

# SHOWDAILY

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## Quantum Leaps

GEOINT FOREWORD SPEAKERS BO EWALD AND WILLIAM HURLEY TO DISCUSS HOW QUANTUM COMPUTING CAN PROPEL THE GEOINT COMMUNITY INTO THE FUTURE

By Scott Mason

**G**EOINT Foreword 2019 promises an exciting line-up of speakers, including two individuals at the forefront of quantum computing and its potential application to the geospatial intelligence field. *The GEOINT Symposium Show Daily* spoke with Bo Ewald of ColdQuanta, Inc., and William Hurley of Strangeworks, Inc., who will both give keynote addresses Sunday, to learn more about their upcoming presentations.

### UNPRECEDENTED POTENTIAL FOR PNT

Bo Ewald has long been part of the advanced computing industry. He started his career at Los Alamos National Laboratory, where under his watch it became one of the most powerful scientific and engineering computing facilities in the world. Since then, he has been involved with several high-performance computing companies, including being president of Cray Research and CEO of Silicon Graphics. He currently serves as president and CEO of ColdQuanta, Inc., in Boulder, Colo.

“In my career, we’ve provided conventional and quantum systems for companies like Lockheed Martin, Google, and NASA,” Ewald said. “And I’ve participated in several GEOINT meetings over the years, so I’m quite familiar with many of the topics and attendees at the conference.”

In his keynote, Ewald plans to give a brief introduction to quantum mechanics, including some basics and a history of the field, before diving into more detail about the potential application of a set of quantum technologies and high-powered computing for the GEOINT Community. “To borrow from Winston Churchill, ‘We’re coming to the end of the beginning’ of quantum computing. It’s really an exciting time in the field,” he explained.

Ewald detailed the use of quantum devices for advancement in positioning, navigation, and timing. “With quantum technology, you can create devices that provide more accurate timing than we have today, even more precise than the NIST-F1, the cesium fountain atomic clock in Boulder, Colo.,” he said. “This new clock and technologies will be so

➤ see *Quantum Leaps* p. 16



Bo Ewald of ColdQuanta, Inc., is an advanced computing expert and hobby pilot.

“To borrow from Winston Churchill, ‘We’re coming to the end of the beginning’ of quantum computing. It’s really an exciting time in the field.”

—BO EWALD, COLDQUANTA, INC.

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## GEOINT 2019 WELCOME CELEBRATION

Join USGIF and 3,500 of your closest friends as we kick off the week with the GEOINT 2019 Welcome Celebration Sunday from 7 to 9 p.m. This is a great setting to network with colleagues while enjoying food, beverages, and entertainment. Join us on the South Bank of the River Walk at 111 W. Crockett St.

# FROM THE



PHOTO COURTESY OF RED HAT

Since launching in September 2018, Red Hat's Mobile Portfolio Center has traveled more than 27,000 miles, hosted 100+ events, and visited enterprise customers in two countries and 44 states.

## DRIVING THE 'OPEN' ROAD

RED HAT INTRODUCES GEOINT USERS TO THE POWER OF OPEN SOURCE

By Matt Alderton

Speed. Flexibility. Interoperability. Scalability. These are just a few of the things GEOINT users need to innovate, collaborate, and compete in a data-rich world—and open-source software offers all of them, according to **Red Hat (Booth 140)**. The company plans to spend this year's GEOINT Symposium promoting its open-source, enterprise IT solutions to GEOINT analysts, data scientists, and developers.

"Years ago, open source was a tough sell. But now, even the most proprietary of vendors is embracing open-source technology because it allows them to work better, faster, and easier," said Jeff Spugnardi, Red Hat's GEOINT program lead. "Some of the biggest companies in the world now realize how much innovation there is in open source, and how much faster innovation occurs."

Believing that innovative, on-the-move technology deserves an innovative, on-the-move space in which to showcase it, Red Hat this year will exhibit not in a traditional booth, but rather in its new Mobile Portfolio Center—a self-contained, Red Hat-branded, 18-wheel semi truck that it will park on the exhibit floor. The truck, which expands to more than 930 square feet, features classroom space, private meeting areas, and six kiosks where Red Hat will provide hands-on demonstrations of its open-source solutions, including: Red Hat Enterprise Linux 8 (RHEL 8), the latest version of its open-source operating system; Ansible, its open-source IT automation software; and OpenShift, its open-source container application platform.

"We're going to be highlighting our products as the underlying infrastructure for GEOINT mission programs," concluded Spugnardi, who said demos will encompass everything from infrastructure optimization to integration to automation and management, all viewed through a GEOINT lens. "Our goal is showing government and industry leaders everything open-source software can do to help make the GEOINT mission more successful."

## SCALABLE SEARCH

ELASTIC TURNS BIG LOCATION DATA INTO BETTER LOCATION SERVICES

By Matt Alderton

Imagine having a car but no gas, a turkey but no oven, or a stapler but no staples. That's what big data is like without **Elastic (Booth 1530)**, a search company whose products make data usable in real time and at scale for use cases such as application search, site search, enterprise search, logging, application performance management, metrics, security, and business analytics.

"It's fast, it's flexible, it's scalable, it's secure," George Young, vice president, U.S. public sector, said of Elastic's technology. "If you haven't heard of us, pull up your Uber or Tinder app and we're there powering them."

Elastic—which recently joined USGIF and will therefore be exhibiting in the New Member Showcase at GEOINT 2019—is best known for its Elastic Stack suite of products, which includes Elasticsearch for searching, analyzing, and storing data; Kibana for visualizing data; Beats for shipping data; and Logstash for ingesting and centralizing data.

Elasticsearch, in particular, will be front and center for Symposium attendees. "Elasticsearch is used extensively for geospatial analytics with well-known applications," Young said. "It is the data store of choice for people looking for massive scale, real-time analytics and visualization of geospatial data combined with other sources such as open-source intelligence." ➤

# FLOOR

EXHIBIT  
HALL  
HIGHLIGHTS

## A MULTIDISCIPLINARY EDUCATION

JHU'S GEOINT MASTER'S DEGREE PROGRAM  
CELEBRATES ONE YEAR

By *Lisbeth Perez*

**J**ohns Hopkins University's (JHU) Geospatial Intelligence master's degree program (Booth 1827) celebrated its one-year anniversary in May. Program director Jack O'Connor is leading the program toward eligibility for USGIF Collegiate Accreditation.

The burgeoning program combines three areas of study: the history of GEOINT, the science and mathematics of digital geography and its related databases, and the art of converting data into multiple forms (i.e., written, spoken, and visual).

"It's a multidisciplinary program," O'Connor explained. "There are some unique geospatial intelligence courses. There are some courses related to GIS, another set related to remote sensing, and several courses related to creating intelligence analysis."

Johns Hopkins will share information about its dynamic curriculum at GEOINT 2019. To further encourage those who are interested in continuing their GEOINT education, the university will also distribute a list of suggested reading material.

"We've had quite a number of inquiries from students about what should they read if they are considering a career or want to learn more about geospatial information," O'Connor said.

JHU will also hold a daily contest at its booth, offering small prizes.



IMAGE COURTESY OF DIGITAL ELEMENT

## GLOBAL IP INTELLIGENCE

DIGITAL ELEMENT TO SHOWCASE IP-BASED  
GEOLOCATION CAPABILITIES

By *Kristin Quinn*

New USGIF member **Digital Element (Booth 1626)** plans to introduce its Net Acuity "IP intelligence" product to GEOINT 2019 attendees.

"Anybody and anything connected to the internet has an IP address," said Steve Hensler, the company's director of government accounts. "Our service is to determine where that IP address originated from ... and to return over 60 data points just based on that IP address."

After participating in GEOINT 2018 as an attendee, Hensler said as a first-time exhibitor at GEOINT 2019 he hopes to educate the GEOINT Community about the overall concept of IP intelligence, which can enable GEOINT professionals to tie persons of interest on the internet to physical locations in the real world.

"NIST Special Publication 800-53 talks about cyber architecture and the vulnerabilities within government systems," Hensler said. "IP intelligence is referenced in there dozens of times, so we play directly into the cyber, intelligence, investigative, and fraud communities."

At its booth, Digital Element—which already works with the U.S. Departments of Defense, Energy, and Justice—will have examples of its IP intelligence data points available for Intelligence Community visitors.

In addition to interacting with Dr. Nick Knize, the company's resident geospatial expert and the lead geo developer for Elasticsearch, visitors to Elastic's booth will learn: how to collect, store, search, and analyze logs and metrics for continuous monitoring and telemetry efforts; how to derive metrics and KPIs to drive efficiency in DevOps; and how to manage and monitor the performance of code, application dependencies, transaction times, and overall user experiences with the GEOINT application development lifecycle.

Concluded Young, "We ultimately want to share the diverse application of Elastic technology, particularly through use cases that demonstrate its full-scale capabilities for geo/map analytics."

## BRINGING COMMERCIAL SAR TO THE U.S.

CAPELLA SPACE AIMS TO LAUNCH 36 SATELLITES BY 2023

By *Lisbeth Perez*

Earth's surface is 196.9 million square miles and is always changing, sometimes dramatically and without warning. The synthetic aperture radar (SAR) small satellites being developed by **Capella Space (Booth 963)** will be able to detect those changes.

"That is because [we will have] 36 satellites flying in 12 orbits with three satellites each," said Dan Brophy, the company's VP of government services. "We'll be able to see change occurring. [Such change] can affect transportation, agriculture, energy, and our national defense."

Capella's SAR systems will be able to see through clouds and in all lighting conditions—even at night. The persistence will allow the company to look anywhere on Earth within a revisit rate of one hour or less.

"That's important because it allows you to see change on a more regular basis, which is helpful for both business and national security users," Brophy said.

At GEOINT 2019, Capella Space will discuss its pending capabilities and current launch timeline. The company launched its first



IMAGE COURTESY OF CAPELLA SPACE

San Francisco-based Capella Space aims to launch 36 commercial SAR small sats by 2023.

satellite, dubbed Denali, in December, and plans to launch its second, Sequoia, by the end of this year. Then, it plans to launch six satellites approximately every six months until it reaches its goal of a 36-satellite constellation in late 2022 or early 2023, Brophy said.

Capella provides frequent and timely SAR data for monitoring change on Earth. With flexible imaging modes and low latency ordering from tasking to downlink to delivery, Capella's goal is to offer a new experience for high-resolution Earth observation across many different markets.



## Congratulations to the 2019 Golden Ticket Winners!

 <b>Cheyney Allen</b> NGA	 <b>Meghan Anand</b> Renaissance Strategic Advisors	 <b>Alexander Case</b> NGA	 <b>James Crnkovich</b> AECOM	 <b>Brad Gardner</b> Perspecta	 <b>Tom Gemmer</b> Aptima
 <b>Stephen Hanna</b> Vricon	 <b>Parker Hornstein</b> Esri	 <b>Aaron Houghton</b> NGA	 <b>Poppy Immel</b> Ursa Space Systems	 <b>Zachary Ishman</b> T-Kartor	 <b>Elliott Killick</b> Renaissance Strategic Advisors
 <b>Tyler Kuhns</b> Lockheed Martin	 <b>Eric Lane</b> Continental Mapping Consultants	 <b>Kolemann Lutz</b> Frontier Space	 <b>Chelsea Mansulich</b> NGA	 <b>Caitlin Marsh</b> Ball Aerospace	 <b>Stefanie R. Melone</b> Guidehouse
 <b>Kevin Mercy</b> University of Southern California	 <b>Liza Munion</b> Harris Corp.	 <b>Alison Obrecht</b> Maxar	 <b>Tarang Patel</b> Quadrant	 <b>Pedro Rodriguez</b> Planet	 <b>Geoffrey Sasaki</b> University of Colorado Boulder
 <b>Ashleigh Schaar</b> Perspecta	 <b>Kimmy Spaventa</b> Guidehouse	 <b>Joshua Swain</b> NGA	 <b>Dustin Turpin</b> GeoSTL	 <b>Marc Uber</b> Harris Corp.	 <b>Savannah Wilson</b> NGA

# SHOOTING FOR THE STARS

MAXAR TECHNOLOGIES BUILDING “LEGION” OF COMMERCIAL SMALL SATS

By Matt Alderton

When an equipment malfunction caused system failure in January 2019, DigitalGlobe’s WorldView-4 commercial Earth observation satellite was just two years into what was supposed to be a 10- to 15-year program. In a subsequent interview with SpaceNews, former DigitalGlobe President Dan Jablonsky called it a “terrible loss.”

But the company now known as **Maxar Technologies (Booth 639)**—of which Jablonsky is president and CEO—isn’t looking back. Instead, it’s moving forward. Its destination: WorldView Legion, a next-generation constellation of commercial small satellites, which is expected to launch in early 2021 and to be the galvanizing driver behind

Maxar’s presence at this year’s GEOINT Symposium.

“We’re about halfway through the build cycle for WorldView Legion,” said Tony Frazier, Maxar’s executive vice president of global field operations. “That augmentation to our constellation is going to build on the leadership position we have with high-resolution optical imagery, and it’s also going to add a very high revisit component to our program. Instead of seeing a location once a day, we’re going to be able to see many locations around the world on an hourly basis.”

At GEOINT 2019—Maxar’s first exhibiting as a single, unified company—the principal objective is illustrating what its new capabilities will mean for



IMAGE COURTESY OF MAXAR

Maxar offers capabilities and expertise in Earth imagery, machine learning and analytics, satellites and spacecraft systems, and nimble robotics.

customer GEOINT missions. During demonstrations in its booth, Maxar will illustrate three capabilities in particular, according to Frazier.

First, is the ability to create “living maps” that show the world—including roads, buildings, and points of interest—as it really is instead of how it used to be. Second, is the ability to enable indicator and warning missions by applying machine

learning algorithms to commercial imagery, which allows users to engage in change detection and to understand patterns of life. Finally, is the ability to receive and analyze commercial imagery at the tactical edge.

“Our focus is on revealing insight where and when it matters to impact critical missions ... and answer at scale really interesting questions about our planet,” Frazier concluded.

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 Symantec #717	 cloudbees #819	 Trimble #918	 UiPath #919	 SPECTRA #1018	 VENAFI #1019	
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# Exploring San Antonio

WHAT TO EXPERIENCE IN THE ALAMO CITY



## THE RIVER WALK

Take a stroll down the San Antonio River Walk for a scenic tour through the heart of the city. For 15 continuous miles, the river is lined with cobble streets, fine dining, live music, shopping, and nightlife to satisfy travelers of all personalities. The pathway includes a section known as The Museum Reach, which features visual art installations and plant exhibitions and provides direct access to Pearl Brewery and the San Antonio Museum of Art. Riverboats cruise the length of the River Walk, offering tourists a relaxed, fun way to see the signature attractions.

## HISTORIC SITES

For a dose of American history, check out San Antonio's most iconic landmark: The Alamo. The 18th century Spanish mission was the site of a famous 1836 battle in the Texas Revolution and has since been preserved as a museum and popular tourist stop. More Spanish missions such as San Jose, San Juan, Espada, and Concepción are just three miles from downtown in the San Antonio Missions National Historical

Park, where guests learn about Native American life and Spanish Catholic colonialism. Guided mission tours are free, and adventurous visitors can partake in nature hikes and bike trails.

## DINING

Wet your whistle at San Antonio's oldest bar: The Esquire Tavern. Opened in 1933, The Esquire boasts some of the best local craft beers in Texas, not to mention a

revered bison burger. For the very best of a San Antonio staple, stop by Ray's Drive Inn for a famous puffy taco. This Tex-Mex dive is credited with creation of the first puffy taco and even trademarked the term in 1992. There are many imitators, but none compare to the original. For a more elegant dining experience, make a reservation at Bella on Houston. Located in the historic Brady Building in downtown San Antonio, Bella offers seasonal Mediterranean and Southern European dishes in an intimate atmosphere. Live jazz music plays nightly.

## SHOPPING

Those hoping to bring home souvenirs need look no further than La Villita. The historic arts village sits on the edge of the San Antonio River and, at almost 300 years old, is one of the city's first established neighborhoods. With more than 20 boutiques and art galleries, La Villita is a great place to spend a few free hours. Additionally, San Antonio's hip Pearl District is home to some of the city's best restaurants and retailers as well as a weekend farmer's market.



# Taking Education to the Next Level

GEOINT SYMPOSIUM STUDENT ASSISTANT PROGRAM OFFERS EXCITING OPPORTUNITIES FOR ASPIRING GEOINTERS

By Lindsay Mitchell

Twenty-one students from across the country and overseas will experience GEOINT 2019 for free thanks to USGIF's Student Assistant Program. The annual program not only offers students the opportunity to work behind the scenes at the Symposium but also to attend sessions and network with attendees and exhibitors to help grow their careers.

The student assistants—a mix of undergraduate and graduate students from USGIF-accredited schools along with other colleges and universities—will display their research poster presentations Sunday during GEOINT Foreword. Attendees can vote for their favorite student poster via the GEOINT 2019 mobile app. There will also be a group of judges evaluating the posters throughout the day.

The student with the winning poster presentation will receive complimentary, full Symposium registration to GEOINT 2020 in Tampa, Fla., a one-year USGIF individual membership, and the opportunity to present their research on stage at GEOINT Foreword next year. Second- and third-place winners will receive a one-year USGIF individual membership.

“The Symposium is a networking super-starter for the student assistants in their young careers,” said Carlos Jimenez, GEOINT 2019 student assistant coordinator. “While volunteering, the students are given opportunities to attend training courses and sessions normally provided at a cost for conference participants. This, coupled with the unfettered access to hundreds of companies and potential employers, has given past students face time with industry leaders, which in the past has resulted in on-the-spot job offers and interviews.”

Student assistants will wear purple “got questions?” T-shirts throughout the Symposium.

This year’s students represent Fayetteville State University, George Mason University, James Madison University, North Carolina Central University, Northeastern University, Ohio Northern University, Pennsylvania State University, the U.S. Military Academy at West Point, Universidade Nova de Lisboa, University of Maryland College Park, University of North Carolina Wilmington, University of Southern California, University of Texas at Dallas, University of Utah, and West Virginia University.

**Vote for your favorite student poster! Download the GEOINT 2019 mobile app at [app.geoint2019.com](http://app.geoint2019.com).**

## Training Snapshot



The GEOINT 2019 Symposium offers 50+ hours of training and professional development opportunities. Each training session is \$25 for USGIF Members and \$35 for non-members. Please visit the GEOINT 2019 registration desk to purchase training.

### MONDAY MORNING SESSIONS 7-9 A.M.

[An Introduction to the Fundamental Concepts of How Machine Learning & Deep Learning Algorithms Work](#)

#### Altamira Technologies

Room 301A

This training session is an introduction to how machine learning (ML) and deep learning algorithms work, how they are used in practice, and how they provide insights that can be applied to make better decisions. Furthermore, the ability to perform object identification within images and videos from UAVs, satellites, and sensors is critical for the GEOINT Community. In this session, we will provide an introduction on how ML algorithms learn to deal with problems without programming and explain how to train a model on a dataset then use the trained model to make predictions on new data.

[Geolocation Privacy: Where GEOINT is Taking Privacy Law](#)

#### Williams Mullen

Room 301C

The goal of this training course is to explain how legal and policy frameworks are evolving to address growing concerns with the collection and use of geolocation information. This information will help both providers and consumers of geospatial information within the GEOINT Community to better understand the impact that new privacy and data protection laws around the globe will have on their operations.

[Government Business 101 The National Geospatial-Intelligence Agency \(NGA\)](#)

Room 302A

Government contracts represent a tremendous sales and revenue opportunity, but contracting directly with the government can be daunting. Hear the basics on getting started as a government contractor, finding government customers and business opportunities, and finding resources that can help along the way. This course is intended for businesses new to government contracting, small businesses, entrepreneurs, and students. The course is led by NGA’s Office of Ventures and Innovation.

[Efficient Use of Standards-Based Interfaces and Encodings in Geospatial Intelligence](#)

#### Open Geospatial Consortium (OGC)

Room 302B

This training session will provide participants with an end-to-end tutorial on the application of OGC standards that have been adapted by National System for Geospatial Intelligence (NSG) specifications. The aim of the session is to enable GEOINT professionals to more efficiently use standards-based interfaces and encoding formats to solve geospatial problems. By equipping GEOINT professionals with the skills to identify and apply OGC standards, this course will improve participants’ ability to meet challenges within their day-to-day work.

[Storytelling with Data](#)

#### Tableau

Room 302C

This session will focus on the last mile that data travels. An organization spends millions of dollars to collect, process, clean, and finally store data. Automation helps analysis, but in the end, the analyst has to pull something together to share the insight. When an analyst does not spend the time to effectively communicate this insight, the moment is lost. This session will demonstrate the core fundamentals of dashboard visualization design.

# Telling GEOINT's Story

A CONVERSATION WITH USGIF VP OF PROGRAMS RONDA SCHRENK

By Kristin Quinn



Ronda Schrenk now leads content development for all USGIF events, including GEOINT 2019.

Ronda Schrenk joined USGIF in December as vice president of programs, responsible for leading content development for all Foundation events, including the annual GEOINT Symposium.

Schrenk has been on the leading edge of GEOINT tradecraft for most of her career, including more than 25 years in a variety of leadership and analytic positions at the National Geospatial-Intelligence Agency (NGA), the National Security Agency, and the Central Intelligence Agency as well as in commercial, nonprofit, and academic organizations.

Schrenk spoke with *The GEOINT Symposium Show Daily* just ahead of GEOINT 2019 to discuss what she is most excited about for this year's event, her plans for the Foundation beyond the Symposium, and more.

## What's in store on Sunday for participants in the GEOINT Foreword pre-conference science & technology day?

The purpose of GEOINT Foreword is to showcase the increasingly broad range of geospatial applications. It's a great opportunity for members of our discipline to immerse themselves in tradecraft development and look beyond the traditional defense and intelligence applications.

For example, quantum computing is becoming huge in our community, but most people hear the term and think it is far away. Bo Ewald and William Hurley are both experts in the quantum field, and will help us understand how they are applying systems theory and open source to create innovative technologies.

We will also host panel discussions that focus on the increasing abundance of

unclassified geospatial data and how we can leverage it to achieve mission success.

## Monday's general session will have a special opening presentation titled, "Digital Natives Empowering the GEOINT Enterprise." Could you tell us more about that?

The term "digital native" describes a person who grew up in the digital age rather than acquiring familiarity with digital systems as an adult—a "digital immigrant." This opening sequence is something different for the Symposium. We are calling it an "un-panel," and will have three forward-leaning, tenured GEOINTers (digital immigrants) on stage engaging with three junior community members (digital natives). The democratization of technology means we need to move faster and embrace the

overriding intelligence need for knowledge derived from data.

The presentation will begin with a Discovery Channel video about Hurricane Maria and Puerto Rico to focus the audience on how GEOINT data collection has evolved and how it is making a positive impact on our world. You'll then hear from both digital immigrants and digital natives about how they are harnessing the power of GEOINT to positively impact our world.

## What is your perspective on the GEOINT 2019 theme, "Human-Machine Teaming & Innovation Yield Mission Success?"

The rapid introduction of AI is affecting all communities and disciplines. This year's theme embraces the ongoing AI revolution and the incredible potential when machine learning is applied as a tool to assist human decision-making. Geospatial innovation is occurring at an unprecedented rate across government, academia, and industry—with commercial applications being developed worldwide. The convergence of these factors all contribute to heightened mission success. However, AI is not a storyteller. Human input is essential to adapt the story for the purpose or mission. How we convey the data is important to enable better decision-making.

## Vice Adm. Robert Sharp, the new NGA director, will give a keynote address Monday morning at GEOINT 2019. What does a change of leadership at NGA mean for the community?

NGA has been blessed with a succession of talented leaders who have brought a relatively young intelligence agency into a critical role within the community. Vice Adm. Sharp has brought

renewed energy to the workforce with his transparent, inclusive leadership style. He has shown an early commitment to USGIF and our three pillars—build the community, advance the tradecraft, and accelerate innovation. Vice Adm. Sharp has already signaled his commitment to advancing those goals by participating in several smaller community events early in his tenure, and he will likely be present throughout the entire Symposium.

**How does your approach to event programming include diversity in its many aspects?**

With intention, USGIF is embracing the very diverse array of speakers at GEOINT 2019 across age, gender, professional background, sector, and more. We aim to reach across as many channels as possible to present a robust message throughout the event.

Beyond diversity, we've also tried to group topics throughout the agenda. So, for example, if in

“Geospatial innovation is occurring at an unprecedented rate across government, academia, and industry.”

—RONDA SCHRENK, USGIF

the morning we have a high-level speaker on a particular subject, you might see that topic echoed in more detail that afternoon on the Government Pavilion Stage.

**Following the Symposium, what are some of your plans for USGIF events and programs overall?**

I'm working with the USGIF team to evaluate our programming. This summer, for the first time, we plan to publish an 18-month planning calendar. One highlight is that we hope to host a USGIF working group summit later this year at the Foundation's new Trajectory Event Center in Herndon, Va. We also intend to plan more USGIF workshops beyond those we regularly host in the D.C. area. We will aim to expand USGIF's workshop footprint in St. Louis, Mo., and to reach other geographic areas such as Dayton, Denver, or Austin.

**What's next for USGIF Working Groups?**

USGIF Programs Manager Lindsay Mitchell and I interact regularly with the Foundation working groups and member volunteers. Working groups are established to facilitate discussion around a mission area, to promote the use of geospatial solutions to solve these complex

challenges, and to foster broad community development. One of the areas we are exploring is the potential for a working group about proprietary data and how it is contracted for and shared throughout the community.

The Foundation is always looking for working group ideas and participants, so I encourage GEOINT 2019 attendees to reach out if they have feedback or want to become more involved.

**How do you feel at the outset of the first GEOINT Symposium you were instrumental in planning?**

It's an amazing opportunity for me to be on team GEOINT at USGIF. I've worked throughout the GEOINT Community for more than two decades and being a part of this team is the culmination of a career's worth of learning. This position enables me to impact an even greater part of the community than in any previous role, and I could not be more excited about GEOINT 2019. 🌐



## Still Time to Add to Your Registration



## TRAINING & EDUCATION SESSIONS

Rooms 301-302

Monday & Tuesday 7-9am and 2-4pm  
Wednesday 7-9am

[View the agenda for session info.](#)

# USGIF Workforce and Certification Development Initiative

TRAIN AND CERTIFY YOUR ORGANIZATION'S GEOINT PROFESSIONALS AT DISCOUNTED RATES

By Kristin Quinn

**U**SGIF recently introduced a Workforce and Certification Development Initiative, offering organizations the opportunity to train and/or certify their workforces through the Foundation's Professional Certification Program at discounted rates.

GEOINT professionals can be certified in one or more of the areas identified in USGIF's GEOINT Essential Body of Knowledge (EBK), to include GIS and Analysis Tools, Remote Sensing & Imagery Analysis, and Geospatial Data Management.

In February, USGIF published version 2.0 of its EBK, which was drafted by volunteers from industry, government, and academia to provide background information and context as well as to outline standards for the broad practice of GEOINT. Because the GEOINT EBK is at the heart of USGIF's efforts to professionalize the global GEOINT workforce, the Foundation also invested in matching its training and professional certification exams, so all reflect the appropriate knowledge and competencies.

"While the EBK sets the expectations for recent college graduates and working professionals at different stages of their careers, the Workforce and Certification Development Initiative aims to help our community meet those expectations," said USGIF VP of Academic Affairs Dr. Camelia Kantor. "We hope to accomplish that by supporting GEOINT continuing education coupled with our certification



exams. We developed Boot Camps designed to provide hybrid learning and practice opportunities for individuals seeking to refresh and upgrade current job-related skills. In addition, the initiative aims to provide a thorough examination as part of aggregated reports that assess the GEOINT Community's readiness at large."

Organizations who participate in the initiative will benefit from: discounts of up to 80% on individual registrations by training and/or certifying 15–25 employees at one time; refreshed GEOINT knowledge among their personnel; aggregated feedback; and Continuing Education Units and college credits for employees who participate in USGIF's online Boot Camp. ☺

Visit [usgif.org/certification/WorkforceInitiative](http://usgif.org/certification/WorkforceInitiative) to view options and rates. To learn more about the initiative, attend an information session Monday or Tuesday at 10 a.m. in USGIF Booth 1511.

## USGIF Volunteer Spotlight: Talbot Brooks

USGIF's Professional Certification Program would not be possible without the dedication of volunteers such as Talbot Brooks, director of the Center for Interdisciplinary Geospatial Information Technologies at Delta State University. A longtime USGIF volunteer, Brooks chairs the Foundation's Certification Governance Board (CGB) and led development of the GEOINT EBK.



According to Brooks, certification in the geospatial industry is inevitable as market pressures increasingly require organizations to demonstrate the qualifications of their GEOINT professionals. Brooks, who has been involved in geospatial workforce and professional development for nearly 20 years, said he sees many parallels between the GEOINT industry and professionalization that has already occurred in disciplines such as engineering and photogrammetry. He's been involved with USGIF's certification efforts since the outset.

"There is no better way to prepare my students than to be actively involved in that process that is going to establish certification for the National System for Geospatial Intelligence," Brooks said. "We are giving definition, quite literally, to an industry. Doing so is a much-needed, revolutionary step forward."

USGIF's certification program reflects the uniqueness of the GEOINT professional overall.

"It's not just GIS, remote sensing, photography, data management, or visualization," Brooks said. "It's all of these things. You can gain knowledge and expertise across the entire domain."

Brooks recognized the contributions of the dozens of volunteers who helped shepherd USGIF's EBK and exam process. But, he added, there remains much work to be done to sustain and grow USGIF's GEOINT Professional Certification Program.

"We're looking for volunteers to help us take this work into the next phase," he said. "This is a stakeholder-driven process and there's room for all who want to participate in defining our industry and defining what GEOINT certification looks like."

**To learn more about GEOINT certification or to express interest in volunteering, email [credential@usgif.org](mailto:credential@usgif.org).**

# The Transformation Toward “Intelligent GIS”

JACK DANGERMOND ON HOW ESRI IS INTEGRATING AI ACROSS ITS SUITE OF GIS TOOLS

By Kristin Quinn



Jack Dangermond, president and founder of Esri.

Jack Dangermond, president and founder of Esri (Booth 439), will participate in a special opening presentation Monday morning at GEOINT 2019 titled, “Digital Natives Empowering the GEOINT Enterprise.” The discussion will feature three tenured geospatial experts (digital immigrants) alongside three junior community members (digital natives).

“Esri is seeing so-called ‘digital natives’ using the tools we are building to help them in a lot of ways,” Dangermond said. “They take to our tools very quickly.”

With the maturation of digital natives—those who grew up connected to the internet—comes a greater appreciation for location-based services and heightened spatial literacy, according to Dangermond. As a result, the company is finding that customers are increasingly interested

in more advanced analytics and visualization tools.

“We’re getting a much stronger following that want the tools that allow them to do the next step. It’s growing our community a lot,” Dangermond said. “A lot of the basic training we used to do 15–20 years ago—people have already achieved that level when they walk in.”

## HUMAN-MACHINE TEAMING FOR GIS

What is that next step? Esri is moving toward “Intelligent GIS” enabled by artificial intelligence (AI), integrating the technology throughout its geospatial infrastructure rather than offering it as additional products or services. The company views AI and machine learning as way to advance the value of GIS across organizations and industries, according to Dangermond.

“[Intelligent GIS] enables you to infuse your domain expertise into GIS models and scale them as required and have it working for you, even when you aren’t,” he said.

AI and machine learning are already helping Esri’s approximately 7 million users with feature extraction, change analysis, structured observation management, 3D building footprints, damage assessments, and more.

“We are building a GIS that can also work with machines as consumers, able to integrate and build smarter systems, bringing out the true power of location intelligence to business workflows,” Dangermond said.

## NEW TOOLS FOR THE IC

Recent technological advancements from Esri are also enabling partners across the Intelligence

Community. The company’s IC GIS Portal, based on the ArcGIS platform and created in 2018, is “the foundation for enterprise GIS within the National Geospatial-Intelligence Agency and across the Intelligence Community,” Dangermond said.

The largest GIS implementation the U.S. federal government has ever fielded, the portal spans 55 agencies and 77,000 users on one network.

In March, Esri introduced ArcGIS Notebooks, a unified data science experience that enables access to the ArcGIS Python API. The new offering creates a bridge between the GIS and data science communities.

“[ArcGIS Notebooks] opens the whole data science world to [GIS], and opens the GIS and mapping community to the world of open data science. ... It’s taking the open data science community by surprise,” Dangermond said.

And in April, Esri released ArcGIS Excalibur, a web-based tool for geospatial intelligence analysts that enables semi-automated imagery analysis. Excalibur is ideal for conducting structured observation collection and management as well as feature extraction from multi-spectral imagery, according to Dangermond.

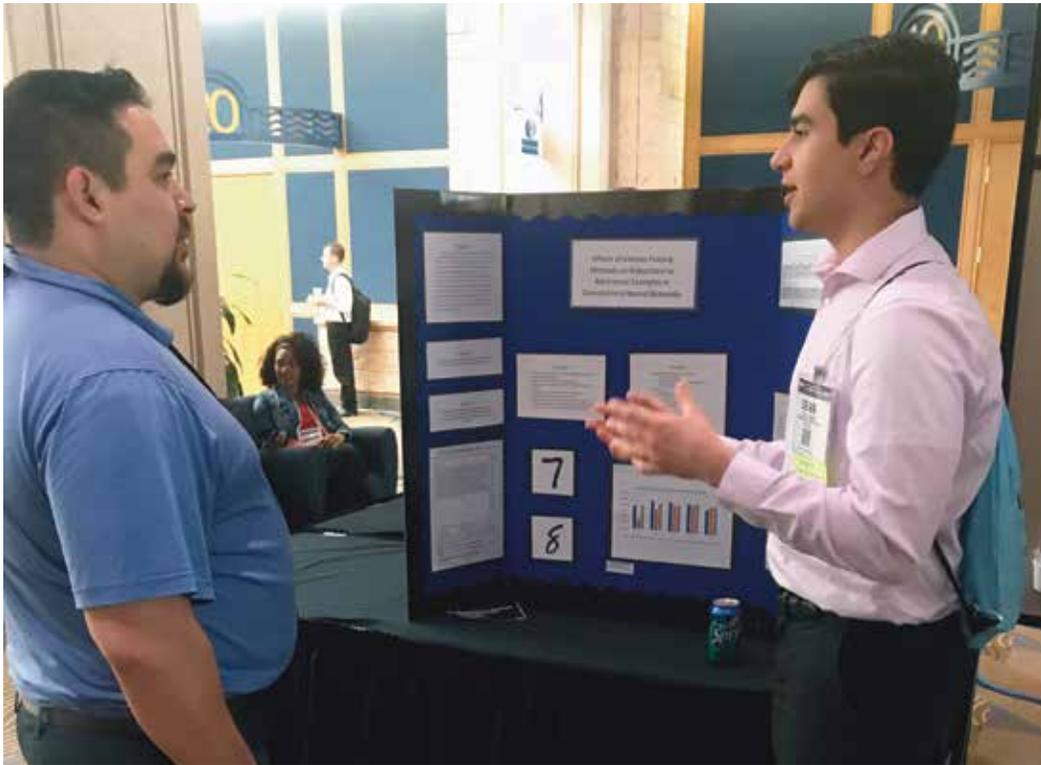
He concluded he is looking forward to attending GEOINT 2019 to meet with Esri’s Intelligence Community users and to gain their feedback on these recent developments.

When asked what’s next for GIS, Dangermond said, “the dynamic geospatial integration of multiple types of intelligence data done by way of web services, and the enrichment of those services with AI, machine learning, and deep learning activities.” 🌐

# A Promising Future in Computer Science

THIS HIGH SCHOOL STUDENT'S PARTICIPATION IN GEOINT 2018 LED TO A HIGH-PROFILE INTERNSHIP

By Lindsay Mitchell



Dean Alvarez (right) shares his research with attendees at GEOINT Foreword 2018.

**W**hen attending USGIF's GEOINT Symposium, you never know who you will meet and where those connections might lead you. Take, for example, the experience Dean Alvarez, a senior at Strawberry Crest High School in Dover, Fla., had when he attended GEOINT 2018 in Tampa.

USGIF invited Alvarez, then a junior, and three other Tampa area high school students to share their science fair posters during GEOINT

2018's GEOINT Foreword alongside 22 college students from across the country. Alvarez's research focused on the "Effect of Various Pooling Methods on Robustness to Adversarial Examples in Convolutional Neural Networks."

"It was really cool to talk to people who understood what I was doing," Alvarez said. "I learned a lot, not just from the experience of talking about my poster to professionals in the field, but also from what many of them had to tell me in terms of my research. It was also interesting to hear from the speakers [at GEOINT Foreword] about how they are applying similar technologies."

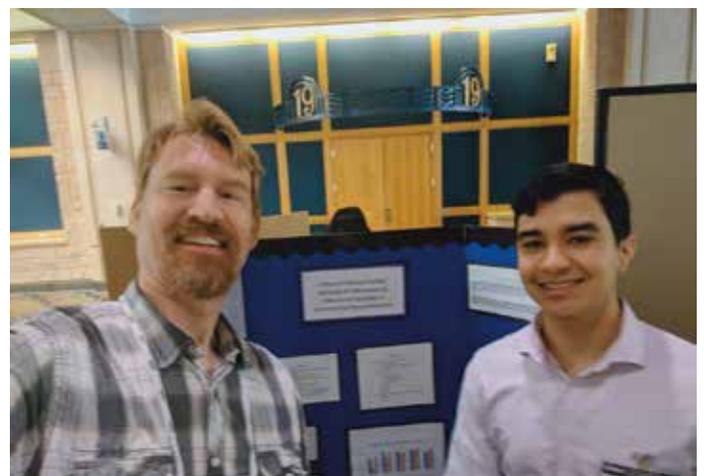
One of the attendees Alvarez had the opportunity to share his project with was Jasen Halmes, CACI's director of artificial intelligence.

"I was attracted to his poster based on the research he was presenting," Halmes said. "I was very surprised when I learned he was still in high school."

As a result of their interaction, Alvarez and Halmes exchanged contact information. Following the Symposium, Alvarez interviewed and was selected for a summer internship with CACI as a junior research scientist. Through the internship, he worked with the organization's computer vision research team and conducted experiments to help advance knowledge of deep neural network applications to GEOINT challenges.

"Our team was very impressed with Dean's abilities," Halmes said. "I was struck with both his individual contributions and left with the impression that we should do more as a community to foster exposure to our industry technologies. Dean proved that we could be doing a lot more to encourage our future technology leaders."

Following high school graduation, Alvarez will intern at CACI once again this summer and intends to build upon last year's experiences by performing his own research experiments. In college, he plans to major in computer science with a focus on artificial intelligence. 🌐



Student Dean Alvarez (right) and CACI's Jasen Halmes at GEOINT Foreword 2018.

**Student posters will once again be on display throughout GEOINT Foreword 2019. Visit with students during networking breaks and lunch to learn about their research, then vote for your favorite poster when you download the GEOINT 2019 mobile app at [app.geoint2019.com](http://app.geoint2019.com).**

# Going Beyond STEM

USGIF TO WELCOME SAN ANTONIO AREA GIRL AND BOY SCOUTS TO SYMPOSIUM

By Lindsay Mitchell

As an educational nonprofit, part of USGIF's mission is to educate individuals of all ages about geospatial intelligence. As part of the Foundation's K-12 Program, USGIF strives to include dedicated programming for K-12 students each year at the GEOINT Symposium.

At GEOINT 2019, Girl and Boy Scouts from the San Antonio area will attend to learn about GEOINT and related education and career paths. About 50 girls from the Girl Scouts of Southwest Texas chapter will participate June 3-4 to earn their STEM patch. Their experience will include interactive activities on USGIF's Portable Planet map of North America, presentations from female leaders, and technology demonstrations from AGI and BAE Systems, who generously sponsored the K-12 programming at this year's Symposium.

"As part of USGIF's K-12 program, we design and deliver learning materials, sponsor STEM events, provide judges at high school science fairs, and much more," said Dr. Camelia Kantor, USGIF's VP of Academic Affairs. "Our Portable Planet is a

About 50 girls from the Girl Scouts of Southwest Texas chapter will attend GEOINT 2019 to earn their STEM patch.



K-12 students participate in activities using USGIF's Portable Planet map of North America at GEOINT 2018.

highly powerful tool for building geographic literacy as well as for introducing kids to GEOINT competencies and careers in an engaging way. In an increasingly digital world, stepping on a physical map helps children more quickly acquire deep, cognitive knowledge and spatial relationships."

Speakers for the Girl Scout program will include:

- Julie Baker, COO and Co-Founder, Ursa Space Systems
- Kate Dargan, Co-Founder and Chief Strategist, Intterra Group
- Karyn Hayes-Ryan, CEO, KHR Impacts
- Elin Henningson, Graduate Student, University of Southern California
- Dr. Camelia Kantor, VP of Academic Affairs, USGIF

- Cynthia Snyder, Deputy Associate Director for Support, NGA

Additionally, about 30 middle school-age boys from the Boy Scouts of America Alamo Area Council will participate in a geocaching activity with members of USGIF's Young Professionals Group (YPG) June 5. YPG members will accompany the scouts on a geocaching activity throughout downtown San Antonio, where they will navigate historic landmarks. After completing the activity, each scout will earn a geocaching merit badge.

Stop by the EdGEOcation Station, adjacent to the GEOINT 2019 registration area, to see USGIF's K-12 programming in action. 📍

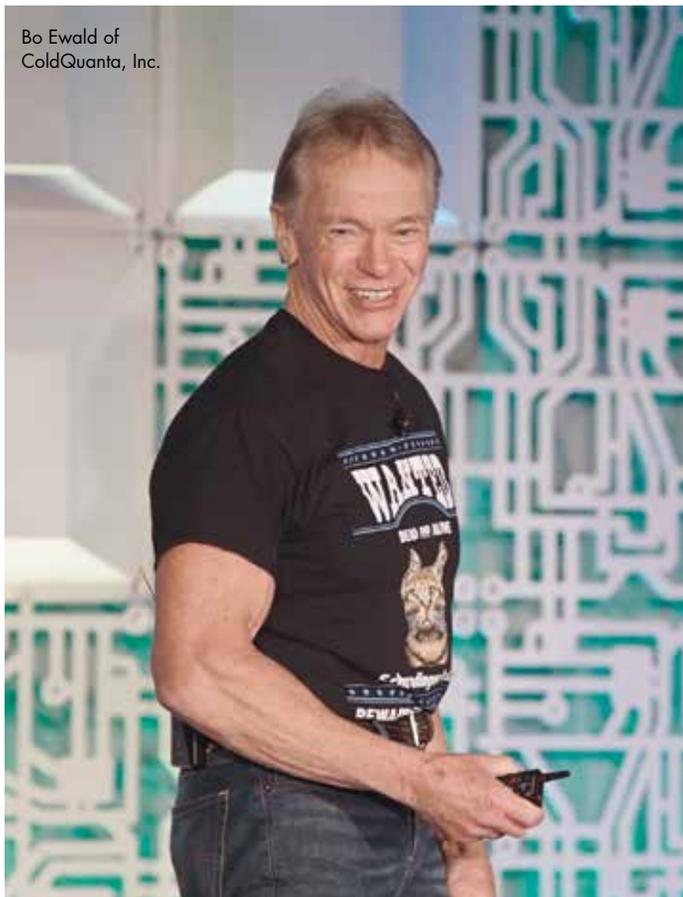


## TAKE A "DIP" IN SUPPORT OF K-12 EDUCATION

USGIF aims to raise \$5,000 at GEOINT 2019 to fund the shipment of its Portable Planet map of North America to schools across the nation. Help us meet this goal by simply "dipping" your credit card at the DipJar, to automatically donate \$25. The DipJar will be located at the EdGEOcation Station adjacent to registration beginning Monday afternoon. Be sure to share your donation on social media with #Dip4GEOINT!

Quantum Leaps *continued from cover*

Bo Ewald of  
ColdQuanta, Inc.



“With quantum technology...we would be able to create inertial guidance systems that don’t rely on any outside time keeping.”

— BO EWALD, COLDQUANTA, INC.

sensitive that we would be able to create inertial guidance systems that don’t rely on any outside time keeping.”

Another breakthrough on the horizon is what Ewald terms “quantum positioning systems.” He explained, “It’s like GPS without the satellites, and it can be made personal. The first models will be larger, a couple of feet by a couple of feet (which can fit on an aircraft carrier). But eventually, we think we can shrink the technology to what would be as ubiquitous as the technology in your cellphone.”

Ewald is looking forward to attending this year’s conference to refresh his knowledge of state-of-the-art technologies and to see what GEOINT areas quantum technology can fit into or build from.

But Ewald isn’t completely consumed with his work. In

his spare time, he’s a pilot. “I’ve been flying for the past 40 years, and I still love it,” he said. “I fly some old airplanes—military trainers used from WWII up until the 1980s.” He also owns two biplanes, with which he has completed a few cross-country flights. “You can only travel about 250 miles before needing to stop for gas, and their top speed is about 70 knots,” he explained. “So, it takes a few days to make the trek. Whenever you stop, a crowd comes out to greet you.”

### MAKING QUANTUM MORE ACCESSIBLE

William Hurley, known to most as “whurley,” is founder and CEO of Strangeworks, Inc. Beginning his career at Apple as a research and development engineer, whurley had an extensive tenure in tech startups before settling down in Austin, Texas. He is also chair of the Institute of Electrical and Electronics Engineers (IEEE) Quantum Computing Standards working group and helped write one of the most popular books on quantum computing, *Quantum Computing for Babies*, which is an introductory overview on the subject for children and adults alike. This will be whurley’s first time attending the GEOINT Symposium.

Quantum computing on the surface seems rather daunting. But access to the technology and building the community is what whurley hopes to encourage. Strangeworks provides a platform that brings all of the tools, hardware, and framework options together in an industry that has previously been siloed from one hardware option to another. The company makes the dense subject matter more easily available and understandable for those who wish to learn and explore all things quantum.

“We have multiple software frameworks that touch multiple hardware,” whurley explained.

“Everything is built into one place and is always current, no updates necessary. You can pull code and start experiments on your own—it really is an accelerator for getting into the quantum space.”

During his keynote address, whurley plans to share with the audience what he thinks can and needs to be done to advance the state of quantum computing today, with some relevant examples and analogies included for context. He also wants to explore the current state of the technology and what can be done to utilize it.

“Quantum computing should be of interest to anyone who has large amounts of information to process or computationally complex problems to solve,” whurley said. “Using quantum computing in an area like geospatial intelligence, this opens up a new era of new technologies that have been considered almost impossible in the past, to now be possible by a variety of agencies.”

The potential of unlikely discoveries through agency

collaboration is something whurley hopes audience members will consider. His goal is to be an “honest broker” of the current state of the technology as well as the potential for incorporating quantum computing into existing geospatial fields.

“Rather than the hype [interested stakeholders] might read about in the press, we try and make sure they get a solid understanding of where things stand now, what the realistic capabilities are of quantum computing, and how people can contribute to the quantum community,” he said.

Whurley wryly stated that he doesn’t have much time for hobbies between running a company and being a father to three boys. “But I do like to go longboarding and skateboarding,” he said. Playing music is another passion of his, with bass guitar being his favorite instrument to play. Has he ever been in a band? “I’ve made sure to erase all traces of that from the internet,” he joked. 🎸

“Quantum computing should be of interest to anyone who has large amounts of information to process or computationally complex problems to solve.”

— WILLIAM HURLEY,  
STRANGeworks, INC.

William Hurley, known to most as “whurley,” aims to make the dense subject of quantum computing more accessible.





**8:00a-3:30p GEOINT Foreword**  
**Pre-Symposium Science & Technology Forum (Hall 1)**  
*Sponsored by Esri*

**8:00-9:00a**

GEOINT Foreword Registration, Breakfast, and Poster Sessions

**9:00-9:10a**

USGIF Welcome: Patty Mims, USGIF Board of Directors

**9:10-9:15a**

GEOINT Foreword Welcome: Jeff Dawley and Ben Conklin, Esri

**9:15-9:45a**

Keynote: William Hurley, Founder and CEO, Strangeworks, Inc.

**9:45-10:00a**

Presentation: Using Augmented Reality for Terrain Visualization in Support of Mission Planning & Professional Development

- Gabe Powell, Assistant Professor, U.S. Military Academy

**10:00-10:30a**

Networking Break and Poster Sessions

**10:30-11:15a**

Panel: Working with GEOINT at Scale – Leveraging Machine Learning

- Moderator: Barry Tilton, USGIF Volunteer
- Meida Chen, Graduate Research Assistant, Computer Science & Civil Engineering, University of Southern California
- Isaac Zaworski, Vice President, Vricon
- Joshua Delmonico, Enterprise Support Branch Chief, U.S. Army Geospatial Center

**11:15-11:45a**

Keynote: Bo Ewald, President & CEO, ColdQuanta, Inc.

**11:45a-12:45p**

Lunch, Networking, and Poster Sessions

**12:45-1:30p**

Panel: Leveraging Artificial Intelligence – Working with GEOINT as a Forecasting Tool

- Eli Ibanga, Student, University of Southern California
- Brian Collins, Chief Executive Officer, Intterra
- William Porter, Sr. Manager, Operations Support, Team Rubicon
- Jessica Hulsey, Product Development Manager, BAE Systems

**1:30-2:00p**

Exploring Beyond Earth's Atmosphere with Human-Machine Teams

- Jeffrey C. Smith, Data Scientist, SETI Institute, NASA Ames Research Center

**2:00-2:30p**

Networking Break and Poster Sessions

**2:30-3:15p**

Education vs. Training – GEOINT in an AI-Enabled World

- Dr. Todd Bacastow, Professor of Practice for Geospatial Intelligence, College of Earth and Mineral Sciences, Dutton e-Education Institute, Penn State World Campus

- Col. Steven D. Fleming, Ph.D., U.S. Army (Retired), Professor of Practice of Spatial Sciences and Institute for Creative Technologies, Spatial Sciences Institute, University of Southern California
- Dr. Camelia Kantor, Vice President of Academic Affairs, USGIF

**3:15-3:30p**

Thank You and Closing Thoughts: Esri  
2019 Poster winner announcement

**7:00-9:00p**

**GEOINT 2019 Welcome Celebration**  
**(South Bank, San Antonio River Walk)**  
**Sponsored by Amazon Web Services**

**» MONDAY, JUNE 3, AT-A-GLANCE**

EXHIBIT HALL OPEN 10:00A-5:00P

<b>7:00-9:00a</b>	<b>TRAINING &amp; EDUCATION SESSIONS</b> (Third Level, 301A-302C)
<b>08:30-8:55a</b>	<b>PRESENTATION OF COLORS AND NATIONAL ANTHEM FROM SAN ANTONIO POLICE DEPARTMENT HONOR GUARD AND JEFFREY "SKUNK" BAXTER; GEOINT 2019 WELCOME FROM THE HONORABLE JEFFREY K. HARRIS, USGIF CHAIRMAN OF THE BOARD</b> (Hall 1)
<b>8:55-9:00a</b>	<b>MASTER OF CEREMONIES: CARMEN MEDINA, USGIF BOARD OF DIRECTORS</b> (Hall 1)
<b>9:00-9:45a</b>	<b>OPENING PRESENTATION: DIGITAL NATIVES EMPOWERING THE GEOINT ENTERPRISE</b> (Hall 1)
<b>9:45-10:30a</b>	<b>KEYNOTE: VICE ADMIRAL ROBERT SHARP, NGA DIRECTOR</b> (Hall 1)
<b>10:00-11:00a</b>	<b>USGIF WORKFORCE &amp; CERTIFICATION DEVELOPMENT INITIATIVE INFORMATION SESSION</b> (Exhibit Hall, USGIF Booth 1511)
<b>10:30-11:00a</b>	<b>MORNING COFFEE AND NETWORKING BREAK</b> (Exhibit Hall) <i>Sponsored by HERE Technologies</i>
<b>11:00-11:45a</b>	<b>PANEL: TECHNOLOGY INSPIRED EVOLUTION</b> (Hall 1)
<b>11:45a-12:30p</b>	<b>PANEL: CIOS - MOVING FROM CHIEF INFORMATION OFFICERS TO CHIEF INNOVATION OFFICERS</b> (Hall 1)
<b>12:30-2:00p</b>	<b>LUNCH</b> (Exhibit Hall)
<b>1:00-2:00p</b>	<b>ACCREDITED SCHOOL INFORMATION SESSION</b> (Exhibit Hall, USGIF Booth 1511)
<b>1:00-3:45p</b>	<b>GOVERNMENT PAVILION STAGE</b> (Exhibit Hall, Booth 466) <i>Sponsored by AT&amp;T</i>
<b>1:30-4:10p</b>	<b>LIGHTNING TALKS</b> (Exhibit Hall, Innovation Corner, Booth 1943)
<b>2:00-2:30p</b>	<b>AFTERNOON COFFEE BREAK</b> (Exhibit Hall) <i>Sponsored by Veritas</i>
<b>2:00-2:45p</b>	<b>YOUNG PROFESSIONALS MENTORING DISCUSSION</b> (Exhibit Hall, YPG Lounge, Booth 2005)
<b>2:00-4:00p</b>	<b>TRAINING &amp; EDUCATION SESSIONS</b> (Third Level, 301A-302C)
<b>4:00-5:00p</b>	<b>NETWORKING RECEPTION</b> (Exhibit Hall) <i>Sponsored by Lockheed Martin</i>
<b>4:00-5:00p</b>	<b>ACCREDITED SCHOOL INFORMATION SESSION</b> (Exhibit Hall, USGIF Booth 1511)
<b>4:00-5:00p</b>	<b>USGIF PROFESSIONAL CERTIFICATION INFORMATION SESSION</b> (Exhibit Hall, USGIF Booth 1511)
<b>4:00-5:00p</b>	<b>YOUNG PROFESSIONALS MENTORING DISCUSSION</b> (Exhibit Hall, YPG Lounge, Booth 2005)

**USGIF**  
**geoint** 2019  
SYMPOSIUM

# Join Us at the Welcome Celebration

aws

welcome celebration sponsor

**Sunday, June 2 • 7-9pm • River Walk South Bank**

Barriba Cantina • Ben & Jerry's • Hard Rock Café • Howl at the Moon • Merkaba • Paesano's Riverwalk • The County Line

