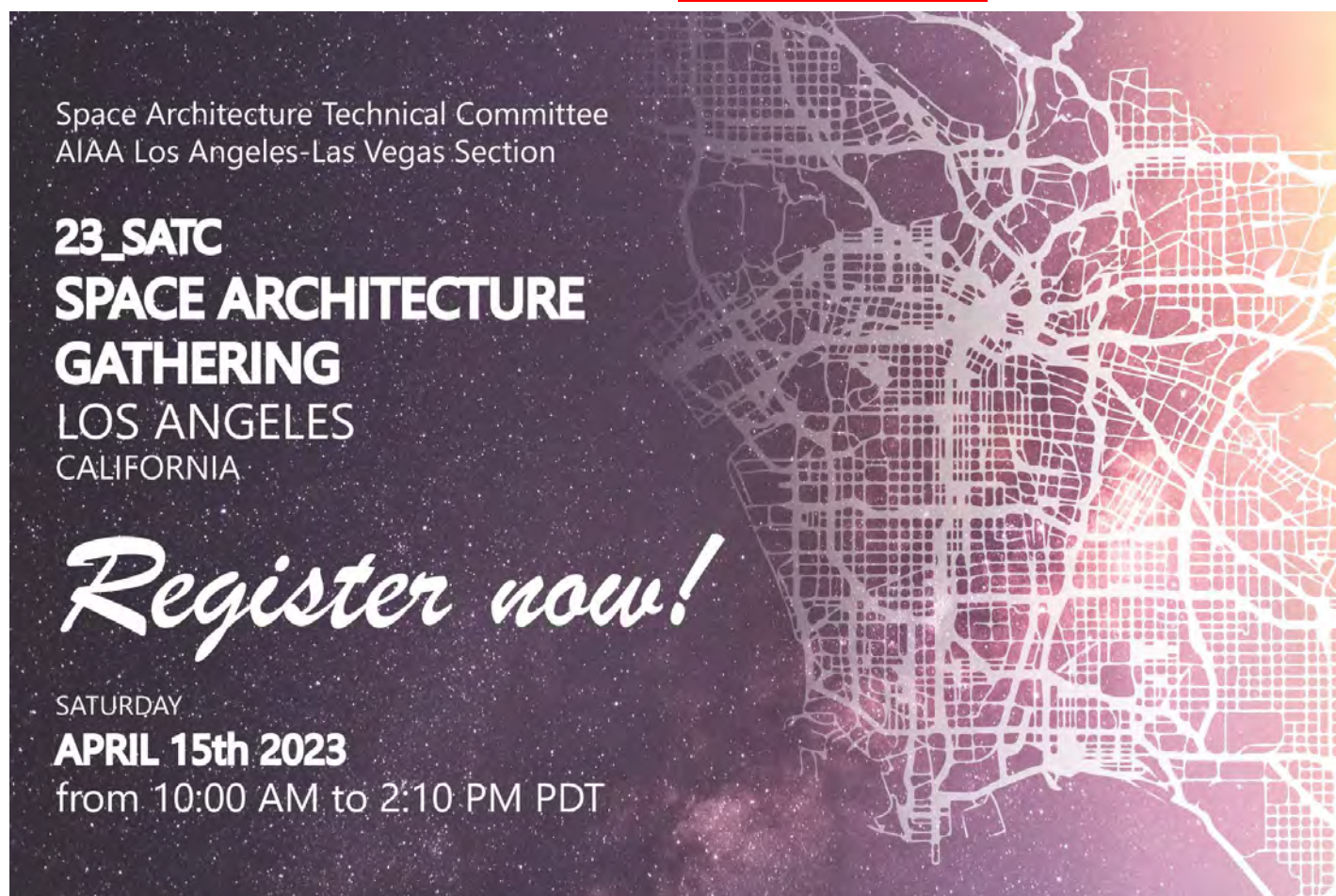
+1 386 347 5053 US

877 853 5257 US Toll-free

888 475 4499 US Toll-free

**Please contact Mr. Gary Moir ([gary.moir@ingenuir.com](mailto:gary.moir@ingenuir.com))**



RSVP and Information: (<https://conta.cc/3SRFqll>)

## 23\_SATC SPACE ARCHITECTURE GATHERING

Get more information

**[Register Now!](#)**[ADD TO CALENDAR](#)[I can't make it](#)

Please join us for a warm and impressive meeting with the AIAA LA-LV 2023 Public Space Architecture Gathering on Saturday, April 15th, on-line, or in Lawndale Library (in the Los Angeles area of Southern California, USA).

The event will start at 10:00am PDT ONLINE, continuing HYBRID and available online afterwards. AIAA members (and non-members) are invited to join online or in situ and to meet with and listen to the leaders and practitioners in Space Architecture.

Tentative Agenda: (All Time PDT (GMT -0700)) (US and Canada)

10:00 am: Welcome and Introduction

10:10 am: (Session I & II) AIAA SATC Presentations

13:10 pm: Panel Discussion and Q&A

14:10 pm: (Session III) Non-AIAA SATC invited Presentations

15:00 pm: Networking, Adjourn. (Meeting Room closes at 17:00 pm)

**PRESENTERS: (On-line and in-person) (See next page)**

***Disclaimer: The views of the speakers do not represent the views of AIAA or the AIAA Los Angeles-Las Vegas Section.***





**Ms. MELODIE YASHAR**  
Anticipating Lunar Surface  
Construction & Infrastructure  
(On-line)



**Mr. BRAND GRIFFIN**  
Rules of Thumb for  
Space Habitat Design  
(In-person)



**Dr. SANDRA  
HÄUPLIK-MEUSBURGER**  
TBA  
(On-line)



**Ms. ALMA KUGIC**  
X-plor - Lunar Exploration and  
Habitation Rover  
(On-line)



**Dr. PAOLO CARATELLI**  
Lunar Oasis - An Educational  
Collaboration Experience  
(On-line)



**Dr. BARBARA IMHOF**  
Designing for Earth by living in Space  
(On-line)



**Dr. OLGA BANNOVA**  
Reality check: How Space Architecture  
responds to Industry needs  
(On-line)



**Mr. SAM XIMENES**  
Leto Mission for Lunar Settlement at  
the Marius Hills Lava Tube  
(On-line)



**Mr. VITTORIO NETTI**  
XR Testing framework for Human-  
System Interaction design validation  
(On-line)

**Disclaimer:** The views of the speakers do not represent the views of AIAA or the AIAA Los Angeles-Las Vegas Section. Contact: General Contact: [contact@aiaa-lalv.org](mailto:contact@aiaa-lalv.org), Events/Program [events.aiaalalv@gmail.com](mailto:events.aiaalalv@gmail.com)





**Dr. MARC COHEN**  
Innovation and Tradition in  
Space Architecture  
(On-line)



**Prof. MADHU THANGAVELU**  
TBA  
(In-person)

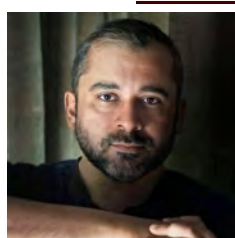


**Dr. A. SCOTT HOWE**  
(Panel Discussion Only)  
(In-person)

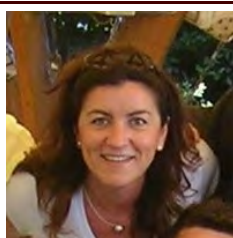
### **NON-AIAA SPACE ARCHITECTURE TC INVITED PRESENTERS**



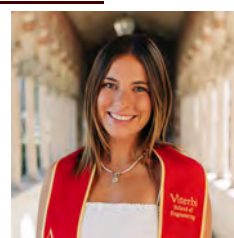
**Dr. KAJA ANTLEJ**  
Space for Everyone: Embracing diversity  
through heritage-based extended reality  
(XR) dining experiences for astronauts  
(On-line)



**Prof. SAMER EL SAYARY**  
Rationalizing nature for extreme  
environments  
(On-line)



**MARIA ANTONIETTA PERINO**  
TBA  
(On-line)



**CLAIRE STEVLINGSON**  
TBA  
(On-line)



**CARLA UYEDA**  
CHEF - Creating an Exceptional  
Food Experience for Short or Long  
Journeys to Space  
(On-line)

#### **(Session I)**

##### **10:10 am: SATC Presentations**

*Melodie Yashar*

*Brand Griffin*

*Alma Kugic*

*Sandra Haeuplik-Meusburger*

*Paolo Caratelli*

**11:20 am: Panel Discussion and Q&A**  
*(Scott Howe will join the Panel)*

#### **(Session II)**

##### **12:00 pm: SATC Presentations**

*Barbara Imhof*

*Olga Bannova*

*Sam Ximenes*

*Vittorio Netti*

*Marc Cohen*

*Madhu Thangavelu*

**13:10 pm Discussion and Q&A**

#### **(Session III)**

##### **14:10 pm: Non-SATC invited Presentations**

*Kaja Antlejš*

*Samer El Sayary*

*Maria Antonietta Perino*

*Claire Stevlingson*

*Carla Uyeda*

**15:00 pm: Networking (Adjourn afterwards)**

**17:00 pm: Meeting Room closes.**

#### **In-person attendance:**

Lawndale Library (Meeting Room)


14615 Burin Ave., Lawndale, CA 90260

(South of 105 Hwy and East of 405 Hwy/Pacific Coast Hwy (1))(Near  
SpaceX Hawthorne, and close to Northrop Grumman Space Park)

(This event is not sponsored by the Lawndale Library)

#### **On-line attendance:**

Zoom connection information will be provided in  
the confirmation email after registration / RSVP.



**AIAA LA-LV Section**

SPACEARCHITECT.ORG

**Contact**  
American Institute of Aeronautics & Astronautics,  
Los Angeles - Las Vegas Section  
949-426-8175  
events.aiaalav@gmail.com

**Disclaimer: The views of the speakers do not represent the views of AIAA or the AIAA Los Angeles-Las Vegas Section.**

Contact: General Contact: [contact@aiaa-lalv.org](mailto:contact@aiaa-lalv.org), Events/Program [events.aiaalav@gmail.com](mailto:events.aiaalav@gmail.com)

RSVP and Information: (<https://conta.cc/3Ylr52t>)

**AIAA LA-LV 4/29 @10:30 AM PDT Section (Hybrid) Meeting**

**Saturday, 2023 April 29, 10:30 AM PDT (US and Canada) (GMT -0700)**

# **Serendipity and contrarianism in scientific research: Hit 'em where they ain't**



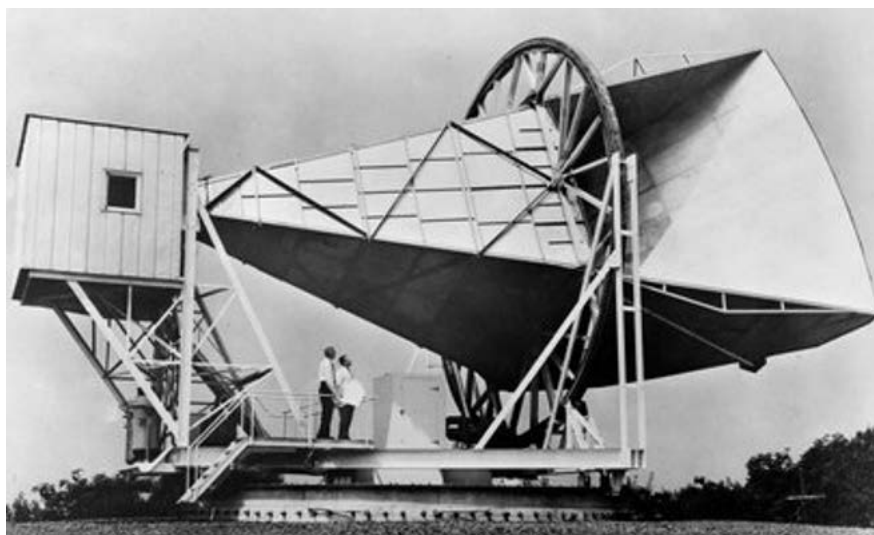
*by*

**Prof. Paul D. Ronney**

Department of Aerospace and Mechanical Engineering

University of Southern California, Los Angeles, CA

(The speaker will present in person.)



## Physical Location

Olin Hall of Engineering (OHE), room 406 (Conference Room)

University of Southern California (USC)

3650 McClintock Ave.,

Los Angeles, CA 90089

<https://www.campus-maps.com/usc/olin-hall-ohe/>

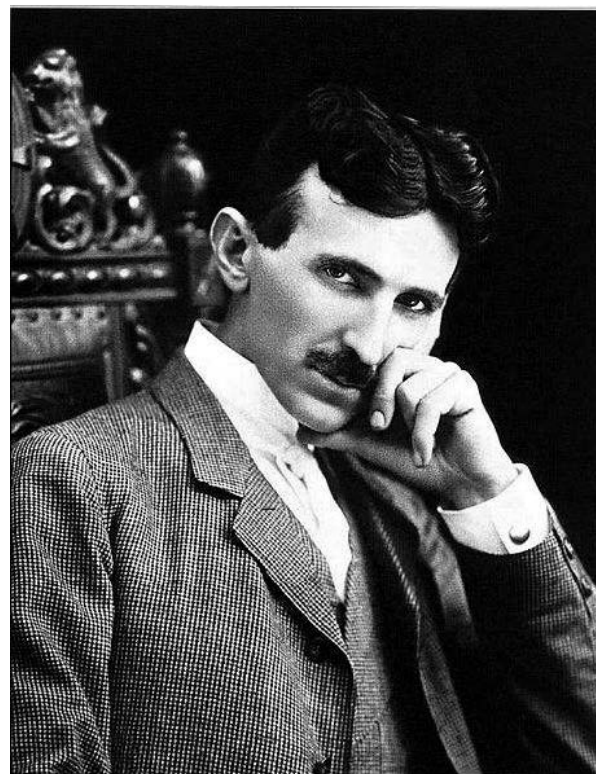
(South of 10 Hwy, West of 101 Hwy, East of 405 Hwy, North of 105 Hwy)

## Online on Zoom

(Please register /RSVP and you will receive the ticket with the Zoom link.

Please check Spam or Junk folder shortly after registration to make sure.

If not, please try using an alternative email address.)



**Disclaimer:** *The views of the speakers do not represent the views of AIAA or the AIAA Los Angeles-Las Vegas*

**Section.** Contact: General Contact: [contact@aiaa-lalv.org](mailto:contact@aiaa-lalv.org), Events/Program [events.aiaalalv@gmail.com](mailto:events.aiaalalv@gmail.com)



RSVP and Information: (<https://conta.cc/3K3mUnl>)

## AIAA LA-LV 5/11 Annual Awards Dinner

Thursday, 2023 May 11, 5:30 PM PDT (US and Canada) (GMT -0700)

# AIAA LA-LV Annual Awards Dinner



### Keynote Address:

Artemis-1 and Aerojet-Rocketdyne  
Mr. James Maser (AIAA Honorary Fellow (Class 2023))



### Recognitions:

Council Members, Membership Honors and Advancement, Volunteers

AIAA LA-LV Section Excellence Award  
AIAA LA-LV Section K-12 Student Awards

AIAA LA-LV Section James Wertz Scholarship

AIAA SSTC Middle School Essay Contest local entry Recognition

#### Physical Location

Cambria Hotel LAX, Meeting Room/Patio  
199 Continental Blvd, El Segundo, CA 90245  
(South of LAX/105 Hwy, West of 405 Hwy, and East of PCH 1. Adjacent to LAX, Raytheon, Aerospace Corp. Northrop Grumman, Boeing, LA AFB / Space Force, Millennium Space Systems, LA Kings/Toyota Sports Performance Center etc.)

#### Online on Zoom

(Please register /RSVP and you will receive the ticket with the Zoom link. Please check Spam or Junk folder shortly after registration to make sure. If not, please try using an alternative email address.)

#### Tentative Agenda (All time PDT (GMT -0700))

**5:00 PM: Check-in / Cash Bar (Lobby) / Student Posters**

6:00 PM: Dinner

7:05PM: Recognitions

7:15PM: Keynote Address / Excellent Award

8:15PM: Student Awards, James Wertz Scholarship, SSTC Essay Contest

8:55 PM: Concluding Remarks



**Disclaimer:** The views of the speakers do not represent the views of AIAA or the AIAA Los Angeles-Las Vegas

**Section.** Contact: General Contact: [contact@aiaa-lalv.org](mailto:contact@aiaa-lalv.org), Events/Program [events.aiaalalv@gmail.com](mailto:events.aiaalalv@gmail.com)

## AIAA On-line short courses in the first half of 2023

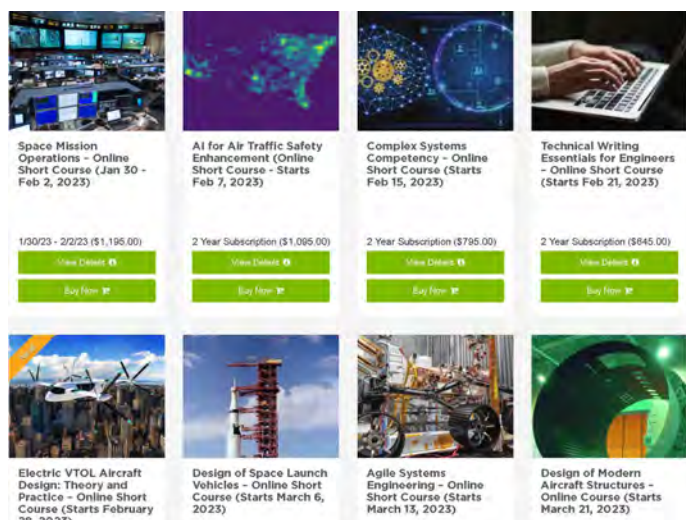
<http://learning.aiaa.org/>

AIAA is offering over 25 online short courses in the first half of 2023 and will provide Member Discounts and group discounts for organizations registering 5+ people for a given course.

All Details at <http://learning.aiaa.org/>

Any question please contact:

Jason Cole, Director, Continuing Education, 800-639-AIAA (2422), [jasonc@aiaa.org](mailto:jasonc@aiaa.org) 703.264.7596 (direct)



|                     |   |
|---------------------|---|
| Jan 30 - Feb 2      | Space Mission Operations  |
| Feb 7 - Mar 2       | AI for Air Traffic Safety Enhancement – NEW!  |
| Feb 15 - Feb 24     | Complex Systems Competency – NEW!   |
| Feb 21 - Mar 2      | Technical Writing Essentials for Engineers  |
| Feb 28 - Mar 30     | Electric VTOL Aircraft Design: Theory and Practice – NEW! (Joint with Vertical Flight Society)      |
| March 6 – April 12  | Design of Space Launch Vehicles   |
| March 13 – April 5  | Agile Systems Engineering – NEW!  |
| March 21 - April 20 | Design of Modern Aircraft Structures  |
| March 28 – April 6  | Introduction to Propellant Gauging – NEW!   |
| April 5 - April 26  | Optimal Control for Unpiloted Aerial Vehicles (UAVs) – Online Guided Short Course                   |
| April 11 - April 27 | Overview of Python for Engineering Programming  |
| April 19 - May 12   | Electrochemical Energy Systems for Electrified Aircraft Propulsion: Batteries and Fuel Cell Systems |
| April 19 - June 9   | Design of Gas Turbine Engines: From Concept to Details – NEW!                                       |
| April 17 - May 17   | Hypersonic Flight Vehicle Design and Performance Analysis   |
| April 25 - May 11   | Understanding Aircraft Noise: From Fundamentals to Design Impacts and Simulations – NEW!            |
| April 25 - April 26 | OpenFOAM® CFD Foundations   |
| May 2 - May 11      | Digital Engineering Fundamentals  |
| May 8, May 15       | Essential Model-Based Systems Engineering – NEW!  |
| May 9 - May 11      | Launch Vehicle Coupled Loads Analysis: Theory and Approaches – NEW!                                 |
| May 16 - June 8     | Introduction to Aeroelasticity: From Basics to Application – NEW!                                   |
| May 16 - May 17     | OpenFOAM® External Aerodynamics   |
| May 16 - May 25     | Aircraft Reliability & Reliability Centered Maintenance   |
| May 22- May 25      | Understanding Space: An Introduction to Astronautics and Space Systems Engineering Sustainable      |
| May 23 – June 6     | Aviation: Challenges, Design Implications, Recent Advancements, Noise, Emissions,                   |
|                     | Alternative Fuels, Electric Aircraft, and Emerging Technologies – NEW!                              |
| June 6              | OpenFOAM® Aeroacoustics Modeling  |
| June 7              | OpenFOAM® Dynamic Mesh Modeling   |
| June 20 - June 23   | Safety Management System (SMS) in Aviation – NEW!   |
| July 19 - July 28   | Aircraft Maintenance Management – NEW!  |