

Ames wins NASA “Commercial Invention of the Year” Award

BY KATIE SMYTH

The NASA General Counsel has selected the Direct-To controller tool, developed at NASA Ames, as winner of the 2014 NASA “Commercial Invention of the Year” award. The award was made at the recommendation of the NASA Inventions and Contributions Board. Congratula-

ways structure may be safely eliminated, thereby saving flight time, fuel and increasing the productivity of air traffic controllers and the efficiency of aircraft trajectories within the constraints of the current air traffic control environment. The design and operational use of the invention represents a proactive approach to problem solving in that

Former Ames winners of NASA’s Government Invention of the Year include:

- Lightweight Ceramic Ablator (LCA) or Low-Density Resin Impregnated Ceramic Article and Low-Density Resin Impregnated Article and Method Of Making Same (PICA/SIRCA) (2007)
- High-Speed Three-Dimensional Laser Scanner with Real-Time Processing (2008)
- Future ATM (Air Traffic Management) Concepts Evaluation Tool (FACET) (2010)
- Toughened Uni-Piece Fibrous Reinforced Oxidation-Resistant Composite (TUFROC) (2011)
- High Sensitive, Low Power and Compact Nano Sensors for Trace Chemical Detection (2012)
- CheMin (“Chemistry and Mineralogy”) X-Ray Diffraction/X-Ray Fluorescence Instrument (2013).



NASA photo

Direct-To on Radar Controller Display, FAA Technical Center

tions goes to the winning inventors, David McNally (NASA/ARC), Heinz Erzberger (University of California Santa Cruz, NASA/ARC), Phillippe Ari Stassart (Sensis Seagull Technology Center, Raytheon STX Corporation) and Danny Chiu (University of California Santa Cruz, Raytheon STX Corporation). Their outstanding work offers a significant game-changing contribution towards safely increasing fuel efficiency and reducing flight time and emissions for aircraft flying in the national airspace system.

Aircraft operators in today’s air traffic control system are usually constrained to follow established airways that are often comprised of inefficient route segments to a destination. The Direct-To controller tool is a method of automation, and a system of computer hardware and software to implement the method, which helps en-route air traffic controllers and aircraft operators identify opportunities to safely fly directly to specified downstream waypoints or navigation fixes on their previously filed flight plans. It is designed to automatically identify conditions where doglegs within the current air-

it allows actively searching for, and pointing out, opportunities for improving the efficiency of trajectories to airlines and controllers. The continuous, automatic, real-time search analyzes thousands of airborne flights and finds high-value time and fuel saving direct routes checked for traffic and operational constraints. It is the first-ever and only commercial application of air traffic trajectory automation for proactive automatic search involving airline favorable route changes.

Commercial sales of this technology by The Boeing Company started in 2014 with their Direct Routes service. Seeking to help airlines save fuel and increase environmental efficiency, Boeing’s InFlight Optimization Services leverages NASA technology for advanced algorithms and software to provide up-to-the-minute information to airlines and their flight crews, enabling adjustments en route to account for weather and air traffic control status. Boeing estimates US savings at 1,000,000 flight minutes per year and about \$75,000,000 per year airline operating cost savings.

Every year, NASA issues two

prestigious Invention of the Year Awards: Government Invention of the Year and Commercial Invention of the Year. In the last eight years, Ames’ innovators have won eight of a possible 16 “Invention of the Year” awards. That is an amazing fifty percent win rate. Ames was honored with the NASA Commercial Invention of the Year in 2010 for the Powder Handling Device for Analytical Instruments.

Special thanks to Mary Livingston and Lee Stone, Ames Inventions and Contributions Board members; to Robin Orans, the Ames’ Space Act Awards Liaison Officer; to the patent attorneys in the Ames Office of Chief Counsel; and members of the Ames Technology Partnerships Office who helped obtain a patent on the Direct-To technology and helped transfer and license the technology to Boeing.

It is important to remember that, to receive this prestigious award, the key first step is to disclose your inventions via completing a New Technology Report (NTR). Submission of an NTR documents NASA technology development allowing NASA to understand how your work can be more broadly applied across the Agency and helping it track progress towards achieving its research and development goals.

Employees are encouraged to submit disclosures on their technology development work at <https://invention.nasa.gov> to make these important benefits a reality.

Ames' NEQAIR is co-winner of the 2015 NASA Software of the Year Award

NEQAIR v14.x, the Non-Equilibrium Radiative Transport and Spectra Program from Ames Research Center, was selected as a co-winner of the 2015 NASA Software of the Year Award competition sponsored by the NASA Chief Engineer, the NASA Chief Information Officer, and the NASA Office of Safety and Mission Assurance.

NEQAIR is a line-by-line radiation code that computes spontaneous emission, absorption and stimulated emission due to transitions between various energy states of chemical species along a line of sight. NEQAIR has been NASA's main radiation code for the last 30 years and in 2013-2014 was upgraded in terms of both the physics and computational efficiency. Its accurate prediction of radiative heat flux allows for efficient design of heat shields with minimal mass for successful and safe missions. Therefore, missions can carry heavier payloads and experiments while being assured of safe trips for astronauts and robotic landers.

The NEQAIR team is comprised of research scientists, Aaron Brandis (Analytical Mechanics Associates, Inc.), Brett Cruden (Analytical Mechanical Associates, Inc.), Chul Park (NASA ARC, Retired), Grant Palmer (Analytical Mechanical Associates, Inc.), and Software Engineer, David Saunders (Analytical Mechanical

Associates, Inc.). Their outstanding work has made a significant and lasting contribution to Ames' technology development portfolio and to NASA's leadership in providing a game-changing proven tool that enables accurate design of spacecraft heat shields.

Special thanks to Mary Livingston, chair of the Ames Software of the Year selection panel, and panel members: Sylvia Longchamps, Paul Keller, Ray Gilstrap, Kapil Sheth, Robert Duffy, William Toscano, Martha Del Alto, Jakob Kalinowski, and Kim Chrestenson. Thanks also to Robin Orans, (retired) Ames' Space Act Awards Liaison Officer, Antoinette McCoy, (current) Ames' Space Act Award Liaison Officer, David Hash, TSA Branch Chief; Katie Smyth who helped guide the award nomination process; and to Carolina Blake, Chief of the Technology Partnerships Office, who participated in the presentation reviews.

As a Center, we have enjoyed great success in previous NASA Software of the Year competitions.

Former Ames winners include:

- Configuration-Based Aerodynamics (CBAERO) (with MSFC, 2014);
- NASA App (with JPL, 2012);
- Kepler Science Operations Center (SOC) (2010);
- World Wind Java (2009);
- Data Parallel Line Relaxation Code (DPLR) (2007);

- Future Air Traffic Management Concepts Evaluation Tool (FACET) (2006);
- Cart3D (2002);
- Remote Agent (with JPL, 1999);
- Center TRACON Automation System (1998);
- Flow Analysis SoftwareToolkit (FAST) (1995);
- Incompressible Navier-Stokes Flow Solver in Three Dimensions (INS3D) (1994).

NEQAIR shares the honor of winning the 2015 NASA Software of the Year Award with co-winner Orion Guidance, Navigation, and Control Flight Software from The Johnson Space Center. The Orion Crew Exploration Vehicle's onboard Guidance, Navigation & Control (GN&C) flight software has been developed to a class-A, human-spaceflight-ready standard.

The technology uses a MATLAB/Simulink tool suite to embrace a model-based development approach. By working together the GN&C and FSW teams can generate software iterations more quickly, producing final flight software much sooner than before and at reduced overall cost and schedule to the program.

There will be a special awards ceremony for our NEQAIR innovators and recipients of other technology-related awards at Ames in Jan. 27, 2016.

NASA, global aviation leaders discuss green aviation

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German Aerospace Center, French aerospace lab ONERA, and Netherlands Aerospace Centre also were highlighted as focus areas warranting innovative collaborations.

In addition to its scientific and technical expertise, IFAR promotes exchanges among young aviation scientists and engineers. During a Young Researchers Conference held at this year's summit, 18 participants from the United States, Germany, Japan, Canada, Romania, South Korea and Portugal exchanged views on the future of aviation as contributions to IFAR's own vision.

The next IFAR summit will be hosted in the fall of 2016 by the Korea Aerospace Research Institute in Daejeon, Republic of South Korea.



Dr. Jaiwon Shin, (fourth from top right) associate administrator for NASA's Aeronautics Research Mission Directorate in Washington, provides opening remarks Oct. 7, 2015 to the members of the International Forum for Aviation Research at their annual meeting, this year hosted by NASA Ames.

NASA photo by Dominic Hart

Nichelle Nichols flies to the stratosphere on board SOFIA

BY NICK VERONICO

On the night of Sept. 15, 2015, Nichelle Nichols watched the stars from the main deck of NASA's Stratospheric Observatory for Infrared Astronomy, or SOFIA, a highly modified Boeing 747SP jetliner optimized for astronomical observations in the infrared spectrum.

Nichols inspired generations with her role as communications officer Lt. Uhura on the Star Trek television series and movies, and she continued with an important real-life mission for NASA—helping to recruit top women and multicultural candidates for science, technology, engineering and mathematics (STEM) careers at the space agency.

During the 10-hour science mission, Nichols watched as infrared measurements were taken at 20 and 37 microns – infrared wavelengths that cannot be seen from ground-based telescopes. SOFIA's science team took measurements of the star forming regions W31S (in the constellation Sagittarius), W49A and W51A (both in the constellation Aquila), and W58A (constellation Cygnus). These measurements gave Nichols the opportunity to see science observations being conducted first-hand.



NASA photo by Carla S. Thomas

Nichelle Nichols (seated right) and SOFIA scientist Andrew Helton (seated center) discuss how SOFIA's instruments capture infrared energy from star forming regions during the Sept. 15 flight. Looking on, from left to right: SOFIA instrument scientist Joe Adams, seated, and Airborne Astronomy Ambassadors Michael Shinabery, Jeffrey Killebrew and April Whitt.

Describing her science experience on board SOFIA, Nichols said, "Flying on SOFIA has many parallels to the

starship Enterprise. We went where no man or woman has gone before, and I think that's what SOFIA gives us – a tool to study where we want to go in the future. It's magnificent."

portunity to see science observations being conducted first-hand.

SOFIA program management transitions to Ames



Eddie Zavala, SOFIA program manager

The NASA's Stratospheric Observatory for Infrared Astronomy, or SOFIA, program management function is transitioning to NASA Ames. SOFIA is a highly modified Boeing 747SP aircraft, which features a German-built 2.5-meter infrared telescope. The

program, a cooperative effort between NASA (Ames and Armstrong research centers) and DLR, the German Aerospace Center, operates the world's largest airborne observatory, giving astronomers routine access to the infrared and sub-millimeter portions of the electromagnetic spectrum of the universe.

As a planned component of the program office transition, Eddie Zavala, SOFIA program manager, will be joining NASA Ames as an addition to the Center's senior executive complement. Zavala, selected as the SOFIA program manager in 2012, is responsible for overall observatory development and operations. This includes science operations at the SOFIA Science Center based at NASA Ames and aircraft operations at the SOFIA Operations Center, based at the NASA Armstrong Flight Research Center, Edwards, California. Under his leadership, the program completed the development phase, implemented an improved cross-center organizational construct and became fully operational in March 2014.

Zavala earned a bachelor's degree in aerospace engineering from Texas A&M University in 1991. Prior to joining NASA Ames, he worked at Armstrong Flight Research Center and Johnson Space Center. He has advanced/expert level OMB Federal Acquisition Certification for program and project managers, with broad NASA experience that spans the Science, Human Exploration & Operations and Aeronautics Research mission directorates.

His experience includes expertise in Fly-by-Light (fiber optics) technology, electrical actuation control systems, space operations experience as a shuttle flight controller and project/technical management of aeronautics research for intelligent flight controls, flight systems demonstrations and subsonic fixed wing projects. He is a recipient of the 2011 NASA Exceptional Achievement Medal and the 2014 NASA Outstanding Leadership Medal.

This transition marks the beginning of a new and exciting chapter for SOFIA with great promise of impactful science observations for the future.

Secretary of Defense attends award event at Ames' NFAC

On Aug. 28, Secretary of Defense Ashton B. Carter and several congressional members (Congresswoman Eshoo, Congresswoman Lofgren and Congressman Honda) visited and attended an event at the National Full-Scale Aerodynamics Complex (NFAC) at NASA Ames. Also in attendance were other high-ranking officials and various news media.

Secretary of Defense Carter announced the award of the Manufacturing Innovation Institute for Flexible Hybrid Electronics to the non-profit research and development consortium FlexTech Alliance. NASA Ames participated by providing a member of the selection panel for the award. This is a part of the Department of Defense efforts to partner with the private sector and academia to ensure the United States continues to lead in the new frontiers of manufacturing.

"NASA Ames is known for innovative collaborations, and the Center is honored that the Department of Defense selected Ames and the NFAC to host this announcement. Center management looks forward to utilizing future aerospace applications from this partnership in such areas as wearable biosensors, soft robotics and distributed sensors for systems health," said NASA Ames Center Director Eugene Tu.

Attending the recent NFAC award event, left to right: Johnny Khamis, San Jose City Council Member; Vice-Mayor Rose Herrera, San Jose; Secretary Ash Carter; Mayor Sam Liccardo, San Jose; Congresswoman Anna Eshoo (D-18th); Congresswoman Zoe Lofgren (D-19th); Dr. Om Nalamasu, CTO, Applied Materials; and Congressman Mike Honda (D-17th).



NASA photos by Dominic Hart

Silver Snoopy and Trailblazer awards presented

The Space Flight Awareness (SFA) Program is a NASA-managed motivational and recognition program with invited representation from NASA and contractors having major responsibilities for human spaceflight mission success. The SFA Program is managed by NASA Headquarters Human Exploration and Operations Mission Directorate.

The SFA Silver Snoopy Award is the astronauts' personal achievement award that provides special recognition for non-management individuals from government and industry who have provided exemplary support of NASA's Space Flight Program. This prestigious award is one of the most coveted honors and is presented to one percent of the NASA workforce annually. This year's recipients of the award

recently went to Maria Bualat, Ann Kapusta, Kara Martin and Jeremy C. Vander Kam, presented to them by Astronaut Suni Williams. For photographs of all award recipients, see: <http://goo.gl/FFhkIL>

In addition, the SFA Trail Blazer award was presented to Erik Williams by Astronaut Steve Smith. This award is used to recognize employees who are in the early stages of their career. Awardees must demonstrate strong work ethic and creative, innovative thinking in support of human spaceflight.



NASA photo by Dominic Hart
Erik Williams (right) recently received the SFA Trailblazer award, presented to him by Astronaut Steve Smith (left).

Ames guests learn about CubeSats, view launch at VAFB

BY KIMBERLY WILLIAMS

NASA and The Aerospace Corporation of El Segundo, California, successfully launched the Optical



Atlas V launch of OCSD CubeSat spacecraft, Oct. 8, 2015 (courtesy ULA)

Communications and Sensor Demonstration (OCSD) CubeSat spacecraft on an Atlas V rocket on Oct. 8, at 5:49 a.m. from the Vandenberg Air Force Base in California. OCSD is the first in a new series of six NASA-managed technology demonstration missions set to launch during the coming months using CubeSats to test technologies that can enable new uses for these miniature satellites.

CubeSats are measured in terms of units with a 1-unit (1U) measuring 10 cm by 10 cm by 10 cm (about 4 inches per side). These small satellites give NASA, other government agencies, academia and commercial companies an opportunity to incorporate new technologies, which range from high-speed communications to novel propulsion systems to technologies that enable rendezvous and docking, into future space missions.

As part of the launch activities, NASA held press briefings on the four NASA-related CubeSats that launched along with OCSD, to highlight the growing importance of small satellites in exploration and technology development. In addition to the media event, Ames hosted a special program for NASA guests on the evening of Oct. 7. Andres Martinez, deputy program manager for the Small Spacecraft Technology Program (SSTP) presented an overview of Ames' role in small satellites technology, OCSD mission highlights and summaries for upcoming CubeSat launches. Nearly 80 guests, including VIPs, Ames employees and their families, were in attendance to watch the launch on the morning of Oct. 8 at Vandenberg, AFB.

The technology demonstrated by OCSD differs from other space-based laser communication systems because the laser is hard-mounted to the spacecraft body, and the orientation of

the CubeSat controls the direction of the beam. The second OCSD mission, scheduled to launch no earlier than Feb. 1, 2016, will use two CubeSats to demonstrate the ability to maneuver small spacecraft in close proximity to one another using low-cost sensors and a novel propulsion system that uses water as a propellant.

Small satellites, including CubeSats, provide a low-cost platform for NASA missions, including planetary space exploration; Earth observations; fundamental Earth and space science; and demonstration of science instruments and technologies like cutting-edge laser communications, satellite-to-satellite communications and autonomous movement capabilities. CubeSats also allow an inexpensive means to engage students in all phases of satellite development and operation through real-world, hands-on experience on NASA-funded small satellite projects.

Funded through NASA's Space Technology Missions Directorate, the OCSD project is managed by the SSTP office at NASA's Ames Research Center.

For more information about NASA's SSTP, visit:

<http://www.nasa.gov/smallsats>

NASA's Real Martians discussed during interview with Andy Weir



NASA photo by Dominic Hart

NASA Administrator Charles Bolden, Deputy Administrator Dava Newman and agency leadership held an engaging discussion Sept. 17 on NASA's Real Martians. The event was broadcast live from the NASA Headquarters auditorium on NASA Television and the agency website. During the program, Andy Weir, author of "The Martian," a fictional story and now a film currently showing in theaters, reflected on real challenges for astronauts on the Red Planet, answered employee questions live and was interviewed by Ames' planetary scientist Chris McKay. To show the many ways NASA expertise was incorporated into "The Martian" movie, NASA created videos depicting how the film's fictional account of exploration is fast becoming reality. These videos are available online as well as other stories related to the film and our journey to Mars, visit <http://www.nasa.gov/realmartians>

UAS impact and challenges discussed at convention



Ames Deputy Center Director Tom Edwards (left at podium) welcomes attendees to the UAS Traffic Management (UTM) Convention in July. Seated left to right, John Cavolowsky, Brian Wynne, Jaiwon Shin, Edward Bolton, Parimal Kopardekar and event emcee Timothy Steiger.



On July 28, officials welcomed unmanned aircraft systems (UAS) stakeholders to the UAS Traffic Management (UTM) Convention. NASA Ames hosted the three-day UTM Convention to bring together a broad domestic and international audience of government and civilian representatives, industry and academia, aviation, agriculture, film and other industries, to understand and define the UAS impact and challenges ahead.

The morning of the first day started with a welcome (top left photo) from Thomas Edwards, deputy director NASA Ames and opening remarks from John Cavolowsky, NASA Airspace Operations and Safety Program director at the agency's headquarters. Brian Wynne, president and CEO of the co-hosting organization, the Association of Unmanned Vehicle Systems International also made welcoming remarks

Opening keynote speakers followed, including Jaiwon Shin, NASA Associate Administrator, Aeronautics Research Mission Directorate; Edward L. Bolton, Jr., Federal Aviation Administration Assistant Administrator for NextGen; and Parimal Kopardekar, NASA Safe Autonomous System Operations Project Manager and UTM Principal Investigator at Ames.



Demonstrations of flying drones were giving throughout the conference (above) and also displayed by vendors throughout the special convention tent (top right photo).



NASA photos by Eric James

Jaiwon Shin, NASA associate administrator, Aeronautics Research Mission Directorate, spoke about the importance of aviation to a full house at the Unmanned Aircraft Systems (UAS) Traffic Management (UTM) Convention on July 28, 2015.

TESS receives commendation by NASA audit team

BY SARA-ANNE LEE

The Ames Transiting Exoplanet Survey Satellite (TESS) project team was awarded a commendation for their superior use of the software management tools during June’s NASA Safety Center Quality Audit, Assessment and Review (QAAR). A commendation is a formal recognition by the NASA Audit Team of exceptional or noteworthy activities.

The team has been using the Dynamic Object-Oriented Requirements System (DOORS) and JIRA tools for requirement management and traceability for the project. What makes the TESS project unique is not the tools themselves, but how the team is using them.

“It’s not just the tools, it’s the whole methodology,” said Masoud

Mansouri-Samani, systems engineer for TESS’s Science Processing Operations Center. “What we do is essentially maintain and manage traceability between different artifacts using DOORS, and then automatically generate documentation from that source. If we change an artifact, all the documents related to that artifact will get updated at the same time, so we don’t have a problem of documents going out of sync.”

Another improvement the team implemented was using the requirement management tool for test plan procedures and verification. Having the test plan, requirements and test cases all stored in the same database streamlined the requirement verification process.

“In addition to the current test cases and all the verification we are going to perform, we maintain verification results and change proposals in DOORS and we create records in JIRA,” said Mansouri-Samani. “It coordinates things like approvals to change proposals, so stakeholders receive notifications through JIRA. DOORS keeps a full history of those changes — at any point we can go and trace that back. It’s a major advantage over a traditional spreadsheet.”

Auditor Tommy Tayman stated, “Given that a majority of the projects that were audited at ARC (and others) use this particular set of tools, TESS is a model case of what is possible with these tools.”

Moffett Lease Team wins Silicon Valley Business Journal Award

The Moffett Federal Airfield Lease Team recently won the Silicon Valley Business Journal “Public/Civic Project” award. This nomination competed with many local public or private school projects, civic structures, transportation and other infrastructure projects with significant and quantifiable benefits.

Of all the many recent mega-deals in Silicon Valley, this 60-year, \$1.12 billion lease of Moffett Field

stood out both for its complexity, economics and positive long-term impact on the Valley. This deal involved competing and negotiating a long-term lease and operations hand-over for a 1,000-acre limited-use federal airfield for use by Google, Inc., and continued use by NASA itself, the California Air National Guard and other local, state and federal airfield users. It involved negotiating terms for the renovation and reuse of iconic Hangar One as

well as historic Hangars Two and Three that collectively comprise over 1.2 million square feet of exceptionally challenging rehabilitation work due to their age, condition and use limitations.

This lease will positively impact Silicon Valley’s future prosperity by activating an under-utilized property in the heart of Silicon Valley.

Employees enjoy a “spooktacular” chilli cook off



NASA photo by Dominic Hart



NASA photo by Jon-Pierre Wiens



NASA photo by Dominic Hart

The 18th Ames Annual Chili Cook-off was held Oct. 8, 2015. This year’s theme was “Chili Spooktacular.” The cook-off is always an eagerly anticipated event with folks sampling various concoctions of chili and ultimately voting for their favorite choice. A panel of judges selects teams for awards in other categories such as best vegetarian chili, hottest chili and judge’s choice. The judge’s 1st choice was Firehouse Chili Dawgs and 2nd choice was Frankenwild. People’s choice awards went to: first place: Frankenwild, second place: Amazing C; and third place: Team JA. Dippin’ dots, hot dogs and turkey legs also were served. Vintage cars were also displayed by Ames employees and pumpkins were given away. Additional photos from the event can be seen on AILS (Ames Imaging Library System) at: <http://goo.gl/5XvQGK>

Employees enjoy good food and learn about Ames' diverse workforce



photo by Cyndi Carbon-Norman



NASA photo by Jon-Pierre Wiens



Photo by Amanda Steffen



NASA photo by Donald Richey

The Office of Diversity and Equal Opportunity (ODEO) hosted Diversity & Inclusion Day, Aug. 6. This event was held to help enrich the understanding of our diverse workforce here at Ames with the objective to optimize the value of the employees at NASA by leveraging our knowledge, similarities and differences. Participants hosted exhibits portraying their culture and chose either a country, region or a US state; a NASA directorate; NASA business exhibit; or an area of particular interest to them. Exhibits included artifacts, cultural wear, art, costumes, introduction to foreign language, etc. During the same event, employees were able to view the annual student poster symposium located at the same site, in a large white tent (photo below). This year's students are seen below in front of the exhibition tent.



NASA photo by Donald Richey

Ames employees celebrate Jack Boyd's 90th birthday

The Ames Exchange hosted a special happy hour for the grand re-opening of The SpaceBar Cafe in Building 3, Aug. 19. That day was Jack Boyd's 90th birthday, and helping him celebrate were hundreds of Ames people, many of his distinguished friends and our summer interns. Jack shares his birthday with Orville Wright, who served on the NACA main committee when Jack started at Ames in 1947. Today, Jack serves as senior advisor to the center director and ombud at Ames, and the nation celebrates Aug. 19 as National Aviation Day.



Left to right; Vic Peterson (former Ames deputy center director); Jack Boyd; John Dusterberry, an aerodynamicist who started working at Ames in 1943 and is best known as a leader in flight simulation technology. Both Vic and John are very active in the Owl Feathers; and Jacquie Peterson (Vic Peterson's wife).



Jack Boyd pictured on the birthday cake in the cape and uniform he wore from 1943 to 1947 as a member of the Corps of Cadets of Virginia Tech.



From left to right: Winnie Boyd (Jack's wife), K. R. Sridhar and Jack Boyd. Sridhar formerly worked at Ames on experimental Mars spacecraft and then took his concepts to create Bloom Energy now located at Moffett/NASA Research Park.



Ames center director Eugene Tu (left) with former Ames center director Dr. Hans Mark.



Susan Long, secretary to the associate center director Research & Technology, associate director Mission Support and the chief scientist (left), with Jack Boyd and Eugene Tu (right).



Employees enjoying the food at the happy hour celebrating Jack Boyd's 90th birthday.



Left to right: Julie Oijala (Jack's daughter); Leena Oijala (Jack's granddaughter) with Jack at his birthday celebration.



Left to right: Meredith Moore (retired Ames); Bill Warmbrodt, chief, Aeromechanics Office; Jack Boyd and Winnie Boyd.

NASA photos by Donald Richey

Space settlement paintings depict possible future habitats

photo by April Gage



The artist Rick Guidice is seen here with one of his paintings, "Double Cylinder Settlement," which he created in 1975, within the exhibit "Rick Guidice: The NASA Paintings" event held at the New Museum in Los Gatos.

A selection of Rick Guidice's space settlement paintings from the History Office Archives Artifacts Collection is currently on exhibit at New Museum Los Gatos in Los Gatos, California until Feb. 14, 2016. The exhibit was produced by the New Museum in Los Gatos' curator Marianne McGrath and Executive Director Lisa Coscino and has attracted the attention of national media including Forbes magazine and National Public Radio's Science Friday program.

The artist and a panel of scientists from NASA Ames were at the museum Sept. 24 for an evening conversation about the future of space settlements and what scientists are working on today to create space habitats and settle the next frontier. The panel answered questions and shared their latest findings with the community. The panelists were: Sid Sun, chief of the Space Biosciences Division; Ann-Sofie Schreurs, NASA Postdoctoral Program (NPP) Fellow; and Lynn D.

Harper, lead of Integrative Studies for the Emerging Commercial Space Office and NASA Ames Space Portal. The moderator was Alexandra Hall, principal, Sodor Space Agency LLC.

In the 1970s, Ames researched the feasibility of setting up orbital space colonies in a series of summer studies, the first being jointly hosted by Ames and Stanford University in 1975, with Princeton University's Gerard K. O'Neil as a participant. In a time before computerized graphic design, the center commissioned paintings when it needed imagery for technical publications, so local artists Rick Guidice and Don Davis were tapped to illustrate the concepts emerging from the studies.

Using acrylic paint and paintbrush, the two men translated highly technical data into fully-developed, highly imaginative visualizations that brought these hypothetical colonies to life. The pair depicted three styles of habitats, along with mining operations and other support infrastructure necessary for building and supplying the settlements. The iconic artwork they created has inspired generations of scientists and engineers.

As a tribute to Los Gatos native Rick Guidice, the New Museum Los Gatos exhibit features 11 of his settlement paintings. Of note are the large, brightly-colored works showing detailed exterior and cutaway views of the Bernal Sphere, O'Neil Cylinder, and Stanford Torus designs.

Dr. Vernon J. Rossow, aeronautical engineer, passes on

Dr. Vernon J. Rossow's passed away Sept. 21, 2015 at the age of 89. Vernon was a long-time employee of NASA Ames, having joined the Ames Laboratory of the NACA in 1949. He worked for NACA/NASA until his retirement in 2005, then continued to serve as a dedicated Ames Associate until 2014. Including military service during World War II, he amassed 67 years of government service.

During his career, Vernon performed theoretical and experimental research in fluid mechanics and aerodynamics on a wide variety of topics important to NASA and the nation. He published/presented more than 100 reports/papers in technical journals and at national and international conferences.

A major facet of his research was the study of vortical flow—its theoretical prediction and experimental

measurement. On this topic alone, Vernon published 60 papers during his career. In particular, he studied the lift-generated vortical wakes downstream of transport aircraft.

As a leading international authority on this topic, he was invited to write a comprehensive survey on the subject. His 150-page expose entitled "Lift-Generated Vortex Wakes of Subsonic Transport Aircraft," was published in Progress in Aeronautical Sciences in 1999 and has become a de facto reference for researchers in this field.

Vernon is survived by his wife of 67 years, Ruth Ellen (Hartwell) Rossow of Los Altos; their four children, Ellen Bowen of Santa Rosa, Elise Holst of Los Altos, Matthew Rossow of Dos Palos and Heidi Rossow of Exeter; six grandchildren; and 10 great grandchildren.



Dr. Vernon J. Rossow

Stanley Schmidt, former Ames aerospace engineer, dies



Stanley Francis Schmidt

In 1959, even before President Kennedy had announced that we choose to go to the Moon, Stanley F. Schmidt was developing a mid-course navigation system needed for a space capsule on a circumlunar voyage. Stan then was chief of the dynamics analysis branch at NASA Ames when his former boss, Harry Goett, challenged him to do pioneering research in advance of the Apollo mission. High-speed computer processing was in its infancy, and processing vast amounts of data in real time – accurately enough to direct a spacecraft to and from the Moon – was a daunting challenge.

In a stroke of luck, mathematician Rudolf Kalman invited himself to Ames to present an abstract paper on an algorithm for linear quadratic estimation. Other electrical engineers had rejected Kalman's work, but as Stan read the paper, he

realized Kalman's method of filtering meaningful signals from varied observations could be integrated into Apollo's navigation system. The hitch was that Kalman's had developed a linear model and Apollo needed a nonlinear filter.

Stan worked out a nonlinear adaptation which reduced the computational complexity of the problem (now called the Schmidt-Kalman filter), and by the following summer he and his team had developed the first practical application for this groundbreaking mathematical model. Stan continued to cooperate on scientific work that made this method a key part of all aerospace navigation, and made it a standard tool for estimation problems in many fields today, including biology, medicine, oil exploration, traffic engineering, robotics and power plant control. He is widely credited with developing the first applications of this filter and wrote and lectured extensively about it all over the world. He helped teach a new generation to carry this important technique forward.

Stan Schmidt, the future aerospace pioneer, grew up without electricity on a San Benito County ranch settled by his grandparents in 1878 near Pinnacles National Park. After joining the Navy Air Corps, he was sent to Marquette University and graduated with an electrical engineering degree. He joined the NACA Ames Laboratory in 1946 and while at Ames he completed masters and doctoral degrees in electrical engineering at Stanford University.

He started in the electrical branch, rigging Ames' state of the art wind tunnels, and in 1953 he moved

into the instrument development branch. Stan left Ames in 1961 but continued his affiliation with NASA. In 1961, he joined with Lockheed Missiles & Space Company as a senior staff engineer on military and NASA projects. In 1962, he joined Philco Space and Systems Division working on military aerospace and NASA projects.

From 1966 to 1992, Stan was vice president and director of the Western Office of Analytical Mechanics Associates (AMA). AMA contributed to such NASA missions as the Hyper-X, International Space Station, and the vehicles used in the Mars exploration program. From 1992 to 2001, Stan was a consultant to Northrop in the development of the B2 stealth bomber navigation system. Among his many awards, in 1981 Stan received the IEEE Award for Outstanding Achievement in Control Engineering.

In retirement, his ties to Ames remained strong. He met his future wife, Meredith Hallenbeck, when both worked at Ames. His son Gregory works in the Solar System Exploration Research Virtual Institute, and his daughter in law Cynthia Schmidt works in Earth Sciences. He also is survived by his son Rick and daughter Janis and their spouses, and five grandchildren. Stan died on Aug. 13, 2015 in Los Altos, California.

A Celebration of Life will be held on Nov. 21 at 10:30 a.m. at Michael's on Shoreline Blvd, Mountain View.

Successful future Mars heat shield testing completed

continued from front page

protective layers that prevent degradation of the stitched fabric joints.

Extensive instrumentation and imaging products from the test will be used to validate how materials respond to the testing conditions and thermo-structural design codes. The testing approach demonstrated with this test will enable future, more exten-

sive testing of the ADEPT configuration – toward possible future use of the system on missions bigger than anything NASA's ever flown.

The ADEPT project is led by NASA Ames, with contributions from multiple other NASA centers. Testing, conducted by Ames' Entry Systems and Technology Division, was funded

by the Game Changing Development Program within NASA's Space Technology Mission Directorate. For more information about the ADEPT project, visit: <http://gcd.larc.nasa.gov/projects/deployable-aeroshell-concepts-and-flexible-tps/>

WPA painting “Mission San Juan Bautista” discovered at Moffett Field

By KEITH VENTER AND APRIL GAGE

A lost piece of California history has been found at Moffett Field. An oil-on-canvas painting by a well-known California landscape artist, commissioned by the Works Progress Administration (WPA) during World War II, was discovered in Building 20 during a routine cleanout.

The work, entitled "Mission San Juan Bautista," features a southeast façade view of the historic mission's church and bell tower framed by rich, red soil, iconic California plants such as juniper and yucca, and a brilliant blue sky. This colorful, somewhat fanciful rendition of the mission was painted by Eugenia Francis Baker "Gene" McComas with help from Cuban artist Wifredo Óscar de la Concepción Lam y Castilla during the latter's visit to California in 1942.

A deteriorated original WPA art program identification card affixed to the back of the painting's frame showed that it was loaned to the Naval Air Station (NAS) Moffett Field on July 26, 1942, shortly after our nation's entrance into World War II. It is believed that the painting was initially hung in the lobby of the Bachelor Officer Quarters in Building 20, where it remained undisturbed until the 1990s.

During the upheaval following the decommissioning of NAS as part of the 1991 Base Realignment and Closure process, the painting could easily have been lost or discarded. When control of the base was transferred to NASA, materials and personnel were moved around and items tossed into dumpsters during the hustle and bustle of cleaning up and shipping out. Outgoing Executive Officer Carl Honaker apparently discovered the McComas painting and tucked it away for safekeeping.

Years later in 2014, when the work was rediscovered during a building cleanout, it once again could have been lost to posterity. Fortunately, someone had the presence of mind to take it to Herb Parsons at the Moffett Field Historical Society Museum. Understanding the object's historical and cultural significance, Parsons immediately alerted Ames Research Center Historic Preservation Officer Keith Venter, who tasked Archivist April Gage with moving it to the History Office Archives. Learning that re-



Ames Research Center Historic Preservation Officer Keith Venter (right) and archivist April Gage hold up the Gene McComas painting "Mission San Juan Bautista." The painting has been returned to the General Services Administration's Fine Arts Program repository where it will be restored, cataloged, and loaned to the Monterey Museum of Art sometime next year.

sponsibility for the stewardship of New Deal artwork resided with the GSA, Gage contacted that agency's Fine Arts Division. GSA staff verified federal ownership and made arrangements to recover the painting. Now with the GSA, the painting will be restored, cataloged, and loaned to the Monterey Museum of Art sometime next year.

The GSA leads the effort to recover and keep track of artwork commissioned by the Works Progress Administration under various New

Deal art programs, such as the Federal Art Project under which the McComas painting was commissioned. The agency partners with the Inspector General and the public to locate lost or stolen New Deal artworks. Museum professionals at the GSA catalog and conserve the works, and establish cooperative agreements for museums to house, maintain, and publicly display these works. So far, over 20,000 artworks have been located as part of this effort.

Ames Fire Dept. practice on real aircraft fire



NASA photos by Donald Richey



The NASA Ames Fire Department performed their annual certification and proficiency training using a propane fueled aircraft fire trainer on the aircraft parking ramp of the Moffett Federal Airfield Oct. 8, 10 and 12, 2015. This training provides the department's first responders with an opportunity to practice their response to a wide variety of realistic aircraft fire fighting scenarios.

Fiscal year end picnic enjoyed by all



At the end of FY15, there was no better way to celebrate than enjoying free food and the company of fellow co-workers with an Ames Exchange sponsored picnic, held Sept. 16 in Shenandoah Plaza. The Exchange provided complimentary BBQ ribs, various sausages, veggie burgers, and more.



NASA photos by Jon-Pierre Wiens

Ames ongoing monthly events calendar

African American Advisory Group (AAAG) Mtg., last Tuesday of each month, 12 - 1 p.m., Bldg. N-255, Rm. 101C. POC: Porsche Parker, ext. 4-0044.

Moffett Aikido Club, Monday and Wednesday evenings, 6:30 p.m., Bldg. 944. Aikido is a non-competitive, defensive martial art known as the "Way of Harmony." POC: Diane Pereda (650) 575-9070 or Robert Dean (650) 787-1007, email: mfaikido@aol.com

Ames Amateur Radio Club, third Thursday of each month, noon, N-T28 (across from N-255). POC: George Tucker, at ext. 4-2200.

Ames Bluegrass Club, every Tuesday from 11:30 a.m. to 1 p.m. in Bldg. 944. Players of all instruments and all levels are welcome, but we are particularly interested in experienced players willing to help improve the group's musical skills. POC: Bob Haberle at ext. 4-5494 or email: robert.m.haberle@nasa.gov

Ames Bocce Ball Club, Ames' newest Exchange-sponsored club is seeking members. POC: Mike Lindsay email: michael.c.lindsay@nasa.gov

Ames Bowling League, at Fourth Street Bowl in San Jose. Looking for teams of four for start of season, Sept. 4. Need regular and substitute bowlers. Thursdays starting at 6:15 p.m. For sign up questions: Michael Hom at ext. 4-0302 or Mina Cappuccio at ext. 4-1313.

Ames Contractor Council Mtg., first Wednesday of each month, 11 a.m., Bldg. N-200, Committee Room. POC: Herb Finger at ext. 4-6598.

Ames Federal Employees Union (AFEU) Mtg., third Wednesday of each month, noon. Bldg. N-204, Rm. 101. Guests welcome. Check for schedule changes at: <http://www.afeu.org>. POC: Paul K. Davis, ext. 4-5916.

Ames Golf Club, Members have the opportunity to play approximately 13 tournaments per year at a variety of 18-hole golf courses in the Bay and Monterey Area. POC: Barry Sullivan: Barry.T.Sullivan@nasa.gov.

The Hispanic Advisory Committee for Excellence (HACE) Mtg., first Thursday of each month, 11:30 a.m. - 12:30 p.m., Bldg. N-255, Rm. 101C. POC: Jeanette Zamora, jeanette.zamora-ortega-1@nasa.gov.

Ames Jazz Band Club, Bldg. 944, 5:30 p.m. - 7 p.m. POC: Ralph Bach, email: ralph.e.bach@nasa.gov

Jetstream Toastmasters, Mondays, 12 p.m. - 1 p.m., Bldg. N-262, Rm. 100. POC: Tim Steiger, ext. 4-0195, tim.steiger@nasa.gov. Web: <http://jetstream.freetoasthost.com>

Native American Advisory Committee (NAAC) Bi-Monthly Meeting, First Thursday of the month beginning March 5, 2015, 11:00 a.m. - 11:45 a.m. Building 19, Room 1096. For more information contact Anita Abrego at Anita.I.Abrego@nasa.gov, or by phone at ext. 4-2565.

Ames Nimble Knitters Club, every Monday at 11:30 a.m., Bldg. N-210, Rm. 141. POC: Diane Alexander at ext. 4-3140 or email diane.alexander-1@nasa.gov. All knitters and crocheters are welcome to attend and participate in our charity projects.

Ames Roller Hockey Club, meets daily from noon to 1 p.m. at rink on north end of the 80-foot-by-120-foot wind tunnel. Players should have experience skating and must wear protective equipment. POC: James Prunty, james.a.prunty@nasa.gov

Ames Safety Committee, third Thursday of each month, 10 a.m. - 11 a.m., Bldg. N-237, Rm. 200. POC: John Livacich, jlivacich@mail.arc.nasa.gov, ext. 4-3243.

Women's Influence Network (WIN), first Wednesday of each month, Bldg. N-244, Rm. 209, noon - 1:00 p.m., POC: Ali Guarneros Luna, ali.guarnerosluna@nasa.gov

Exchange Information

Information about products, services and opportunities provided to the employee and contractor community by the Ames Exchange Council. Visit our web site at: <http://exchange.arc.nasa.gov>

Beyond Galileo Gift Shop N-235 in the cafeteria, 8 a.m. - 2 p.m., ext. 4-6873

Visitor Center Gift Shop (Exploration Center), Tues-Fri, 10 a.m. - 4 p.m., Sat. - Sun, 12 - 4 p.m., ext. 4-5412
Remember to purchase your baby shower, birthday and holiday gifts at Ames' two gift shops!

Mega Bites Cafeteria N-235, Mon - Fri, 6 a.m. - 2 p.m., ext. 4-5969/Catering ext. 4-2161

The SpaceBar: Subs & Burgers, Bldg. 3, The Space Bar is open Mon through Fri from 7:30 a.m. - 7:00 p.m. Continental breakfast and coffee starting at 7:30 a.m. with full food and beverage service 11:00 a.m. to 7:00 p.m. See: <http://exchange.arc.nasa.gov/cafe/menu.html> for menu items.

RV lots available. Call to reserve a space at (650) 604-0698.
Civilian/Contractors, \$50/mo; military \$25/mo

NASA Lodge (Bldg. 19) (650) 603-7100
Where to stay when you're too tired to drive home? What about the lodge?! Two types of rooms: Bldg. 19 (43 rooms), rate: \$65/night (\$5 ea add'l adult); Bldg. 583 A&B (150 rooms), rate: \$55/night (\$5 ea. add'l adult); B547 rate \$60/night (for large groups)

Ames Swim Center (N-109) (650) 603-8025

The swimming pool is now open. Hours of operation are as follows (lap swim only):
MWF 10 a.m. - 1 p.m.
MWF 3 p.m. - 6 p.m.
TTH 10 a.m. - 1 p.m.
TTH 4 p.m. - 7 p.m.
The pool is heated year round. The pool normally is available for lap swim, pool parties and special events. POC: Ryan Storms, pool manager (650) 603-8025. Memberships: single memberships: \$60/yr. Family memberships: \$80/yr. After purchasing a membership, there is an entrance fee: daily entrance fee - \$3/day or lap pass fee - \$50 for 20 uses. Platinum membership - \$380/yr. (no daily fee). Special events include military training, swim team events, kayak role practice, etc. The cost for special events is \$75/hr, or \$50/hr for military.

Exchange basketball gym, Bldg. 2
(650) 603-9717
Hours of operation:
M-F 11 a.m. - 1:30 p.m.
M-F 4 p.m. - 7 p.m.

Chase Park reservations, call ext. 4-4948
NACA Park reservations, call ext. 4-4948

Ames emergency announcements

To hear the centerwide status recording, call (650) 604-9999 for information announcements and emergency instructions for Ames employees. You also may listen to 1700 KHz AM radio for the same information.

Ames Cat Network

The Ames Cat Network needs help finding homes for cats trapped at Moffett. They range from feral to abandoned/lost pets. They are tested, altered and inoculated. Call Iris at ext. 4-5824 if you or someone you know are interested in fostering or adopting a cat.

Students learn about science and video production at Ames



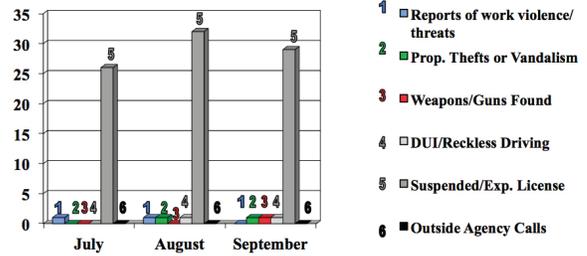
NASA photos by Donald Richey

The Ames community was invited July 31 to the Space Sciences Auditorium to the premiere of the "Be a STEM Videographer: Women in Science," video project. Middle and high school girls learned the art and science of video production during the two-week camp and then interviewed five female NASA Ames researchers, Linda Timucin (Code S), Elysse Grossi-Soyster (Code SCB), Kamalika Das (Code TI), Wenonah Vercoutere (Code D) and Diana Gentry (Code SGE) about the science research with which they are associated. The girls produced video vignettes highlighting the researchers and three NASA Ames research projects. They shared the videos with their peers via the Girl Scouts web site, the NASA web site and the UARC YouTube channel. On the last day of the course, the girls premiered their videos at Ames to an audience of researchers, administrators, family and friends and were given NASA patches and a certificate of completion.

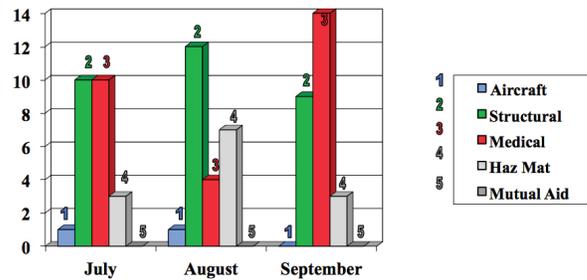
Protective Services monthly activity

A statistical summary of activities of the Protective Service Division's Security/Law Enforcement and Fire Protection Services units for the three-month period ending September 2015 is shown below.

Protective Services Office – Activities Security/Law Enforcement Monthly Activity Report



Protective Services Office – Activities Fire Protection Services



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Ames Research Center
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