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Quantum Computing Will Change Everything, but Not Without Your Help and Patience

WILLIAM HURLEY "WHURLEY" OF STRANGWORKS, INC., GIVES GEOINT FOREWORD KEYNOTE ADDRESS

By Rob Pegoraro

One of quantum computing's foremost advocates brought a coin and a children's book to GEOINT 2019 to make his case for the technology's possibilities.

Strangeworks, Inc., founder and CEO William Hurley—who goes by "whurley"—described quantum computing as both a breakthrough technology and one still being born in his GEOINT Foreword keynote Sunday morning.

He took care throughout his remarks to note that quantum computing remains subject to a lot of hype-driven misunderstanding. So, he started by taking out a coin to explain the basics.

In classical computing, whurley said, the coin is either heads or tails. But flip it in the air, as he did on stage, and it enters a state of "superposition" when it's not just heads or tails but is both.

That's how the "qubit" of a quantum computer differs from the one-or-zero bit of a traditional computer.

While the concept may be straightforward—or perhaps simple enough to convey to readers under five years old, as whurley and Chris Ferrie did when they wrote *Quantum Computing for Babies*—building computers that can perform these calculations by managing individual atoms is intensely difficult.

"Quantum computing is a trip to Mars to save the species, not a trip to Vegas for the weekend, okay?," whurley explained. "It requires a lot of resources to build these machines, it takes a lot of brainpower."

A recent rush of progress in quantum-computing hardware—since 2017, the number of qubits a quantum computer can host has grown from 17 to 160—runs the risk of raising expectations that can't be fulfilled inside the desired time frames of Silicon Valley investors.

"This creates the potential for a quantum winter," whurley warned, noting that China has put more than \$25 billion toward quantum computing. "If we go around and we promise everybody in the room

> see *Quantum Computing* p. 20



William Hurley, known as "whurley," described quantum computing as both a burgeoning and breakthrough technology.

"Quantum computing is a trip to Mars to save the species, not a trip to Vegas for the weekend, okay?"

—WILLIAM HURLEY, STRANGWORKS, INC.

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THERE'S AN APP FOR THAT

The GEOINT 2019 mobile app, free for download on iOS and Android devices, puts everything you need to know about the GEOINT Symposium in the palm of your hand. The app, sponsored by HERE Technologies, features an up-to-date, detailed agenda, exhibit listings, speaker biographies, social media streams, and more. Visit app.geoint2019.com to download.

FROM THE



IMAGE COURTESY OF PLANET

Two years of Panama Canal ship detection overlaid on Planet imagery.

DAILY IMAGERY FOR ANALYTIC INSIGHT

PLANET TO HIGHLIGHT ANALYTIC TOOLS AND SERVICES FOR GOVERNMENT CUSTOMERS

By Rob Pegoraro

Satellites and software will be on the menu at GEOINT 2019 for Planet (Booth 759). The San Francisco-based firm self-describes as the operator of “the world’s largest constellation of Earth-imaging satellites,” but its analytical tools and services now constitute a major focus of its business alongside the Dove, RapidEye, and SkySat birds it has launched from sites as varied as the U.S., Russia, India, New Zealand, and the International Space Station.

“We’re focused on developing analytic capabilities to help customers and partners in the Intelligence Community more easily consume Planet’s daily satellite imagery and arrive at insights more quickly,” spokesperson Sara Bates wrote via e-mail. “Planet’s analytics have the potential to create efficiencies and offer alerts that can point analysts to relevant change on Earth.”

Former NASA scientists founded Planet in 2010, and since then the company has acquired such GEOINT organizations as Google’s Terra Bella subsidiary and St. Louis-based Boundless Spatial. Bates said the company has ramped up its efforts to cooperate more closely with government customers. This year, for instance, Planet signed its third contract with the National Geospatial-Intelligence Agency—a six-month, \$5.9 million extension of a 2018 contract, and inked a \$6.7 million contract with NASA to provide climate data.

Bates added that Planet will host “an evening of networking, shared learnings, and product vision” Tuesday from 4:30 to 7 p.m. in room 217D of the convention center. Interested attendees should RSVP at learn.planet.com/planet-geoint-2019.

AUTOMATING GEOINT FOR WARFIGHTERS

HARRIS CORPORATION TO OFFER GEOINT AUTOMATION TECH TALKS AND MORE AT GEOINT 2019

By Irene Lockwood

Harris Corporation (Booth 423) provides data processing, analytics, and content management solutions that turn data into trusted information for warfighters. At GEOINT 2019, Harris will explore GEOINT automation advancements through machine learning, automated analytics, and cloud-based solutions.

“Based on decades of developing proven technologies that collect, process, and analyze remotely sensed data, Harris’ analytical tools are the most trusted in the GEOINT Community,” said Erik Arvesen, vice president and general manager of Harris Geospatial Solutions. Harris’ William Rorer will present a lightning talk on “Quantifying the Use of Synthetic Data for Remotely Sensed Object Detection” Monday from 3:20 to 4:10 p.m. at the **USGIF Innovation Corner (Booth 1943)**.

And Tuesday from 7 to 9 a.m., join Harris’ Ben Woolf to learn more about “Conflation: Merging Overlapping Map Data” during a training session in Room 301B.

The Harris booth will also feature a series of GEOINT Automation Tech Talks Monday through Wednesday afternoon on machine learning and activity-based intelligence, maritime situational awareness, Geiger-mode LiDAR, and automatic target recognition. **Learn more at harris.com/events/geoint-symposium-2019.**

FLOOR

EXHIBIT HALL HIGHLIGHTS

DECIPHERING THE DEVELOPING WORLD

FRAYM SINGS THE PRAISES OF HYPER-LOCAL HUMAN GEOGRAPHY IN DATA-STARVED LOCALES

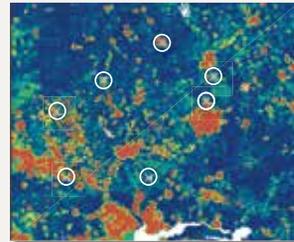
By Matt Alderton

Like most innovations, **Fraym (Booth 967)** was born out of frustration. Before Fraym, the company's leadership, who held senior positions in government and at international organizations, faced one consistent and fundamental challenge—sourcing localized population-based data to make informed decisions.

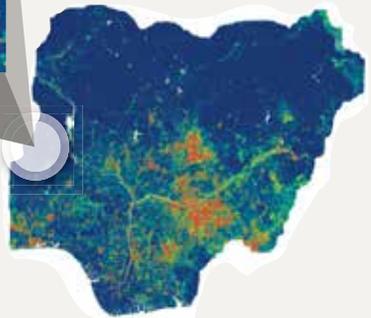
"My quest for actionable, hyper-local data began nearly two decades ago," said Fraym CEO Ben Leo. "While serving at the National Security Council, where I advised the U.S. President on Africa-related issues, I wanted to know what people looked like and how they acted in areas affected by conflict, health crises, or other driving forces. That type of foundational information would have been incredibly helpful for establishing and executing U.S. policies in the region. Unfortunately, it simply wasn't possible or available in most places back then, and certainly not at scale or on the timelines we needed."

Established in 2016, Fraym produces and maintains high-resolution human geography content, focusing on data-poor areas in Africa, Asia, and Latin America.

"We're able to help you understand population characteristics down to 1 km²," continued Leo, who said Fraym will showcase its



Fraym's layers deliver insights as inputs for models and predictive analytics. This map was generated by inputting HG data into machine learning algorithms and used to predict areas with high vulnerability to certain types of conflict such as farmer-herder violence in Nigeria.



data layers in its booth on the GEOINT 2019 exhibit floor as well as during in-depth demonstrations taking place Monday and Tuesday at 2 p.m. in meeting room 304A.

The demos will answer questions such as: "What are the human factors that drive situational awareness around a fixed asset?"; "How can human geography improve situational awareness around a fixed asset?"; and "How can human geography layers help identify communities vulnerable to extremist violence?"

Concluded Leo, "We're here to show what's possible in the realm of human geography and how far we can go beyond the traditional approach of analyzing points, lines, and polygons."

IMAGE COURTESY OF FRAYM

WHERE RESEARCH MEETS EDUCATION

THE UNIVERSITY OF MARYLAND HIGHLIGHTS TWO USGIF-ACCREDITED M.S. PROGRAMS

By Lisbeth Perez



IMAGE COURTESY OF UMD

The Center for Geospatial Information Science at the **University of Maryland (UMD) (Booth 1829)** has both a research and an education mission. With regard to research, the Center focuses on all things geospatial, including big data, time series analyses, and volunteered geographic information. To meet its educational mission, the Center offers two USGIF-accredited master's degree programs, one in Geospatial Information Sciences and another in Geospatial Intelligence.

"We focus on all the latest, cutting-edge skills such as machine learning and big data analytics," said GEOINT lecturer Dr. Micah Brachman. "We also focus on soft skills such as writing, briefing and creating GEOINT products."

At GEOINT 2019, UMD is providing a look at its hybrid course model and research initiatives. This will include an article Brachman co-authored for USGIF's 2019 State and Future of GEOINT Report that examined emergency management scenarios related to hurricanes and conducted modeling experiments to recommend how to make evacuations safer.

"We try to get our students ramped up, so they understand all the interesting GEOINT research that's happening, so they become active members of the GEOINT Community," Brachman said.

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 AFTERNOON SESSIONS 2-4 P.M.

Space-Based Spectral Image Analytics & Reporting

Maxar

Room 301C

In this training session, attendees will be provided with a detailed understanding of multi- to super-spectral imagery. They will also learn how light and energy across key portions of the electromagnetic spectrum can provide unique advantages in the identification of features and phenomenology in satellite imagery. Walk through best practices in spectral image processing and learn how to read a spectral signal strung together by all available bands from a satellite. Lastly, attendees will learn how to communicate critical insights.

Integrating AI for Comprehensive Location Intelligence

Esri

Room 302B

This session will teach best practices for using native artificial intelligence (AI) and machine learning (ML) tools and methods for integrating popular libraries. Attendees will also learn how to apply AI and ML techniques to derive actionable insight from imagery, tabular data, and unstructured data.

Interactive Machine Learning in Satellite & Marine Imagery

Kitware Inc.

Room 302A

This training course will demonstrate interactive machine learning (ML) by analysts based on the

open-source Visual Global Intelligence and Analytics Toolkit (VIGILANT) and Video and Image Analytics for Marine Environments (VIAME) systems. These systems allow an analyst to develop ML-based object detectors without the need for any programming.

AI for GEOINT Leaders

OGSystems

Room 301A

In this session, OGSystems will present the fundamental AI lexicon and describe how myriad terms, concepts, and capabilities relate to each other. The session will address how AI practitioners understand human intelligence, and how that rapidly evolving framework informs the development of deployable AI systems.

Working with Planet Data: Human to Machine

Planet

Room 302C

This workshop will cover the extraction of information by a human imagery analyst leveraging visual inspection and then augmenting this extraction by using machine learning models as applied to real-life use cases. This course will be dynamic and engaging for attendees, turning them into active participants in the learning process. Each attendee will walk away with not only a fundamental understanding of Planet data but also how to work with it and derived products.

Google Earth for Tactical Use Cases

Thermopylae Sciences + Technology

Room 301B

The Google Earth Enterprise Platform (GEEP) is a collection of tools



that helps organizations with imagery and other geospatial data make their information accessible and useful to decision-makers via an intuitive, visual, and fast application. This session will give interested users a crash course in the history and makeup of Google Earth Enterprise (GEE), the basics of how the server and fusion features operate, and a special focus on deploying GEEP for tactical use cases.

TUESDAY MORNING SESSIONS 7-9 A.M.

Deep Learning Demystified: AI for GEOINT Practitioners

Booz Allen Hamilton

Room 302B

This training session removes the mental barrier many people encounter when thinking about AI. It ensures attendees understand the core concepts of deep learning, enabling them to sort out the realities from the hype. Attendees will better understand how automation through AI will allow them to free up time for tasks that require human-level understanding.

Conflation: Merging Overlapping Map Data

Harris Corporation

Room 301B

How do you combine multiple representations of a geospatial object into a single feature that is geometrically superior with richer attribution? This is the challenge of the conflation process for vector geospatial data. This course will introduce the issues and potential solutions involved with fusing datasets. Participants will learn about procedures for matching and transforming data and will be given overviews of toolsets that exist for automated conflation processing.

Introduction to Deep Learning for Computer Vision & GEOINT Applications

MIT Lincoln Laboratory

Room 301A

Attendees will be shown the essential mathematical underpinnings of supervised deep learning, along with lessons that help build an intuition for the data-driven needs and limitations of learned models. They will be introduced to the popular open-source technologies most widely used among deep learning practitioners, and they will receive an overview of the current state of GEOINT-related deep learning. This session requires a computer.

NGA's Maritime Support**The National Geospatial-Intelligence Agency (NGA)**

Room 302A

Join NGA Maritime leadership to learn about the myriad sources, products, and services that comprise maritime GEOINT. This training course will cover NGA's current Safety of Navigation offerings; their move to cloud-based, data-centric operations; and the transition from MILSPEC products to the global standard. The session will also cover NGA's leadership role in developing the next generation of international maritime data standards.

In-Browser 3D Exploitation of Multi-Platform, Multi-Resolution Imagery PixElement

Room 302C

This course will provide knowledge and hands-on training on how to rapidly stream, exploit, and disseminate 3D geospatial products directly in the browser. Participants in this workshop will gain understanding of how massive 3D datasets are created from multi-resolution 2D imagery, processed in the cloud, and served on-demand to the client with minimal bandwidth. Specific examples and integrations based on Amazon Web Services and Cesium will be provided.

Unlocking the Power of Persistence with Satellite SAR for GEOINT & Discovery**Ursa Space Systems**

Room 301C

Attendees will learn the general data flow required for prototyping SAR-based analytics using open-source software and cloud computing. We will discuss extending machine learning, deep learning, and transfer learning to SAR data; SAR for interferometric applications; 3D SAR modeling and machine vision; 3D change detection; data fusion; and analysis algorithms and approaches. This course will teach new, machine-driven analytics to extract useful intelligence from multi-modal/multi-temporal SAR data.

Back by Popular Demand: The Innovation Corner

The Innovation Corner (Booth 1943) was such a hit in the GEOINT 2018 exhibit hall, USGIF has brought it back for an encore at GEOINT 2019.

The Innovation Corner features lightning talks that focus on GEOINT applications conducted by scientists, academics, analysts, and other community professionals. Each talk is seven minutes and focuses on subjects relevant to the GEOINT 2019 theme "Human-Machine Teaming & Innovation Yield Mission Success."

MONDAY AFTERNOON LIGHTNING TALKS**1:30–2:20 p.m.****IQT@ 20: Strategic Investing for Geospatial Machine Learning**

> Keynote: Ryan Lewis, Senior Vice President & Lab Director, In-Q-Tel

Social and Behavioral Sciences Research Agenda for Advancing Intelligence Analysis

> Carmen Medina, The National Academies of Sciences, Engineering, and Medicine

Third Generation Neural Networks for Third Wave AI

> Jeff Clark, Ph.D., Riverside Research

Detecting Anti-Aircraft Sites Across North Korea in a Weekend with Fast and Globally Scalable Computer-Vision-Based Search

> Krishna Karra & Steven Truitt, Descartes Labs

Data at the Edge: Providing Analytic Capabilities in Communication Limited Environments

> Susan Janiszewski, Ph.D., Michigan Tech Research Institute

Retro-Reflective Arrays for Satellite Interferometry and Long-Range Comms

> Marius Necsoiu, Ph.D., Southwest Research Institute

2:25–3:15 p.m.**Blockchain Supporting GEOINT Data Provenance**

> Sandra L. Vaughan, Ph.D., NGA

How Commerce Works with Tech Partners to Put Geospatial Data to Work: The Opportunity Project Geo-Cohort

> Drew Zachary, U.S. Census Bureau, Department of Commerce

AT&T Smart Bases

> Seth Henneman & John Blair, AT&T

SpaceNet: Defining Levels of Automation for Machine Learning Applied to Mapping using Satellite Imagery

> Todd M. Bacastow, Ryan Lewis & Adam Van Etten, Radiant Solutions

Leveraging Augmented Reality to Enhance the Human-Machine Interface in Space Applications

> Nadine E. Miner, Ph.D. & Nicholas Blazier, Sandia National Laboratories

Clairvoyant: Leveraging Machine Learning for Enhanced Geolocation Situational Awareness

> Michael Henry, Pacific Northwest National Laboratory

3:20–4:10 p.m.**Why Automatic Target Recognition is So Hard, and How We'll Solve It Anyway**

> John Greer, Ph.D., NGA

Innovative Solutions for Education and Workforce Development

> Corinne Jorgenson, Riverside Research

Full Spectrum GeoVisualization & Tactical Decision Toolkit Development

> Jason Knowles, Ph.D., University of Southern California

Accelerating Geospatial Intelligence with GPU-Accelerated Analytics

> Todd Mostak, OmniSci

GEOINT for Anti-Money Laundering and Counter Terror Finance Investigations

> Dan Steiner, Pennsylvania State University

Forensic GEOINT: Setting Context for Terrorism Trials Using 3D Data in the Courtroom

> John Bridgwood & SSG Robert Bartlett, Vricon

Quantifying the Use of Synthetic Data for Remotely Sensed Object Detection

> William Rorrer, Harris Corporation

The Next Generation of GEOINTers

GEOINT 2019 offers numerous opportunities for young professionals



GEOINT 2018 Golden Ticket winners participate in a mentoring session at the YPG Lounge in the exhibit hall.

USGIF selected 30 up-and-coming GEOINTers for its 2019 Young Professionals Golden Ticket Program. This is an exclusive opportunity for young professionals—individuals 35-years-old and under or with

five or less years of experience in the GEOINT Community—to take part in a specially tailored agenda.

In addition to receiving complimentary GEOINT Foreword and GEOINT 2019 Symposium registration, Golden

Ticket winners will benefit from activities such as mentoring discussions with senior leaders, exclusive luncheons, and an invitation to the USGIF Chairman's Reception.

Golden Ticket recipients will also participate in the USGIF Young Professionals Group's outreach project, accompanying 30 students from the Boy Scouts of America Alamo Area Council on a geocaching activity throughout downtown San Antonio.

The 2019 Golden Ticket winners are:

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

Events for Young Professionals at GEOINT 2019

Though the following events are tailored toward young professionals, all GEOINT 2019 attendees are invited to join.

Monday, June 3
2-2:45 p.m.
Advancing your Career in Technology Leadership Forum
YPG Lounge (Booth 2005)

4-5 p.m.
Young Professionals Mentoring Discussion
YPG Lounge (Booth 2005)
 Join USGIF's Young Professionals Group (YPG) to hear from guest speaker

Jeff Jonas, founder and chief scientist of Senzing.

Tuesday, June 4
2-2:45 p.m.
Work on What Matters Discussion
YPG Lounge (Booth 2005)

4-5 p.m.
Young Professionals Mentoring Discussion
YPG Lounge (Booth 2005)

Join YPG to hear from guest speaker Dr. Steven Hall, NGA's Deputy Director for Stakeholder Engagement, Analysis and GEOINT Mission Lead for Automation, AI, Augmentation (AAA).

5-7 p.m.
Young Professionals Networking Reception
Broken Crust Cafe, Henry B. Gonzalez Convention Center

Learn More About USGIF at GEOINT 2019



Visit USGIF (Booth 1511) in the exhibit hall for information sessions on some of the Foundation's educational initiatives.

ACCREDITED SCHOOLS

Meet with university representatives and current students to learn more about USGIF's Collegiate Accreditation program.

MONDAY, JUNE 3

1-2 p.m.

- Penn State University, Stephen Handwerk
- NOVA Information Management School, Universidade Nova de Lisboa, Dr. Marco Painho
- Northeastern University, Dr. Craig Gruber

4-5 p.m.

- University of North Carolina Wilmington, Dr. Narcisa Pricope and Dr. Eman Ghoneim
- Fayetteville State University, Dr. Trung Tran

TUESDAY, JUNE 4

1-2 p.m.

- University of Maryland College Park, Dr. Micah Brachman
- University of Southern California: Dr. Steve Fleming

4-5 p.m.

- James Madison University, Dr. Tim Walton
- University of Texas at Dallas, Dr. Michael Tiefelsdorf

USGIF WORKFORCE & CERTIFICATION DEVELOPMENT INITIATIVE

Talk with Dr. Camelia Kantor, USGIF's Vice President of Academic Affairs, about the Foundation's new Workforce & Certification Development Initiative. This initiative offers organizations the opportunity to train and/or certify their workforces through the USGIF Professional Certification Program at discounted rates.

Monday, June 3:

10-11 a.m.

Tuesday, June 4:

10-11 a.m.

USGIF PROFESSIONAL CERTIFICATION

Interested in becoming professionally certified in GEOINT? Hear more about USGIF's GEOINT Professional (CGP™) Program from Talbot Brooks, chair of USGIF's Certification Governance Board.

Monday, June 3:

4-5 p.m.

Tuesday, June 4:

1-2 p.m.

GEOINT Carahsoft Partner Pavilion

carahsoft.

#617

Join us at our networking reception

June 4 | 5-8pm
Lonestar Ballroom
Grand Hyatt San Antonio

 Google Cloud #719	 splunk > #822	 okta #823	 palouta #922	 + ableau #923	 axway #1022	 ATLASSIAN #1023
 Trustwave Government Solutions #820	 THALES #821	 CYBERARK #920	 Markforged #921	 APPGUARD #1020	 databricks #1021	
 Symantec #717	 cloud bees #819	 Trimble #918	 UiPath #919	 SPECTRA #1018	 VENAFI #1019	
 nvidia #816	 VERITAS The truth in information. #817	 CLEARCUBE #916	 Infoblox NEXT LEVEL NETWORKING #917	 OPSWAT #1016	 ca technologies Broadcom Company #1017	
 carahsoft. UAS Solutions #713	 difféo #812	 servicenow #811	 CLOUDERA #912	 Akamai #913	 CIPHER #1012	
 TREND MICRO #711	 DECISION LENS #810	 GitLab #910	 alteryx The Thrill of Solving #911	 Mattermost #1010	 MarkLogic #1011	

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A New Atomic Age

COLDQUANTA'S BO EWALD PROPHESES THE FUNCTIONAL FUTURE OF QUANTUM COMPUTING

By Matt Alderton



Bo Ewald chronicled possible PNT applications for quantum computing and described a “third wave” of the Information Age.

The typical atom has a diameter of just 0.1 to 0.5 nanometers. At that size, you’d need to arrange more than 100,000 atoms side-by-side—yielding the width of a human hair—just to see them with the naked eye.

But don’t let their scant dimensions fool you: Although they’re minuscule, atoms are about to make a major impact.

So predicted Robert “Bo” Ewald during a keynote address Sunday at GEOINT Foreword. According to Ewald, president and CEO of Boulder, Colo.-based ColdQuanta, Inc., a new “Atomic Age” is dawning. Not the kind that smells of nuclear annihilation, but rather the kind that smacks of technological promise and potential.

“It’s a big deal,” Ewald said of quantum technology, for which the fundamental building block—atoms—constitute what he described as the “third wave” of the Information Age, the first and second waves belonging to electrons and photons, respectively. “There’s electrons, photons, and atoms, and we think that with quantum atomics we’ll be able to build a whole set of things that we couldn’t otherwise.”

Ewald devoted the first portion of his address to defining what, exactly, quantum mechanics is—he likened quantization to a kitchen

cupboard in which you organize atoms instead of dishes—then spent the balance of his 30-minute keynote exploring what practical ideas and innovations the technology will eventually enable. Just as electronics led to radios and televisions, for example, and photonics to supermarket scanners and LASIK eye surgery, quantum atomics will lead to advances such as super-stealth communications, he predicted.

“What we have demonstrated you will be able to do is harness a collection of cold atoms that emit entangled photon pairs ... that we believe, with a fair amount of work, will let us create communication networks that are secure,” explained Ewald, adding such networks would allow users to transmit short, low-bandwidth messages that are “so quiet ... that

others can’t detect the message was even sent.”

Ewald predicted quantum atomics will also unlock advanced wayfinding; advanced radio frequency sensing; state-of-the-art accelerometers and gyroscopes; and even next-generation positioning, navigation, and timing (PNT) capabilities. In fact, he calls the PNT use case QPS—Quantum Positioning System. By using gravity measurements instead of satellite positioning to calculate location, he said, QPS will be able to provide precision navigation and timing in GPS-denied environments.

“Eventually, you’ll be able to have a portable [QPS] that will let your location be private,” continued Ewald, who said the zenith of these and other quantum-based applications will ultimately be quantum computing, which will allow both government and industry to tackle complex problems with unprecedented computing power.

Though it’s still in its infancy, early case studies have emerged at enterprises such as Recruit Holdings, a Japanese company using quantum computing to power a highly targeted hotel recommendation engine; Volkswagen Group, which is developing an application that will use quantum computing to optimize traffic flow; and Japanese

automotive components manufacturer DENSO, which is using quantum computing to power robots and optimize operations on its factory floor.

“We’re getting close to having the first production quantum computing applications around optimization for small problems,” Ewald concluded. “We are at the start of this third [phase] of the Information Age—electronics, photonics, and now atomics—and you’re going to see it used in [the geospatial] world in a whole host of applications.”

“Eventually, you’ll be able to have a portable [QPS] that will let your location be private.”

— BO EWALD, COLDQUANTA, INC.

A 3D Globe for Operational Training

WITH THE AID OF MACHINE LEARNING, ONE WORLD TERRAIN STRIVES TO ENHANCE MILITARY TRAINING

By Jim Hodges



The slogan “train like you fight, fight like you train” has long been a military mantra.

But any soldier who has walked alongside model buildings made of cinder blocks at Fort Polk and been told to imagine themselves on an operation, only to find themselves in Syria a month later, can relate to the difficulty of mentally transitioning from training to live fire.

Full realization of the mantra requires accurate geospatial data and digital support to create a more realistic environment for training, then applying said data to conduct the mission.

The quest to create a 3D, high-resolution map intends to take some of that imagination out of the equation.

“One World Terrain” (OWT), a research effort underway as part of the U.S. Army’s Synthetic Training Environment, would “expand the understanding of geospatial data at high resolution to the whole planet,” said Barry Tilton, who moderated Sunday’s GEOINT Foreword panel discussion titled, “Working with GEOINT at Scale: Leveraging Machine Learning.”

With the map as a center point, the data it generates, along with the proliferation of other

data sources, can create a training model that reduces surprises in battle.

The operative word here is “scale.” Or, as panelist Isaac Zaworski of global 3D data and analytics provider Vricon put it, “human scale.” “The scale is part of the bigness of the problem,” he said.

The small, discrete databases often used by artists to create the limited fidelity used in today’s training must give way to big data that can drive a new, geo-specific reality for the training of the future, according to Zaworski.

“We’re focused on collecting real data about the real world,” he said.

The data is overwhelming and will require help to both develop and deploy it. The goal is to reduce the weeks or months and millions of dollars required to accurately model a city for training purposes to hours at a lesser cost.

Needed are machine learning algorithms that can mesh elements of segmented data—about buildings, forestry, ground conditions, etc.—that would impact the mission, then turn the result into a realistic fighting environment. Those algorithms can guide the entire process, from data collection to

creating the simulated training environment.

The goal is to move from the semi-automated procedure used today to one that is fully automated. Doing so will “improve the accuracy ... without the constraints of the human workforce that is available ... and can be easily scaled up,” said Meida Chen, a graduate research assistant at the University of Southern California, which has done extensive research as part of OWT.

But the path toward Army adoption of OWT is a long one, according to Joshua Delmonico, enterprise support branch chief at the Army Geospatial Center.

“I’m in the enviable position of seeing all of the technology and things that are possible,” Delmonico said. “And part of my mind says, ‘Yeah, but ...’”

The “but” includes the ability to integrate with current systems, many with out-of-date components.

“With the One World Terrain, we have to figure out how to take all of that data, which is generally 2D ... and feed it into a variety of systems,” Delmonico said. “And one of the big challenges is how to take this fundamentally 2D-designed system and 3D data and make those things work for that ‘train to fight’ paradigm.” 🌐

Panelists from left to right: Barry Tilton, USGIF volunteer; Isaac Zaworski, Vice President, Vricon; Meida Chen, graduate research assistant, Computer Science & Civil Engineering, University of Southern California; Joshua Delmonico, Enterprise Support Branch Chief, U.S. Army Geospatial Center

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 “We’re focused on collecting real data about the real world.”

— ISAAC ZAWORSKI,
 VRICON

.....

A Legacy of Innovation in St. Louis

ST. LOUIS MAYOR LYDA KREWSON TO GIVE HER FIRST GEOINT SYMPOSIUM ADDRESS WEDNESDAY

By Megan Kramer



St. Louis Mayor Lyda Krewson

USGIF's St. Louis Area Working Group will host a panel discussion Wednesday at 12:30 p.m. on the Government Pavilion Stage (Booth 466) titled, "St. Louis: An Emerging Geospatial Center of Excellence."

For many, it will come as no surprise that St. Louis has always been a hub for geospatial intelligence—entrepreneurs, economic developers, educators, and more have been innovating inside the city for years. It was this energy that influenced the National Geospatial-Intelligence Agency (NGA) in 2017 to select North St. Louis as the building site for its Next NGA West (N2W) campus.

But for those who might not be aware of the city's stake in geospatial intelligence, St. Louis Mayor Lyda Krewson will attend GEOINT 2019 with one major goal in mind: to deliver the message that the future of geospatial is St. Louis-made.

"Put another way, as Silicon Valley was to the tech sector, St. Louis will be for the geospatial-intelligence sector," said Krewson,

who will deliver a keynote address Wednesday at 9:30 a.m.

NGA has a long history in St. Louis, making the city all the more suited to host the agency's western campus. But beyond N2W, a large effort is underway to establish St. Louis as the nation's center for geospatial excellence.

Programs are being developed at St. Louis area public schools and higher education institutions to educate and train students to work at NGA and at geospatial companies throughout the region. Early next year, Saint Louis University will partner with NGA to host Geo-Resolution 2020, a continuation of the first such event hosted in April.

Two of the city's primary technology incubators, the Cortex Innovation Community and T-REX, have also fueled innovation

in the area. Later this year, T-REX will open the Geosaurus Innovation Resource Center.

Krewson noted that thousands of people go to work in these incubators every day, creating new ideas and businesses for a variety of industries, particularly geospatial. With the addition of N2W, she expects the geospatial and broader St. Louis workforce to grow significantly.

"That's why it's so great to see NGA, our schools and universities, and organizations already putting in the work today to develop the talent pipeline we will need for the jobs of tomorrow," she said.

In her keynote, Krewson will share all of these reasons and more that demonstrate how St. Louis is shaping the future of GEOINT. She'll encourage audience members to visit—and perhaps, ultimately, to relocate there.

"A visit would be a real opportunity for folks, especially if they have startup businesses, to understand that there's a real connection here between those businesses and that [St. Louis] might be a great place for them to locate," Krewson said.

In addition, Krewson said she hopes GEOINT 2019 attendees—and everyone involved with the GEOINT discipline—help the geospatial ecosystem grow by continuing to attend USGIF's GEOINT Symposium; St. Louis has been selected to host the event in 2023 and 2025.

Though this will be the mayor's first Symposium, she is looking forward to spending time in the exhibit hall to see what projects, products, and energy various organizations are bringing to the event and to the industry as a whole. 🌐

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The Future of Human-Machine Teaming

“TECHNOLOGY-INSPIRED EVOLUTION” WITH CHRIS EDWARDS AND KEVIN SURACE

By Myrna Traylor



The Third Floor creates 3D computer renderings for storyboarding and effects planning for major film and television projects.
Above: Avengers: Infinity War
Below: The Last Jedi
Facing page top: Avengers: Infinity War
Facing page bottom: Ant-Man and the Wasp

The speakers for Monday’s GEOINT 2019 discussion on “Technology-Inspired Evolution” will address the promise of technology in two different ways. Chris Edwards, CEO and founder of The Third Floor, Inc., will speak from the perspective of someone who spends his days asking computers to create believable images

of things no one has ever seen before. Kevin Surace, tech innovator and futurist, has a vision for how AI will present data bundles to human beings for analysis and decision-making.

SUPERVISING AI

Surace has been known to ask his audiences what they will do in a

“jobless future,” one in which AI will free them from mundane, repetitive tasks and empower them to focus on the more interesting, creative, and interpretive aspects of work and life. For the geospatial intelligence community, that future is on the horizon.

“AI can already do certain kinds of image recognition better

“AI can detect a difference of a few pixels. If we teach it to look for that kind of change, we can definitely improve our intelligence.”

– KEVIN SURACE, TECH INNOVATOR AND FUTURIST



than people can,” Surace said. “We will be using AI to detect changes [in an image set] that people can’t see. Once you tell the AI what to look for, it can tirelessly go through image after image and generate more relevant output. So, rather than spending time picking through those images, people will be using their skills to look at the AI’s output and ask, ‘Is this something I care about? And if so, what should we do about it?’”

But, before searches can be turned over to algorithms, the programs will need to be taught what to look for.

“AI will need supervised learning,” Surace said. “If you’re trying to detect missile launchers, you’ll have to train the program with a million pictures of missile launchers, and people have to compile the dataset.”

The promise of more useful information is tantalizing, especially if you consider AI’s ability to detect miniscule differences in images.

“AI can detect a difference of a few pixels,” Surace continued. “What else can we find? Tracks [of certain kinds of vehicles] in the grass? If we teach it to look for that kind of change, we can definitely improve our intelligence.”

HOLLYWOOD PARALLELS

Chris Edwards has parlayed his early interest in AI and machine vision—by way of a Smithsonian Associates program when he was in junior high school and later, a job at George Lucas’ Skywalker Ranch—into a Hollywood tech boutique. His firm’s 3D computer renderings—known as pre-visualizations or “pre-vis” for short—are a vital component for storyboarding and effects planning for blockbuster projects such as *Godzilla*, *Game of Thrones*, and multiple Marvel films. In addition, his firm works with augmented reality in projects as varied as commercials, video games, and location-based entertainment, and generates the programming for cranes, dollies,



and drones needed on film locations.

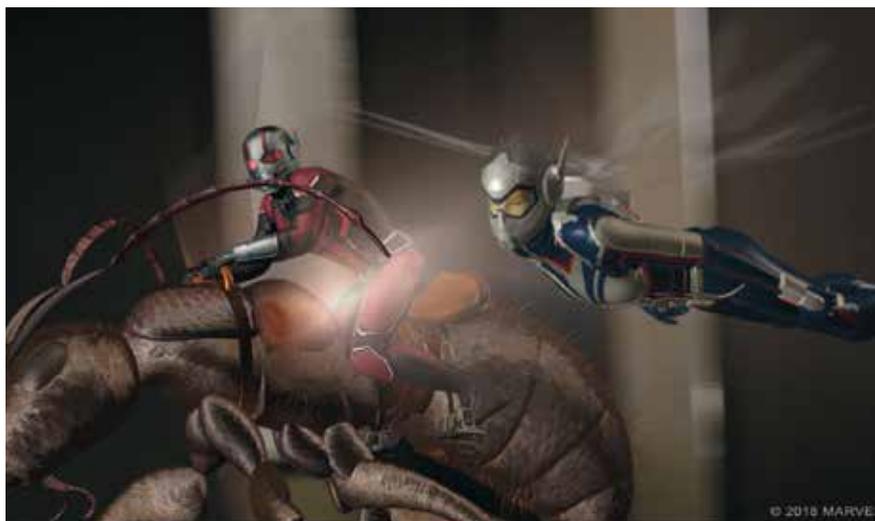
Edwards sees certain parallels in the assignments *The Third Floor* gets from filmmakers to mission assignments in the GEOINT sphere.

“There are similarities in how visualizations are approached and used in the real world,” he said. “Our teams work with a leader—a director or producer—who is equivalent to a general or chief executive in charge of a mission. Their goal is broad, but they need to be informed on all the details. It’s our job to collect that recon and boil it down into data that can be used effectively.”

Edwards said his team members specialize in taking that data and being responsive to the “mission” parameters.

“Our visual artists get key information then inject creativity to make the pre-vis more sophisticated than a standard storyboard,” he continued. “Just like in the military, there are a lot of people whose craft is dependent on the quality and accuracy of the data they receive. It’s what allows them to make better decisions.”

Like the Intelligence Community, Hollywood is also searching



for the sweet spot between reliance on humans and machines.

Our message to Hollywood is, you are spending millions of dollars aiming to hit the cultural zeitgeist, which is a moving target,” Edwards said. “It is in your interest to create a film that achieves the balance between the human factors and tech—not just tech—to tell stories and to produce value.”

At GEOINT 2019, Edwards will convey a message similar to Surace’s. “Tech empowers us; it does not rule us. We are facing a time when tech is making things happen ‘automagically.’ By having the computer do major repetitive tasks, people are empowered.” 🌐

“Tech is making things happen ‘automagically.’ By having the computer do major repetitive tasks, people are empowered.”

—CHRIS EDWARDS,
THE THIRD FLOOR, INC.

Bringing NGA's Future into Focus

AGENCY LEADERS ON RESEARCH, DATA SCIENCE, INDUSTRY PARTNERSHIPS, AND MORE

By Kristin Quinn



Christy Monaco at USGIF's GEOINT Symposium Sneak Peek event in April.

The National Geospatial-Intelligence Agency (NGA) sent 265 representatives to GEOINT 2019 to learn about the latest geospatial technology and trends. Agency personnel will participate in a variety of programs throughout the week, including training sessions, lightning talks, and **Government Pavilion Stage (Booth 466)** discussions.

Three NGA leaders spoke with The GEOINT Symposium Show Daily ahead of the event to share a preview of their presentations as well as insights on agency priorities and initiatives.

DR. CINDY DANIELL, DIRECTOR, RESEARCH

Daniell's panel discussion, "NGA: Bringing the Future into Focus," will take place Monday from 1:15 to 2:00 p.m. at the Government Pavilion Stage in the exhibit hall.

Dr. Cindy Daniell



The discussion, moderated by Sandra Auchter, associate deputy director of capabilities, will also include Director of Analysis Sue Kalweit, Director of Source Kim Fite, and Associate CIO Susan Shuback.

Daniell, who became director of NGA Research in June 2018, said her office's mission is "to deliver future GEOINT capabilities to users for operational impact." In the panel discussion, she will talk about the future of research, including automation "as it drives the warfighter, the analyst, and the machine."

With respect to the warfighter, Daniell said the future is "secure, persistent, and on-demand GEOINT"—that is able to yield answers whether the warfighter is in the field searching for fresh water or an urban environment in need of a safe route to headquarters.

In the future, Daniell predicts analysts will drive an automated, adaptive workflow environment. With speech-to-text already available, the addition of eye-tracking has the potential to further accelerate workflow. And, she continued, machines will operate in concert with both warfighters and analysts, optimizing and feeding data sources to the right people at the right time.

Daniell said all aspects of NGA's research portfolio align under one of three themes: foundation GEOINT, collection technologies, or analytic technologies.

"We have a big objective to expand our performer base," Daniell said. "To do so we are looking at new ways of contracting as one of the biggest vehicles to help us with that."

Daniell also encouraged attendees to check out a lightning talk by NGA's John Greer, Ph.D., titled, "Why Automatic Target Recognition is So Hard, and How We'll Solve it Anyway." Greer's talk will take place Monday at 3:20 p.m. at the **Innovation Corner (Booth 1943)**.



DR. ANDREW BROOKS, CHIEF DATA SCIENTIST

Brooks will participate in a panel discussion titled, "People, Data, and Technology as Strategic Assets," Monday from 2:30 to 3:15 p.m. at the Government

Pavilion alongside NGA CTO Mark Munsell, NGA Chief Data Officer Deepak Kundal, and Jeanne Stacey of NGA Data Corps.

According to Brooks, each presenter will discuss different perspectives on the question, “How do you create value out of data?” For example, how to create value at scale, how to create value for users, and how to maintain and increase the value of data as an asset.

The discussion will also touch upon the agency’s new strategic plan for data science, which explores how to create value through the lenses of people, data, and technology, according to Brooks.

From a people perspective, that means having the right people inside the agency with the knowledge to create value out of data as well as understanding who NGA’s customers are and how they use data.

When it comes to data, the plan includes cataloging the

agency’s existing data with the proper labeling and metadata to make it structured and discoverable, and also engaging with industry to determine what new forms of data to pursue.

Regarding technology, the new plan considers what NGA personnel need to perform their job today and in the future, including the necessary technology for the agency to pursue its Artificial Intelligence, Automation, and Augmentation (AAA) initiative.

CHRISTY MONACO, CHIEF VENTURES OFFICER, OFFICE OF VENTURES AND INNOVATION

Monaco and Dave Gauthier, NGA’s director of Commercial GEOINT Solutions, will host a discussion titled, “Harnessing Innovation through Industry Partnerships,” Wednesday from 12 to 12:30 p.m. at the Government Pavilion.

The goal is to provide more clarity for industry partners about how Monaco and Gauthier’s respective offices relate and differ. The duo will provide a “peek behind the curtain” as to “what happens inside NGA when we are approached by an industry partner and the potential solutions and offerings they have,” according to Monaco.

One new way the agency is harnessing innovation is through its Partnership Intermediary Agreement with the Missouri Technology Corp. (MTC) in St. Louis.

“We are lucky we live in a time where the geospatial industry is so important that a lot of technology being developed, both internal and external to NGA, has dual uses,” Monaco said. “It can be applied to NGA/GEOINT mission needs and also to commercial use cases. The PIA with MTC gives us the opportunity to promote and support technology transfer from NGA to industry.”

Monaco added that partnering with MTC will help NGA harness the energy around creating a geospatial tech hub in the St. Louis area, and the agreement will hopefully serve as a proof of concept for similar collaborations in the future.

At GEOINT 2019, Monaco is looking forward to meeting with companies that aren’t already “on her radar.”

“My team has been asking who I want to meet with, and my answer is that I want to meet with people we haven’t met with before,” she said. “Let’s look for those new opportunities and those potential new partners.” 🌐

Visit the NGA website to view a full schedule of the agency’s involvement at GEOINT 2019 and to download the publication, “NGA Tech Focus Areas: Hard Problems List.”

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From Architecture to GEOINT

HOW THE GEOINT SYMPOSIUM HELPED CECE SMITH PURSUE A MAJOR CAREER CHANGE

By Lisbeth Perez



CeCe Smith

PHOTO COURTESY OF CASEY DUNN

For about three years, CeCe Smith worked at Lake Flato Architects in San Antonio, Texas, involved in projects such as the Pearl Brewery Redevelopment, a multi-phase plan tied to the San Antonio River Walk expansion. Though she was contributing to local change, Smith sought to pursue a career in the geopolitical world.

“I looked for organizations I could get involved with, such as AFCEA,” Smith said. “Then learning about AFCEA led me to learn more about USGIF. I became a member of USGIF shortly before GEOINT 2017.”

Smith was concerned her experience and skillset wouldn’t necessarily translate well on paper to a new career in geospatial intelligence. So, in 2017, she attended the GEOINT Symposium in San Antonio with the goal to network as much as possible. Smith now works in technical documentation

for USGIF Member Orbital Insight—hers is a true GEOINT Symposium success story.

Why did you decide to switch careers?

It was a huge life decision to transition away from a career that I had spent a lot of time in, and I knew I would have to move. It took me over a year to decide. By the time GEOINT 2017 came around, I was 70 percent sure I was ready to make the leap. People from my AFCEA chapter who had participated or were going to the GEOINT Symposium encouraged me to attend. They said the conference would either make or break my decision.

How did your background in architecture prepare you for a career in GEOINT?

In architecture, I conducted spatial analysis to predict which residents would vote for county

bonds proposing new construction. I developed spatial interaction models to make design decisions about visitor circulation throughout a mixed-use building or to facilitate pedestrian and traffic flow in urban centers. I actively incorporated data collection sensors into building designs to empower energy efficient and high-performance buildings, foster occupant and environmental wellness, and create data-rich,

smart cities. There are many parallels between geodesign, data and sensor-based design, and their connections to the problem-solving and data-driven decisions that are prevalent in GEOINT.

What was your career transition strategy?

My strategy for getting a job in the Intelligence Community was attending the GEOINT Symposium. I took the week off from work and self-funded my attendance. I spoke with private companies, a systems integrator, and employees from the National Geospatial-Intelligence Agency and the National Reconnaissance Office. I wanted to make sure I spoke with a wide variety of people. By the time the event ended, I figured I would either have a new job or have planted the seeds to get one.

How did you arrive in your current position?

Christopher Incardona, a former Orbital Insight employee, recruited me. He posted on LinkedIn that he was attending GEOINT 2017 and looking to fill a client success manager position. I reached out and we scheduled a time to meet. I was able to get an offer shortly after that, and I moved my life from San Antonio to D.C. I am now the technical writer for Orbital Insight, where I develop intelligence reports for government programs and product education materials for customers.

What USGIF groups are you involved with?

I have attended several gatherings with USGIF’s Young Professionals Group (YPG). At GEOINT 2017, I made sure to attend several YPG networking opportunities. I am also an active member of USGIF’s Machine Learning and Artificial Intelligence Working Group and am co-leading the AI Lexicon Subgroup with Peter Morosoff. This year, we are focused on developing an ontological framework the GEOINT community can use for communicating about AI.

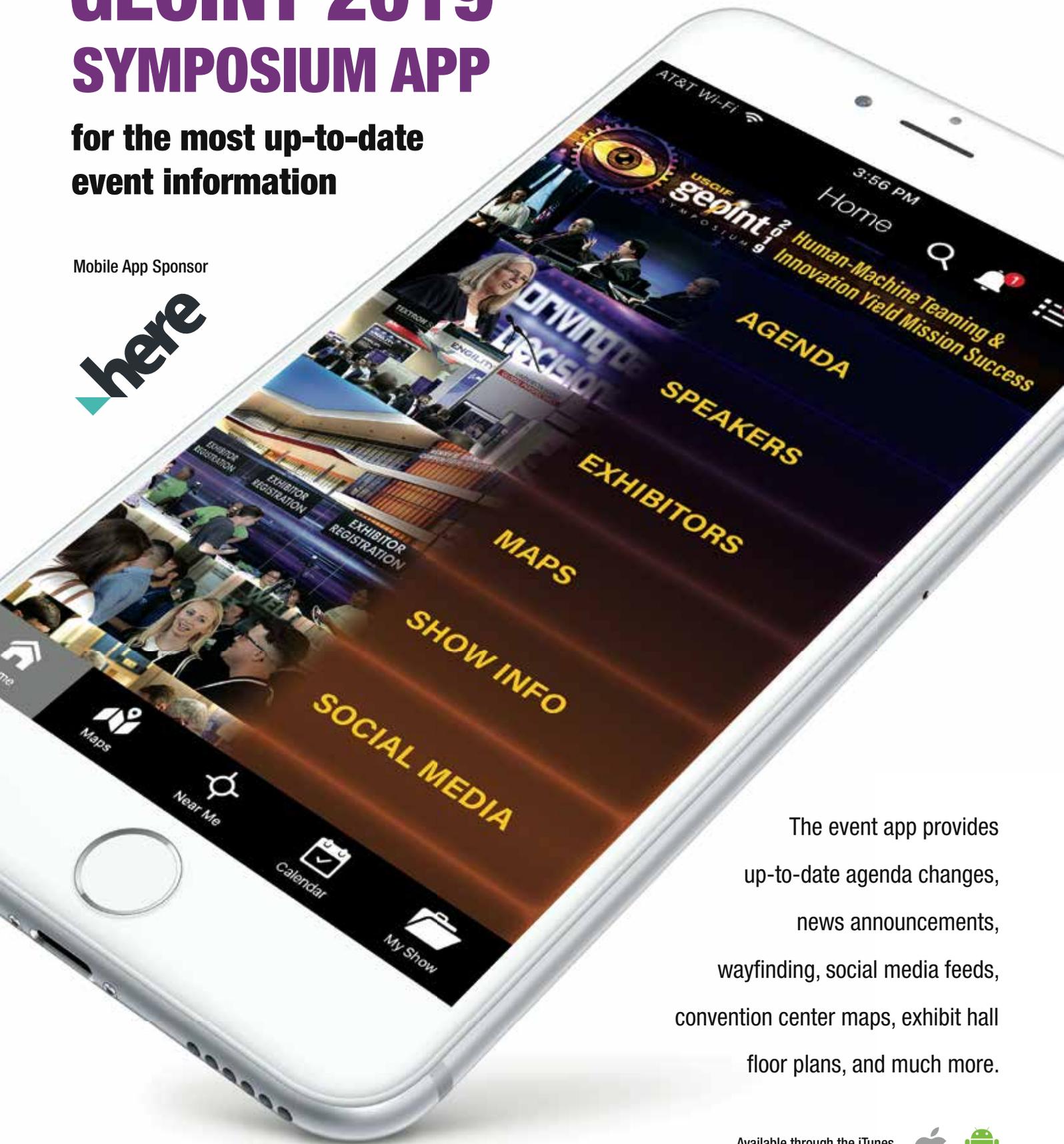
What advice would you give other young professionals who want to switch careers?

If you’re not in the Intelligence Community, the field may feel out of the realm of possibility. It’s not—the community is full of people who are doing a lot of different things such as architecture and engineering. People cared more about the passion that I had to produce great work. Also, I can’t reiterate how important it is to be there and be present. We foster relationships online, and though that was part of my strategy, it was even more important to network in person. 🌐

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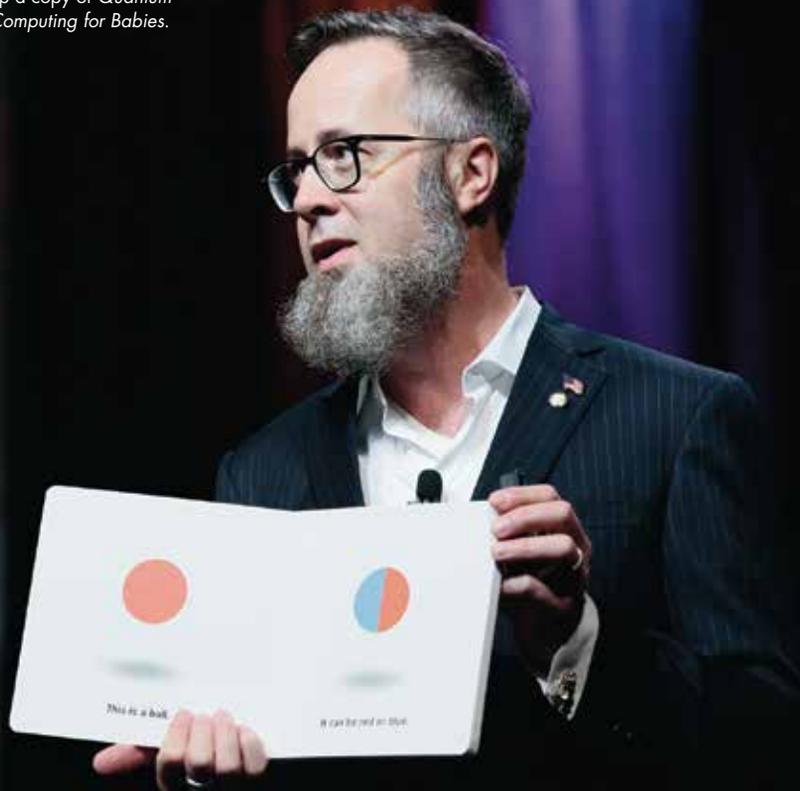
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Quantum Computing *continued from cover*

William Hurley holds up a copy of *Quantum Computing for Babies*.



“You need to be thinking about this, but you don’t need to be scared about it.”

—WILLIAM HURLEY,
STRANGWORKS, INC.

that these machines are going to cure cancer and solve all your geospatial information problems, etc.—it’s a little too early for that.”

In the U.S., meanwhile, the National Quantum Initiative Act of 2018 authorized \$1.2 billion in federal funding, but Congress has yet to appropriate that money.

Unsurprisingly, the first question whurley took from the audience was about quantum computing’s potential to break existing encryption. His advice: Don’t panic.

“You need to be thinking about this, but you don’t need to be scared about it,” he said.

Stronger encryption can still impose a difficult-to-impossible time penalty to crack cryptography with quantum computing. And quantum computers could enable forms of encryption implausible with classical computing.

“There’s no reason to fear quantum computing, and there’s actually reasons to embrace it,” he continued.

In the second half of his talk, whurley emphasized the importance of collaboration and setting realistic expectations when determining an organization’s approach to quantum computing.

As he put it: “There are a lot of people competing in this space right now, and those people are all competing over a piece of pie. But they’re standing in a kitchen where the ingredients are just spread all over the place, and there’s no cook, the oven

doesn’t have gas, and none of the water is hooked up yet.”

Instead, whurley pointed to such models of collaboration as a quantum-computing forum established last year, and sponsored by Strangeworks, at the programming Q&A site Stack Exchange.

He also invited GEOINT 2019 attendees to join the private beta of Strangeworks’ quantum-computing development platform, which he noted enables developers to experiment with five different development coding frameworks: IBM’s Qiskit, Microsoft’s Q#, Rigetti’s Forest, the Google-developed Cirq, and D-Wave’s Leap.

Developing for quantum-computing machines—which whurley said don’t rank as functional computers just yet and are better described as “really, really extremely fascinating lab

equipment for exploring the quantum universe”—demands a deeper level of scientific knowledge.

“You can’t take a software developer from your organization and make them a quantum-computing developer,” whurley warned. “To program a quantum computer, you need to be a physicist or have an extremely deep knowledge of physics.”

Quantum development will also require an absence of egotism: “I’m not going to write the next great quantum application, and neither are you, but several of you working together probably are.”

He forecast a future in which quantum computing doesn’t take over classical computing but instead makes currently impossible problems possible, just as airplanes enabled fast travel over oceans but did not render trains obsolete for shorter distances.

“And now we need quantum computers to kind of be the air travel of computing,” he said.

But whurley didn’t go into detail about what quantum computing could do for GEOINT or similar computationally-intensive fields.

“It’s definitely going to revolutionize science,” he said. “There’s cures for diseases that will probably be discovered, custom drug discovery, obviously things like climate change and weather will be affected.”

But those advances won’t transpire without allowing time and space for discovery that isn’t often permitted by traditional funding cycles. And just as people viewed early-generation personal computers as tools to run spreadsheet apps, not ways to communicate across the internet, it will be the unexpected and even unimagined possibilities of quantum computing that make the biggest dents in the universe.

“There’s no killer app for quantum right now,” whurley concluded. “But there will be.” 🌐

LIGHTNING TALKS

Innovation Corner - Booth 1943

MONDAY, JUNE 3

1:30-2:20p

Featured Talk: IQT@ 20: Strategic Investing for Geospatial Machine Learning - In-Q-Tel

Social and Behavioral Sciences Research Agenda for Advancing Intelligence Analysis - The National Academies of Sciences, Engineering, and Medicine

Third Generation Neural Networks for Third Wave AI - Riverside Research

Detecting Anti-Aircraft Sites Across North Korea in a Weekend with Fast and Globally Scalable Computer-Vision Based Search - Descartes Labs

Data at the Edge: Providing Analytic Capabilities in Communication Limited Environments - Michigan Tech Research Institute

Retro-reflective Arrays for Satellite Interferometry and Long Range Comms - Southwest Research Institute

2:25-3:15p

Blockchain Supporting GEOINT Data Provenance - NGA

How Commerce Works with Tech Partners to Put Geospatial Data to Work: The Opportunity Project Geo-Cohort - U.S. Census Bureau, Department of Commerce

AT&T Smart Bases - AT&T

SpaceNet: Defining Levels of Automation for Machine Learning Applied to Mapping using Satellite Imagery - Radiant Solutions

Leveraging Augmented Reality to Enhance the Human-Machine Interface in Space Applications - Sandia National Laboratories

Clairvoyant: Leveraging Machine Learning for Enhanced Geolocation Situational Awareness - Northwest National Laboratory

3:20-4:10p

Why Automatic Target Recognition (ATR) is So Hard, and How We'll Solve it Anyway - NGA

Innovative Solutions for Education and Workforce Development - Riverside Research

Full Spectrum GeoVisualization & Tactical Decision Toolkit Development - University of Southern California

Accelerating Geospatial Intelligence with GPU-Accelerated Analytics - OmniSci

GEOINT for Anti-Money Laundering and Counter Terror Finance Investigations - Pennsylvania State University

Forensic GEOINT: Setting Context for Terrorism Trials Using 3D Data in the Courtroom - Vricon

Quantifying the Use of Synthetic Data for Remotely Sensed Object Detection - Harris Corporation

TUESDAY, JUNE 4

1:30-2:20p

Featured Talk: Innovative Results: Why R&D Transition Matters - IARPA

Space-Based High-Resolution Global Fiducials Imagery Time-Series for Outreach, Research, and Education - USGS

Turning Big Data into Actionable Intelligence - Sandia National Laboratories

Global Cropland Fire Emissions Accounting Using OPIR Sensing - Michigan Tech Research Institute

Lessons Learned from Commercial Data Curation Services and How We Can Apply Them to Our Craft - ODNI

GEOINT in the 2020 Census- A Civilian Agency Use Case - U.S. Census Bureau

2:25-3:15p

GEOINT Analysis in the Age of Automation - NGA

Near Real Time AI Satellite Imagery Insights Leveraging Amazon Ground Station, Sagemaker and GBDX - DigitalGlobe/Amazon Web Services

A Lightweight, Robust Exploitation System for Temporal Stacks of UAS Data: Use Case for Forward-Deployed Military or Emergency Responders - University of Southern California

Machine Learning for Flight Planning Systems - BAE Systems

The QuakeFinder High Resolution Magnetometer Array: Forecast Earthquakes, Monitor Solar Storms and More! - Stellar Solutions Inc.

Space, Ground, and Cloud: An infrastructure Framework For Real-time Analytics - Capella Space

3:20-4:10p

Human Geography... To Infinity and Beyond - NGA

Automated Material Mapping for Humanitarian Assistance and Disaster Relief - DigitalGlobe

Wildfires - A Machine Learning Approach to Calculating Changes in Rate of Spread and Direction of Movement - Next Tier Concepts, Inc.

Augmenting the Analysts Through AI Agents: Implication in Concept of Operation and Change Management - Earthcube

Common Operating Picture for Situational Awareness and Safety - BAE Systems

Machine Learning for GEOINT: Computer Vision on the Edge - Mapbox

**7:00-9:00a**

Training & Education Sessions (Third Level, 301A-302C)

08:30-8:55a

- 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 (Hall 1)

8:55-9:00a

Master of Ceremonies: Carmen Medina,
USGIF Board of Directors (Hall 1)

9:00-9:45a

**Opening Presentation: Digital Natives
Empowering the GEOINT Enterprise (Hall 1)**

- The Honorable Jeffrey K. Harris, USGIF Chairman of the Board
- Jack Dangermond, Founder and President, Esri
- SSG Aljune Lerio, USMC, Civil Affairs NCO
- Katie McGaughey, Crop Assessment Specialist, USDA
- Benjamin Foster, Technical Lead GEOINT Services Capabilities, NGA

9:45-10:30a

**Keynote: Vice Admiral Robert Sharp,
NGA Director (Hall 1)**

10:00a-5:00p

Exhibit Hall Open (Halls 2-3)

Sponsored by General Dynamics IT

10:00-11:00a

USGIF Workforce & Certification Development Initiative Information Session (Exhibit Hall, USGIF Booth 1511)

10:30-11:00a

Morning Coffee and Networking Break (Exhibit Hall)
Sponsored by HERE Technologies

11:00-11:45a

Panel: Technology Inspired Evolution (Hall 1)

- Kevin Surace, Futurist/Visionary on Disruptive Innovation, AI, and the Age of Automation
- Chris Edwards, Founder & CEO, The Third Floor Inc.

- Moderator: Sean Roche, Associate Deputy Director for Digital Innovation at Central Intelligence Agency

11:45a-12:30p

**Panel: CIOs - Moving from Chief Information
Officers to Chief Innovation Officers (Hall 1)**

- Moderator: Jill Singer, Vice President, National Security, AT&T Public Sector and Wholesale Solutions
- La'Naia Jones, Deputy Chief Information Officer of the Intelligence Community, Office of the Director of National Intelligence
- Juliane Gallina, Chief Information Officer, Central Intelligence Agency
- Annette Redmond, Chief Information Officer, Department of State
- Mark Andress, Chief Information Officer, National Geospatial-Intelligence Agency

12:30-2:00p

Lunch (Exhibit Hall)

1:00-2:00p

Accredited School Information Session
(Exhibit Hall, USGIF Booth 1511)

1:00-4:15p

**Government Pavilion Stage (Exhibit Hall, Booth 466)
Sponsored by AT&T**

1:00-1:15p GAPP Grand Challenge Award Announcement and Check Presentation

Master of Ceremonies: Suzanne Heckenberg,
Chief Operating Officer, Intelligence and National Security Alliance

1:15-2:00p NGA: Bringing the Future into Focus

- Moderator: Sandra Auchter, Associate Deputy Director of Capabilities
- Sue Kalweit, Director of Analysis
- Kim Fite, Director of Source
- Dr. Cindy Daniell, Director of Research
- Susan Shuback, Associate Chief Information Officer

2:00-2:30p – IARPA's GEOINT Perspective

Dr. Catherine M. Cotell, Deputy Director, Research, IARPA

2:30-3:15p – Panel: People, Data, and Technology as Strategic Assets

- Mark Munsell, Chief Technology Officer, NGA
- Dr. Andrew L. Brooks, Chief Data Scientist, NGA
- Jeanne Stacey, NGA Data Corps
- Deepak Kundal, NGA Chief Data Officer

3:15-3:45p – Commercial Imagery and the NRO:

The Way Forward

Dr. Troy Meink, Director, GEOINT Directorate, NRO

1:30-4:10p

Lightning Talks (Exhibit Hall, Innovation Corner, Booth 1943)

2:00-2:30p

Afternoon Coffee Break (Exhibit Hall)

2:00-2:45p

Young Professionals Mentoring Discussion (Exhibit Hall, YPG Lounge, Booth 2005)

2:00-4:00p

Training & Education Sessions (Third Level, 301A-302C)

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

Sponsored by Lockheed Martin

4:00-5:00p

Accredited School Information Session (Exhibit Hall, USGIF Booth 1511)

4:00-5:00p

USGIF Professional Certification Information Session (Exhibit Hall, USGIF Booth 1511)

4:00-5:00p

Young Professionals Mentoring Discussion (Exhibit Hall, YPG Lounge, Booth 2005)

» **TUESDAY, JUNE, 4 AT-A-GLANCE**

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

7:00-9:00a TRAINING & EDUCATION SESSIONS (Third Level, 301A-302C)

8:30-8:45a MASTER OF CEREMONIES: KEITH MASBACK, USGIF BOARD OF DIRECTORS (Hall 1)

8:45-9:45a KEYNOTE: THE HONORABLE SUE GORDON, PRINCIPAL DEPUTY DIRECTOR OF NATIONAL INTELLIGENCE (Hall 1)

09:45-10:15a KEYNOTE: THE HONORABLE LISA PORTER, DEPUTY UNDER SECRETARY OF DEFENSE FOR RESEARCH AND ENGINEERING (Hall 1)

10:00-11:00a USGIF WORKFORCE & CERTIFICATION DEVELOPMENT INITIATIVE INFORMATION SESSION (Exhibit Hall, USGIF Booth 1511)

10:00-11:00a USGIF MACHINE LEARNING & ARTIFICIAL INTELLIGENCE WORKING GROUP SESSION (Third Level, Room 303AB)

10:15-10:45a MORNING COFFEE AND NETWORKING BREAK (Exhibit Hall)

10:45-11:30a PANEL: WILDFIRES – SCIENCE AND TECHNOLOGY – CHANGING THE WILDFIRE PARADIGM (Hall 1)

11:00a-12:00p NGA AND USGIF SMALL BUSINESS ADVISORY WORKING GROUP SESSION (Third Level, Room 302A)

11:30a-12:15p KEYNOTE: BG MATT EASLEY, DIRECTOR, ARMY ARTIFICIAL INTELLIGENCE TASK FORCE, ARMY FUTURES COMMAND (Hall 1)

12:30-2:00p LUNCH (Exhibit Hall)

1:00-2:00p ACCREDITED SCHOOL INFORMATION SESSION (Exhibit Hall, USGIF Booth 1511)

1:00-2:00p USGIF NGA ADVISORY WORKING GROUP SESSION (Room 303AB)

1:00-2:00p USGIF PROFESSIONAL CERTIFICATION INFORMATION SESSION (Exhibit Hall, USGIF Booth 1511)

1:00-4:00p GOVERNMENT PAVILION STAGE (Exhibit Hall, Booth 466) Sponsored by AT&T

1:30-4:10p LIGHTNING TALKS (Exhibit Hall, Innovation Corner, Booth 1943)

2:00-2:30p AFTERNOON COFFEE BREAK (Exhibit Hall) Sponsored by HERE Technologies

2:00-2:45p YOUNG PROFESSIONALS MENTORING DISCUSSION (Exhibit Hall, YPG Lounge, Booth 2005)

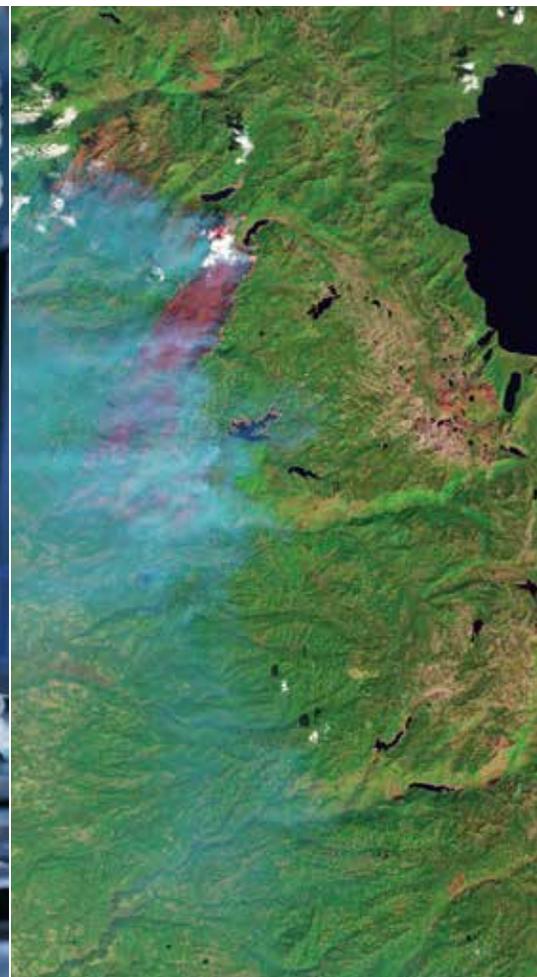
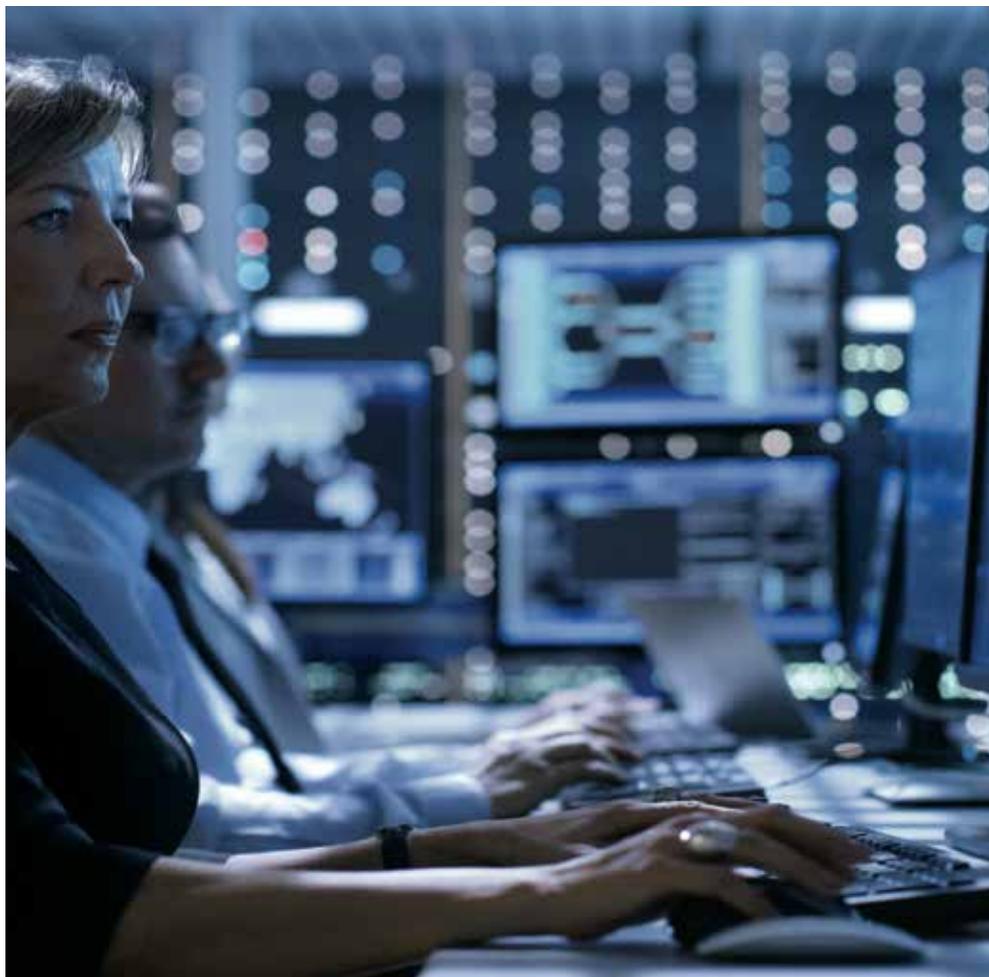
2:00-4:00p TRAINING & EDUCATION SESSIONS (Third Level, 301A-302C)

4:00-5:00p NETWORKING RECEPTION (Exhibit Hall)

4:00-5:00p ACCREDITED SCHOOL INFORMATION SESSION (Exhibit Hall, USGIF Booth 1511)

4:00-5:00p YOUNG PROFESSIONALS MENTORING DISCUSSION (Exhibit Hall, YPG Lounge, Booth 2005)

5:00-7:00p YOUNG PROFESSIONALS NETWORKING RECEPTION (Broken Crust Cafe) Co-hosted by Esri's Young Professionals Network



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Find out more at booth 327 during GEOINT 2019.

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