

HILLER AVIATION MUSEUM WHERE INSPIRATION TAKES FLIGHT

PRIZE ACHIEVEMENT SPACESHIPONE AND THE ANSARI X-PRIZE

by Jon Welte



Wilbur and Orville Wright first popularized their flying machines in 1908, staging demonstration flights that stunned onlookers and silenced those who had come to doubt that they had been the first to fly. Shortly thereafter millions of people had a chance to see first hand the astonishing work of engineering at public "air meets", including ones at Dominguez Field (Los Angeles) and Tanforan (San Francisco) in early 1910.

One of the observers of the 1910 California air meets was publishing magnate William Randolph Hearst. Hearst grasped the appeal of aviation and its potential for boosting newspaper sales, and knew that the year before a prize offered by the London-based Daily Mail inspired Louis Bleriot to fly across the English Channel. Hearst developed a prize of his own for a transcontinental flight across the United States. Although the deadline expired before the prize could be claimed, it motivated Cal Roberts' pioneering cross-country trip in the Wright Model B Vin Fiz in 1911.

Prize purses remained common throughout the first decades of aviation. Perhaps the most celebrated was the Orteig Prize, which led teams of aviators in a quest to fly across the Atlantic Ocean between New York and Paris. In May 1927, the prize was famously won by former air mail pilot Charles Lindbergh, flying solo in his Spirit of St. Louis airplane.

With the coming of World War II, prizes fell by the wayside as the pace of aerospace achievement was largely set by government-funded military programs. Wartime requirements accelerated the adoption of jet propulsion, and during the Cold War uniformed test pilots flew to the sound barrier and beyond. Yet the allure of privately-funded prizes, competed for by private-funded builders and pilots, remained compelling.



How to Make a Spaceship SpaceShipOne by Julian Guthrie and Brian Binnie Saturday June 24, 11am



PLANES, TRAINS & HOT RODS

SUNDAY JULY 16



Smithsonian Institution Affiliations Program In 1996, engineer and entrepreneur Peter Diamandis rekindled the practice of offering flight-related prizes by announcing the X-Prize, which promised a purse of \$10 million for the first privately-funded human spaceflight. Renamed the Ansari X-Prize in 2004 after substantial funding was provided by Anousheh and Amir Ansari, the prize rules stipulated that the spacecraft must be reusable and capable of carrying a crew of three, and must complete two separate flights beyond an altitude of 100 kilometers (62 miles).



One of the speakers at the announcement of the X-Prize was an eccentric aircraft designer named Burt Rutan. Rutan had worked with the United State Air Force as a civilian engineer at Edwards Air Force Base, then designed and built kits for personal aircraft before establishing Scaled Composites at Mojave Airport in 1982. He led the design and construction of a range of innovative aircraft, including the Voyager aircraft which completed the first nonstop, unrefueled flight around the world in 1986. Rutan had long advocated a larger role for private industry in the development of flight, and was intrigued by Diamandis' idea of a prize to spur new advances in space transportation.

Rutan and a small team of engineers at Scaled Composites worked on the problem of low-cost, suborbital manned spaceflight for several years, with a particular focus on the problem of safe re-entry from suborbital space. In the 1960s the North American X-15 had been tested at Edwards. Funded by NASA and the United States Air Force, the X-15 was carried aloft by a Boeing B-52 as a mothership, igniting its rocket motor only after being dropped at altitude. The X-15 achieved altitudes as high as 67 miles, but was demanding of its pilots. Rutan was at Edwards in 1967 when Air Force test pilot Michael Adams was killed in a fatal crash. The X-15 flown by Adams entered a spin near the high point of its flight and re-entered the atmosphere in an incorrect attitude at excessive speed, disintegrating in midair. Determined to design a spaceplane with superior stability, Rutan settled on a unique design feature that would "feather" the wings of the vehicle at an extreme angle as it reached its apogee, increasing drag and ensuring a stable descent back into the atmosphere below.

A workable design in hand, Rutan secured funding from Microsoft co-founder Paul Allen and created a company called Mojave Aerospace Ventures to support construction and testing of the spacecraft. In April 2003 Rutan rolled out what he called the "first private manned space flight program" at his facility in California's high desert. The vehicles involved were unlike any that had flown to space before, although the mission profile was similar to that used by the X-series research aircraft. A carrier aircraft with a narrow, high-aspect wing appeared alongside a stubby rocket plane with a split vertical tail. The carrier, named White Knight, would lift the spaceplane to a launch altitude close to 50,000'. The spaceplane, named SpaceShipOne, would ignite a rocket motor when released and initiate a near-vertical climb beyond the edge of the atmosphere.

Captive flight tests began the following month, with glide tests in which SpaceShipOne was released from White Knight beginning that summer. On December 17th, 2003—the 100th anniversary of the Wright Brothers' first flight—SpaceShipOne completed its first powered mission, exceeding the speed of sound under thrust from its powerful rocket motor.

On September 29th, 2004, SpaceShipOne launched on the first of two flights required to win the X-Prize. Piloted by Mike Melvill, SpaceShipOne reached an altitude of 103 kilometers and, crucially, landed safely and successfully back at Mojave. This enabled a rapid servicing and turnaround of the vehicle, culminating in a second launch on October 4th, 2004, with pilot Brian Binnie at the controls. With the successful completion of this second consecutive launch to space, the SpaceShipOne team won the Ansari X-Prize and demonstrated an entirely new means of reaching to the edge of space.

One year after its last historic free flight, SpaceShipOne was placed in the Milestones of Flight gallery at the Smithsonian Air & Space Museum. The molds and tooling used to construct its composite fuselage has since been used to create several full-scale replicas. The Hiller Aviation Museum is pleased to have one such replica on display through 2018, courtesy of the Chabot Space and Science Center. Now hanging in the Museum's Atrium, this artifact stands in tribute to the team that designed, built and flew the world's first privately-funded manned spacecraft.

Resources

Aviation Week & Space Technology, "Rutan Aims for Space", April 21, 2003 How to Make a Spaceship, Julian Guthrie, 2016

https://airandspace.si.edu/collection-objects/ spaceshipone, downloaded 24 April 2017





PRESIDENT'S PERSPECTIVE

s we wind down the academic year, we are proud to report

that 2016-2017 was our busiest school year, ever, with about 12,000 youth visiting the museum on field trips from K-12 schools throughout the Bay Area, along with an additional 3,000 teachers and chaperones.

We made a special effort this year to reach out to children with financial challenges, enabling them to take advantage of what the museum has to offer with 40% of school visitors coming from low-income families, thanks to help from sponsors such as the Franklin and Catherine Johnson Foundation and Google. Our special initiatives for low-income participants are delivered by the museum's Education Staff and dedicated volunteers led by Jon Welte and Linh Fanger. Well done!

New exhibit offerings are in our development pipeline. Coming this summer will be a multi-media interactive display presenting real-time weather and the state of air traffic in the country along with intriguing information about how airline operations are conducted behind the scenes involving the efforts of meteorologists and flight dispatchers. This new exhibit is funded by the JetBlue Foundation and we are grateful for their support.

Thank you for helping make the Hiller Aviation Museum a vibrant and exciting place to visit. We look forward to seeing you soon at the Museum this summer!

Jeffery Bass, President & CEO Hiller Aviation Museum

AVIATION CAMP SUMMER PROGRAMS GRADES K-8 NOW ENROLLING FOR SUMMER ADVENTURES



WELCOME MEMBERS! WE WOULD LIKE TO WELCOME THE FOLLOWING NEW AND RETURNING MEMBERS FEBRUARY THROUGH APRIL:

Crystal Adams, Elizabeth Alasko, Melissa Albritton, Lauren Altbaier and Keyla Marques, Jeff Alvarez and Rosa Lumbe, Modell Marlow Andersen, Roger and Donna Anderson, Linda Anderson, Jaime Angulo and Davana Salazar, Tiffany and Josh Austin, JoAnne Bailey, Sarah Bailey Hogarty and Tom Hogarty, Brian Ballou, Samrat Banik and Sampa Das, Celeste Baranski and Paul Hammel, Tamar and Jacob Barley, Chuck Barnes and Cindy Rodriguiz, Jenny and Verena Baumgartner, David and Frances Becker, Daniel R. Bedford and Valerie L. Westen, Sreekar and Ulana Bhaviripudi, Jerry Bianchini, Carolyn and Peter Bierman, James C. Biggers, Ben and Martha Bixby, Per Bjorke and Andrea Kohler, Russell and Cee Blaine, Jeff Blohm, Kelly and Julianne Blythe, Peter and Angela Boese, Thomas and Tanya Boone, Regan and Tim Botsford, Christopher and Elizabeth Brauman, Patricia Briscoe, William Brockenborough, Richard and Judy Bruno, Michael and Vivian Brzustowicz, Lysle Buchbinder and Ted Huang, Jennifer and Charles Buchbinder, Robert and Pat Burns, Lawrence Cannon, Paula and Bandel Carano, Sarah and Dante Cassanego, Yohana and Abner Catalan, Allan Chan and Carrie Lee, Janette and Derrick Chan, Cecilia Chang and Jason Coffer, Catherine Chapman and Chris Sallen, Michele and Jonathan Charles, Kuang Tsung Chen and Juichi Huang, Jean and Albert Chiang, Kandasamy and Ashwat Chidambaram, Sarah and Robert Chinn, Kokil and Kapil Chopra, Deanna Chow and Michael Liw, Robert Coley and Elena Coley-Ford, Nicole and Reuben Collins, Ryan and Brenna Connolly, Trish and Gene Cook, Robert and Mary Cormia, Catalin Cosovanu, William Craig, Kathryn and Gary Crandell, Erin Crescenti, Scott Cronce and Deborah Maxwell, Curtis and Julia Cronin, Laura and Ian Cruickshanks, Maria Cruz and Pedro Martinez, Sveta Damorat and Galina Galburt, Rajiv and Arlene Darji, Aaron and Kirsten Daru, Lawrence and Kathy Davenport, Carol Day Paine, Rosa Delgdo and Victor Leza, Richard DeLuna, Richard DeLuna, Tejasvi Devaru and Jing Guo, Andrew-John Dittrich and Irena Danijela Peti, Jennie Doberne and Naday Rokach, Tamra Donovan and Alexander Revnolds, Blair Dore, Siddharth Doshi and Shachi Khichadia, Rebecca Duran and Frik Malinowski, Robert L. 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HOW TO MAKE A SPACESHIP

PRESENTATION & BOOK SIGNING BY JULIAN GUTHRIE SATURDAY, JUNE 24, 11AM



A new era in space exploration dawned with the winning of the Ansari X-Prize by Space Ship One in 2004. Since then, a small group of dedicated entrepreneurs has sought to forge a new route to space. Author Julian Guthrie and SSI Pilot/Astronaut Brian Binnie present the story of the

winning of the Ansari X-Prize and the birth of an exciting new industry in spaceflight.

Event included with Museum admission.

FREE FALLING – WORLD'S HIGHEST PARACHUTE JUMP SATURDAY, MAY 27, 11AM PRESENTATION BY ALAN EUSTACE

In 2011, Alan Eustace decided to pursue a stratosphere parachute jump. Over the next three years, the test program included 5 airplane jumps from 18,000 feet, and 3 balloon jumps, from 57,000, 105,000 and 135,890 feet, setting 3 skydiving world records, including the highest exit altitude.

On October 24, 2014, Eustace made a jump from the stratosphere, breaking Felix Baumgartner's 2012 world record. The launch-point for his jump was from an abandoned runway in Roswell, New Mexico, where he began his gas balloon-powered ascent early that morning. The balloon used for the feat was manufactured by the Balloon Facility of the Tata Institute of Fundamental Research, Hyderabad, India. Eustace in his pressure suit

hung tethered under the balloon, without the kind of capsule used by Felix Baumgartner.

His descent to Earth lasted 15 minutes and stretched nearly 26 miles with peak speeds exceeding 821.45 miles per hour, setting new world records for the highest free-fall jump, and total free-fall distance 123,334 feet.



Alan's talk summarizes solutions to critical issues like redundancy, emergency aborts, CO2, fogging, spins, drogue deployment, and balloon launches, along with photos and videos of the key milestones. Event included with Museum admission.

PLANES, TRAINS & HOT RODS







SUNDAY JULY 16, 10AM - 2PM



On Sunday July 16 the museum is joining forces with the Golden Gate Hot Rod Club and the European Model Train Enthusiasts to present Planes, Trains and Hot Rods!

We will feature some of our "cooler" local airplanes along with over 100 custom and hot rod cars and of course everyone's favorite models trains.

Event included with museum admission.



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CALENDAR

JUNE

SAT, JUNE 3 • 10AM-1PM Biggest Little Air Show

WED, JUNE 7 • 11AM Drone Fest

WED, JUNE 14 • 11AM Happy Birds

TUE-THUR. JUNE 20-22 10:30AM & 1PM Starlab

WED, JUNE 21 • 11AM Water Rocket Rally

SAT, JUNE 24 • 11AM How To Build A Spaceship

WED, JUNE 28 • 11AM & 1PM Paper Airplanes

JULY

WED, JULY 5 • 11AM Happy Birds SAT, JULY 8 • 11AM

Paper Airplanes

TUE-THUR. JULY 11-13 10:30AM & 1PM Starlab

WED, JULY 12 • 11AM Water Rockets SAT, JULY 15 – SUN JULY 23 11AM & 3PM Model Train Exhibit

SUN, JULY 16 • 10AM - 2PM Planes. Trains & Hot Rods

WED, JULY 19 • 11AM & 1PM Paper Planes

SAT/SUN JULY 22 & 23 • 10AM-4PM EuroWest Model Train Show

WED, JULY 26 • 11AM Happy Birds

AUGUST

WED, AUG 2 • 11AM Water Rockets

WED, AUG 9 • 11AM-2PM Kids Air Faire

TUE-THUR. AUG 1-3 10:30AM & 1PM

Starlab WED, 16 • 11AM Happy Birds

WED, AUG 23 • 1:30PM Paper Airplanes SAT, AUG 26 • 10AM-2PM Day of Drones

WED, AUG 30 • 1:30PM Water Rockets

GOURMET FOOD TRUCKS WEDNESDAYS, 11AM-2PM,

DRONE PLEX SATURDAYS & SUNDAYS, 10:30AM-12PM & 1PM-3PM

> INVENTION LAB SATURDAYS & SUNDAYS, 10:30AM-4PM

FLIGHT SIM ZONE SATURDAYS & SUNDAYS, 11AM-2PM,

AVIATION CAMP WEEK-LONG SESSIONS JUNE 5-SEPTEMBER 1

DAY OF DRONES SATURDAY AUGUST 26, 10AM-2PM

Unmanned Aerial Systems (UAS) have been known as "drones" since the 1930s, but until recently were known for little except their hapless role on the receiving end of target practice. Today, military



drones are widely known (and sometimes feared) for their prowess in reconnaissance and strike missions, and civilian drones offer the promise of changing our everyday lives, from sporting events to package delivery.

The Hiller Aviation Museum exhibits an amazing variety of drones within its collection, including its enormous Boeing Condor. In August, the Museum will host the Day of Drones, a special event highlighting the growing role UAS play in the national airspace system. Many different remotely piloted aircraft will be on display, and private multi-rotor drone operators will fly demonstrations throughout the



event. Presenters will speak on UAS operations, and hobby-level drones will be available in the Museum's Gift Shop for purchase.

Make your plans today to experience how UAS are remaking the world of flight.

🗧 EUROWEST 🗜

Trains with Names

at the 21st EuroWest MODEL TRAIN SHOW

HILLER AVIATION MUSEUM 601 Skyway Rd., San Carlos, CA 94070

Saturday, July 22nd, 2017 10:00am to 5:00pm Sunday, July 23rd, 2017 10:00am to 4:00pm

- Operating European Model Train Layouts
- Clinics and Lectures
- Fun Challenges for Young and Old!
- Sales Tables
- Children's Activities
- Raffle Prizes
- Manufacturer and Distributor Displays

ADMISSION PRICE INCLUDES ADMISSION TO THE HILLER MUSEUM Please see http://www.hiller.org for current admission

For show and vendor information please contact **Dave Cowl**: <u>eurowest@ete.org</u> or visit <u>http://www.ete.org</u>



AVIATION CAMP 2017

Aerial adventures for kids depart this summer from the Hiller Aviation Museum! Aviation Camp introduces kids entering Grades JK-8 to aerospace with hands-on experiments, design challenges, flying models, flight simulation, experiences with real aircraft and much more. Seven different topics are available. See the

enclosed brochure for more information, and visit www.hiller. org for current availability information or to enroll today!



WEDNESDAY FAMILY EVENTS SPECIAL EVENTS AT THE HILLER AVIATION MUSEUM WEDNESDAYS, JUNE 7-AUGUST 30

Wednesdays are fun days all summer long! Special events and programs for kids and their families are offered each Wednesday, and gourmet food trucks are available 11AM-2PM.

HAPPY BIRDS WEDNESDAYS JUNE 14, JULY 5, JULY 26, AUGUST 16 ALL SHOWS 11AM



The amazing team of tropical flyers returns! Meet a colorful crew of parrots, macaws and cockatoos as they fly and show off remarkable natural behaviors and amazing trained tricks and antics.

DRONE FEST

WEDNESDAY, JUNE 7 • 11AM-12PM Learn more about the role of remotely piloted aircraft, see a demonstration of drone flight in the Museum's Drone Plex, and take the controls of a realistic quadcopter simulator. Event included with Museum admission.

PERFECT PAPER PLANES

WEDNESDAYS, JUNE 28 & JULY 19 (11AM & 1PM), AUGUST 23 (1:30PM) SATURDAY, JULY 8 (11AM)

Champion paper plane maker John Collins shares his design techniques while putting on a



remarking demonstration of flying paper airplanes. Build a paper plane and watch unique designs take flight.

WATER ROCKET RALLY

WEDNESDAYS, JUNE 21, JULY 12, AUGUST 2 • 11AM-12PM AND AUG 30 • 1:30PM-2:30PM

Discover the technology that makes spaceflight possible! Learn about the science of rocketry, then create a high flying water rocket! Bring a clean, recycled soda bottle from home or purchase one at the Gift Shop for \$1 on the day of the event.



INVENTION AND EXPLORATION • DROP-IN WEEKEND/HOLIDAY ACTIVITIES

Join special, immersive hands-on experiences on weekends and select holidays. Visit www.hiller.org for a complete list of dates and topics.

- Flight Sim Zone, 11AM 2 PM*
- FMX flight simulation, 11AM 2PM*
- Invention Lab, 10:30AM 4PM
- Drone Plex, demonstration and simulation open 10:30AM – 12PM
- Drone Plex, Drone Flight Experience 1PM – 3PM*
- *Additional fee required

KIDS' AIR FAIRE WEDNESDAY, AUGUST 9 • 11AM-2PM



Join Bay Area pilots and local public safety agencies as they share airplanes, helicopters, fire engines, police cruisers and other emergency vehicles with children of all ages. Fly a glider or paper helicopter, explore the Museum's gallery in an Exhibit Safari and more! Event included with Museum admission.

STARLAB SKY SHOWS

JUNE 20-22, JULY 11–13, AUGUST 1–3 (TUESDAYS THROUGH THURSDAYS) 10:30AM, 1PM

Enter a giant inflatable dome to see the summer night sky and discover the stars, constellations and planets visible from your own backyard! Space is limited. Tickets are available at the Gift Shop on the day of the event.





Big things come in small packages in an amazing aerial display at the Hiller Aviation Museum!

Join the festivities as the Biggest Little Air Show matches a thrilling aerobatic performance by airshow pilot John Collver and his full-sized 1944 WWII trainer airplane along with demonstrations of exceptional radio controlled models. San Carlos Airport will close to regular traffic from 10:30 am to noon to allow realistic jet- and propeller-powered model aircraft to roll down the runway and into the sky to take their part in a unique aerial extravaganza including aerobatic helicopters, Jets, Drones, quadrotors, high performance model rockets and more!!



Performers are scheduled to include:

- John Collver flying his 1944 SNJ trainer airplane in a full aerobatic routine
- RC Flyers model aircraft demonstrations
- Aerobatic gyroscopic routines
- 3D aerobatic helicopters
- Drone racing and combat
- Jets and other RC
 aircraft

Beautifully detailed radio control model aircraft will be on display at the Museum from 10 AM to 1 PM, with air show flight demonstrations from 10:30 AM to 12 PM! Combat drone wars from 12-1pm in the Drone Plex!



Event is included with Museum admission—no charge to Museum Members! Capacity is limited and advanced ticket purchase is recommended.

For more info www.hiller.org • Hiller Aviation Museum 601 Skyway Rd. San Carlos CA 650-654-0200





FOOD TRUCK CRAZE CONTINUES!

AT HILLER! EVERY WEDNESDAY 11AM TO 2PM – RAIN OR SHINE!

The parking lot of the museum turns into a food court every Wednesday. Several food trucks participate in this gourmet event. The trucks rotate weekly, so come for your favorite truck or try something new! Dine under our porte-cochere, or indoors when it's a little cold, or, grab and go!





HILLER AVIATION MUSEUM

601 Skyway Road, San Carlos, California 94070

www.hiller.org

Non – Profit Organization US POSTAGE PAID San Carlos, CA PERMIT No. 96

Join Now!

 $\hat{\mathbf{x}}$

Senior (age 65+) \$50

Unlimited admission for you + 2 guest passes.

Individual \$65 Unlimited admission for you + 2 guest passes.

Family \$90

Unlimited admission for 2 named adults and up to 4 children (17 & under) + discounts on Aviation Camp.

Pioneer \$125

Family Membership benefits + an additional card for a named member (ideal for caregivers) and 2 guest passes.

Pilot \$275

Family Membership benefits with a total of 3 guest passes + 8 FMX Flight Simulator passes and 50% off additional FMX tickets.

Barnstormer \$550 • Adventurer \$1,000 Pilot Membership benefits with a total of 4 guest passes + 10% off Museum Rental and Birthday Parties.

Explorer \$2,500 • Navigator \$5,000

Pilot Membership benefits with a total of 8 guest passes + 15% off Museum Rental and Birthday Parties.

Aviator \$10,000

Pilot Membership benefits with a total of 12 guest passes + 25% off Museum Rental and Birthday Parties and a Hiller Aviation Museum jacket.

Thank you for your support.

Annual Membership Application Or join online at www.hiller.org/member

I want to be a member of Hiller Aviation Museum in the following category:

Senior (65+) \$50
 Individual \$65
 Family \$90
 Pioneer \$125
 Pilot \$275

Barnstormer \$550
Adventurer \$1,000
Explorer \$2,500
Navigator \$5,000
Aviator \$10 000

□ New Member □ Annual Renewal

Primary Adult Member: _

Second Adult Member: (Family Memberships and up)			
Third Adult Member:			
Address:	City:		
State: Zip:	Daytime Phone:		
Email:			
This is a gift membership from:			
Pavment Amount:	□ VISA	□ мс	□ AMEX

Card #: ______Exp. Date: _____

CSC: _____ Print Name on Card: ___

Signature___

Please make checks payable to Hiller Aviation Museum 601 Skyway Rd, San Carlos, CA 94070



SUPPORT THE MUSEUM! DONATE YOUR CAR

TRUCK, RV, OR BOAT



CALL TOLL FREE 1-888-500-1555

Or call Development Office at 650-654-0 200 x215 Tax Deductible Gift

AN AVIATOR'S PARADISE! VISIT OUR GIFT SHOP

Gift Certificates available!