



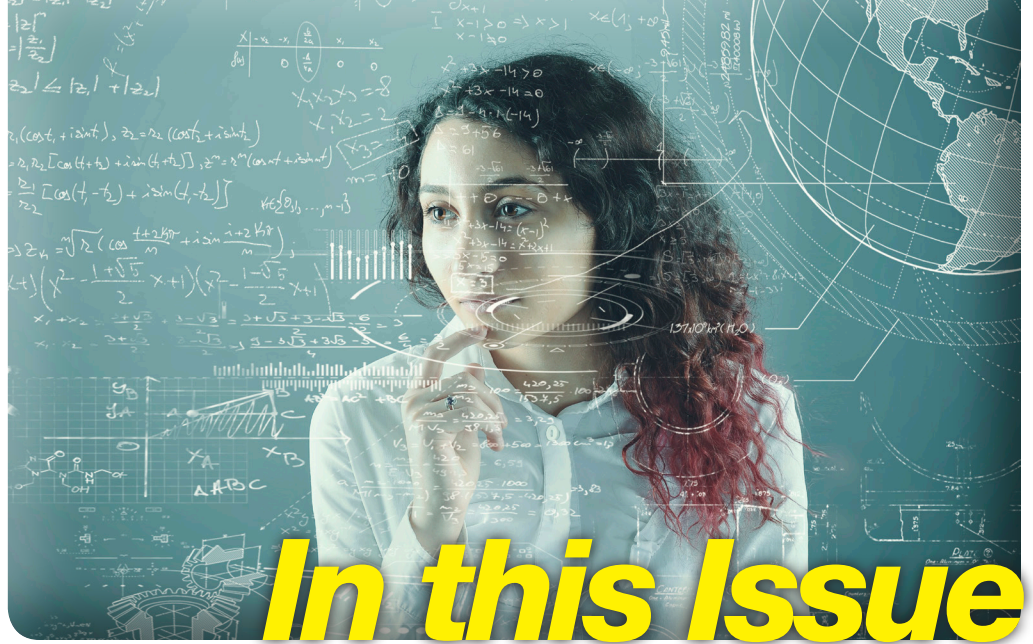
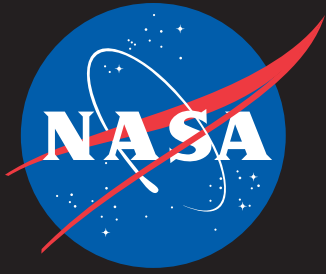
IT Talk

July - September 2016

Volume 6 • Issue 3

Women in Data





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IT Talk is an official publication of the Office of the Chief Information Officer of the National Aeronautics and Space Administration, Headquarters, Washington, D.C. It is published by the OCIO office for all NASA employees and external audiences.

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Message from the NASA CIO

The development of world-class talent in science, technology, engineering, and mathematics (STEM) is critical to America's global leadership. While women are still an underrepresented minority in STEM, women in data and technology are no longer outliers. Data science is a critical field in which women and girls of all ages, backgrounds, and interests can participate today. In this issue, you'll learn how women in data are achieving success and about inspiring, revealing insights that will widen the path for even more women in tech.

We'll also further highlight some other innovative projects happening at the Centers. There are a few cloud solutions supporting NASA's missions.

And for the last few months, the Office of the Chief Information Officer has been implementing the IT Business Services Assessment (BSA) plan. This will help us improve the delivery of IT services across the Agency. The BSA process establishes clear objectives for the NASA CIO to approve the Agency's IT spending plan for non-highly specialized and highly specialized IT.

Finally, a special recognition goes out to the Jet Propulsion Laboratory (JPL) IT Directorate. The team was recently recognized with a few industry honors.

We have a great lineup in this issue, so I hope you enjoy it.

~Renee



Stennis Space Center's Jeff Henderson gives NASA CIO Renee Wynn a tour of the facility.



NASA's Chief Information Officer, Renee Wynn, along with her Executive Officer, Ruth McWilliams, recently visited the NSSC for a two-day working session to discuss the NSSC and HQ Information Technology operations.

The CIO met with the NSSC's Senior Managers and was also briefed by the staff on the following topics during the two-day visit: NSSC Overview of the Enterprise Services Center, Support Operations Business Office, Service Delivery, Simplified Acquisitions & Enterprise License Management. She also met with the Information Resources Division.

IT Business Service Assessment: Where Are We Going?

By Leah Hollander, Business Service Assessment Implementation Manager

Why Conduct a Business Services Assessment of IT?

Information Technology (IT) was the ideal pilot activity for the Business Service Assessment (BSA) because for several years preceding the BSA, NASA was on a path to transforming the IT Operating Model so that more IT services were managed and provisioned at the enterprise (Agency) level. Using the BSA methodology, we were able to evaluate the health of IT services, assess opportunities to achieve efficiencies, and evaluate the feasibility of moving to an enterprise approach for some IT services. The BSA was also the best way to understand and address how NASA will implement the near- and long-term requirements of the Federal Information Technology Acquisition Reform Act (FITARA) enacted in December 2014. Like FITARA, the BSA was designed to ensure that IT is seen as a strategic Agency resource.

What Does This Mean to You?

The implementation of the BSA decisions is being managed by a BSA Leadership Team. Members include all of the CIO leadership, some Center CIOs, and the Agency CIO.

The IT BSA decisions focus on developing greater visibility of IT investments, along with improved structures for governance and decision making. The implementation plan lays out a framework that will be used to help decide when a consolidated or enterprise approach is appropriate, as well as to affirm that there are specific business drivers where a diversified or decentralized operating model is appropriate. The IT BSA plan also lays out a disciplined approach to measure and understand IT service delivery as we organize around the six IT domains (communications, applications, computing services, end-user services, information management, and security).

Moving forward, we will focus on optimizing and balancing IT services and operations. We will evaluate our baseline service levels, continue to increase insight into IT investments, develop criteria to assess IT program performance, and evaluate services and requirements for potential enterprise solutions. Some decisions may result in changes to organizational constructs and necessitate the realignment of resources. As we proceed, it is our intent to keep our workforce informed and enable workers to make decisions about the future.

What Have We Done So Far?

Implementation of the decisions is underway, and key tasks have already been completed. These major accomplishments include the following:

1. New IT Council (ITC)—The new council was established and held its first meeting on May 25. The new council includes representation from all Mission Directorates, Centers, and key functional offices such as the Office of the Chief Engineer. This council serves as the Agency's senior decision authority for IT resource management issues and/or IT investments that require a high degree of integration, are deemed high-risk, are highly visible, or require a higher authority than that granted to line organizations.
2. Completion of the first Annual Capital Investment Reviews (ACIR)—At the first meeting of the ITC, the council members reviewed the results of the ACIR and approved IT investments for FY 2017 and FY 2018. This review is a key part of the implementation of BSA and FITARA, which mandates that NASA's CIO have approval authority over the entire IT budget and increases the CIO's responsibility. The scope of the review includes mission-support funded IT, program-funded IT and related acquisition strategies. ♦

Final Outcome (What Will Employees See?)

When fully implemented, we will have greater visibility into cost and service quality. This will enable the Agency to make informed and intentional decisions about the best mode of IT delivery for specific solutions in the future and better address instances of less-than-adequate service. Finally, the biggest effect on the IT workforce over time will be the ability to more broadly leverage IT resources across Center boundaries. This will meet the growing demand for specialized IT skills and services. These changes will also allow us to better deploy our existing resources in order to meet demands in an environment where expanding the IT budget is not likely.





IT Governance at Goddard

Goddard Space Flight Center (GSFC) has put a new federated governance process into operation. It includes governance boards and IT working groups to support initiatives across the Center, and it serves as a link to the Agency IT enterprise.

In 2012, the GSFC Chief Information Officer (CIO) was charged with establishing a governance model to ensure the alignment of Center-wide IT decision making with relevant policies and Lines of Business (LOBs) strategic priorities. The goal was to create a framework that:

- Ensures transparency,
- Fosters collaboration,
- Improves communication,
- Delivers efficiencies, and
- Leverages LOBs.

Dawn McGowan, GSFC IT Governance Lead, seized the opportunity, energetically engaged with leaders across the Center, and established an IT Governance Steering Committee; she led the committee in creating a structured decision-making process for IT investments and IT

architecture change management. McGowan's leadership culminated in the development of the GSFC Federated IT Governance Framework, designed to increase accountability and both efficient and effective delivery of GSFC IT services.

In April 2013, the IT Governance Steering Committee presented the GSFC Federated IT Governance Framework to the GSFC Executive Council and gained unanimous acceptance. The Federated Framework ensures coordination of an integrated decision-making process for the full IT portfolio, executed through four governance boards with clearly defined roles:

The Executive Governance Committee (EGC) is the most senior leadership board, established to direct the vision, goals, and objectives for the execution and continuous monitoring of GSFC IT assets.

The Strategic Advisory Group (SAG) determines what GSFC will do at the Center level and where it makes sense to elevate issues and tradeoffs to the most senior

leadership. This board serves as the link to the Agency in cases where IT services involve questions that must be resolved across the entire NASA enterprise.

The Tactical Planning Group (TPG) determines the "how" and identifies resources needed to implement the strategic goals established by the SAG.

The IT Working Groups (ITWGs) perform requirements analysis, design, implementation, and operations for Center-wide IT assets. The ITWGs also make implementation recommendations to the TPG. There are currently six working groups: Applications, Communications, Data Center, End User, Information Security, and Management and Operations.

To date, the Federated IT Governance framework is fully operational and has supported multiple IT projects that affect the Center, including Data Center Consolidation and Cloud Computing. For additional information, please contact Dawn McGowan at dawn.w.mcgowan@nasa.gov. ♦

Women in Data *By Beth Beck, OCIO Open Innovation Program Manager*

For the last 5 years, NASA has hosted the International Space Apps Challenge. With over 15,000 participants coming together over a weekend to create nearly 1,300 innovative solutions, Space Apps is more than an open-data watering hole. It has proven to be an unexpected, yet reliable, focus group on the usability of NASA data and what datasets are most compelling and relevant, as well as eyes and ears into fledgling innovation communities around the world. In addition, Space Apps gives us insight into the state of women in data science.

Two years ago, the Open Innovation team noticed a disparity in the ratio of Space Apps participants—roughly 80 percent men to 20 percent women. We embarked on a quest to better understand how to attract more women and girls to data by conducting a yearlong study, which included a literature review followed by dozens of interviews with leading women’s organizations in the data, tech, and startup communities.

As we dug into the literature, we found that the Space Apps ratio reflected national trends. Although women in the United States earned 57 percent of all bachelor’s degrees since the late 1990s, only 18.2 percent are in the field of computer sciences, according to the 2015 National Science Foundation

report titled “Women, Minorities, and Persons with Disabilities in Science and Engineering.” In 2013, women represented only 26 percent of the professional computing workforce, a sharp decrease from 35 percent in the 1990s, according to the American Association of University Women’s “Solving the Equation” study. A 2002 “Women in Computing Around the World” study suggested that the gender gap in science, technology, engineering, and mathematics (STEM) and computing is inconsistent across cultures, with the lowest participation rates among women in the United States, the United Kingdom, and Australia. And the gap is widening.

As we surveyed the data landscape, we focused on one measurable goal: to increase the number of women and girls who attend Space Apps. As a side benefit, we hoped to enhance opportunities to grow the number of women in the new discipline of data science. Our focus was not how to engage women who are already professionals in the data fields, but how to attract women and girls who would not take part in Space Apps or data science without intentional program design.

Here is what we heard in our interviews: women are looking for a “safe space” in which to engage. Women are drawn to collaborative,

rather than competitive, endeavors and seek out opportunities to team in a supportive environment. They are not looking for women-only events or activities, but rather take cues from the signals around how events are organized to see if they might fit in. Women do their homework before determining how to invest their time and effort. For instance, they look for women as featured speakers or on the leadership team and for early access to an event or activity to allow them to gain new skills or form teams ahead of the main event. Offers of childcare or travel stipends send a clear signal that women are welcome. If we want to draw more women into the NASA data space, we need to create a welcoming community atmosphere.

Based on these insights, we created two new initiatives to signal that NASA open-data is a safe space in which to engage: Data Bootcamp and NASA Datanauts. We kicked off the inaugural Space Apps Data Bootcamp pre-event last year to lower barriers to entry for newcomers to the hackathon experience—to share introductory content on coding, making, retrieving and manipulating datasets, and storytelling. This year, we provided the model to our 161 global Space Apps organizers, who orchestrated 54 Data Bootcamps for 5,300 participants. At the Space



Ellen Stofan, NASA Chief Scientist



Dava Newman, NASA Deputy Administrator



Megan Smith, United States CTO



Beth Beck, OCIO Open Innovations Manager



In conjunction with the United State of Women Summit, NASA hosted “Engaging Women and Girls in STEM Through Data Science.” It was an afternoon of discussions and presentations on the role of data science at NASA; opportunities for women and girls in data science; and NASA initiatives designed to engage women and girls in science, technology, engineering, and mathematics (STEM) through data science, such as the Space Apps Challenge, Data Bootcamp, and Datanauts. Speakers included Megan Smith, U.S. Chief Technology Officer; Dava Newman, NASA Deputy Administrator; and Ellen Stofan, NASA Chief Scientist, as well as program staff and participants from Space Apps Challenge, Data Bootcamp, and Datanauts. For information about the United State of Women Summit, visit <http://www.theunitedstateofwomen.org/>.

Photo Credits above: (NASA/Aubrey Gemignani) | Photo Credits below: (NASA/Michael Porterfield)

Apps Pasadena main-stage event and Data Bootcamp, 47 percent of participants were women—including a majority who had never attended a hackathon before.

NASA Datanauts, our second initiative, leverages the annual Space Apps challenge event by creating a supportive, collaborative environment for each class of 50 participants, featuring monthly online challenges and toolkits for community-based data dinner clubs. To signal our intent to attract women, we selected an all-female founding class—though all future classes will also include men.

Though this is only the beginning of a conversation about women

in the field of data science, it is one that other Federal agencies are eager to join. Each agency struggles with the lopsided ratio of women to men in the computer science and STEM-related disciplines. They look to NASA to help discover new ways to bring more women to the data table.

As we began the focus on women in data, we tracked the number of women represented on teams nominated for Space Apps global awards. In 2015, we discovered that 47 percent of the Top 60 Global Award semifinalists had at least one woman on the team. In 2016, more than half of the Top 25 finalists had women on the teams, along

with four of the five Global Award-winning teams. Projects with a mix of men and women tend to be more interesting, less linear and offer a social or humanitarian component to the solution. These projects rise to the top—a lesson for future teams. Women bring a different perspective to the problem-solving process. Providing women with opportunities to gain skills in data science will offer different perspectives on how citizens can better leverage NASA’s open data to solve community-based issues and concerns. In doing so, we grow innovation at the local level, which enables NASA to meet our Federal open-data mandates. ♦



Michelle Easter



Tina Lai



Jerelyn Rodriguez



Dr. Shobhana Gupta

Innovation of Business Processes Happening at NASA Langley Research Center

A cross-Center collaboration group, the Center Automation Team (CAT), plans to utilize the ServiceNow platform to automate a growing list of more than 68 business processes at NASA Langley Research Center. Led by CAT Project Leads Hope Venus, Office of the Chief Information Officer (OCIO), and Chuck Brooks, Office of the Chief Financial Officer (OCFO)/Advanced Analytics and Automation Office (AAAO), the platform, named OnePlace, will launch this summer.

The Center Automation Team was formed when Center leadership saw an opportunity to improve performance and save money through process optimization and integration utilizing modern technology and methods. "It is exciting to be utilizing the ServiceNow enterprise solution cloud technology to better integrate our processes and information, resulting in more affordable, customer-focused IT services," said Cathy Mangum, NASA Langley Associate Director and the initiative's executive sponsor.

ServiceNow is an enterprise cloud company that specializes in providing custom service-management platforms that deliver automated business services. Founder Fred Luddy describes his vision for the platform as "a cloud-based platform that enables regular people to create meaningful applications to route work through an enterprise." The platform was selected because it meets, and in many cases exceeds, the team's business requirements, which are to

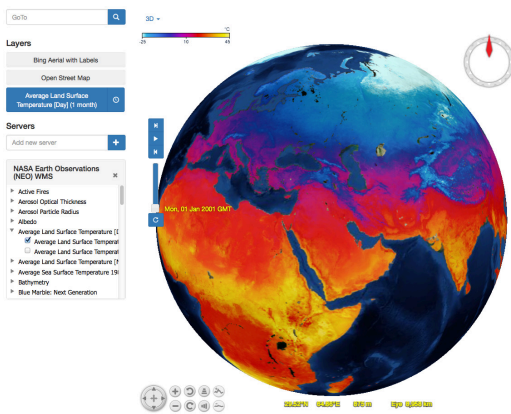
provide integrated process improvement and integration into an agile software development framework (processes and people over technology), enable shared services to minimize redundancies and increase collaboration, utilize a low-code (point-and-click) mobile-optimized automation platform, and host in the cloud.

Hope and Chuck see the potential that OnePlace holds, not only to automate a multitude of processes across the Center, saving time and resources, but also to increase collaboration between organizations. When OnePlace is launched, it will initially focus on two capabilities: the Center's Key Activities and Talent Development. Following this, phase two of the implementation will assess other automation needs and enable "citizen developers" within organizations to ultimately ensure the solution's continued growth and optimization. ♦



Reap the WorldWind: Data Visualization

By Patrick Hogan, WorldWind Program Manager; Nick Skytland, Data Evangelist; & John Sprague, Deputy, Technology & Innovation Division



Long ago and far away, in the land of NASA Education, one of our nobler efforts, and certainly an invaluable one, we have enjoyed a special opportunity to share knowledge and excite the imagination toward a greater understanding of our universe.

In 2002, NASA Learning Technologies, the Agency's effort to place NASA content in classrooms, engineered the first open-source virtual globe. Even at 250 megabytes, due to

the base set of BlueMarble data, there were successive days of almost 100,000 downloads per day from SourceForge, where WorldWind was transferred because NASA servers were unprepared for this level of interest at the time.

It was over a year later that Google Earth was to arrive on the scene. Educational models were built with WorldWind, from tracking the Lewis and Clark journey to examining a 3D Moon and Mars! Imagine being able to fly through the Valles Marineris of Mars or visit the far side of the Moon way back in 2003!

This was all great fun and had tremendous educational value that also strengthened the NASA name. WorldWind was a Windows app at the time. Since then, we have added a Java version in 2006, an Android version in 2012, an iOS version in 2013, and now the Web App version in JavaScript/HTML5. Today, the Federal Aviation Administration's (FAA's) next-generation technology for maintaining optimum performance of the National Airspace System (NAS) is based on

WorldWind. Additionally, many U.S. Government agencies, including the Missile Defense Agency, Army, Navy, Air Force, and Drug Enforcement Administration (DEA), as well as European government agencies, including the European Space Agency, all use NASA WorldWind to visualize their operations with great success.

Web WorldWind is written in JavaScript and provides a JavaScript Application Programming Interface (API) for controlling all aspects of virtual globe interaction and display. The WorldWind Web version enables Webpage and Web app developers to quickly and easily create interactive visualizations of geographic information displayed on a 3D globe or 2D map.

WorldWind won the NASA Inventions and Contributions Board 2009 Software of the Year Award. One development project based on WorldWind was also a Europa Challenge winner in 2015.

To see WorldWind in action for yourself, please visit <http://worldwindserver.net/webworldwind/apps/Explorer.html>. ♦

WESTPrime Delivers Cloud Solutions for NASA

The Web Enterprise Services Technologies Prime (WESTPrime) contract is available to all NASA Centers and Headquarters to provide reliable, efficient, and secure cloud and Web services to support NASA's mission. Managed by InfoZen, in conjunction with the NASA Web Services Office (WSO), these services include providing leading-edge cloud solutions, such as cloud migration, hosting and optimization, security and compliance, DevOps, big data/data integration, disaster recovery (DR)/continuity of operations (COOP), and cloud readiness assessments for your applications and Websites. InfoZen provides WESTPrime customers with Infrastructure as a Service (IaaS), Software as a Service (SaaS), Platform as a Service (PaaS), and custom design and development services in the cloud. InfoZen has migrated over 160 applications from NASA data centers to WESTPrime Cloud, which includes more than 65 applications over a record period of 13 weeks.

InfoZen's team of architects and engineers has collaborated with a host of NASA customers, including the Extra Vehicular Activity (EVA) team, who wrote and deployed a consolidated and transparent Electronic Data Integration Application in support of the EVA mission. The team also supported the Human Exploration Research Analog (HERA) team, who required terabytes of storage in the cloud in support of their Human Health and Performance system. The WESTPrime architected, self-managed Storage System helped the customers manage their archival data easily and effectively in the cloud. In addition, the www.nasa.gov and Science Mission Directorate teams have extensively engaged WESTPrime to redesign and deploy their CMS and portal sites using a responsive design,

open-source framework, and over 70 applications across multiple Centers and missions. The InfoZen team established a DevOps environment for Continuous Integration (CI), Continuous Delivery (CD), collaboration, and project management, which was very widely adopted by WESTPrime customers.

The InfoZen team has incorporated proven security, compliance, and privacy practices into the entire migration and operations life cycle to manage risks and has worked with the Agency to ensure that cloud solutions meet Federal Information Security Management Act (FISMA) and Federal Risk and Authorization Management Program (FedRAMP) requirements in compliance with our continuously monitored ATO. Our enterprise cloud approach focuses on meeting the common needs across NASA, providing a holistic approach to cloud security, maximizing the performance of cloud solutions, and providing shared services that reduce costs for all stakeholders. We maintain independence from Cloud Service Providers (CSPs) and ensure that the best solutions are selected and implemented according to each customer's unique requirements.

Our team architected and deployed an IPv6 solution in the public cloud in support of the customer's requirements and the Federal mandate, which is a notable achievement considering that most CSPs fully support only IPv4 addresses. WESTPrime worked with NASA to deploy their Enterprise Search solution in the cloud. By replacing the Google Search Appliance, Enterprise Search saved NASA thousands of dollars in licensing fees. The Enterprise Search architecture involved a state-of-the-art hybrid deployment model that met business requirements and reduced OpEx costs. InfoZen and

WESTPrime have received several NASA awards. The WESTPrime cloud program is one of the largest and most successful cloud programs in the Federal market. ♦

Cloud Computing at NASA

Cloud computing in its modern context was introduced nine years ago, with web-age companies leading the charge. Since then, the industry has greatly expanded and matured to the point that the tremendous benefits of the cloud computing model are getting clearer every day for large institutions like NASA. The Enterprise Managed Cloud Computing (EMCC) program offers selected cloud services suitable for Agency use AND provides Agency-level guidance and instructions for other NASA entities to take the steps necessary, on their own, to leverage the universe of commercial cloud services in accordance with NASA's Enterprise Managed Cloud Program. To learn more about Cloud Computing at NASA, point your favorite browser to the EMCC site at <https://intranet.share.nasa.gov/agency/cloudservices>. Information includes Center Cloud Points of Contact, Technical & Guidance documentation, News, Forums, and more. The Computing Services Program Office (CSPO) also hosts a monthly Cloud Community of Interest (CCOI) session, covering informative enterprise cloud topics of interest to the community. Special guest speakers present a variety of interesting updates, and the Q&A sessions are always informative. Recent sessions included: How JSC is using S3 to Expand its Service Offerings; Running Code without Thinking About Servers (AWS' Lambda offering); The NASA Earth Science Data Systems Program's Development of a NASA-Compliant and Secure Cloud-Based Platform for Application Hosting; and, The Evolution of FedRAMP – Today and Moving Forward. To view past presentations, get added to the distribution, or suggest a topic you'd like to hear about, visit the CCOI site at <https://intranet.share.nasa.gov/agency/cloudservices/Pages/CCOI.aspx>. CCOI's are held the first Thursday of the month, at Noon (Pacific). We hope you will join us at a future NASA Cloud Community of Interest. ♦



JPL IT Directorate Recognized with 2016 Industry Honors

By Whitney Haggins, IT Communication Strategist, Jet Propulsion Laboratory, California Institute of Technology

The Jet Propulsion Laboratory's (JPL) IT Directorate was recognized in the first half of 2016 with four prestigious industry honors.

In January, JPL was named to the [Digital Edge 25](#) at IDG Enterprise's AGENDA16 conference. The award recognizes a select group of organizations who are digital achievers working toward becoming a digital-centric business. This is JPL's first time being selected to the Digital Edge 25.

In April, JPL was ranked tenth in the annual [InformationWeek Elite 100](#). The award, celebrating its 28th year, ranks and honors the 100 most innovative users of business technology in the United States. The selection marks JPL's second appearance on the *InformationWeek* Elite 100 and its second top ten finish.

On June 1, JPL was named a CIO 100 Honoree by [CIO Magazine](#). The CIO 100 honors 100 organizations that have distinguished themselves through their innovative use of technology to create business value. The award recognized JPL's enhanced search capability and its use for analysis of data within the science, engineering, business, and flight mission communities. NASA's Glenn Research Center was also named to the CIO 100. This marks JPL's fifth consecutive appearance on the CIO 100. The 100 honorees will be profiled in the August issue of *CIO Magazine*.

On June 13, JPL was named one of the [Best Places to Work in IT](#) by *Computerworld Magazine*. JPL was ranked number 17 among large companies on the Best Places to Work in

IT list. This is JPL's fourth consecutive time to be honored with inclusion on the list, a ranking of the top 100 work environments for information technology professionals by IDG's *Computerworld Magazine*. The list is compiled based on a comprehensive questionnaire regarding company offerings in categories such as benefits, career development, training, and retention. In addition, *Computerworld* conducts extensive surveys of IT workers, and their responses factor heavily in determining the rankings.

Jim Rinaldi, JPL CIO said, "I'm thrilled and honored that the JPL IT team's accomplishments are recognized by industry, especially as these recognitions are focused on the value that IT brings to JPL." ♦



JPL's IT Expo: A Hands-on Experience of the Future

By Chris Cornwell, Manager, Customer Care and Performance Management Office, and Whitney Haggins, IT Communications Strategist, Jet Propulsion Laboratory, California Institute of Technology

On May 19, JPL's Office of the CIO, IT partners, and organizations welcomed the Laboratory community to its annual IT Expo, located on the JPL Mall. The OCIO-hosted event's theme, "My Digital Life," highlighted the power of technology and its ability to connect people and places from around the globe by embracing emerging technologies and best practices to help users thrive in JPL's digital environment. Participants engaged in conversations with OCIO team members, partners, and industry vendors to learn about IT products and services designed to help simplify the individual's digital workspace, enable process improvements, ensure cybersecurity, and enhance collaboration through innovation.

The event expanded beyond the traditional "big white tent" to accommodate more than 60 exhibitors, a combination of JPL and industry vendors, to include areas for an Immersion Experience exhibit, an Internet of Things (IoT) tent, and a special enclosure created to showcase drone technology. From augmented reality apps to JPL's digital data strategy, cybersecurity to document marking and handling, going paperless to customized tools supporting the business, engineering, and science communities, the event generated widespread enthusiasm for JPL's IT portfolio of products and services. Through the use of a free Guidebook app available for download to mobile devices, attendees were able to preview the exhibitor list and descriptions about the

products, services, and vendors participating at the Expo in advance, enabling participants to customize their IT Expo experience. One of the new technologies prototyped at the IT Expo by IT Solutions Strategist Gabriel Rangel was 360-degree camera technology. JPL is testing 360 or VR photography to capture the entire area's surroundings which can be viewed in an immersive way with a mobile device. The technology could prove beneficial in labs, clean rooms, and conference rooms. We invite you to experience the IT Expo through the following sampling of 360-degree photos:

<http://gabriel360.azurewebsites.net/ITExpo2.html>

<http://gabriel360.azurewebsites.net/ITExpo3.html>

<http://gabriel360.azurewebsites.net/ITExpo4.html>

From Subterranean Communications to Mars Hopping, NASA Global Challenge Yields Mobile Innovations

Six teams from around the world will have a chance to attend a NASA launch at Cape Canaveral Air Force Station in Florida as the winners of NASA's 2016 International Space Apps Challenge, a global contest to create mobile apps and technologies that aid in space exploration and help improve life here on Earth.

"The Space Apps Challenge is one vehicle for NASA to engage individuals and communities around our open-data and technology tools. NASA's culture of innovation enables us to sharpen our focus on future exploration of our solar system and to make discoveries that benefit human life here on Earth," said Agency Deputy Administrator Dava Newman. "We're committed to unleashing the spirit of innovation not only at NASA, but with citizens around the world, and to getting more girls and women in data science fields. We're encouraged by the enthusiastic response we've seen in these creative team solutions."

The fifth annual code-a-thon was held April 22–24 at 161 locations worldwide. More than 15,000 participants took on the task of designing solutions for the 25 challenges in NASA's six mission-related categories: Aeronautics, Earth, International Space Station, Journey to Mars, Solar System and Beyond, and Space Technology. Six "best in class" winners were selected from the more than 1,200 entries.

Best Use of Data

Scintilla, created at the main-stage event in Pasadena, CA, mitigates the impact of poor air quality in the global community by democratizing

air quality data collection. Leveraging social media and text analysis, the Scintilla Web portal collects and displays real-time human sentiment on air pollution. Scintilla solves the AirCheck challenge to develop an app or platform to crowd-source data on environmental factors that affect human health.

Best Use of Hardware

Canaria, created by a team at the London event, is a 3D printed earpiece designed as a lifeline for the wearer, simultaneously monitoring heart rate, blood oxygen, and atmospheric carbon dioxide levels. Named for the canaries used by 19th-century miners as a warning system for toxic levels of dangerous gases in the mines, Canaria has an audible danger threshold alarm to alert the wearer. Canaria addressed the Rock-IT Space Fashion and Design challenge to create high-tech fashion that can collect or distribute data and provide interconnectivity, health benefits, or entertainment.

Best Mission Concept

FractalNet, created by a Greensboro, NC team, is a network of wireless devices that provides communications in a subterranean environment where radio communications are not possible beyond short distances, such as caves or lava tubes on the Moon, Mars, or asteroids. Key to the concept is the Data Glove, the link between mobile nodes and a base station. FractalNet also solves the Rock-IT challenge.

Galactic Impact

The Live Ice Velocity Estimation (L.I.V.E.) Glacier

Project, created at the event in Rome, Italy, is a Web tool that provides near-real-time visualizations of glacier surfaces, an indicator of climate change. In conjunction with the Glancy image-sharing app, L.I.V.E. can be used to collect crowdsourced glacier photos to support scientific analysis and awareness of environmental impact. L.I.V.E. addresses the Earth Live challenge to develop a Web tool or app that uses NASA and/or European Space Agency (ESA) satellite imagery and climate data to illustrate impacts of our changing Earth.

Most Inspirational

Kid on the Moon, created by a team in Toronto, is an interactive app with a self-guided exploration of the Moon to inspire passion for space travel in children 4 to 8 years old and their families. This project solves the Book It to the Moon challenge to create an interactive app that children can use to locate the Moon and unlock lunar data, images, and stories.

People's Choice Award

Mars Hopper, created at the event in Kiev, Ukraine, is a concept plane designed to investigate the Mars poles and their surroundings, using dry ice from the surface of the planet as fuel. Mars Hopper solves the Jet Set Mars challenge to design a conceptual mobility device that allows easy and rapid exploration of difficult Martian terrain.

To learn more about the International Space Apps Challenge and recent winners, visit <http://spaceappschallenge.org>. ♦

NASA STIPO/STISS Answering the Call at JSC *By Jaumarro A. Cuffee, JSC IRD Communications*

NASA's Scientific and Technical Information Program Office (STIPO) and Scientific and Technical Information Support Services Office (STISS) are answering the call to encourage responsible publication by NASA authors and raise awareness of the scientific and technical information (STI) resources available for NASA authors, the NASA community, and the public.

STIPO representatives Deputy, Program Manager Jennifer Perez and Agency Technical Publication Manager Gerald Steeman, along with STISS personnel Senior Technical Lead Annie Dash (LAMPs) and Project Coordination Support Zehna Windle, are making the rounds. During their visit to Johnson Space Center (JSC) May 11 to 12, STIPO

and STISS visitors reminded JSC authors of the importance of submitting their work through the STI review process, not only for appropriate distribution, but also to build upon an ever-growing body of scientific and technical knowledge. JSC STI Program Manager Vanessa Beene agrees that the information made available through the NASA Technical Reports Server (NTRS) can help further the research in the NASA community; educate presenters and volunteers who champion science, technology, engineering, and mathematics (STEM) activities in their communities; and arm parents who wish to encourage their children and expand young minds. Apprehension of limited access was partly assuaged by the reminder that although NTRS makes STI information publicly available, additional information

is made available to NASA users in NTRS Registered. NASA users can request access to NTRS Registered through the NASA Access Management System.

Responsible publication is important for preserving and furthering NASA's mission and providing the public with a valuable resource. During their visit, Beene says STIPO and STISS personnel asked, "How can we make this easier for you? How can we help you?" Through their Center visits, willingness to provide information to groups and individuals, and availability for future training, NASA STIPO and STISS are easing hesitations associated with the STI review process and helping people better understand the wealth of information available as they continue to answer the call. ♦

Glenn Invites Public To Celebrate 75th Anniversary

NASA Glenn Research Center at Lewis Field hosted approximately 25,000 visitors during its 75th anniversary open house on May 21 and 22, 2016. Neighbors near and far ventured to Cleveland, OH, to enjoy Glenn's unique research and testing facilities, such as the Zero Gravity Drop Tower, the Icing Research Tunnel, the Telescience Support Center, and the Glenn Extreme Environments Rig. Each day featured special presentations by NASA astronauts and Glenn's technologists and researchers, as well as hands-on activities for kids.

Over 4,000 guests visited the Glenn Office of the Chief Information Officer Graphics and Visualization (GVIS) Lab and the Glenn Reconfigurable User-interface Virtual Reality Exploration (GRUVE) Lab. Visitors had the opportunity to meet with GVIS computer researchers and engineers and experience how the GVIS uses scientific visualization, interactive augmented reality, gesture-based interfaces, and 3D displays of simulation data to support the research being conducted by NASA researchers as well as external partners.

On June 11 and 12, 2016, NASA Glenn's Plum Brook Station opened its doors to the public, enabling guests to tour the world's largest vacuum chamber, which is housed at the Space Power Facility, the world's largest space simulation facility; the Spacecraft Propulsion Research Facility, also known as the B-2; and the new Combined Effects Chamber, which, when completed, will simulate the conditions found on the surfaces of the Moon and Mars. ♦

IT Talk



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