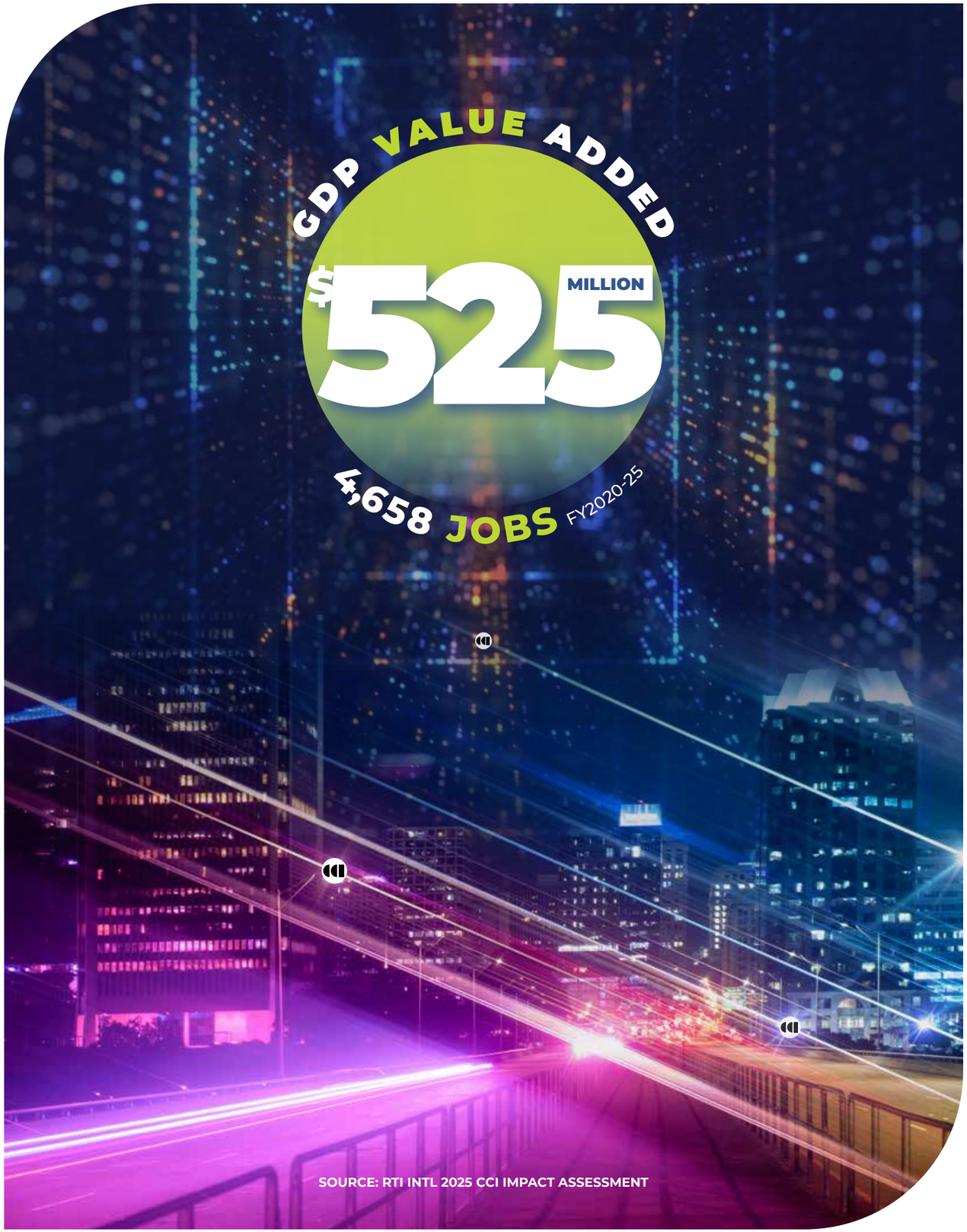
Advancing people and technology for a SECURE TOMORROW.



SOURCE: RTI INTL 2025 CCI IMPACT ASSESSMENT

The **COMMONWEALTH CYBER INITIATIVE** (CCI) is an unprecedented and bold investment by the Commonwealth of Virginia. It brings together **47 institutions of higher education with a shared mission of WORKFORCE DEVELOPMENT, INNOVATION, and RESEARCH in cybersecurity**.

Our researchers, students, and innovators are securing our infrastructure and supply chains, as well as critical technologies like artificial intelligence and mobile networks. Virginia is well positioned to do so: we are a recognized leader in cybersecurity, with **four times more cyber professionals per capita** than the national average, surpassing states like California and New York. This strength makes the commonwealth a **magnet for venture capital investment and federal spending**.

Our results speak for themselves. An independent economic impact study conducted by RTI International revealed that, from 2020 to 2025, CCI was responsible for the creation of **4,658 JOBS**, corresponding to **$370 MILLION in LABOR INCOME** and contributing **OVER HALF A BILLION dollars to the GDP OF VIRGINIA**.

In cybersecurity, fostering talent is everything. CCI workforce development programs connect Virginia students and professionals to employers through real-world projects. In the 2025 fiscal year, almost five thousand students participated in CCI's experiential learning and career preparedness programs, helping them get the skills needed to land top cybersecurity jobs.

CCI has incubated and **launched 12 new spinouts**, founded by our students and faculty. We have also closely collaborated with more than **110 cybersecurity startups** in Virginia, placing our students in internships, partnering in research projects, and contributing intellectual property to accelerate innovation.

To support all this work, our researchers have brought **$384 MILLION in new cybersecurity research funding** from federal and private sector sources. About 30% of those funds come from industry, illustrating the direct value that our research brings to new products and services.

Cybersecurity will remain a growth area for years to come, and CCI will continue to lead the way by building a safer, more innovative future for Virginia and beyond.

Warm regards,

Luiz DaSilva
CCI Executive Director
Bradley Professor of Cybersecurity
Virginia Tech

CCI Network

our vision: To establish Virginia as a global center of excellence in cybersecurity research and serve as a catalyst for the commonwealth's economic diversification and long-term leadership in this sector.

our mission: To serve as an engine for research, workforce development, and innovation at the intersection of cybersecurity, autonomous systems, and intelligence.

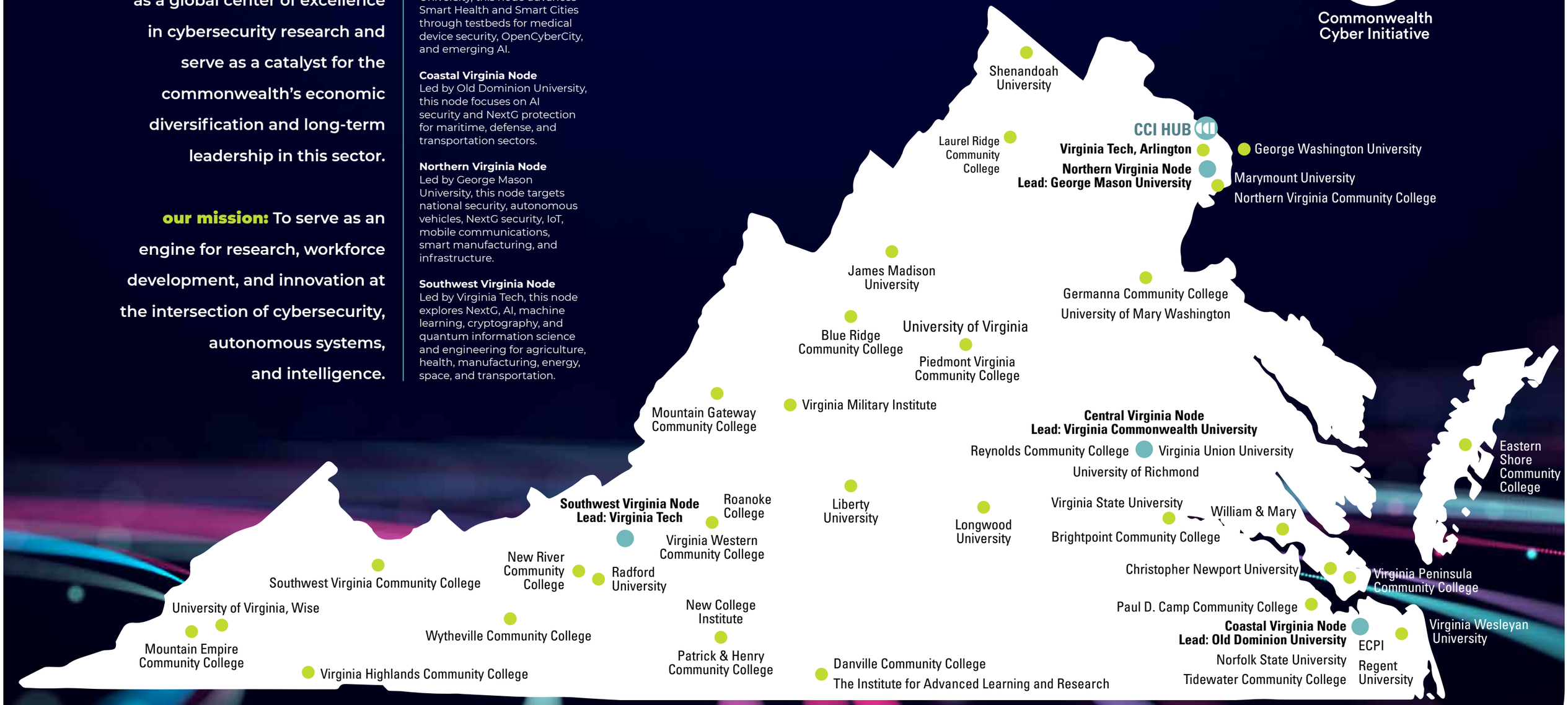
Central Virginia Node
Led by Virginia Commonwealth University, this node advances Smart Health and Smart Cities through testbeds for medical device security, OpenCyberCity, and emerging AI.

Coastal Virginia Node
Led by Old Dominion University, this node focuses on AI security and NextG protection for maritime, defense, and transportation sectors.

Northern Virginia Node
Led by George Mason University, this node targets national security, autonomous vehicles, NextG security, IoT, mobile communications, smart manufacturing, and infrastructure.

Southwest Virginia Node
Led by Virginia Tech, this node explores NextG, AI, machine learning, cryptography, and quantum information science and engineering for agriculture, health, manufacturing, energy, space, and transportation.

Commonwealth Cyber Initiative



ENABLING LEGISLATION, 2018 Special Session 1, Budget Bill HB5002 Chapter 2, Item 252, Paragraph B.1 • "The Commonwealth Cyber Initiative shall be established to serve as an engine for research, innovation, and commercialization of cybersecurity technologies, and address the Commonwealth's need for growth of advanced and professional degrees within the cyber workforce."

Building Virginia's Cybersecurity Future

Preparing the next generation of cybersecurity professionals is a cornerstone of our mission. With 112,411 people working in cybersecurity, Virginia is second only to California's cybersecurity workforce numbers. There's a consistent demand by Virginia employers for qualified cyber professionals.

In FY25, we **trained 4,838 Virginia students** to prepare for a career in cybersecurity. CCI's workforce programs **prioritize experiential learning**. We connect students and future employers through such programs as project-based learning, cyber career clinics, security clearance preparedness, competitions, internships, and more.

Our deep reach into Virginia's cybersecurity community puts students right where they want to be—working alongside top professionals in the field. Students are helping solve crucial challenges facing our privacy and data security and putting their classroom lessons to the test.

This hands-on approach:

- Bridges the cybersecurity talent gap
- Increases retention in the cybersecurity field and within Virginia
- Positions students for success in their first jobs upon graduation

REAL PROJECTS. REAL IMPACT.

Real-World Cyber Experience for CCI Students

GuidePoint Security partnered with CCI to give students hands-on experience tackling real cybersecurity challenges. Their work has already made an impact: *"These students deliver high-impact work—like creating a SOC-in-a-Box automation our engineers use every day,"* says Kevin Woods, director of GuidePoint University. Some interns stood out so much they were invited to stay on, helping GuidePoint innovate while developing exceptional cyber talent.

REAL PROJECTS. REAL IMPACT.

Preparing Students for Their First Tech Careers

CCI's Project-Based Learning Program helped Virginia Tech computer science major Yasemin Tanyu turn classroom knowledge into career-ready skills. Graduating in May 2026, she's headed to Appian as a software engineer—crediting both her hard work and the hands-on grounding she gained through CCI. ***"CCI gave me real-world experience—working with industry experts at Microsoft and students from different majors taught me how collaboration drives innovation,"*** **she says.** ***"Applying classroom concepts to real projects showed me why security and ethics matter at every step of software development. That's a lesson I'll take into my career."***

CCI's High-Demand Workforce

Programs include:

- The **Cyber Startups Internship Program:** Our paid internship program gives Virginia public university students a chance to work with local cybersecurity startups—and learn what it takes to become an entrepreneur. Since 2021, 220 students have worked at 120 startups. The best part: 100 of them landed a job or another internship.
- **CCI xG Testbed:** CCI grad students are driving next-gen wireless networks with cutting-edge tech and industry partnerships—making them top picks for employers.
- **CCI Project-Based Learning Program:** Pairs students with top employers to tackle real cybersecurity challenges—think security operations centers, vulnerability testing, and more. Since 2023, companies like CACI, GuidePoint Security, LMI, Microsoft, and PBS have teamed up with dozens of students to turn classroom skills into career opportunities.
- **INNOVATE Cyber Challenge:** Students develop the top skills employers seek in cybersecurity—innovation, creativity, and critical thinking.
- **Cyber Fusion:** Brings Virginia's top students together to compete and connect with employers at this premier job fair and capture-the-flag event.
- **Virginia State Police Internship:** Year-long digital forensics experience, sometimes supporting active investigations.
- **Cyber Navigator Internship:** Students help secure local election offices in partnership with colleges, the State Board of Elections, and industry.
- **Cyber Clinics:** 41 students have delivered cybersecurity services to local small businesses and local government.
- **Virginia Cybersecurity Students** (VCyS): The first statewide student organization, supported by CCI.
- **Clearance Preparedness:** Students learn what it takes to receive a security clearance and the opportunities one provides.
- And more! ■

innovation

Building Virginia's Cybersecurity Future

Fueling Cyber Innovation

FY2020-25

12 Spinouts Launched — new cybersecurity companies founded

419 Cutting Edge Patents — fueling innovation in cybersecurity

In talent-rich Virginia, CCI connects top cybersecurity researchers, industry, and investors to address tomorrow's cyber challenges. CCI's innovation programs accelerate the commercialization and market adoption of cutting-edge cybersecurity technologies.

Our innovation programs are helping faculty and startups take cyber innovations to market. From mentors and expert guidance to funding and best practices, we give companies the footing they need to succeed. CCI's Cyber Startups Internship Program also is launching the next generation of entrepreneurs by giving students experience working at a startup.

Founded by CCI faculty and students, **12 SPINOUTS** have launched right here in Virginia. These companies are delivering cutting-edge cybersecurity products and services that make a real impact.

110

STARTUPS supported

We help ideas grow from the ground up by supporting early-stage ideation, prototyping, and business model development. And we don't stop there. **110 VIRGINIA STARTUPS** have partnered with CCI programs since 2021, gaining access to student interns through subsidized stipends and joining federally funded research projects.

Our researcher community is fueling Virginia's leadership in cybersecurity innovation with **419 PATENTS** (FY2020–25). That's a powerful engine for progress.

Companies in our incubator and accelerator programs have **raised $23.5 MILLION in venture deals and SBIR/STTR awards** since 2021. In fact, cybersecurity innovation accounted for 50% of Virginia's SBIR/STTR awards in 2024, totaling **$133 MILLION**.

CCI is helping ideas become breakthroughs—and where Virginia continues to lead the way in cybersecurity.

IDEAS INTO IMPACT

Empowering Cybersecurity Innovation

CCI supports cybersecurity startups at the most critical early stages by providing the resources, expertise, and connections needed to turn ideas into market-ready solutions. Fend Inc. is a prime example—a pioneering data pipeline and cybersecurity company that leveraged CCI's support to accelerate its growth. • *"CCI gave us just what we needed as we were growing,"* said Colin Dunn, founder of Fend. *"An intern, R&D funding, and expert advice from experienced faculty gave us the boost we needed to help bring our idea into the marketplace. People and expertise can make all the difference."* • Fend's success speaks for itself. In 2024, the company was acquired by OPSWAT, a global leader in critical infrastructure protection.

IDEAS INTO IMPACT

Turning Cyber Intelligence Into Action

Funded through ASCEND in 2025 and winner of a pitch event, **Glacier21** is tackling illicit cryptocurrency activity by analyzing data from social media, leaks, and the dark web. Led by former FBI agent **Ren McEachern** and supported by George Mason University's **Foteini Baldimsti**, the team overcame technical challenges while sharpening their customer-focused execution. *"ASCEND helped us move faster, smarter, and with the right networks in place,"* says McEachern, underscoring how the program opened doors that transformed Glacier21's approach. Baldimsti calls the experience *"incredibly valuable,"* sparking her own interest in entrepreneurship.

Incubating and accelerating innovation

At CCI, we're turning big ideas into real-world solutions. Our regional and statewide programs help researchers and startups start to move their technologies from concept to market. It's a hands-on experience that gives them the tools they need to succeed—everything from pitching to investors to connecting with industry leaders.

Programs often start local and scale statewide. For example, CCI's Incubator and Accelerator launched at the Northern Virginia Node in 2022 and, with support from the CCI Hub, has grown to serve the entire state.

The program, which has worked with 34 teams and their technologies, offers two powerful tracks:

- **CATAPULT Fund** – Designed for teams from Virginia's public research universities
- **ASCEND Fund** – Created for startup teams working alongside faculty experts (added in 2025)

CCI isn't just accelerating technology: it's building a community where ideas thrive and innovators grow. ■

By uniting academia, industry, and entrepreneurs, CCI is shaping the future of secure and intelligent systems worldwide.

CCI INNOVATION FLOWCHART

	Ideation	Formation/ Feasibility	Validation/ Launch	Growth	Maturity/ Exit
Maturity Stage					
Startup Stage	PRE-SEED Concepts, Ideas	SEED MVP, Prototypes	SERIES A Production-Market Fit	SERIES B+ Working at Scale	PUBLIC/EXIT Diverse Revenue Streams
Funding Level	$50K	$10K-$3M	$2M-15M	$30M	$50M+
Virginia Funding Sources	▪ **CCI Programs:** ◦ CATAPULT (CCI+A, ASCEND) ◦ SWVA Ideation Commericialization ◦ Innovate Cyber Challenge ◦ COVA Cyber Clinic ▪ VA Venture Partners ▪ SBIR/STTR	▪ **CCI Programs** ▪ VA Venture Partners ▪ SBIR/STTR ▪ CCF ▪ VA Founders ▪ Fund	▪ **CCI Programs** ▪ VA Venture Partners	▪ Private Sector Funding (VCs) ▪ VA Venture Partners	▪ Private Sector Funding (VCs)

research

EXTERNAL FUNDING

$384 MILLION

CCI RESEARCHERS SECURED
$384 MILLION IN EXTERNAL FUNDING
FOR CYBERSECURITY RESEARCH FROM
FEDERAL AND INDUSTRY SOURCES, FY20–25.

Safeguarding Privacy, Connectivity, and Data

Research is our foundation, fueling ideas, talent, and innovation. We start small by funding seed grants. Researchers use these grants to test ideas and technology, applying what they learn to win large national grants.

Over the past six years, CCI researchers have brought **$384 MILLION IN EXTERNAL FUNDING** to Virginia. Cybersecurity activity at CCI universities is growing at **8% annually, outpacing the national rate** of 5.2%.

We're investing in such crucial areas as securing artificial intelligence, wireless networks, and critical infrastructure.

Advancing AI for Cybersecurity

We awarded 18 seed grants totaling **$1.61 MILLION** to nine Virginia public universities in 2024 to tackle cybersecurity challenges in artificial intelligence. Funded projects explore how AI can strengthen networks, expose new vulnerabilities, and more.

Researchers are securing iris biometrics with generative AI, detecting software flaws with large language models, and applying privacy-preserving learning for public health.

AI helps stop fraud and system attacks, but it also creates new risks. Cybercriminals exploit AI through data poisoning, ransomware, phishing, and jailbreak attacks on language models. CCI is leading efforts to make AI safer and more resilient.

CCI builds a global network of partners tackling cybersecurity challenges through collaboration and shared expertise.

Global Partnerships for Cyber Resilience

Securing Tomorrow, Together

Cybersecurity challenges are global—and so are our solutions. Through strategic collaborations across Europe and Asia, we advance research that strengthens digital resilience. Our teams, supported by the National Science Foundation and European agencies such as **Research Ireland, Northern Ireland's Department for the Economy, and Finland's Research Council**, are building secure communication networks. In Japan, partnerships with leading companies fund blockchain-based solutions for financial security, while a government agency explores adopting our collaborative model to enhance its national cybersecurity ecosystem.

We convene global experts to shape the future of security. Recent events include a joint forum with **KU Leuven in Belgium**, bringing together 60 specialists from 35 institutions in 10 countries, and "Northern Lights: Securing the Future through Advanced Connectivity and AI," co-hosted with the Embassy of Finland in Washington, D.C., attracting 100 participants from industry, government, and academia.

Our universities are active members of the International Cybersecurity Center of Excellence (INCS_CoE), driving research, policy, and education worldwide. Students compete in **global Capture the Flag** challenges, and in 2026, our Executive Director is chairing the INCS_CoE board—underscoring our leadership in shaping international cybersecurity standards.

Together, we build a safer digital future.

By working globally, CCI is

- Building relationships between top international universities and industry cybersecurity research partners, and the U.S.
- Advancing key cybersecurity research areas that benefit from international collaboration
- Identifying opportunities for joint funding
- Identifying opportunities for faculty and student exchanges
- Increasing awareness of cybersecurity research led by Virginia on the international stage

SEED. SUPPORT. SUCCEED.

Seed Grants Spark Big Wins

CCI seed grants give Virginia researchers early support to pursue bold ideas that grow into major initiatives, strengthening cybersecurity and expanding innovation across the state. Recent successes include a $900,000 National Science Foundation award for AI research at the University of Virginia and a $2.3 MILLION grant awarded to Old Dominion University to advance cyber defense and training environments—both launched through CCI-funded research. As Wajih Ul Hassan, assistant professor of computer science at UVA, explains, *"The CCI seed grants provided crucial early support for exploring bold ideas... These initial experiments validated both the feasibility and scalability of our approach,"* helping establish a strong foundation that led to NSF funding.

Where Infrastructure Meets Cyber Innovation

Protecting Critical Services

We rely on water flowing from the tap and lights turning on with a flip of a switch. **A cyberattack can disrupt these essentials and even threaten lives.**

CCI's Critical Infrastructure Cybersecurity Program is funding researchers who are addressing vulnerabilities across sectors such as energy, healthcare, transportation, water systems, manufacturing, and more. More than 80 percent of U.S. critical infrastructure is privately owned, and in rural areas, small cooperatives often provide vital services. The need is real—and we are acting now.

This program builds on Virginia's deep expertise. These seed grants will pave the way for larger initiatives and research centers that strengthen security across the state and nation.

Developing Next-Generation Research Platforms

CCI testbeds across Virginia are helping integrate cybersecurity into critical industries. CCI researchers use these testbeds to develop secure wireless networks, medical devices, manufacturing systems, smart cities, water systems, energy infrastructure, rural connectivity, and more.

One of the largest of its kind in the nation, the **CCI xG Testbed advances wireless network security with indoor and outdoor components**. It includes more than 70 software-defined radio nodes at the Virginia Tech Research Center in Arlington and a 1.5-mile outdoor extension along Stroubles Creek at Virginia Tech's Blacksburg campus.

Industry partners include **Verizon**, **AT&T, Samsung**, **Interdigital**, **Lockheed Martin**, and **Northrop Grumman**. CCI plays a key role in a **$42 MILLION** project with AT&T and Verizon that uses the xG Testbed. CCI also serves as an Open Testing and Integration Center, providing end-to-end testing for radio access network interoperability, conformance, and performance in both lab and field environments for **open radio access networks**. It is one of the few such centers in the United States.

As our lives become increasingly connected through mobile devices, securing communications against eavesdropping, data breaches, denial of service, and ransomware is critical. Wireless networks are evolving beyond smartphones to support robots, autonomous vehicles, industrial automation, and augmented and virtual reality. The xG Testbed is helping ensure these networks remain secure as technology advances.

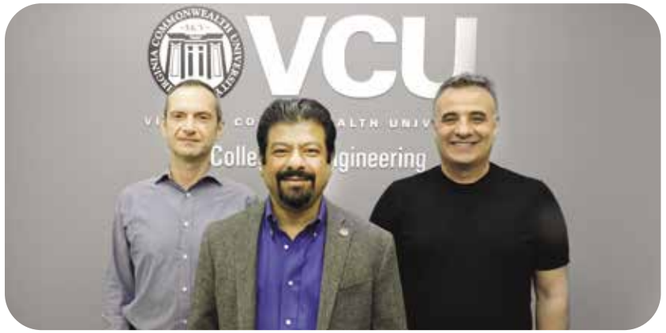
Working with Industry Leaders

WISPER » The **Center for Wireless Innovation towards Secure, Pervasive, Efficient and Resilient Next Generation Networks** (WISPER) is a new **Industry-University Cooperative Research Center** (IUCRC) co-funded by the **National Science Foundation** (NSF) and industry. WISPER focuses on developing secure 6G technologies, with industry-leading in funding and project selection.

- **13 industry members**
- **$1 MILLION annual funding**
- Led by the **CCI Executive Director** and involving **Virginia Tech**, **George Mason University**, and the **University of Arizona**

ACCoRD » A major industry collaboration, **ACCoRD**, is funded by the **National Telecommunications and Information Administration** (NTIA) and led by **AT&T** and **Verizon**. Key portions of this **$42 MILLION research and testing project** are conducted in the **CCI xG Testbed**.

Cyber SMART » CCI and Virginia Tech joined **Cyber SMART**, another IUCRC focused on multidisciplinary cybersecurity solutions. CCI Southwest Virginia Node Director **Gretchen Matthews** (center) serves as site director at Virginia Tech for Cyber SMART, which stands for **Science**, **Management**, **Applications**, **Regulation**, and **Training**.



Convergence Lab Initiative » In FY25, **Virginia Commonwealth University** received the final disbursement of a **$17.8 MILLION** project funded by the **U.S. Department of Defense**. This initiative supports a unique industry-academia partnership for industry-specific training and hands-on research for graduate and undergraduate students. Launched by CCI Central Virginia Node Director **Erdem Topsakal** (right), pictured with fellow VCU researchers **Ümit Özgür** and **Nibir K. Dhar**.

Engaging the Public

CyberArts Program

Cybersecurity threats affect everyone. CCI engages with the broader public to inform and demystify issues such as cyberattacks, privacy, data stewardship, and the growing role of artificial intelligence.

Cyber Meets Creativity

Our unique CyberArts initiative brings together experts in cybersecurity and the creative arts to reimagine and depict cybersecurity research for scientific and artistic purposes. The resulting exhibits, displayed at the Torpedo Factory Art Center in Alexandria (Oct 2024–Jan 2025), reached 170,000 visitors.

Visitor Impact

A Virginia high school teacher wrote:
"As a high school teacher, I'm really excited to encourage my students to visit this exhibit. I'm hoping that it will make them excited to potentially study CS [computer science] not just for the 'lucrative' job, but to be a part of something special, creative, and to have the chance to make work that is touching, inspiring, and thought-provoking."