

# THE FLIGHT PLAN

The Newsletter of AIAA Albuquerque Section  
The American Institute of Aeronautics and Astronautics

## IN-PERSON MEETING RETURNS

### *The Next Aeronautics Revolution*

Presenter ; Vanessa V. Aubuchon, NASA Langley



Vanessa Aubuchon has conducted research, guided development activities, and managed various aspects of projects and programs at NASA for over 18 years. She has an unfettered vigor for learning and development, solving problems, and improving processes. Thus, her career has been filled with experiences spanning space exploration to aviation, in multiple NASA organizations, including headquarters, in positions of researcher, project manager, systems engineer, and branch head. Currently, she manages the Revolutionary Aviation Mobility SubProject in the Transformational Tools and Technologies Project.

Ms. Aubuchon holds a Bachelor's degree from Mississippi State University and a Master's degree from Virginia Tech. She is pursuing a Ph.D. in Engineering Management from Old Dominion University. She has been the recipient of the AIAA Hampton Roads Section Mitcheltree Young Engineer of the Year Award, Orion Exceptional Contribution Award, NESC, and NASA Group Achievement Awards, and multiple NASA Team Awards.

She serves as honorary president of the Peninsula Engineers Council, AIAA HRS Council Member, and AIAA Region I Deputy Director for Career and Professional Development, among several other roles on boards and committees. Ms. Aubuchon is also a mother of two young boys and enjoys volunteering as judge and queuer at annual FIRST Robotics Competitions and various other local STEM events.

#### Abstract

Imagine going home from work in a pilotless aircraft that takes off vertically from a building rooftop and transitions to forward flight to carry you out of the city to a landing pad in the suburbs. When you get home, you're too tired to cook dinner, so you order your favorite Thai food from a restaurant three miles away and it lands in your driveway fresh and hot. Later that night, you get a stomachache and order some antacids from the pharmacy down the

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## CALENDAR

### Local Section Events

Next General meeting TBD

Hybrid Meeting In-Person & Zoom

Meet & Greet 5:45 pm

Presentation Start 6:00 pm

Presentation End 7:00 pm

### National AIAA Events

[2022 AIAA Aviation and Aeronautics Forum and Exposition \(AIAA AVIATION Forum\)](#)

27 JUNE - 1 JULY 2022

Chicago, Illinois and Online

[2nd Annual Leadership Symposium – How Disruptive Change Results in Growth and Impact](#)

26 JUNE 2022 1300 - 1700 (CENTRAL DAYLIGHT TIME)

Chicago, Illinois

[2022 AIAA Aviation and Aeronautics Forum and Exposition \(AIAA AVIATION Forum\)](#)

27 JUNE - 1 JULY 2022

Chicago, Illinois and Online

[AVIATIONx Webinar: Automation and Autonomy in General Aviation: Opportunities and Challenges for Safety, Accessibility and Sustainability](#)

13 JULY 2022 1200 - 1330 (EASTERN DAYLIGHT TIME)

Virtual

#### Upcoming U.S. Launches

Jun Falcon 9 • Starlink 4-19

Jun 18 Falcon 9 • SARah 1

Jun 28 Falcon 9 • SES 22

Jun 29 Atlas 5 • USSF 12

NET Jun 28 Falcon 9 • SpaceX CRS 25

Jul Falcon 9 • Starlink 3-1

Jul Falcon 9 • Starlink 4-21

Jul Atlas 5 • SBIRS GEO 6

Aug Falcon 9 • O3b mPOWER 1,2,3

Aug 15 Antares • NG-18

Aug Delta 4-Heavy • NROL-91

Summer Alpha • Multi-payload

TBD Starship • Orbital Test Flight

NET Aug SLS • Artemis 1

## ALBUQUERQUE SECTION OFFICER NEEDED

By Robert A. Malseed, Treasurer

Your Albuquerque Section needs you to serve on the section Council. Our **Communications** position is currently vacant. (It would be nice to return to monthly newsletters.)

“The **Communications Officer** shall be responsible for the Section publication activities including, but not limited to, the periodic preparation and distribution of the Section newsletter and any other print or social media required to support Section activities.”

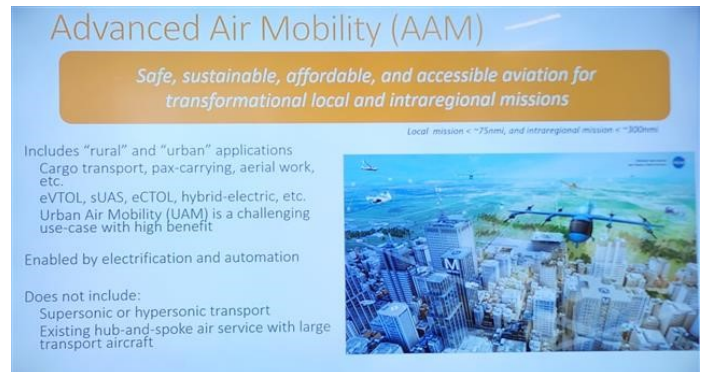


# WE WANT YOU!

# IN-PERSON MEETING RETURNS

(Continued from page 1)

street, which is delivered via a drone to your home in a matter of minutes. Can you imagine a world of convenience and efficiency that is enabled by ubiquitous, autonomous air transportation? We are in the middle of an aeronautics revolution right now, where those scenarios are becoming a reality. This talk discussed the “Third Wave of Aeronautics,” which is bringing aviation to people’s daily lives. NASA, alongside industry and the FAA, is developing the technologies and safety standards to enable faster local commutes, widespread package delivery, cost-effective cargo transportation to rural areas, and more routine connections between regional airports. Advanced Air Mobility targets safe, sustainable, affordable, and accessible aviation that will transform the world’s transportation systems. Current manufacturer progress, new enabling technologies, and challenges to realizing this new paradigm were described.





## MARCH MEETING

Robert Malseed, Treasurer

## State of the Space Industrial Base

Dr. Thomas Cooley, Air Force Research Laboratory – Chief Scientist, Space Vehicles Directorate

The US space industrial base is tactically strong but strategically fragile. While the pace of innovation and investment in the US is at an all-time high, participants cautioned that this will not be sustained without strategic direction, robust adoption of commercial space capabilities expressed in meaningful contract opportunities, strategic workforce development, attention to fragile domestic supply lines, and addressing the anemic funding to prototype, validate and accelerate the adoption of innovative and disruptive space capabilities for national security. This talk discussed key findings captured in the recently released State of the Space Industrial Base report.

## FRAMING SPACE IN THE PUBLIC DISCOURSE

- Space is Key to Winning the Future
- Space is an Economic Domain
- Space is a Strategic Domain

- Space is Critical to US Soft Power
- Space is Critical to US Hard Power

- Space is a Transportation Mode

- Space is Infrastructure

- Space is Critical Infrastructure
- Space is Key to Tackling Climate Change



- Space is a 21st Century Industry
- Space is a Source of New Jobs
- Space is America's Competitive Advantage
- Space is a Source of Economic Growth
- Space is a Source of Technological Innovation
- Space is an Investment, Not a Must-Pay Bill

## ISSUES &amp; CHALLENGES

## STRATEGIC ISSUES

- Space Policy is Not Connected with Domestic or Foreign Policy Priorities
- What's at Stake
- Cislunar Matters
- It's Not a 100 Years Out!
- Flag of Choice in Jeopardy
- Accelerating Soft Power Competition
- Call the Play / Motivate the Team
- Guidelines for a North Star Vision

## TACTICAL ISSUES

- The Lack of Meaningful ISR Contracts is Harming US Companies
- Overclassification is Harming Innovation
- Licensing Bottleneck
- Transitioning the 'Valley of Death'
- Capital Misallocation
- Accelerating Hard Power Competition
- Predatory Foreign Practices
- No Industrial Targets for Artemis
- Anemic Allied International Partnering

## KEY ACTIONS &amp; RECOMMENDATIONS

ATTENDEE RECOMMENDATIONS FOR THE WHITE HOUSE &amp; SPACE COUNCIL

1. Establish "Space Development and Settlement" as our National "North Star" Space Vision
2. Build Back Beyond: Incorporate the Moon into the Earth's Economic Sphere by Catalyzing the Space Superhighway
3. Sustain funding for the Hybrid Space Architecture as a foundation for the future Space Internet
4. Expand "Artemis Accords" Beyond NASA
5. Increase Space Science & Technology Funding to Parity with Other Domains
6. Reform Policy to Address 21st Century Conditions
7. Declare Space a Special Economic Zone and Deploy the Full Range of Tools
8. Recognize Space-critical Infrastructure / Make Space a Part of Infrastructure Plans
9. Make Space a Central Part of Climate Action Plans
10. Include Space in Supply Chain Planning

## KEY ACTIONS &amp; RECOMMENDATIONS

ATTENDEE RECOMMENDATIONS FOR THE DOD

1. Integrate JADC2 with the Hybrid Space Architecture
2. Enable the Space Superhighway by Including Commercial Solutions for In-space Logistics Infrastructure
3. Mandate a Percentage of Commercial Services Buys Starting in 2022
4. Expand Use and Management of Space Commercial Services within the Space Force
5. Bolder Acquisition Reform Means a More Level Playing Field for All Business, Particularly Small Business
6. Enable Rapid Innovation by Shifting Resources from SBIRs to OTAs

## A NATIONAL NORTH STAR VISION FOR SPACE

- Incorporate the central elements of the big audacious goals current in industry, partners and contenders: *space economic development, a Cislunar economy, Lunar and asteroid mining, the industrialization of space and moving industry off Earth, space solar power, planetary defense, becoming multi-planetary, and space settlement.*



- Update White House's *A New Vision for Space Development and Exploration*
- Socialize the National North Star Vision with Congress
- Publish an Executive Order and Energize the National Space Council
- Stand up a National Space Enterprise Task Force
- Lead International Efforts to Create International Institutions for the Space Economy
- Construct a Space Defense Alliance to Secure the Vision
- Maintain the Cislunar Economy as an Open Economic System



## SPACE POLICY &amp; FINANCE TOOLS

- Recognize space or key space capabilities as US 'Critical Infrastructure'
- Establish a US-based Space Commodities Exchange
- Adopt a holistic readiness level framework such as the System Readiness Level Metric in order to translate TRL, MRL, IRL and business readiness
- Adopt a scheduled National Security Space Launch strategy
- Create a Chief Economist within the Department of Defense
- Address structural barriers to new entrant competition Establish a Strategic Propellant Reserve similar to the Strategic Petroleum Reserve (SPR) capital. Establish a 'STEM ROTC' or similar scholarship program

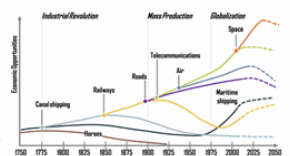


Figure 49: The introduction of new transportation modalities and their impact on economic opportunities (Source: HOP and Associates)



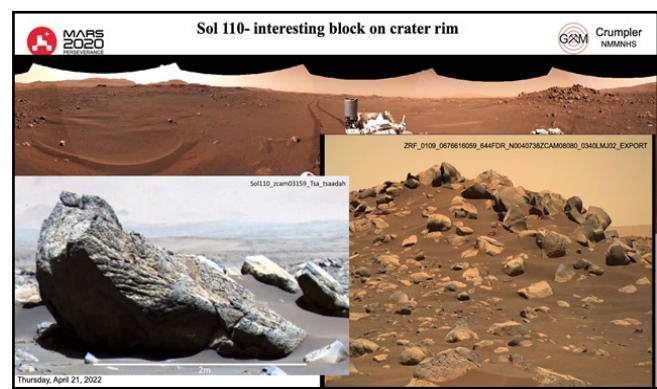
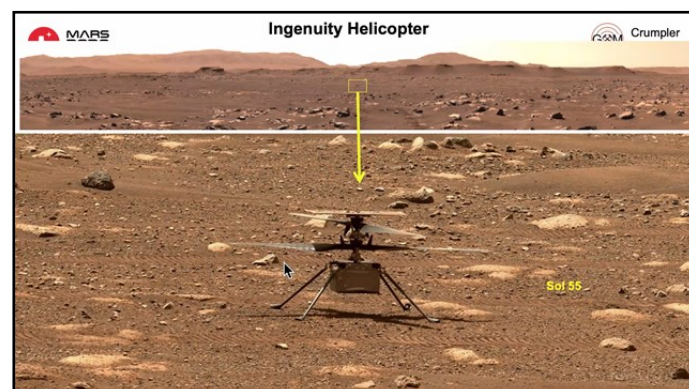
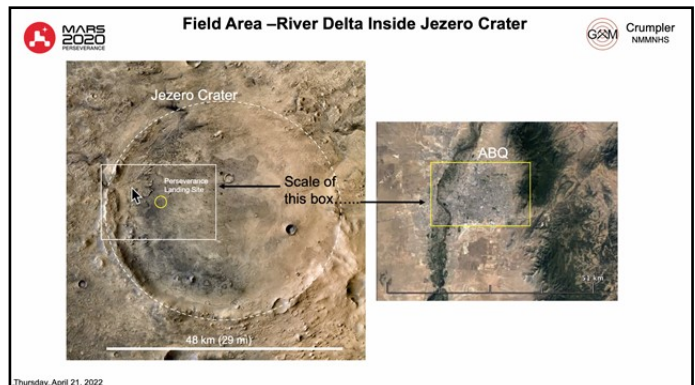
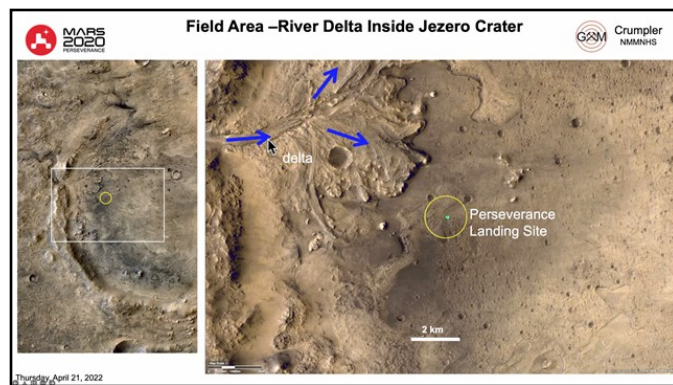
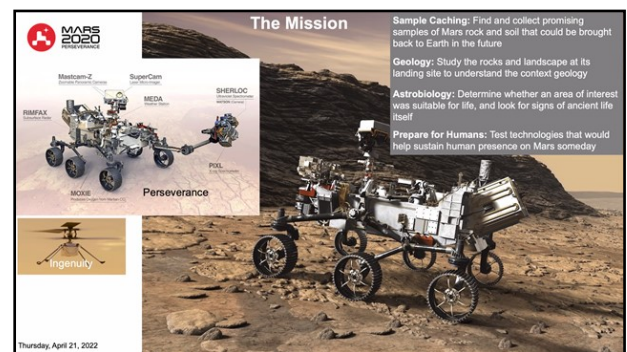
## APRIL MEETING

Robert Malseed, Treasurer

## Exploring a New World: The First 400 days on Mars with Perseverance and Ingenuity

Larry S. Crumpler, Ph.D., New Mexico Museum of Natural History and Science

During the first 400 days of operation on the surface of Mars Perseverance has traveled over 8 kilometers and Ingenuity has flown 24 times. In addition to observations focused on understanding the geologic history and context of four samples collected for eventual return to Earth, Perseverance has made a variety of observations of the atmosphere and the moons of Mars. At the time of this presentation we started the exploration of the enormous delta deposited by an ancient river onto the floor of Jezero Crater where Perseverance landed.

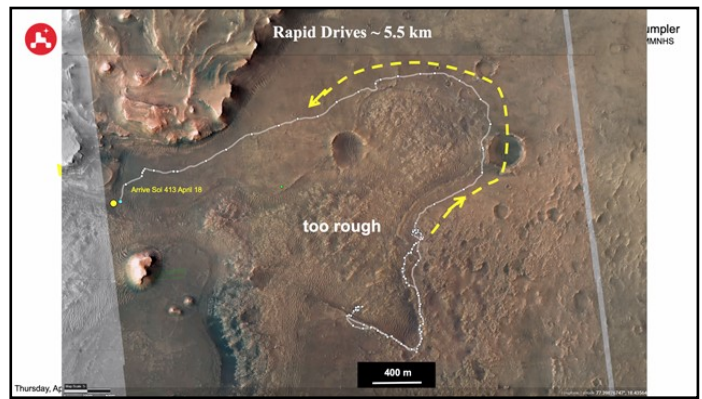




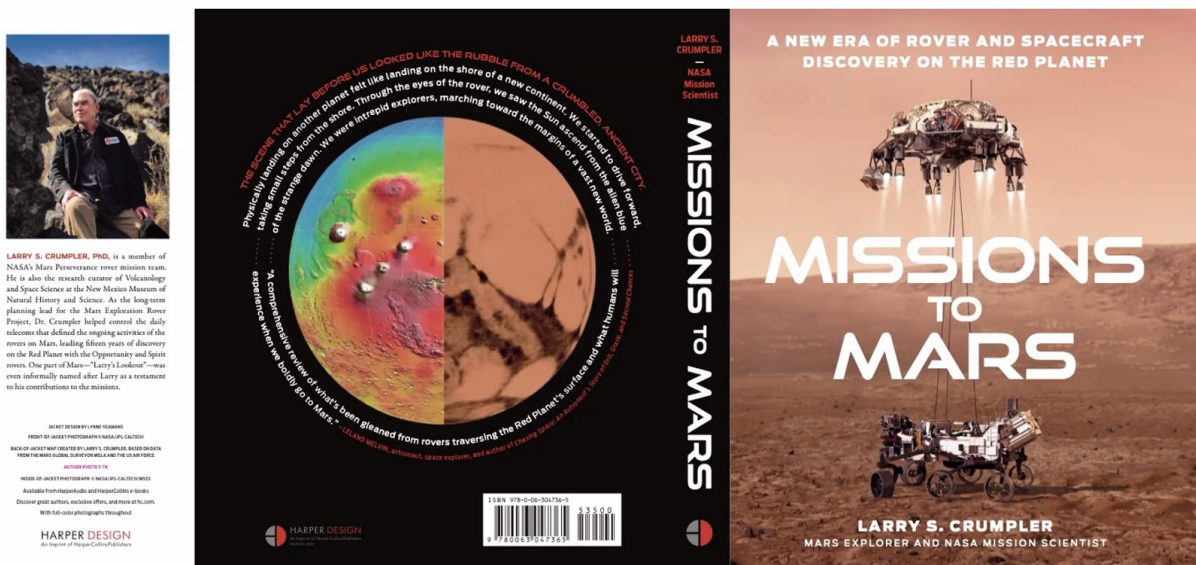
## APRIL MEETING — CONTINUED

By Robert Malseed, Treasurer

We were among the first persons to see the Phobos eclipse pictures.



Cover of Larry Crumpler's new book.

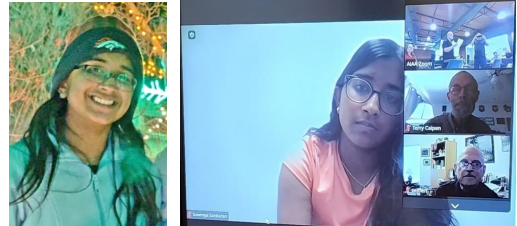


## 2022 SCIENCE FAIR AIAA AWARD WINNERS

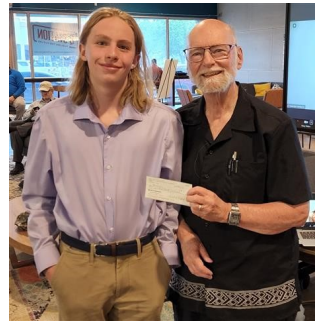
By Stephen Seiffert—Honors and Awards Officer

Three of our Science Fair award winners joined us at our May meeting in person while one joined via Zoom.

Winner Name: Sowmya Sankaran  
Category: Junior Energy & Transportation  
Project Title: **Building a Wind Tunnel to Analyze the Aerodynamics of Cars**  
Grade: 7  
School: Albuquerque Academy  
Teacher: Elliot Wilkinson



Winner Name: Alfred Jones  
Category: Junior Physics & Astronomy  
Project Title: **Do Different Pitch or Pitches Cause Differing Vibrational Movements?**  
Grade: 8  
School: Albuquerque Institute of Math & Science  
Teacher: Donna Brown



Winner Name: Hannah Aldrich  
Category: Junior Physics & Astronomy  
Project Title: **Just Winging It!**  
Grade: 8  
School: Holy Child Catholic School  
Teacher: Lisa Sanchez



Winner Name: Jason McDonald  
Category: Senior Engineering  
Project Title: **What Single Design Change Most Positively Affects a Model Rocket's Altitude and Speed?**  
Grade: 10  
School: The Ask Academy  
Teacher: Carol Donlin



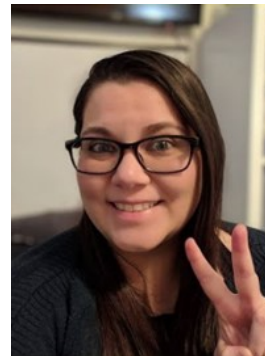
**Congratulations to them All!!!**

## 2022 ALBUQUERQUE SECTION SCHOLARSHIP AWARD WINNER

*By Stephen Seiffert Honors and Awards Officer*

**Sara Lanctot**, has won our 2022 \$1,500 scholarship to use in her pursuit of a Mechanical Engineering degree at NM Tech. Sara is an undergraduate, Mechanical Engineering student at the New Mexico Institute of Mining and Technology and member of our student branch there. In the Newsletter, The Flight Plan, June 2021 edition, of AIAA Albuquerque Section, Ms. Lanctot was featured as a NASA Pathways Agency Cross-Center Collaboration (PAXC) intern for the NASA Armstrong Flight Center in California.

Sara was able to join us via Zoom.



## NEW FREE AIAA HIGH SCHOOL MEMBERSHIP NEW

*By Robert Malseed—Treasurer*

Our section currently has ten members in the new High School Student grade.



**MEMBERSHIP IS FREE AND INCLUDES:**

- AIAA Mentor Match 
-  STEM-focused webinars and on-demand content
- Access to our exclusive Engage community platform 
-  Online subscription to *Aerospace America*
- Discounts to AIAA forums and events 



## REGION IV STUDENT PAPER CONTEST

*By Tito Sylva, Education Officer*

### Region IV SPC (APRIL 1-2, 2022)

Host: University of Texas at San Antonio

Highest number of Grad papers in the last 6 years

Blend of In-Person/ Remote Judging and Presentations

Over 25 volunteer judges overall!

Number of Student Submissions

Undergraduate: 13

Teams: 3

Graduate: 10

Major support from both UTSA and Oklahoma State

Thanks to Dr. James Walker (Director at Southwest Research Institute) for serving as Keynote Speaker.

Next year, SPC will likely be hosted by a university within the White Sands Section.

Keynote Speaker for AIAA 2023 SPC:

**Michael Martindale** (Editor-in-Chief, Space Force Journal; Director, Space Force Association Space Education Committee). Here are some notable (and useful) links to get acquainted with his remarkable career:

<https://www.spaceforcejournal.org/>

[www.ussfa.org](http://www.ussfa.org)

<https://ussfa.org/about/leadership-and-team/executive-committee/>

<https://www.youtube.com/watch?v=bv7YNhonvZY>

## ALBUQUERQUE SECTION OFFICER ELECTION RESULTS

*By Robert Malseed, Treasurer*

The Albuquerque Section Council consists of four elected officers, ten appointed ex-officio officers, and two student branch advisors.

### Council member list for next year (June 2022 – May 2023)

#### Elected Voting Officers:

Chair – Kyle Lynch

Vice – Alex Snyder

Secretary – Terry Caipen

Treasurer – Robert Malseed

#### Appointed Ex-Officio Officers:

Communications – Robert Malseed (Acting) **We still need one!**

Membership – Erin Pettyjohn

Programs – Nick Morley

Public Policy – Mark Fraser

Young Professionals – Caroline Winters

Honors & Awards – Stephen Seiffert

STEM K-12 – Elfego Pinon III

Career Enhancement – Andrea Loper

Education – Humberto Silva

Corporate Liaison – Neal McCasland

#### Student Branch Advisors:

UNM – Daniel Banuti

NMIMT – Mostafa Hassanalian



## APR, MAY, JUN IN AIR &amp; SPACE HISTORY

## FORECAST OF UPCOMING ANNIVERSARIES -- APRIL 2022

## 155 Years Ago -- 1867

April 16: Wilbur Wright born, Millville, IN.

## 75 Years Ago -- 1947

April 25: Wallops Flight Research Facility, VA launched its first rocket-propelled model of a complete airplane for performance evaluation (XF-91).

## 60 Years Ago -- 1962

April 24: Cosmos 3 launched by a Cosmos rocket, 0405 UTC, Kapustin Yar, USSR.

April 24: First transmission of TV pictures in space, via Echo 1.

April 25: Saturn 2 (SA-2 - Project High Water) test launch for Saturn 1; suborbital; launched, 9:00 a.m., EST, Cape Canaveral, Fla.

April 26: Cosmos 4 launched by Vostok rocket, 1005 UTC, Baikonur, USSR.

April 26: Launch by Thor Delta of Ariel 1, the first international satellite, a joint project of NASA and the United Kingdom.

## 55 Years Ago -- 1967

April 5: ATS 2 launched by Atlas Agena, 10:23 p.m., EST, Cape Canaveral, Fla.

April 17: Surveyor 3 launched by Atlas Centaur, 2:39 a.m., EST, Cape Canaveral, Fla, landed on Moon 7:04 a.m., EST, April 19.

April 20: ESSA 5 launched by Thor Delta, 6:21 a.m., EST, Vandenberg AFB.

April 25: Air Force Col. Joseph Cotton and NASA research pilot Fitzhugh Fulton made the first NASA flight in the XB-70A.

April 26: San Marco 2 launched by Scout, 5:06 a.m., EST, San Marco Range SMR, Kenya.

## 50 Years Ago -- 1972

April 4: Molniya 1-20 & SRET 1 (a French acronym for 'Satellite for Research on Environment and Technology') launched by Molniya or Modified SS-6 (Sapwood) rocket, 2039 UTC, Baikonur, USSR.

April 16: Apollo 16 launched, 12:54 p.m., EST, KSC with astronauts John W. Young, Jr.; Thomas K. Mattingly; and Charles M. Duke, Jr.

## 40 Years Ago -- 1982

April 10: Insat 1A (India) launched by Delta, 1:48 a.m., Cape Canaveral, Fla.

April 19: USSR launches Salyut-7 space station on top of Proton K rocket from Baikonur. Station operated until February 7, 1991.

## 35 Years Ago -- 1987

April 15: The U.S. and the Soviet Union signed a new bilateral government-level agreement on civil space cooperation. The agreement called for cooperation in 16 specific project areas to be carried out by joint working groups in space science.

## 30 Years Ago -- 1992

April 1: Daniel S. Goldin takes office as ninth NASA Administrator.

## 25 Years Ago -- 1997

April 4: STS-83 (Space Shuttle *Columbia*) Launched 2:20 EST from KSC. Crew: James D. Halsell, Susan L. Still, Janice E. Voss,

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## APR, MAY, JUN IN AIR & SPACE HISTORY

(Continued from page 11)

Donald A. Thomas, Michael L. Gernhardt, Roger K. Crouch, and Gregory T. Linteris. It carried the Spacelab module containing resources for many microgravity experiments and a combustion facility for the study of the rise, spread, and extinction of flames under microgravity conditions. Landing at KSC on April 8, 1997, 2:33 p.m., EDT. Mission Duration: 3 days, 23 hours, and 13 minutes.

### 20 Years Ago – 2002

April 8: STS 110 (Space Shuttle *Atlantis*) launched at 4:44 p.m. EDT, KSC. Crew: Michael J. Bloomfield, Stephen N. Frick, Jerry L. Ross, Steven L. Smith, Ellen Ochoa, Lee M.E. Morin, and Rex J. Walheim. International Space Station Flight 8A. Delivered an ISS truss assembly. Landing at KSC on April 19, 12:27 a.m. EDT. Mission Duration: 10 days, 19 hours, 43 minutes.

April 25: Soyuz TM-34 launched as the third “taxi” flight from Baikonur at 06:26 UTC to the International Space Station (ISS), bringing a “fresh” Soyuz return vehicle. The crew consisted of one Russian, Yuri P. Gidzenko, an Italian astronaut, Roberto Vittori, and the second commercial space tourist, South African Mark R. Shuttleworth. They returned 8 days later on older Soyuz TM-33.

### 15 Years Ago – 2007

April 7: Soyuz-TMA launched by a Soyuz rocket from Baikonur at 17:31 UTC. Crew: consisted of two cosmonauts, Oleg V. Kotov, Fyodor N. Yurchikhin, and a tourist, Charles Simonyi to the International Space Station (ISS). It docked with the Zarya module of the ISS.

April 25: AIM (Aeronomy of Ice in Mesosphere), an American (NASA) satellite designed to study noctilucent clouds (NLC) or night shining -- mainly ice crystal clouds that form about 85 km above Earth's poles, launched on a Pegasus XL rocket from an L-1011 aircraft flying out of Vandenberg AFB at 21:26 UTC.

### 10 Years Ago – 2012

April 19: NASA transferred Space Shuttle *Discovery* to the Smithsonian's National Air and Space Museum at formal ceremonies at the museum's Stephen F. Udvar-Hazy Center in Chantilly, Va.

### 5 Years Ago – 2017

April 20: Soyuz MS-04 spacecraft launched at 13:18:00 UTC by a Soyuz FG launch vehicle from Tyuratam (Baikonur Cosmodrome), Kazakhstan. Crew: Jack Fischer, a NASA astronaut, and Fyodor Yurchikhin, a Russian cosmonaut (ISS Expedition 51), joined NASA astronaut Peggy Whitson, European Space Agency astronaut Thomas Pesquet, and Russian cosmonaut Oleg Novitskiy (ISS Expedition 50).

April 24: Peggy Whitson received a special long-distance call from the White House to congratulate her on for the most cumulative time in space by a U.S. astronaut, having spent 534 days aboard the space station. Eventually she tallied 665 days from a combined three missions.

## FORECAST OF UPCOMING ANNIVERSARIES -- MAY 2022

### 95 Years Ago - 1927

May 20-21: Charles A. Lindbergh made the first solo nonstop flight across the Atlantic Ocean. Lucky Lindy's single-seat, single engine Ryan monoplane named the *Spirit of St. Louis* began the flight from Roosevelt Field, NY and landed at Le Bourget Air Field, outside of Paris, France. This singular event was a major factor in awakening the nation to the full potential of aviation.

### 85 Years Ago - 1937

May: Peenemünde opened under the Command of, then, Captain Dr. Walter Dornberger.

### 75 Years Ago - 1947

May 29: In what may be the sole example of the US firing a missile at Mexico in peacetime, happened when a modified V-2 was

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## APR, MAY, JUN IN AIR & SPACE HISTORY

*(Continued from page 12)*

launched by the United States from the White Sands Proving Grounds. NM and flew in the wrong direction! It landed 1-1/2 miles south of Juarez, Mexico!

### 70 Years Ago - 1952

May 16: The International Geophysical Year (IGY) was created.

May 22: Two monkeys and two mice were carried 36 miles aloft by an Aerobee sounding rocket. The live cargo was recovered unharmed. White Sands Proving Grounds, NM.

### 65 Years Ago - 1957

May 31: Army's Jupiter IRBM was successfully fired 1,500 miles downrange, Cape Canaveral, Fla.

### 60 Years Ago - 1962

May 24: Mercury Atlas 7/Aurora 7 (MA-7) M. Scott Carpenter astronaut pilot was launched at 8:45 a.m., EDT, for three orbits of the Earth, Cape Canaveral, Fla.

### 55 Years Ago - 1967

May 4: Lunar Orbiter 4 was launched by Atlas Agena, 6:25 p.m., EDT, Cape Canaveral, Fla.

May 5: Ariel 3 launched by Scout, 12:00 p.m., Vandenberg AFB.

May 24: Explorer 34 (IMP-F) launched by Thor Delta, 10:06 a.m. EDT, Vandenberg AFB.

May 29: ESRO II-A launched by Scout, failed to orbit, 10:06 p.m., EDT, Vandenberg AFB.

### 50 Years Ago - 1972

May 24: U.S. President Richard M. Nixon and USSR Premier Aleksey N. Kosygin signed an agreement for cooperation in the exploration of outer space for peaceful purposes and included the docking in space of US/USSR spacecraft in 1975. Moscow, USSR.

May 25: The first flight of the F-8 (Modified F-8C Crusader aircraft) "digital-fly-by-wire," piloted by Gary E. Krier, Dryden Flight Research Center (DFRF), CA.

### 45 Years Ago - 1977

May 26: Launch of Intelsat 4A-F4 at 5:47:00 EDT by Atlas Centaur from Cape Canaveral.

### 40 Years Ago - 1982

May 11: First supersonic flight of the HIMAT aircraft, Dryden Flight Research Center (DFRF), CA.

May 13: USSR launches Soyuz T-5 at 09:58:00 UTC aboard Soyuz rocket, a Modified SS-6 (Sapwood) or Molniya, from Baikonur. Cosmonauts: Anatoli N. Berezovoy and Valentin V. Lebedev. Ferry flight to Salyut-7 space station.

### 35 Years Ago - 1987

May 15: First flight of the Energia rocket carrying the Polyus satellite from Baikonur. Failed to reach orbit. Energia rocket would launch the USSR's space shuttle, Buran.

### 30 Years Ago - 1992

May 7: STS-49 (Space Shuttle *Endeavour*) launched, 7:40 p.m., EDT, KSC. Crew: Daniel C. Brandenstein, Kevin P. Chilton, Richard J. Hieb, Bruce E. Melnick, Pierre J. Thuot, Kathryn C. Thornton, and Thomas D. Akers. Rendezvoused, repaired, and reboosted Intelsat VI communications satellite. Among the firsts on this mission were: First EVA involving three astronauts and first use of a drag chute during a shuttle landing. Landed May 16, 4:57 p.m., EDT, Edwards Air Force Base (EAFB), CA. Mission Duration 8

*(Continued on page 14)*

## APR, MAY, JUN IN AIR & SPACE HISTORY

(Continued from page 13)

days, 21 hours, and 17 minutes.

### 25 Years Ago - 1997

May 15: STS-84 (Space Shuttle *Atlantis*) launched 4:07 a.m. EST, KSC. Crew: Charles J. Precourt, Eileen M. Collins, C. Michael Foale, Carlos I. Noriega, Edward T. Lu, Jean-Francois Clervoy (France), and Elena V. Kondakova (Russia). 6th Shuttle/Mir docking mission. Landed May 24, 9:27 a.m., EDT at KSC. Mission Duration: 9 days, 5 hours, and 20 minutes.

### 20 Years Ago - 2002

May 4: Aqua (previously named EOS PM-1) launched by a Delta 2 rocket from Vandenberg AFB at 05:54 a.m. EDT to study the global water cycle in the oceans, ice caps, land masses and the atmosphere.

### 15 Years Ago - 2007

May: NASA and 13 space agencies from around the world released the framework for a global exploration strategy. The document, titled "The Global Exploration Strategy: The Framework for Coordination," reflects a shared vision of space exploration focused on solar system destinations where humans may someday live and work.

### 10 Years Ago - 2012

May 15: Soyuz-TMA 04M launched from Baikonur cosmodrome by a Soyuz-FG launch vehicle at 3:01 UTC. It carried Russian cosmonauts Gennady Padalka (commander of the crew) and Sergei Revin (flight engineer) along with NASA astronaut Joe Acaba (flight engineer) to the International Space Station (ISS). Docking occurred on May 17.

May 22: Dragon C2/C3 launched from Cape Canaveral at 7:44 EDT by a Falcon 9 rocket. The spacecraft was the first fully functional Dragon spacecraft on the Commercial Orbital Transportation Services (COTS) C2+ Demonstration Mission for NASA. It successfully docked with the ISS and was recovered.

## FORECAST OF UPCOMING ANNIVERSARIES -- JUNE 2022

### 110 Years Ago -- 1917

June 28: Langley Research Center, authorized by NACA as an experimental field, Hampton. VA.

### 80 Years Ago -- 1942

June 13: The first attempted launch of an A-4 (V-2) took place at Peenemünde. The rocket rose about .8 miles then crashed.

### 70 Years Ago -- 1952

June 18: H. Julian Allen, NACA-Ames scientist, conceived the blunt nose concept for reentry vehicles, which was later used in IC-BM's and Mercury, Gemini, and Apollo spacecraft.

### 65 Years Ago -- 1957

June 11: Atlas ICBM No. 1 exploded at two miles altitude, Cape Canaveral, Fla.

### 60 Years Ago -- 1962

Jun 19: Tiros 5 (meteorological satellite) launched by Thor Delta, 8:19 a.m., EDT, Cape Canaveral, Fla.

June 27: The X-15 unofficial world speed record of 4,104 mph was set with pilot Joseph A. Walker at the controls, DFRF. CA.

### 55 Years Ago -- 1967

June 12: Venera 4 launched by Modified SS-6 (Sapwood) or Molniya, 0238 UTC, Baikonur, USSR. Direct atmospheric studies of

(Continued on page 15)



## JAN, FEB, MAR IN AIR &amp; SPACE HISTORY

(Continued from page 14)

Venus.

June 14: Mariner 5 (Venus flyby) was launched by Atlas Agena, 2:01 a.m. EDT, Cape Canaveral, Fla.

**50 Years Ago – 1972**

June 13: Intelsat 4 F5 is launched at 5:53:00 EDT by Atlas from Cape Canaveral, Fla.

**45 Years Ago -- 1977**

June 16: Dr. Wernher Von Braun died, Alexandria, VA.

June 16: GOES-2 launched by Delta, 6:51 a.m., EDT, Cape Canaveral, Fla.

June 21: Robert A. Frosch took office as the fifth NASA Administrator.

**40 Years Ago -- 1982**

June 8: Westar 5 launched by Delta, 8:24 pm, EDT, Cape Canaveral, Fla.

June 24: USSR launched Soyuz T-6 aboard Soyuz rocket to Salyut 7 space station at 16:30:00 UTC. Launch from Baikonur. Cosmonauts: Vladimir A. Dzhanibekov; Alexander S. Ivanchenko; Jean-Loup Chrétien (France).

June 27: STS-4 (Space Shuttle *Columbia*) launched, 11:00 a.m., EDT from KSC. Crew: Thomas K. "Ken" Mattingly and Henry W. "Hank" Hartsfield. Final Space Transportation System research and development flight. Landed July 4, 12:09 p.m., EDT, Edwards Air Force Base (EAFB), CA. Mission Duration 7 days, 1 hour, 9 minutes.

**35 Years Ago -- 1987**

June 30: NASA submitted to President Reagan a report on the agency's implementation of the recommendations of the Presidential Commission on the Space Shuttle Challenger Accident. The report describes the ongoing Shuttle recovery effort -- relative to the nine recommendations made by the commission -- as well as other return-to-flight activities.

**30 Years Ago -- 1992**

June 7: Extreme Ultraviolet Explorer (EWE) launched by Delta 2 from Cape Canaveral, Fla, 12:40 p.m. EDT.

June 25: STS-50 (Space Shuttle *Columbia*) launched, 12:12 p.m., EDT, KSC. Crew: Richard N. Richards, Kenneth D. Bowersox, Bonnie J. Dunbar, Ellen S. Baker, Carl J. Meade, Lawrence J. DeLucas, and Eugene H. Trinh. U.S. Microgravity Laboratory-I carried in the shuttle cargo bay. Landed July 9 at 7:43 a.m., EDT, KSC. Mission Duration 13 days, 19 hours, and 30 minutes.

**20 Years Ago -- 2002**

June 5: STS-111 (Space Shuttle *Endeavour*) launched 5:23 p.m. EDT, KSC. Crew: Paul S. Lockhart, Kenneth D. Cockrell, Franklin Chang-Diaz, Peggy Whitson, with cosmonauts Valery G. Korzun and Sergei Y. Treschev and French astronaut Philippe Perrin. International Space Station flight UF-2. The crew delivered more payload and experiment racks to the Destiny Laboratory. The Mobile Base System was also installed completing the Station's Mobile Servicing System, which includes the Canadarm2 and the Mobile Transporter. Delivered the Expedition Five crew and returned the Expedition Four crew. Landed June 19, 1:58 p.m. EDT at EAFB. Mission Duration: 13 days, 20 hours, 35 minutes.

**10 Years Ago -- 2012**

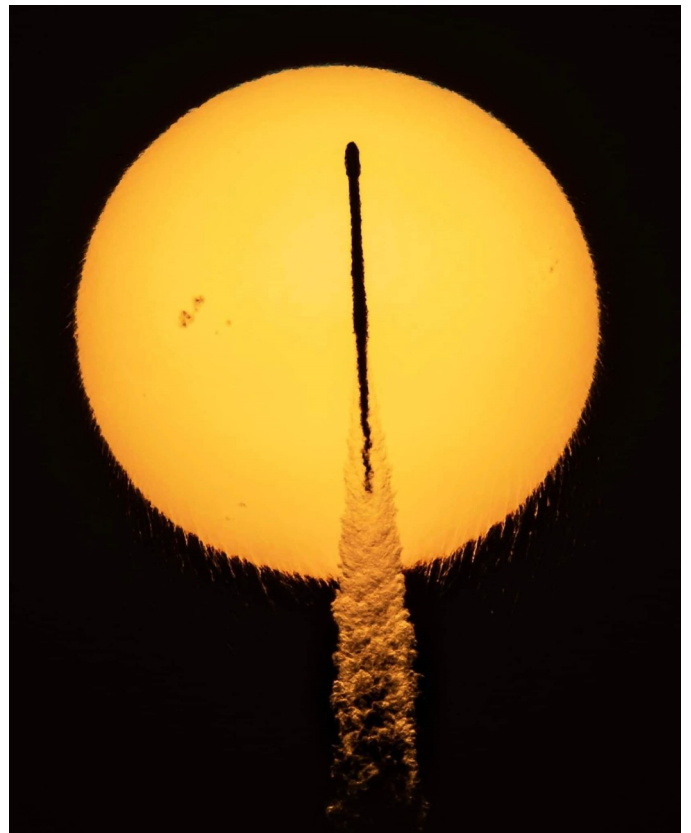
June 16: Shenzhou 9 spacecraft launched at 10:37:00 UTC from Jiuquan, Peoples Republic of China on a Long March 2F launch vehicle from Jiuquan, Peoples Republic of China. It docked with China's first space lab Tiangong-1 at 06:07 UTC on June 18, successfully completing China's first manned spacecraft rendezvous and docking.

## IMAGES OF THE QUARTER

### Solar “Eclipses”



By Phobos—from Mars



By a Falcon 9—from Florida

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### PARTING THOUGHTS

“Physics is, hopefully, simple. Physicists are not. ”

- Edward Teller -

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