THE GEOINT 2016 SYMPOSIUM

TUESDAY
MAY 17, 2016

SHOW DAILY

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A New Age of GEOINT

NGA DIRECTOR REFLECTS ON GEOINT'S PAST, CHARTS COURSE FOR ITS FUTURE

By Matt Alderton

What do Presidents George Washington, Thomas Jefferson, Theodore Roosevelt, and Abraham Lincoln have in common with the National Geospatial-Intelligence Agency (NGA)? A lot, actually, according to NGA Director Robert Cardillo, who used the celebrated American leaders to illustrate the continued evolution of geospatial intelligence during his keynote address Monday morning at GEOINT 2016.

"Seventy-five years ago, the Mt. Rushmore National Memorial was dedicated in the Black Hills of South Dakota," Cardillo said. "It was a phenomenal achievement of art and science resulting in an iconic memorial to four great Americans … So let's use these four remarkable Americans as a framework to look at our progress."

During his first address as director of NGA at the GEOINT 2015 Symposium, Cardillo introduced a new NGA Strategy focused on four distinct pillars: people, partners, profession, and value. Because he would have been an avid NGA customer, President Washington, Cardillo told the audience, personifies value.

"Enabling customer success is what compels [NGA] every day. We're driven forward by our fear of failing them. They—you—are our reason for being," Cardillo said, stressing the importance of NGA's GEOINT Services initiative in creating customer value. GEOINT Services, the Intelligence Community's enterprise-wide GEOINT delivery platform that spans all security domains, is on track to deliver geospatial content fully in the cloud by the end of 2017.

When it does, NGA will be even closer to achieving his vision of succeeding "in the open," according to Cardillo.

The Director then turned to President Jefferson, who

see A New Age p. 16

National Geospatial-Intelligence Agency Director Robert Cardillo discussed the future of his agency's research efforts, workforce development, industry engagement, and more in his GEOINT 2016 keynote.

> "We must go wherever the data, technology, and people exist, and apply that knowledge wherever the customers demand."
>
> —ROBERT CARDILLO, DIRECTOR, NGA

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The first participants Monday in GEOBowl for a Cause were four U.S. military members attending GEOINT 2016—two sailors, one airman, and one soldier. GEOBowl proceeds will go to Boulder Crest Retreat, Freedom Alliance, and USGIF's educational fund. GEOBowl is located in the back left corner of the exhibit hall at Booth 228.

DEPARTMENTS

FEATURES

IARPA INVITES GEOINT COMMUNITY TO SHARE IDEAS

Dr. Stacey Dixon, IARPA deputy director, is on a mission to expand engagement

The deputy director of the Intelligence Advanced Projects Research Activity (IARPA) is challenging the GEOINT Community to come forward with ideas for research projects that will help advance the tradecraft. Read the full recap online at **trajectorymagazine.com/got-geoint**.

FROM THE

PHOTO COURTESY OF KONGSBERG

A military analyst uses Kongsberg Geospatial's ISR Viewer platform to visualize big data.

FLYING UAVS BEYOND LINE OF SIGHT

KONGSBERG GEOSPATIAL DEMOS IRIS UAV NAVIGATION PLATFORM

Visitors to **Kongsberg Geospatial (Booth 1315)** at GEOINT 2016 can interact with a simulated UAV operating over the horizon using the newest version of the company's IRIS UAV navigation platform.

IRIS UAV allows drone operators to safely operate aircraft beyond the line of sight by providing a complete picture of the operating environment on a lightweight tablet. The information displayed includes terrain, air traffic, and other obstacles.

"The platform can also display live feeds from radar, cameras, and LiDAR—all in the same operating picture," said Chris Ivey, the company's marketing manager. "The genius of IRIS UAV is how it makes this flood of information easily manageable without overwhelming the user."

IRIS UAV aims to help increase the commercial and civil use of unmanned aircraft, which are mostly barred from flying beyond an operator's line of sight. Kongsberg has provided similar technology to the military for more than a decade.

Kongsberg Geospatial is also displaying its ISR Viewer visualization software, which integrates with a variety of data sources, including social media, to create map-based displays providing both geolocation and temporal information. The system includes a video animation feature that allows analysts to incorporate information over time to replay changes in a geospatial context.

Kongsberg Geospatial currently has technology aboard military platforms including the Global Hawk UAV and the U.S. Navy's Aegis air defense system. The company is also active in the air- and marine-traffic management markets.

KEEPING WATCH

SPACEKNOW SHOWCASES A RANGE OF ANALYTIC CAPABILITIES

Spaceknow (Booth 1007) is a venture-backed startup that analyzes large data with its analytics-as-a-service products, which the company is showcasing this week at GEOINT 2016.

Spaceknow Analytics is an integrated satellite imagery processing tool that enables users to analyze any location and detect change in the imagery.

Spaceknow's Satellite Manufacturing Index for China analyzes performance of the Chinese economy by monitoring more than 6,000 industrial facilities across the country using propriety algorithms to measure levels of manufacturing activity.

The company is also showing Spaceknow Watchdog, a tool that can monitor any location in the world and notify the user when significant changes occur. At GEOINT 2016, Spaceknow Watchdog is being demonstrated using an Iranian nuclear site as an example location.

"This the second time we're exhibiting at the Symposium," said Spaceknow Founder and CEO Pavel Machale. "We had a tremendous amount of interest at our booth last year and we're excited for this year. We're stoked to show the full potential of our products."

Spaceknow will also give a presentation with partner DigitalGlobe at **DigitalGlobe's booth (1103)** Tuesday at 3:40 p.m. to illustrate the strengths of fully analyzed imagery between the two organizations.

FLOOR EXHIBIT HALL HIGHLIGHTS

PHOTO COURTESY OF ORACLE

Oracle provides intelligence integration solutions from the chip to the cloud, and is featuring eight demo stations in its GEOINT 2016 booth.

'FROM THE CHIP TO THE CLOUD'

ORACLE TURNS RAW DATA INTO ACTIONABLE INSIGHT

Oracle (Booth 401), is demonstrating at GEOINT 2016 its ability to help the Intelligence Community (IC) achieve its IC Information Technology Enterprise (IC ITE) goals across five key focus areas: big data, analytics, security, integration, and cloud computing.

"We look at intelligence integration from the chip to the cloud," explained Denise Matalas, vice president of strategic programs for Oracle's National Security Group.

At the chip level, Oracle will showcase its SPARC M7 microprocessor, which uses the company's Software in Silicon technology to accelerate analytics, secure application memory, and encrypt all data at rest and in flight.

"One of the reasons people don't encrypt their data is performance drag," Matalas said. "We give users world-record performance while still encrypting their data."

The SPARC M7 is one of eight separate demo stations in Oracle's booth, where another highlight is Oracle Big Data Discovery, which uses visual analytics to enable analysts to quickly find and interpret data.

"[Oracle Big Data Discovery] puts power directly into the hands of the analyst by allowing them to take raw data and quickly turn it into actionable intelligence insights without relying on complex tools or scarce specialists to prepare the data for them," said Matalas.

INTEGRATION EXPERTISE

RADIANCE TECHNOLOGIES EMPOWERS THE IC WITH 24/7 GEOINT SUPPORT

The Advanced Technical Exploitation Program (ATEP II) is an eight-year, $960 million indefinite delivery/indefinite quantity contract providing advanced geospatial intelligence support to the National Air and Space Intelligence Center at Wright-Patterson Air Force Base near Dayton, Ohio.

Radiance Technologies (Booth 1416) is demonstrating its contribution to the program as a prime contractor providing research and development, maintenance and sustainment, and analysis and production services for a range of GEOINT and MASINT technical problems.

"We are a premier small business integrator of diverse GEOINT capabilities," said Chief Scientific Officer Dr. Seth Orloff. "The work we do in support of ATEP II demonstrates our ability to manage an extremely complicated, multi-year contractor environment, and we're excited to share that capability."

The company's work at Fort Gordon, Ga., is also featured at its booth.

"We support the Intelligence Community at Fort Gordon by providing image analysis and intelligence analysts looking at real-time and near-real-time information that goes directly back to the warfighter in theater. It's 24/7 mission support," explained David Diaddario, senior vice president for strategic initiatives, who said the company is also highlighting its native capabilities, such as algorithm development and systems engineering.

PHOTO COURTESY OF RADIANCE TECHNOLOGIES

Radiance Technologies' Persistent Infrared (PIR) Team advances the PIR operational production capabilities of the National Air and Space Intelligence Center at Wright-Patterson Air Force Base.

Golfing in Support of GEOINT Education

100 people participated in the Allder Golf Classic Sunday at Celebration Golf Club in Celebration, Fla., to raise more than $10,000 for the USGIF educational fund. The USGIF educational fund supports scholarships, awards, and other educational activities, such as the National Geographic Giant Traveling Map just outside the GEOINT 2016 exhibit hall. In 2016, USGIF will eclipse $1 million in scholarships awarded to students studying the geospatial sciences, remote sensing, and related fields—made possible by activities such as the Allder Golf Classic.

Congratulations to the winning team: Jason Fortner, Luke Balsley, Randy Ridley, and Randy DeWoolfson (pictured left to right). USGIF thanks Allder Golf Classic sponsors AECOM, BAE Systems, CACI, Compass Inc., Harris Corporation, Hortonworks, TomTom, and Vencore, in addition to prize donors BlackSky Global, Celebration Golf Club, E-Group, Golfsmith, and LogRythm.

Experience Disney Springs

FREE SHUTTLE SERVICE TUESDAY EVENING FOR GEOINT 2016 ATTENDEES

USGIF will provide offsite shuttles to Disney Springs at Lake Buena Vista Tuesday evening from 6:30 to 10 p.m. Enjoy more than 100 dining, shopping, and entertainment options. Dining selections range from food trucks and themed bars to standard table and counter service. Disney Springs activities include an AMC movie theater, Characters in Flight—the world's largest tethered helium balloon, Disney Quest Indoor Interactive Theme Park, La Nouba by Cirque Du Soleil, and Splitsville Luxury Lanes.

Shuttles will pick attendees up at the Caribe Royale and the Convention Center Bus Loop at the Gaylord Palms. Buses will run every 15 minutes between the Gaylord, Caribe, and Disney Springs. Once at Disney Springs, attendees will be dropped off at the West Side bus area. When picking attendees up from Disney Springs, the buses will return them to the Gaylord Palms and Caribe Royale. The last bus will leave Disney Springs at 10 p.m.

USGIF Working Group & Committees Snapshot

Many USGIF working groups and committees are holding meetings, panels, and networking events at GEOINT 2016. These events, taking place in Osceola A unless otherwise noted, are open to all Symposium attendees and exhibitors interested in the topic or seeking to learn more about a particular working group or committee.

TUESDAY

Tradecraft & Professional Development Committee Roundtable Discussion

1-2 p.m.

Join the USGIF T&PD Committee as they brainstorm ideas to help analysts achieve life-long learning and advance their technical skill sets in the face of ever-changing data sources and tools.

Small Business Advisory Working Group Panel
Small Business and the GEOINT Revolution

2:30-3:30 p.m.

Join the SBAWG for a panel discussion with NGA Leadership to discuss the role small business will play as NGA moves intelligence into more open, all source analysis with a proliferation of sensor platforms from NTM, small sats, UAS, and crowd sourcing.

- Moderator: Mr. Randy Brown, Vice President of Operations, ICES Inc.
- Diana Hughes, Director, Small Business Office, NGA
- Chris Rasmussen, Source Software Development Lead, NGA Pathfinder, NGA
- William Young, Deputy Component Acquisition Executive, Director of Plans and Programs, NGA

Small Sat Working Group Panel
Small Satellites and Open Source Analytics: Technology and Tradecraft

3:30-5:00 p.m.

This panel will discuss how communications, image processing, cloud computing and advanced analyst-driven analytical tools will marry near-persistent commercial satellite data with open sources to provide decision makers and action takers with timely information.

- Gary Dunow, Director, Analysis/Analytic Capabilities Portfolio Manager, NGA
- John Fenwick, Head, Terra Bella Operations, Google
- Doug Reed, Vice President and Division Manager, Leidos
- Joe Rouge, U.S. Air Force
- Robbie Schingler, Chief Strategy Officer and Co-Founder, Planet Labs

Young Professionals Working Group Networking Reception

5-6:30 p.m.
Sarasota 2-3

Join USGIF's Young Professionals Group for an informal networking event.

WEDNESDAY

Modeling & Simulation Working Group Discussion

8-9 a.m.

This meeting will update working group members and interested attendees on the current state of work to improve interoperability related to modeling and simulation activities. The meeting will also discuss planned activities, and provide insight into a jointly sponsored USGIF, SISO, and OGC M&S Interoperability Summit to be held Sept. 19 in Orlando, Fla.

The Connectivity Revolution

GLOBAL STRATEGIST PARAG KHANNA ON FUNCTIONAL MAPS AND WHAT THEY MEAN FOR AN INCREASINGLY CONNECTED WORLD

By Melanie D.G. Kaplan

During a Monday keynote at GEOINT 2016, global strategist and author Parag Khanna asked the audience to consider how they might change the way maps are constructed in order to emphasize today's global connectivity.

"The infrastructure we have and are building are robust features and will outlive many of the nations they cross," Khanna said.

Khanna, who most recently authored, *Connectography: Mapping the Future of Global Civilization*, said the world is at the beginning of a "connectivity revolution." While urbanization and infrastructure have been occurring for 60,000 years, he said, our newest form of infrastructure—communications—represents an enormous shift in how people today should think about borders, allies, and rivals.

"To me, this represents a paradigmatic shift in human organization," Khanna said. "We have been accustomed for centuries to thinking of the world as primarily organized into divisions between states."

While we'll always have nations, empires, and tribal communities—one won't supersede the other—Khanna said it's impossible to ignore the fact that massive volumes of infrastructure are being built across these borders. He noted the world is projected to spend two to four times as much on infrastructure each year as it does across all military budgets in the world combined.

What does it mean to live in a world in which connectivity shapes relations between states? First, it changes the way states relate to each other and augments political geography with functional geography.

Author and global strategist Parag Khanna urged the GEOINT 2016 audience to reconsider how it maps in order to better emphasize global connectivity.

"Now, when we look at a map of the world we have to look at the lines that connect us as much as the lines that divide us," Khanna said. "We have to think about whether those lines promote cooperation—as they do in many cases—or whether those lines are the battlefield of the 21st century."

Khanna, who has advised the U.S. National Intelligence Council's Global Trends 2030 program, said the lines that connect us are already becoming battlefields because they are so lucrative.

He touched on the concept of mega-cities as more than dots on the map—rather, they are archipelagos that stretch for hundreds of kilometers and have upwards of 70 to 80 million people and many cities within—including wealthy sectors, industrial quarters, and slums.

Khanna also discussed rising urban violence and stressed the difference between that which stems from political unrest based on economic inequalities—where disenfranchised, unemployed youth and restless migrants come together to cause political volatility—and terrorism.

"We have to separate the urban violence that is proliferated on the basis of economic issues versus that which can be political and have international and military and terrorist dimensions," he said. "We have to be careful not to over-securitize the socio-economic kinds of unrest, which is very much about public policy and investment and jobs versus that which is political in nature." The solution, he said, is to focus on poverty and a country's bottom 20 to 30 percent income-earners.

Khanna said today, as opposed to 100 years ago, we not only trade with our rivals but we are also integrated with them financially in many ways. While we have no lack of global conflict, Khanna said there are more barriers to escalation today than there were a century ago. As much as some fear modern conflicts could escalate to World War III, he said there's a sense among decision-makers that financial entanglements may actually incentivize nations to avoid war.

"The more [global connectivity] we encourage, the more of it happens organically, and the better off these situations will be," Khanna concluded.

National Geographic's Giant Traveling Map

USGIF TO HOST ELEMENTARY SCHOOL AND JROTC STUDENTS AT GEOINT 2016

USGIF will host 90 Orlando area fifth grade students at GEOINT 2016 to participate in National Geographic's Giant Traveling Map Program. Celebration Elementary School visited the Symposium Monday morning, while Flora Ridge Elementary School will attend Tuesday morning.

As a way of expanding its educational outreach to K-12 students, USGIF rented National Geographic's Giant Traveling Map of the Pacific Ocean for the GEOINT 2016 Symposium. The map measures 25 by 35 feet and illustrates the Pacific Ocean, Australia, neighboring islands, and parts of Asia, North America, and South America. The Giant Traveling Map program introduces geography and map reading skills to children in grades K-8.

Fifth grade students from Celebration Elementary School visited GEOINT 2016 Monday morning to learn about GEOINT using National Geographic's Giant Traveling Map.

DigitalGlobe volunteered to teach the elementary school students about GEOINT, guiding them in basic geography and satellite imagery analysis activities on the map. Students are also touring the exhibit hall and visiting the booths of pre-selected exhibitors: American Military University, Basis Technology, DigitalGlobe, Esri, Headwall Photonics, MDA, OGSystems, and VRICON.

On Wednesday, USGIF's Young Professionals Group will host 50 Oak Ridge High School JROTC cadets who will also visit the giant map. Capt. Dave Blakesley of the National Geospatial-Intelligence Agency will speak to the JROTC students about the importance of the Pacific Ocean.

The map is located just outside the exhibit hall entrance by the escalators. When students are not using the giant map, attendees are welcome to walk on and explore the map.

Lettre Issues Challenge to GEOINT Community

DOD LOOKS TO GEOINT TO HELP ENSURE SPACE RESILIENCY

By Warren Ferster

New U.S. satellite architectures for gathering geospatial and signals intelligence are being designed to be more resilient in the face of growing threats from near-peer adversaries, even if that means sacrificing some capability, according to the U.S. defense secretary's principal intelligence advisor.

In a GEOINT 2016 keynote Monday morning, Marcel Lettre, undersecretary of defense for intelligence, echoed warnings from his colleagues at the Pentagon and in the Intelligence Community that U.S. adversaries are increasingly looking to neutralize the advantages that come with superior space and technological capabilities.

"Deterrence depends on preparedness," Lettre said. "The blunt reality is we must prepare for adversaries who are willing to fight in every domain, including space."

In the event that some geospatial intelligence collection capabilities are sacrificed in the name of resiliency, the Defense Department and Intelligence Community will be looking to the commercial sector and allied nations to help fill gaps, Lettre said.

Resiliency also will be a key consideration as the U.S. Air Force designs its next-generation missile warning capability, Lettre said. The service recently completed an analysis of alternatives for the follow on to its Space Based Infrared System and is expected to decide before the end of the year on what the next system will look like.

The Pentagon has devised what it calls a "third offset strategy" to cope with increasingly capable adversaries who are benefiting from the proliferation of advanced technologies. The strategy presents challenges to the GEOINT Community in four key areas, Lettre said.

The first is transforming the GEOINT enterprise. This entails greater use of automation and improving human-to-machine interaction to both speed the delivery of information and provide better insights, as opposed to mere pictures, he said. It also involves greater integration of different types of imagery collected by different platforms—airborne and satellite, for example—and leveraging open-source data, he said.

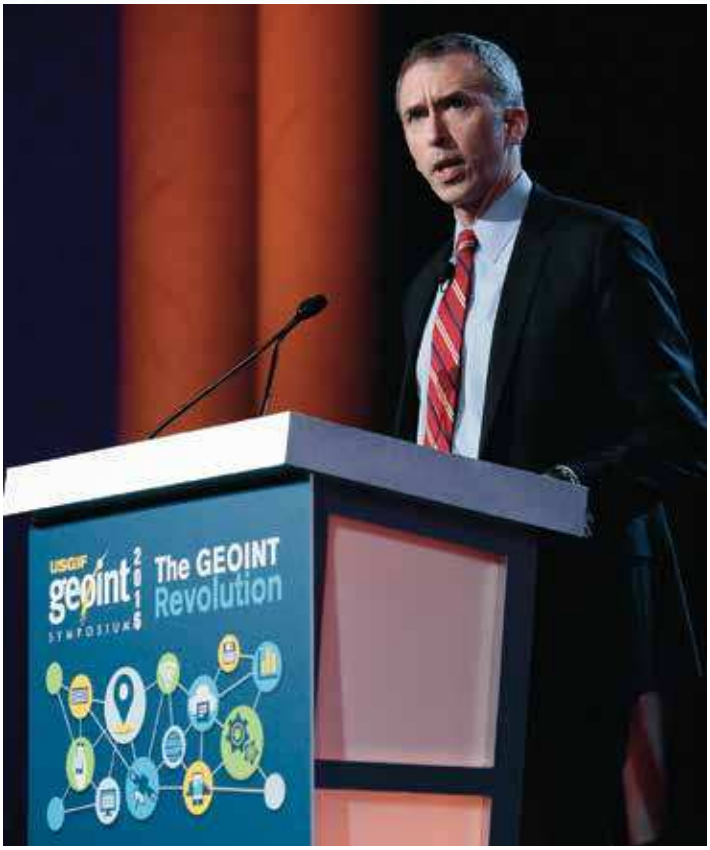
The second area is resiliency. Unlike the air domain, which was always contested, space for a time had been considered a sanctuary.

"That is no longer the case," Lettre said. He noted that the Defense Department is investing $5 billion over the next five years to make its constellations more robust, including $2 billion in "space control" measures.

"The Air Force and the National Reconnaissance Office have taken lead and are cooperatively working to ensure an integrated approach to resiliency across the enterprise," Lettre said.

The third area is engagement with commercial partners, Lettre said. The National Geospatial-Intelligence Agency has long relied on commercial imaging satellite operators to help fill gaps in government collection capabilities, but the industry has entered what might be characterized as a new golden age.

Driven in part by Silicon Valley technology, capital, and thinking, entrepreneurial companies are deploying new and innovative capabilities, both in terms of satellites and ground-based data processing capabilities, he noted.



Marcel Lettre, under secretary of defense for intelligence, appealed to the GEOINT Community to help the U.S. bolster its space resilience during his Monday keynote.

"These advances will prove to be critical enablers for industry users and likely will prove beneficial to the Department of Defense as well," Lettre said.

Finally, the Defense Department will work to better leverage and integrate the space capabilities of its allies, Lettre said. Given the huge volumes of raw data involved, accomplishing this will require what Lettre called a "federated process" for processing, analyzing, and distributing data among U.S. forces and coalition partners.

"Key to 'third offset' is our defense-intelligence capability, particularly the great strengths to be derived from GEOINT," Lettre said. "And it is therefore imperative to continue the transformation of our GEOINT enterprise, to maintain the nation's strategic advantage to make our space architectures more resilient and survivable, to harness the full capability of the academic and commercial sectors, and to seamlessly integrate with coalition partners in unprecedented ways."

Airbus Defense and Space has a constellation of optical and radar satellites that can cover any point on Earth at least twice a day. Whether it is planning ahead for a battlefield situation or quickly capturing intelligence from the frontline, it is vital to have the most relevant and current information at hand. Having timely satellite imagery and geo-intelligence will bring fresh intel to your plan when it matters most.

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DARPA Pushes the Boundaries of Space Technology

GEOINT CAPABILITIES TO BENEFIT FROM ACTIVITIES IN LAUNCH, ROBOTICS

By Warren Ferster

In keeping with its founding mandate, the Defense Advanced Research Projects Agency (DARPA) is aggressively pursuing space-related projects in areas that reflect the increasingly important role satellites play in national security.

Speaking Sunday at GEOINT Foreword, Bradford Tousley, director of DARPA's Tactical Technology Office, provided updates on the agency's latest efforts to advance the state of the art for space launch, on-orbit satellite servicing, and space domain awareness.

Tousley reminded the audience that while DARPA, which invests in high-risk, high-payoff technologies for national security, is best known for pioneering the internet, the agency was created in 1958 to pursue space capabilities. Space remains an important part of DARPA's wide-ranging technology portfolio.

In space launch, DARPA is focusing on the Experimental Spaceplane, or XS-1 program, an effort to field a small satellite launcher that operates more like an aircraft—XS-1 will take off and land from a runway—rather than a traditional rocket. The XS-1 is expected to be able to launch 10 times in as many days at a cost of $5 million per mission. DARPA recently completed the initial study phase of the program and is readying for a second phase that will culminate in a flight demonstration, Tousley said.

While mindful of recently unsuccessful DARPA efforts to field flexible, low-cost launchers, Tousley remains confident about XS-1, in part because it relies on relatively mature propulsion technology and leverages substantial commercial investments in rockets. The company selected to fly the Phase 2 XS-1 demonstration will have to first prove its engine can be fired on the ground 10 times in 10 days, he added.

Bradford Tousley, director of DARPA's Tactical Technology Office, discussed the agency's latest space-related projects Sunday at GEOINT Foreword.

DARPA is preparing to release another solicitation for its latest effort in space robotics, the Robotic Servicing of Geosynchronous Satellites (RSGS) program. DARPA has a long history in space robotics, but operating in geosynchronous orbit presents unique challenges resulting from the high altitude and extreme radiation environment.

Like the XS-1 program, RSGS will leverage work being done in the private sector on robotic satellite servicing, where profit-motivated companies are developing capabilities to extend the lives of on-orbit satellites. Tousley said DARPA will pursue the RSGS mission as a public-private partnership, with the private sector partner contributing funding and ultimately operating the resulting capability as a commercial service.

DARPA envisions a similar transition to a commercial service with XS-1, which will be able to launch payloads weighing up to 3,000 pounds.

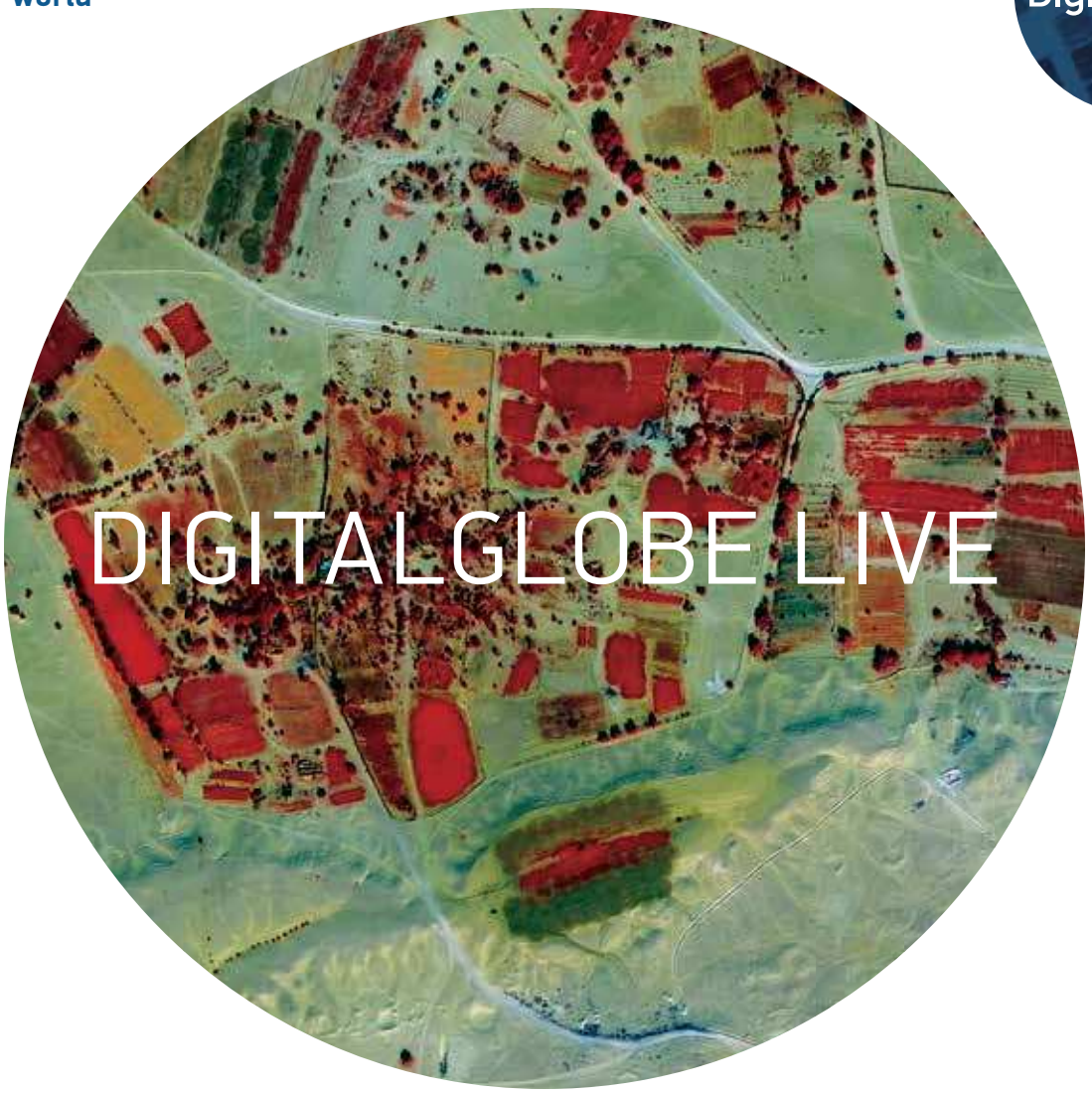
XS-1 and RSGS both directly support GEOINT missions, Tousley said. The ability to rapidly deploy and reconstitute image-gathering satellites at a relatively low cost could yield new approaches to this all-important national security mission, which traditionally has relied on very large and expensive satellite platforms.

Meanwhile, RSGS, Tousley said, could yield an ability to assemble large structures—such as imaging apertures—in geosynchronous orbit, from which satellites can maintain constant surveillance of a given area.

Space domain awareness is another area in which DARPA is pushing the envelope. The OrbitOutlook program will seek to draw data from nontraditional sources—ranging from private companies to hobbyists with good telescopes—to combine with military data and analysis to provide a more complete picture of the orbital environment, Tousley said.

In another program, dubbed Hallmark, the aim is to enable warfighters to collect and use space situational awareness data in real time, as can be done with air operations today, according to Tousley. DARPA envisions Hallmark to be a 24- to 36-month effort, the results of which will feed into the Pentagon's new Joint Interagency Combined Space Operations Center, an experimentation and test effort to boost the ability to detect, characterize, and attribute irresponsible or threatening space activity in a timely manner.

See a better world



LIVE PRESENTATION SCHEDULE
TUESDAY 17 MAY

1:00 pm » The era of Geospatial Big Data

1:20 pm » Extracting GEOINT at speed and scale with GBDX: A developer's introduction

1:40 pm » Revealing the hidden world with shortwave-infrared (SWIR) imagery

2:00 pm » Crowdsourcing: Rapidly turn pixels into reliable insight

2:20 pm » Data made actionable: First Mile Geo

2:40 pm » The evolution of the DigitalGlobe Constellation

3:00 pm » Turbocharge your GEOINT business: Join the GBDX ecosystem

3:20 pm » Tracking the global economy to help seven billion humans with Spaceknow and GBDX

3:40 pm » Mapbox: Prioritizing satellite imagery updates using anonymous telemetry data

See the GEOINT revolution in action at booth #1103

Reinventing Research

NEW NGA RESEARCH DIRECTOR MAPS THE FUTURE OF THE AGENCY'S R&D

By Matt Alderton

It took British watchmaker John Harrison five years to build the first marine clock capable of determining longitude at sea, which he unveiled in London in 1735. Known today as the Harrison 1, or H1, the brass contraption of wheels, gears, springs, and spindles looks more like an alien sea vessel than a clock. And yet, it remains one of the most significant timepieces in history, according to Dr. Peter Highnam, director of research at the National Geospatial-Intelligence Agency (NGA).

Dr. Peter Highnam, who was recently appointed to lead the new NGA Research office, discussed his plans for the agency's R&D efforts Sunday at GEOINT Foreword.

"The Harrison 1 changed the world. That clock was leading-edge technology for its time," Highnam said Sunday while giving the closing keynote address at GEOINT Foreword.

As revolutionary as it was, the H1 wasn't perfect. It led to several more iterative prototypes, the fourth—the H4 chronometer, completed in 1759—earned Harrison a monetary prize from the British government, which in pursuit of its national security interests promised to reward anyone who could develop a simple, practical solution for determining a ship's longitude.

Resembling a large pocket watch, the H4 has come a long way since its H1 iteration. But H4 would not have come to fruition without its prior prototypes, nor the government carrot that encouraged Harrison to create it in the first place, stressed Highnam, who shared this story to illustrate the newfound strategic importance of research and development at NGA.

"Harrison 4 … gave us precision navigation, and it was driven by national security," said Highnam, who last week was announced as head of NGA Research, a new NGA office established to champion and drive research across the GEOINT Community, focusing in particular on research at national labs, universities, and commercial businesses.

The result of a reorganization initiated early this year by NGA Director Robert Cardillo, NGA Research replaces the agency's former InnoVision Directorate and will diverge from its predecessor in at least one major respect: Rather than focusing inward, NGA Research will focus outward, concentrating on the activation of external research in seven distinct focus areas: radar, automation, geophysics, spectral, environment and culture, geospatial cyber, and geophysics.

Along with three special projects shared by Highnam—the In-Q-Tel Interface Center; the GEOINT Pathfinder 2 project; and the creation this summer of a permanent NGA office in Silicon Valley, to be known as NGA Outpost Valley—NGA Research will incentivize and equip modern-day Harrisons to create the GEOINT equivalent of the H1 clock, which with appropriate time, investment, and refinement could one day deliver H4-like capabilities to warfighters, policymakers, and first responders.

"The advantage of working in an 'ARPA' is you don't have a mission of your own except to do R&D; you exist to find something out, to make something happen, and to transition it into practice," concluded Highnam, a veteran of the Defense Advanced Research Projects Agency (DARPA) and the Intelligence Advanced Research Projects Activity (IARPA).

"We at NGA are on the other end of that—I don't care where it comes from. I shouldn't care where it comes from," he said. "If it will give us a war-winning capability ... I should be interested in it and we should take advantage of it."

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NGA LAUNCHES TALENT EXCHANGE PROGRAM

New 'eNGAge' program will infuse agency with external expertise

As part of its efforts to build a next-generation GEOINT workforce, the National Geospatial-Intelligence Agency (NGA) will exchange talent with industry and academia through NGA Geospatial Exchange—"eNGAge," for short—a new program announced Monday by NGA Director Robert Cardillo during his GEOINT 2016 keynote address.

By sending internal employees out, and bringing external resources in, NGA hopes to catalyze a culture of innovation that fuels new business practices, enhances collective tradecraft knowledge, and deepens existing partner relationships.

"[The program] will offer our people immersive experiences with industry and academia—and will also allow us to welcome outside talent into NGA," explained Cardillo, who said NGA already has welcomed its first exchange employee via eNGAge—Dr. Catherine Cotell from the Intelligence Advanced Research Projects Activity—will join NGA Research beginning this week.

Members of the GEOINT Community may propose ideas for exchange opportunities at **nga.mil**.

commissioned the Lewis and Clark expedition and created the country's first cipher system to transmit coded information in advance of the Louisiana Purchase. "For Jefferson, mapping was—as it is today—an intelligence activity," Cardillo said.

To further invest in that activity, as Jefferson did, NGA recently replaced its InnoVision Directorate with the launch of NGA Research, which leverages external research expertise. NGA Research will soon debut a Silicon Valley branch called NGA Outpost Valley to take advantage of tech-industry talent.

"[These initiatives] allow us to put more minds on tasks, bringing fresh ideas, innovative research techniques, and path-breaking science," explained Cardillo, who next pivoted to NGA's focus on its partners—represented by President Roosevelt, a former commissioner of the New York Police Department.

"As police commissioner, he actually walked a beat late at night and early in the morning," Cardillo said. "NGA … must walk every beat with Team GEOINT."

Cardillo said NGA is doing just that by investing in its many partnerships. In particular, he highlighted successful international partnerships, notable domestic partnerships, and evolving industry partnerships—the strength of which is increasing thanks to efforts like the GEOINT Solutions Marketplace (GSM), a joint effort between USGIF and NGA to create an online community connecting GEOINT users with solution providers.

NGA's most important partner is its workforce, Cardillo continued, discussing the final of his four admired presidents and strategic pillars—President Lincoln and people, respectively.

"[Lincoln] united people around a goal to serve a purpose higher than themselves," explained Cardillo, who said NGA is pursuing similar unification through evolution of its human resources strategy. In pursuit of a next-generation GEOINT workforce, his goals include increasing hiring, streamlining the onboarding of new analysts working with unclassified data sources, and improving training and development for existing analysts.

"This is not just about bringing in new talent. It's about growing and unleashing their potential," he said.

NGA is also advancing the GEOINT profession via its GEOINT Professional Certification Program for the Defense Intelligence Enterprise. Since the program began in 2013, the agency has awarded more than 6,000 certifications—20 percent of which to its military partners.

"And what about our colleagues in industry?" Cardillo said, referencing NGA's growing partnership with USGIF and the reciprocity the agency will share with USGIF's Universal GEOINT Certification Program. "We're proud and pleased to be able to announce this major milestone of our intent to functionally recognize the equivalence between [NGA and USGIF certifications] to provide the parity and equivalence across certification programs ... to build a true profession."

Cardillo concluded with some calls to action for industry and academia:

- To "game-ify" GEOINT technologies, platforms, and solutions to leverage constructive competition and improve intelligence outcomes.
- To offer more trial accounts that allow NGA to "test-drive" new technologies.
- To deliver more big data analytics solutions such as subscriptions to alerts, observations, and insights that help analysts turn pixels into reliable, accurate GEOINT data.
- To develop secure multinational technology solutions that facilitate information exchange between NGA and international partners.

Once these and other goals are realized, NGA will be well positioned to exploit what Cardillo called "a new age of GEOINT"—the emergent era of open, on-demand geospatial intelligence.

"We must go wherever the data, technology, and people exist, and apply that knowledge wherever the customers demand. We must let go of any remnants of ownership and embrace our stewardship of the profession. We must enable outcomes that are bigger than ourselves," Cardillo concluded. "If we do these things—and we do them together—we can actually make this planet a better place to live."

USGIF Launches Universal GEOINT Certification Program

USGIF officially launched its Universal GEOINT Certification Program Monday at GEOINT 2016. USGIF's certification program—available to U.S. and international GEOINT practitioners across industry, military, academia, and government—includes three exams: GIS and Analysis Tools, Remote Sensing and Imagery Analysis, and Geospatial Data Management.

Visit usgif.org/certification to learn more.

Each of the three exams and subsequent certifications are valuable as standalone credentials. However, GEOINT practitioners who earn and maintain all three USGIF certifications simultaneously will be eligible to apply for USGIF's overarching Universal GEOINT Professional (UGP) designation.

USGIF announced Monday the six practitioners who achieved the UGP designation during the program's pilot testing phase. The first UGP recipients are: Talbot Brooks, Stewart Bruce, Chris Johnson, Angel Martinez, Christopher Stahl, and Lt. Col. Michael Wood.

Pictured from left to right are: USGIF CEO Keith Masback, Stewart Bruce, Lt. Col. Michael Wood, USGIF Vice President of Professional Development Dr. Darryl Murdock, Talbot Brooks, and USGIF Chairman of the Board The Honorable Jeffrey K. Harris.

7:00-9:00a
Training and Education Sessions (Osceola Rooms 1-6)

8:00-9:00a
USGIF SmallSat Working Group Panel (Osceola A)

8:00-11:00a
Joint USGIF Accredited Programs/ USGS-NGA CAE/HBCU Meeting (Sarasota 2-3)

9:00-9:15a
Master of Ceremonies: Letitia A. Long, Board of Directors, USGIF; Chairman of the Board, INSA (Osceola Ballroom CD)

9:15-10:00a
The Honorable James R. Clapper, Director of National Intelligence

10:00-10:15a
USGIF Awards Program Presentations

10:15-10:45a
Networking Break (Osceola Foyer)

10:45-11:15a
The Honorable Stephen P. Welby, Assistant Secretary of Defense for Research and Engineering

11:15a–12:30p
Panel: The Remote Sensing Revolution

- Moderator: Kevin O'Connell, CEO, Innovative Analytics & Training
- Winston A. Beauchamp, Deputy Under Secretary of the Air Force for Space, and Director, Principal DoD Space Advisor Staff
- Steve Coast, Space Know; Founder, OpenStreetMap Foundation; Chief Evangelist, what3words
- Douglas L. Loverro, Deputy Assistant Secretary of Defense for Space Policy
- Dr. Lisa Porter, Executive Vice President and Director of CosmiQ Works
- Robbie Schingler, Chief Strategy Officer and Co-Founder, Planet Labs
- Dr. Walter S. Scott Executive Vice President, Chief Technical Officer, and Founder, DigitalGlobe

12:30-2:00p
Lunch and Exhibit Hall (Florida Exhibit Hall A-F)

1:00-2:00p
USGIF Tradecraft & Professional Development Committee Roundtable Discussion (Osceola A)

1:30-5:00p
Government Pavilion Stage (Florida Exhibit Hall)

- **1:30-2:30p** – NGA Portfolio Managers by moderator Misty Tullar, Director of Plans and Programs; Gary Dunow, Director, Analysis/Analytic Capabilities Portfolio Manager; John Goolgasian, Director, Source/Content Portfolio Manager; Heidi Smith; Dr. Peter Highnam, Director, Research; Doug McGovern, Director, Chief Information Officer and Director IT Services; and Justin Poole, Director, Xperience Directorate/Customer Service Portfolio Manager, NGA
- **2:30-3:00p** – Spatial Law and Policy Dorothy I. Becker, Assistant General Counsel, NRO Office of General Counsel, and Robert J. Strauss, USGIF Spatial Law and Policy Working Group
- **3:00-3:30p** – Dr. Joseph F. Fontanella, Director, U.S. Army Geospatial Center; and Geospatial Information Office, U.S. Army
- **3:30-4:00p** – ISM & GSM 2.0 by Dave Cacner, Director, Enterprise Innovation Office and Director, NSG Expeditionary Activities, Transformation Services Group, IT Services Directorate, NGA; Christine Jung, President and CEO, Blue Compass; Michaela Mesquite, Analytics Technology Lead, Analysis, NGA; Dr. Darryl Murdock, Vice President of Professional Development, USGIF; and Dan Takane, GEOINT Solutions Marketplace, NGA

2:00-4:00p
Training and Education Sessions (Osceola Rooms 1-6)

2:30-3:30p
USGIF Small Business Advisory Working Group Panel (Osceola A)

3:30-5:00p
USGIF SmallSat Working Group Panel (Osceola A)

4:00-5:00p
The Intersection of GEOINT and the Capital Markets (Government Pavilion Stage)

4:00-5:00p
Exhibit Hall Networking Reception (Florida Exhibit Hall A-F)

5:00-6:30p
USGIF Young Professionals Working Group Networking Reception (Sarasota 2-3)

6:30-10:00p
Busing to Disney Springs (buses run every 15 minutes)

» WEDNESDAY, MAY 18 AT-A-GLANCE

EXHIBIT HALL OPEN 10:00A-3:00P

7:00-9:00a	TRAINING AND EDUCATION SESSIONS (Osceola Rooms 1-6)
8:00-9:00a	USGIF MODELING & SIMULATION WORKING GROUP TALK (Osceola A)
9:00-9:15a	MODERATOR: JIM SCIUTTO, CHIEF NATIONAL SECURITY CORRESPONDENT, CNN
9:15-10:00a	BETTY J. SAPP, DIRECTOR, NRO
10:00-10:30a	A CONVERSATION WITH THE HONORABLE MICHAEL D. LUMPKIN, DIRECTOR OF THE GLOBAL ENGAGEMENT CENTER, U.S. STATE DEPARTMENT
10:30-11:30a	PANEL: JOINT PED: THE SERVICES' APPROACH
11:00a–12:00p	USGIF TRADECRAFT & PROFESSIONAL DEVELOPMENT COMMITTEE/NGA ADVISORY WORKING GROUP DISCUSSION (Osceola A)
12:00-1:30p	LUNCH AND EXHIBIT HALL (Florida Exhibit Hall A-F)
12:30-1:45p	GOVERNMENT PAVILION STAGE (Florida Exhibit Hall)
2:00-3:00p	USGIF GEOSPATIAL & REMOTE SENSING LAW WORKING GROUP DISCUSSION (Osceola A)
6:00-8:00p	GEOINT 2016 CLOSING RECEPTION (Gaylord Palms Coquina Lawn)

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