

ANNUAL REPORT





TABLE of CONTENTS

About Us 1-9 4 **CEO Message Executive Leadership Team** 6 7 Governance 8 2022 New Hires Financials 11 12-17 Programs AIR FORCE STEM 12 13 INFORMATION DIRECTORATE INTERN LEGACY 14 15 VICEROY ACE 16 17 INFORMATION INSTITUTE 18-20 Sponsored Programs **HUSTLE** 18 19 Hack-a-Sat 20 Q41 21-31 Innovare 21 Goal 1 23 Goal 2 25 Goal 3



About Us

The Griffiss Institute cultivates talent and technology for a stronger, safer America.

Founded in 2002 in the Mohawk Valley region of Upstate New York to drive regional community connections for the Air Force Research Laboratory, the Griffiss Institute is a national nonprofit with an international network of academic, government, and industry partners.

With defense technology transfer at its core, the Griffiss Institute is on a mission to inspire and prepare the next generation of scientists, engineers, and entrepreneurs to drive national security solutions from lab to market.

The Griffiss Institute is a STEM Talent + Technology Accelerator





Our Mission

The Griffiss Institute aims to
develop the next generation of
STEM talent and defense
technologies that will strengthen
U.S. national security and create
economic opportunity for our
region, state and nation.

We elevate **TALENT**

We empower **INNOVATION**

We enable **EXPERIENCE**





Message from the President & CEO

On the heels of a deliberate period of thoughtful stakeholder engagement, analysis, and self-reflection in 2021 that revealed our refreshed mission as a STEM talent and technology engine for American defense, we kicked off 2022 with three strategic priorities.

- First was to deepen and focus our engagement with partnering academic institutions to identify those with whom we should strengthen ties to attract top talent to the American defense technical mission.
- Second was to enable and celebrate defense innovation and entrepreneurship in our Mohawk Valley region.
- Third was to create an experience at Innovare Advancement Center that leaves the aspiring and inspiring scientists, engineers, and entrepreneurs who grace our halls with feelings of inspiration,
 validation, and motivation to return.

The action agenda that supported these aspirations meant getting comfortable experimenting with new activities, deepening relationships with diverse community partners, building our GI team to reflect necessary core competencies, and evolving our corporate culture.





As we look forward to 2023, we are proud of all that we have accomplished to tackle new challenges in our first full year of operations at Innovare. In 2022, the Griffiss Institute employed 245 interns and 68 visiting faculty and fellows in technical service to the national defense mission.

We launched New York State's first defense accelerator for seed stage startups pushing AI/ML, cyber, quantum, and uncrewed aerial systems solutions to market.

We graduated 129 regional high school students from AFRL STEM camps during school breaks, and we supported 29 Air Force bases and defense laboratories to deliver K-12 STEM programming in Air Force communities nationwide.

We redefined our corporate brand; placed our first equity investments; and established new communications pathways to promote awareness of our defense partners' mission, hosting over 100 workshops, seminars and co-design sessions, and welcoming over 4,600 unique collaborators to our Innovare network.

The GI team was deeply honored to be recognized as Business of the Year by both Rome Area Chamber of Commerce and Greater Utica Chamber of Commerce.

These are the accomplishments that defined the GI in 2022. The Griffiss Institute is deeply proud to serve at the nexus of national security and economic competitiveness for our region, state, and nation.

Empowered with a strong balance sheet, outstanding team, motivated board of directors, and shared vision among community partners, we look forward to delivering increased impact in 2023.



Heather Hage



Executive Leadership Team

"Leadership is about the team – the culture they keep and embrace; it's about empathy for your customers, clients, employees and the communities where you do business; it's about doing the right thing for the right reasons, being confident enough to take risks and responsible enough to think of those who your decisions and risks may affect."

—Kat Cole, COO & President of FOCUS Brands



TRACY DIMEOExecutive Office Manager



HEATHER HAGE President & CEO



MIKE WESSING Chief Engineer



SETH MULLIGAN Director, Innovations & Partnerships



MELISSA TALLMAN
Director, Brand Strategy
& Marketing



REGAN JOHNSONVice President



Governance



MS. PATRICIA BASKINGER CEO AX Enterprize LLC



COL. WILLIAM GRAY (RET.) Emeritus Corps



MR. STEVEN DIMEO President Mohawk Valley EDGE



WILLIAM VANSHUFFLIN Senior Vice President Mohawk Valley EDGE



DR. JOHN MARSH Chair Network and CS **SUNY Polytechnic Institute**



PETER BAILDON Senior Vice President M&T Bank



DR. SHIU-KAI CHIN **Professor EECS** Syracuse University Welcome!



DR. RICHARD JOSEPH **Chief Scientist (Ret.) United States Air Force**



MR. CHARLES GREEN President & CEO Assured Information Security



MS. LAUREL MCADOO Founder Myles of Smyles Human Resources Director SUNY Research Foundation

Thank You For Your Service

MR. RAYMOND PHILO Professor of Criminal Justice Utica University BOARD MEMBER 2011 - 2022







welcome



Ε

W



. D

E

S



DARYN BOULERICE Multimedia Specialist



BILL CARMENFacility & Maintenance
Specialist



WENDY CARPENTER Student Success Coordinator



PATTI DEVOE Sponsored Program Financial Analyst



MAKENZI ENOS Student Success Coordinator



ACE Operations Coordinator



AMY JAMES Guest Relations Coordinator



ASHLEY LAFORCE Marketing & Communications Coordinator



JENNIFER MARSHALL Portfolio & Project Analyst



TRE MARTINFacility & Maintenance
Technician



KATIE MORRISSETTEProject Support
Associate, VICEROY



QUENTIN RAPPLEYEA IT Intern



DYLAN SNOWEvents Intern



NICK WILCOX Events Intern



The Griffiss Institute **cultivates talent and technology** that tackles the world's biggest challenges. We leverage our storied past to connect communities: defense, industry, academia, and the Upstate New York region we call home. With origins as a facilitator of advanced research for the United States Air Force, the Griffiss Institute has expanded into an incubator of ideas. Our clients include not only the military, but government, startups, small businesses, universities, and more.

This **evolution has transformed** us from being not just a facilitator but also a facility. The Griffiss Institute's home at **Innovare Advancement Center** is a **world-class** research and collaboration **destination** with resources that rival top-tier laboratories. The growing Innovare family of spaces enables discoveries about communications, uncrewed aerial systems, and quantum networking and computing. Interconnected physically, and to a vast network of knowledge and expertise.

Technology transfer is our core business – forging connections and pathways that enable real-life solutions to make their way from the lab bench to the every day life uses. Our next frontier is growing the pool of talented STEM students and professionals that will discover that next big idea.

Together with our partners, we are designing the future of research and technology in ways that ensure America remains globally competitive.

You Belong Here.



Since classical antiquity, griffins were known for guarding treasures and priceless possessions – kind of like top-secret scientific discoveries! With the body, tail, and back legs of a lion, and the head and wings of an eagle, it positions the Griffiss Institute as a force to be reckoned with while giving a strong nod to its Air Force foundations. The line style of the griffin icon, along with the fonts and colors, are intended to correlate directly with the Innovare Brand.









"We get a lot of questions asked how are the winners chosen ... staying power, response to challenges in the area, products or services, innovation and growth within the industry, so that's one of our key things we look at," said Kari Puleo, executive director for the Greater Utica Chamber of Commerce. "We also look at the commitment to the region, the longevity, community involvement, public service and business leadership within your organization. The last piece of the puzzle is your involvement in the Greater Utica Chamber of Commerce."



Women Investing in Women





"Not finance. Not strategy. Not technology. It is teamwork that remains the ultimate competitive advantage, both because it is so powerful and so rare."

— Patrick Lencioni

Achievements

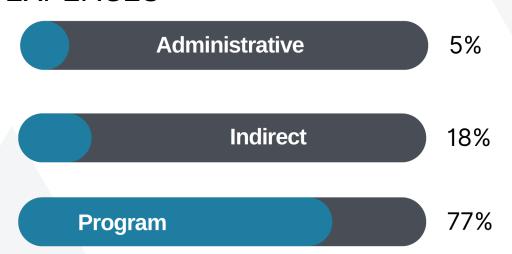


FY 22 FINANCIALS

REVENUE

Private and Con	nmercial	1.7%
New Y	ork State	3.7%
Federal		94.6%

EXPENSES



AIR FORCE & SPACE FORCE STEM



32

19

14

21

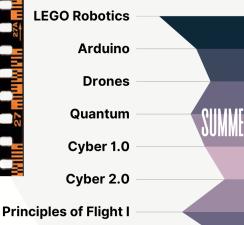
16

9









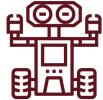




LOCAL STEM CAMPERS



Department of Air Force **Sites Supported**



The relationship the Air & Space Forces K-12 STEM Program has with the **Griffiss Institute** is critical to the **success** of STEM outreach for the Department. Their support provides crucial administrative and program assistance to efficiently deliver quality STEM opportunities and efforts with the goal to inspire and strengthen STEM for hundreds of thousands of students around the United States.

> **Elvse Lohrbach Dept of Air Force K-12 STEM Director**





Madison Venables

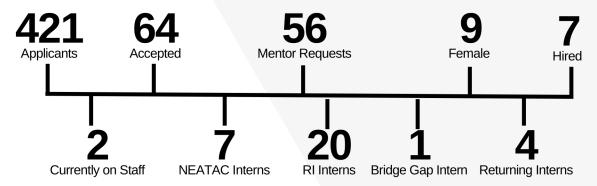
Madison provides both operational and evaluation coordination support to the Air & Space Forces K-12 STEM program. Because of her hard work in 2022, each of our 40+ Base site programs were trained and coached to provide metrics on a monthly basis, have access to personal reports and data about their program and will be participating in an inaugural evaluation study in 2023 to better determine if the program is meeting desired outcomes. Her attention to detail and relationship-building with the site leads has made this possible!



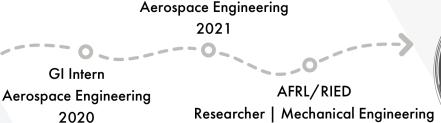


AFRL/RI Interns

Paid summer internship opportunity for students currently enrolled in an accredited college or university at the freshman level through PhD level (U.S. CITIZENS ONLY) to work on-site with AFRL researchers on a wide variety of research projects.







Researcher | Mechanical Engineering 2022-Present



Dr. Jeremy Chapman, Mechanical Engineer Researcher; AFRL/RIED Research Area: Space Data and Exploitation





LEGACY

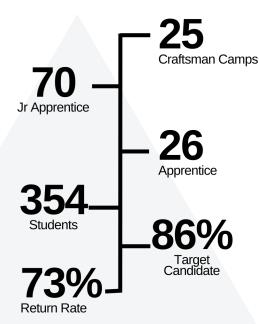
LEADERSHIP EXPERIENCE GROWING APPRENTICESHIPS COMMITTED TO YOUTH



Griffiss Institute helps facilitate the needs of the

LEGACY program through:

- hiring
- onboarding
- managing all of their interns, teachers, and site leads



The vision of this STEM pipeline is to become the premier program employing students from within the pipeline to enhance the nations future STEM workforce.











Virtual Institutes Cybersecurity Electromagnetic Research & Employ

VICEROY establishes:

Virtual Institutes (VIs) at institutions of higher learning with the intent to increase the number of Reserve Officers' Training Corps (ROTC) and civilian graduates possessing job-ready skills.

L8 – Colleges & Universities

These VIs develop the foundational expertise in critical cyber security and electromagnetic spectrum operations for future military and civilian leaders of the Armed Forces and the Department of Defense (DoD).

95 Applied

Virtual Institutes

22-

Collegiate Freshman & Sophmores

UNIVERSITY AT ALBANY
State University of New York

30+
DoD Job Sites







First Person & Female to Complete a VICEROY Internship & Accepted Into Advance Course in Engineering (ACE)





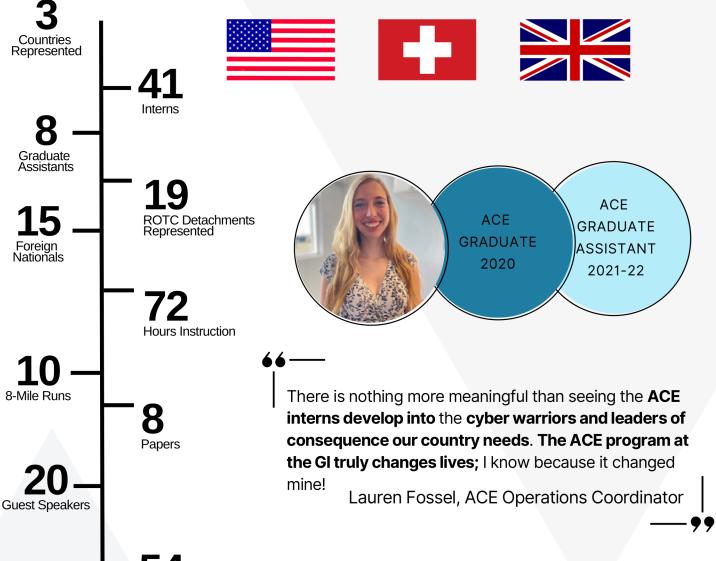


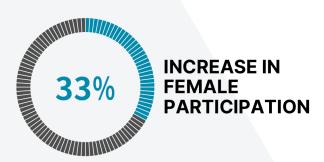






ADVANCED COURSE IN ENGINEERING





Hour Cyber Warfare Capstone





INFORMATION INSTITUTE

A virtual, collaborative research environment that provides a unique opportunity for members of academia to work with the U.S. Air Force to advance the state-of-the-art in Command, Control, Communications, Computers, and Intelligence (C4I) and Cyber for the Air Force, Department of Defense and commercial applications. This government-university partnership promotes and expands research in information technology areas of interest to the Air Force.



-26

Universities

- **52**Professors

- **18**Students

16 Fellows

- **104**

16

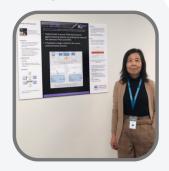
Research Topics

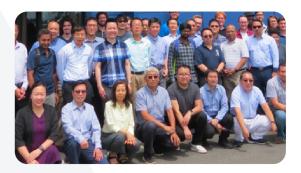


Dr. Ngwe Thawdar

Thanks to GI team's outstanding support, the Terahertz event hosted at Innovare, was very successful with a lot of positive feedback from attendees across DoD, Industry and Academia. We have reports from researchers about collaborations resulting from the event, and a small business that how participation in this meeting led to more business for them.

Ngwe has been with the Air Force Research Laboratory Information Directorate, Rome, NY, USA, since 2012. She is currently serving as a Technical Lead of the AFRL's Terahertz Communications Portfolio.











DEFENSE ACCELERATOR

Helping Upstate Science + Technology Leaders + Entrepreneurs

18
Applicants

5 Teams 25 Mentors

12
Workshops

49
Practiced Pitches

6 Judges

\$300k

Awarded ■







nationalgrid













CRADA's



(Cooperative Research and Development Agreements)



THERMOAI

AFWERX SBIR RI CRADA



HACK-A-SAT 3

A Global Cybersecurity Challenge Competition

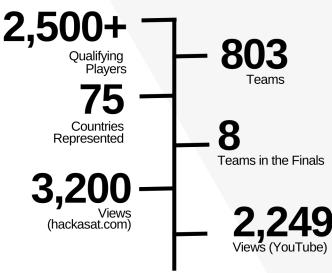
Learn Space Faster



There are many benefits to [Hack-A-Sat]. It reminds us of the **importance and the urgency** to bake **in cyber resilience** during the development phase of our space systems

Col. Kenny Decker, Director of Engineering Space Domain Awareness and Combat Power







Moonlighter

The world's 1st hacking sandbox in space.

Host a king-of-the-hill competition on Moonlighter-based digital twin







LEARN MORE ABOUT HACK-A-SAT Visit hackasat.com for, videos, challenges, and more!

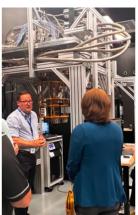


Q41

Quantum Information Science Workshop

A global connectivity initiative to build an open ecosystem of government, academic, and industry collaborations and shape the future of quantum

innovation for the U.S. and its' partners.



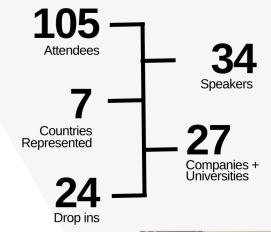














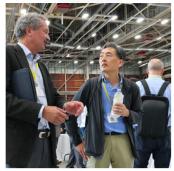






OUR MISSION IS TO EXCITE, ENTICE, AND SPARK YOUR MINDS SO WE CAN **COLLECTIVELY PUSH FORTH INNOVATIVE** IDEAS THAT BUILD A GLOBAL QUANTUM FUTURE. KEYNOTES FEATURE LEADING EXPERTS IN THE FIELD OF QUANTUM INFORMATION SCIENCE.





LEARN MORE ABOUT Q4I

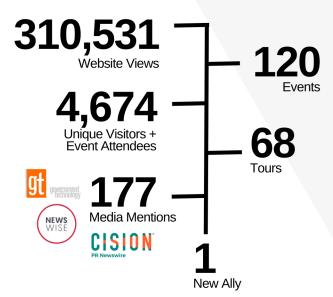




INNOVARE

[INN-OH-VAR-EY] INTO THE NEW

A magnetic global ecosystem accelerating talent and technology.





GOAL 1

89%

Build Rome's runway to the world, engaging a global community of **100 DIVERSE PARTNERS** to introduce game changing capabilities built on Air Force core strengths in AI/ML, Quantum, Cyber, and UAS

RIT

Rochester
Institute of
Technology
is the
FIRST private
university to join
the

Innovare
Alliance at
Griffiss Institute









INNOVARE**ELEVATION**SERIES

The Innovare Elevation Series offers the opportunity to have your voice heard; share your story to include what you are working on, what's in your way, and expand your network.

COFFEE & CONCEPTS - ARMCHAIR DISCUSSIONS - LUNCH & LEARNS

PARTNERS



































SPEAKERS

Dr. Mike Borky

Ms. April Cacciatori

Lt Col Dean Korsak

Ms. Jackie Izzo

Ms. Jaimie Ross Stasio

Ms. Erin Gutierrez Matt

Ms. Laura Wessing

Dr. Kathy-Ann Soderberg

Mr. Kyle Sanders

Mr. Jeff DeMatties

Mr. Brandon Williams

Mr. Zachary Golden

Mr. Jim Wilkes

Mr. John Perretta

Col Benjamin Alvin Drew, Jr.

Mr. Steve DiMeo

Mr. Richard J.R. Raleigh Jr.

Munson Williams Proctor Institute



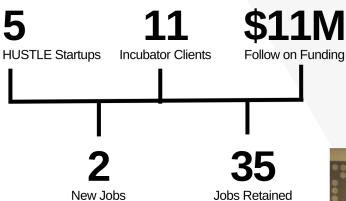
INNOVARE

[INN-OH-VAR-EY] INTO THE NEW

A magnetic global ecosystem accelerating talent and technology.



GOAL 2

















Advance the economy with

100 ENTREPRENEURÍAL

VENTURES and tech

startups



Residents within



Innovare to develop relationships with key stakeholders from participating in events such as the Manufacturer's Association of Central New York (MACNY) Cybersecurity Summit and NYS Innovation Summit, to networking at Coffee & Concepts, supporting HUSTLE, mentoring interns in VICEROY, and spearheading a medical technology IoT Working Group with Innovare's outstanding support

Quanterion was pleased to work alongside

The collaborative
environment has been
essential to the launch of
Quanterion Solutions' Internet
of Things (IoT) Living
Laboratory/Accelerator,
offering a world class
facility for the cutting-edge
Research, Development, Test
and Evaluation (RDT&E)
performed under Innovare
programs.

Development of **technical partnerships and expertise at Innovare** was also a key element in Quanterion Solutions' recent Small Business Innovare Research (SBIR) awards. Quanterion Solutions is performing work under the SBIRs to further research and develop these IoT RDT&E cloud-based ecosystem capabilities that will benefit the DoD tremendously in the future.







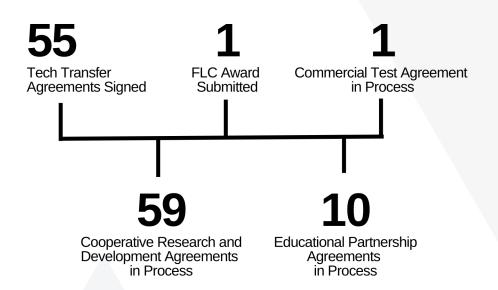
INNOVARE

[INN-OH-VAR-EY] INTO THE NEW

A magnetic global ecosystem accelerating talent and technology.

GOAL 3

ELEVATE by 10% our community's intellectual leadership in AI/ML, Quantum, Cyber, & UAS







Multi-kilometre and multi-gigabit-per-second sub-terahertz communications for wireless backhaul applications

December 2022Nature Electronics 6(2):1-12 DOI:10.1038/s41928-022-00897-6

Authors:

Priyangshu Sen; Northeastern University

Jose V. Siles; Universidad Politécnica de Madrid

Dr. Ngwe Thawdar

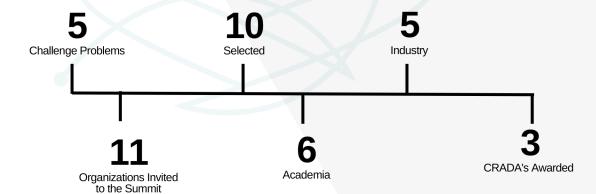
Josep M. Jornet

researchgate.net



ASPIRE

Opportunities to converge diverse capabilities in United States Air Force and United States Space Force strategic priority areas such as artificial intelligence and machine learning, cyber, nanoelectronics, neuromorphic computing, quantum, and UAS; organize and motivate diverse teams to tackle specific technical challenges; and deliver high-impact, performance-ready capabilities that enhance American competitiveness through diversified commercialization pathways.











SELECTED 2022 SUMMIT SUBMITTERS





Trustworthy Networked Autonomy























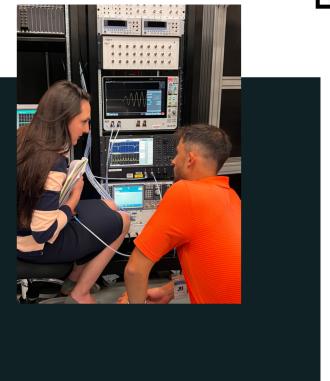


Quantum, Computing & Communications

 10
 11
 9
 9

 Professors
 Fellows
 Interns
 Mentors

 I
 I
 I



Florida International University
Auburn University
Lehman College
The City University of New York
Boise State University
SUNY Polytechnic Institute
Brescia University and Tulane University
Wayne State University
Montana State University-Bozeman
University at Albany SUNY
Villanova University



MENTORS

Dr. Paul Alsing
Dr. Shelton H. Jacinto
Dr. Amos Smith
Dr. Kathy-Anne Soderberg

Ms. Laura Wessing

Dr. Michael Fanto

Dr. Matthew Lahaye

Dr. Dan Campbell

Dr. Ngwe Thawdar





Col. Timothy J. Lawrence Quantum Laboratory

Quantum activity within the Innovare
Advancement Center continues to expand. This
year the Air Force Research Laboratory (AFRL)
Information Directorate Quantum Information
Sciences Branch (RITQ) completed set up of one
of the 2 quantum labs by bringing in equipment
and started to conduct experimentation, while
continuing to populate the other lab space for
further experimentation.

The Griffiss Institute in cooperation with Oneida County, hosted the first-ever field demonstration of Qunnect Inc's Auto Polarization Compensator. The device, whose development was supported through the AFRL Quantum Collider awards, transforms standard telecom fiber into quantum-ready communication channels.



With sponsorship from AFRL Information Directorate STEM program, the GI was able to bring back and sponsor a weeklong STEM camp on quantum computing and quantum communications.

During the week of 15 August 2022, in conjunction with the Quantum Information Sciences Branch (RITQ), Griffiss Institute hosted the Quantum Innovation Camp in the quantum laboratory at the Innovare Advancement Center (IAC). Providing 15 local high school students the opportunity to directly engage with RITQ scientists and engineers to learn about quantum physics and its role in modern technologies.

Over the course of the week, students participated in a wide range of activities including the assembly and operation of lasers and electronic circuits, the construction of cloud chambers for detection of sub-atomic particles, exploration of quantum coding, trapping charged particles with light, and investigation of quantum levitation using superconducting materials.

Additional highlights included laser chess competitions, quantum battleship (a computer game developed by the AFRL Quantum team), liquid nitrogen ice cream, and a physics demo show put on by a physics education expert from Syracuse University.





Computing & Communications

We have established a state-of-the-art laboratory within the first floor of the Innovare Advancement Center to promote Research & Development in communications in frequency bands such as millimeter-wave, sub-terahertz and terahertz. At this state-of-the-art laboratory, a team of AFRL researchers collaborate with academia and industry to develop advanced technologies in architecture, waveform and signal processing that enable access to the emerging spectrum bands for next generation wireless applications. The laboratory also functions as a space for AFRL to showcase government-funded research to the broader commercial and defense communities and to further facilitate partnerships and tech transitions between academia and industry.

Griffiss Institute was instrumental in hosting the first-ever AFRL technology workshop and exchange meeting for terahertz communications. The meeting featured groundbreaking developments from AFRL's Terahertz Communications program through talks, live technology demonstrations and a "show and tell" poster session by AFRL, Northeastern University, Brown University, SUNY University at Albany, SUNY University at Buffalo. The workshop featured many "firsts" in wireless communications —the first-ever live demonstration of intelligent reflecting surfaces (IRS) at >1 THz frequencies, ultra-broadband (4+ GHz) real-time THz band software-defined radio and ground-breaking first-ever demonstration of hierarchical bandwidth modulation scheme with two simultaneous receivers.

The event also **featured an interactive tour of Innovare Advancement Center** as well as invited **talks and a panel discussion** include speakers
from **OUSD R&E**, **Samsung Research America**, **Qualcomm and Nokia Bell Labs**.

The event was attended by 60+ guests from AFOSR, NSF, AFRL, Army C5ISR, NRL, OUSD and it is the first tri-service gathering for the topic of communications at sub-THz and THz frequencies.



On July 14, we hosted the ribbon cutting ceremony to celebrate the completion of Onieda County's Skydome, this is an expansion to the NYS Uncrewed Aerial System (UAS) Federal Aviation Administration (FAA) Test Site also headquartered within the Innovare Advancement Center. New York State is now home to the largest indoor Signal Controlled Environment Chamber for UAS experimentation in the United States, and will provide year-round, indoor testing of advanced drone technologies, including artificial intelligence-based flight controls and autonomous swarms of small drones.

Skydome will support collaborative efforts between the Air Force Research Laboratory Information
Directorate and the New York UAS Test Site, leveraging the region's high tech commercial and academic ecosystem supporting the development of technologies



A \$13 million project created and developed by Oneida County, is funded by \$4 million from the county, and supported by the State through a \$4.5 million grant from the CNY Rising Upstate Revitalization Initiative and \$4.5 million grant from the Mohawk Valley Upstate Revitalization Initiative.

for Small Uncrewed Aircraft Systems to operate safely and securely in the National Air Space. It will also provide an RF-shielded environment where UAS can be tested with GPS simulators and an array of advanced equipment.



At the Griffiss Institute, we're proud to empower innovation and entrepreneurship in the Mohawk Valley. The Skydome launch represents yet another big step forward in developing world-class research and testing capabilities so we can do just that. Autonomous systems that enable safe, secure, and reliable uncrewed vehicle operations hold massive potential to solve our most pressing societal challenges and open transformational economic opportunities for Upstate New York. Skydome will make possible a future in which the sky is no longer the limit.

- Heather Hage, CEO; Griffiss Institute

GRIFFISS

The Innovare Alliance

Together, we elevate the collective's intellectual leadership in technical domains essential for national defense, and positions Upstate startups to grow strong and healthy with an ample supply of skilled talent. We are please to Welcome Rochester Institute of Technology into the Alliance.















faculty, and staff with our fellow scientists, engineers, and entrepreneurs at the Griffiss Institute and AFRL. Working collaboratively, we will continue to address the country's greatest challenges including national security, workforce development and economic competitiveness.

RIT is proud to be the first private

Alliance to better align the talent

university to join the Innovare

and expertise of RIT students,

David C. Munson, Jr., President, RIT

RIT

RIT has demonstrated its commitment to driving outcomes that matter to our community at every level, from students to faculty, administration and leadership. This agreement is an important step to continue a powerful relationship between Upstate New York allies in research translation and commercialization in the interest of national security and economic competitiveness for our region, state, and nation.

Heather Hage, President and CEO, Griffiss Institute

RIT will strengthen our ability to support national defense and to grow the local businesses that contribute to that security. It also furthers the mission of our Innovare Advancement Center to stimulate collaboration and innovation in the areas of artificial intelligence, machine learning, quantum, cyber and uncrewed aerial systems throughout the Upstate New York region.

Oneida County Executive Anthony J. Picente Jr

The research conducted through this collaboration offers and enhances potential advancements to the broader community through this MOU. We rely on academia and students to help us advance exciting, high-risk/high-reward ideas in science and then apply them to more mature technology and advanced development that will promote innovative capabilities for the future of our nation.





2022 ANNUAL REPORT

Any reproduction without expressed Griffiss Institute consent is forbidden.

Mention of any specific commercial products, process or service by trade name, trademark

Mention of any specific commercial products, process, or service by trade name, trademark, manufacturer, or otherwise does not necessarily constitute or imply its endorsement, recommendation, or favoring by Griffiss Institute or Innovare.