Dec. 2025

GEORGIA PATHWAYS

MAGAZINE

New AI Supercomputers

LUX DISCOVERY

CognitoSymbiosis

South College / ATL / Marietta

The STEM of Basketball

Stronger Minds, Stronger Schools

The Technology Association of Georgia Education Collaborative (TAG-Ed) strengthens the future workforce by providing students with relevant, hands-on STEM learning opportunities and connecting them to Technology Association of Georgia (TAG) resources.

Formerly the TAG Foundation, TAG-Ed is a 501(C)(3) non-profit organization formed by TAG in 2002. Later, the organization's name was re-branded to TAG Education Collaborative to facilitate our role as the leaders for K-12 STEM education in Georgia.

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Welcome to the December 2025 edition of Georgia Pathways Magazine, highlighting the people, ideas, and technologies driving Georgia's innovation economy.

In this month's issue, we explore the technological breakthroughs that are strengthening Georgia's ability to lead as an innovator on the world stage. We begin with "South College Nursing Programs," which highlights South College's mission to expand access to medical education programs and the technology driving advancements in the field.

Then, we turn to "Cognito Symbiosis," which examines the relationship between our minds and the AI tools we use, and how this partnership positions us to confront humanity's greatest challenges. Learn about the Department of Energy's investment into supercomputing, aimed at accelerating scientific research and addressing environmental challenges, in "New AI Supercomputers."

Next, we'll learn about the important role of social and emotional learning in supporting our students in "Stronger Minds and Schools." Finally, diving into the exhilarating world of sports, "STEM in Basketball" teaches us about the growing role of science and technology in the games we love.

As Georgia's technology ecosystem continues to grow, so do the opportunities to connect and invest in our future workforce.

TAG
Technology Association of Georgia

That's why TAG Education Collaborative (TAG-ed) is proud to continue expanding its partnership with IBM SkillsBuild. This global initiative provides learners with no-cost access to in-demand tech skills. Through this program, educators, students, veterans, and career-seekers alike can gain industry-aligned training in cybersecurity, data analytics, cloud computing, and more.

With a new cohort beginning January 9th, TAG-Ed and IBM SkillsBuild remain committed to opening doors and career pathways for our Georgia community and beyond. Together, we are strengthening an inclusive talent pipeline that empowers communities and fuels long-term innovation. Learn more about TAG-Ed's no-cost IBM SkillsBuild Certificate Program at https://tagedonline.org/ibm-skillshare-certificates/

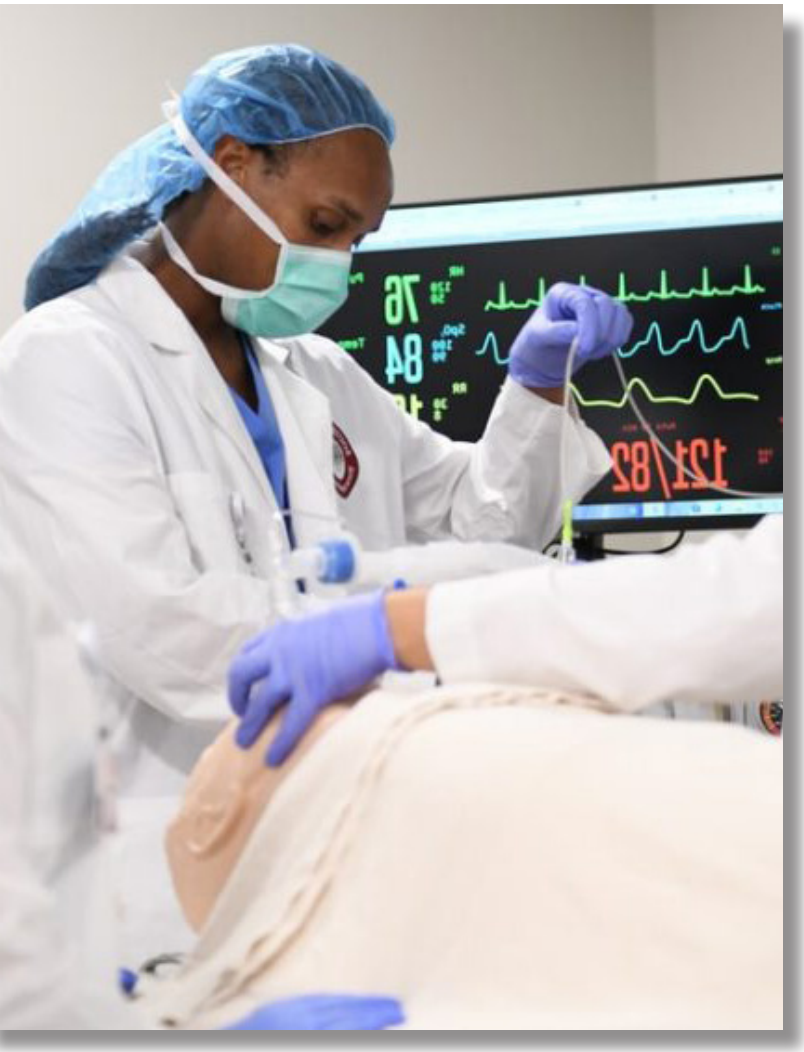
Larry K. Williams
President
TAG / TAG-Ed

Larry K. Williams serves as the President and CEO of the TAG and the TAG Education Collaborative. TAG-Ed's mission is to strengthen Georgia's future workforce by providing students with relevant, hands-on STEM learning opportunities by connecting Technology Association of Georgia (TAG) resources with leading STEM education initiatives.

South College surpasses 20,000 students
amidst unprecedented growth adding Atlanta & Marietta

By Catherine Howell

South College has reached a milestone of 20,000 enrolled students across the higher education institution's national footprint, which now includes 10 physical campuses as well as online learning and competency-based education (CBE).



The institution recently opened new campuses in **Atlanta and Marietta**, Georgia, to help meet growing demand. Its footprint now includes physical campuses in Knoxville and Nashville, Tennessee; Asheville, North Carolina; Atlanta and Marietta, Georgia; Indianapolis, Indiana; Pittsburgh, Pennsylvania, Dallas, Texas; and Orlando, Florida, along with online learning and CBE.

"We've seen substantial growth as more students across the nation seek to advance their professional skills and opportunities," South College Chancellor Steve South said. "This milestone is a significant accomplishment and reflects the dedication of our faculty and staff at every campus, our students who put their trust in us and our graduates who are giving back to communities all over the country."

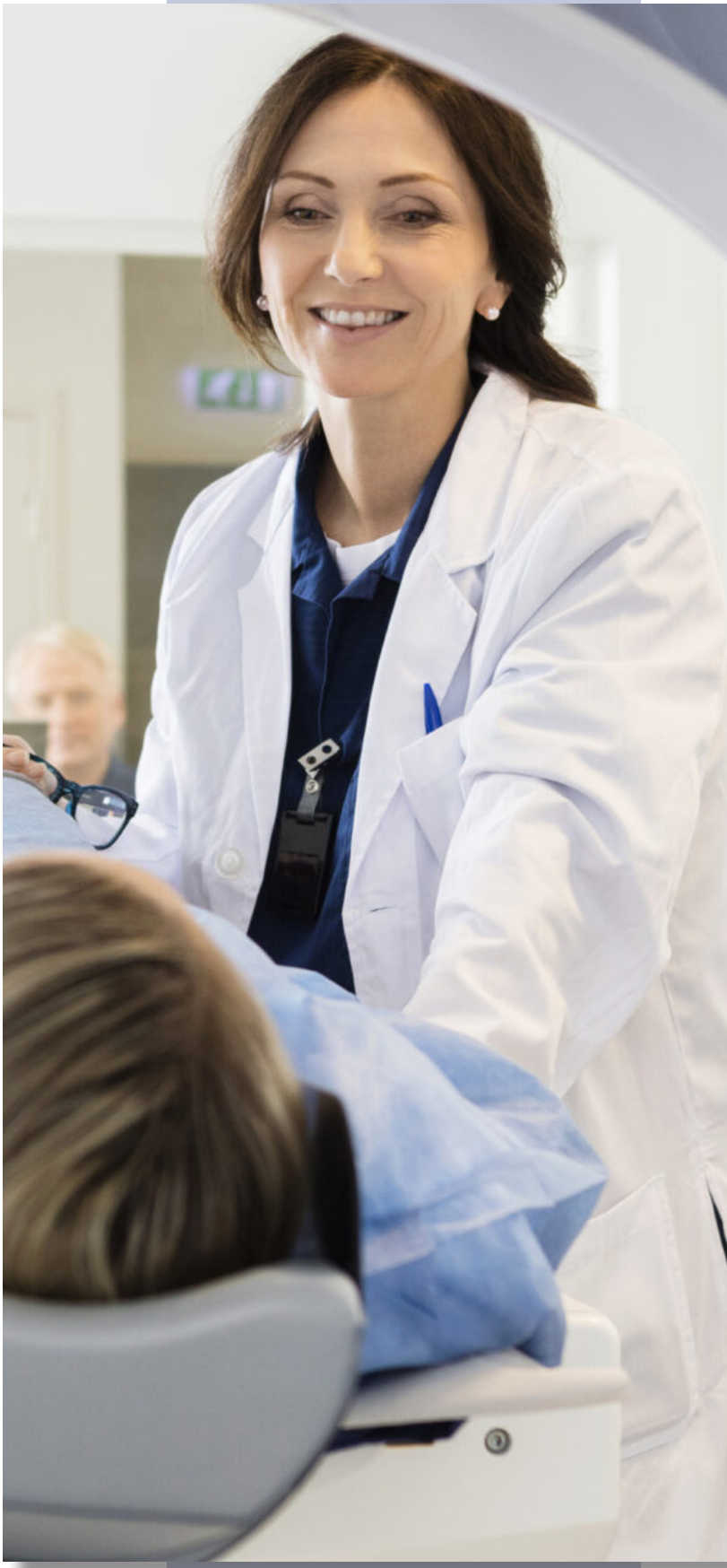
Every medical field is a STEM career, so finely tuned STEM skills and a broader awareness of STEM is a critical asset to Georgia economics and career placement for those seekin their new career in medecine.

The fastest growing demand in the job market is for nursing graduates, and nursing programs are available at all 10 campuses, plus online and through CBE.

However, the South College network offers more than 100 programs across multiple academic disciplines and at a range of levels including professional certificates and associate, bachelor's, master's, educational specialist and doctoral degree programs.

Areas of study include business, criminal justice education, dental hygiene/assisting, diagnostic medical sonography, nursing, occupational therapy, paralegal studies, physical therapy, radiography, respiratory therapy, physician assistant studies, pharmacy and surgical technology.

To help serve the growing programs and student body, the number of South College employees now exceeds 3,000 across the country.



"Our mission at South College has always been to offer academic programs that will both help fulfill a student's goals for their professional future and meet the needs of employers who are seeking well-educated and highly qualified candidates for the workforce," South said. "While we celebrate the milestone, it also reminds us to keep striving to be a leader in higher education and prepare for opportunities and challenges still to come."

South College also has launched the LIVE From South College podcast that is hosted by Chief Marketing Officer Kathleen Stockham and includes special features; detailed looks at academic programs; information for students and interviews with faculty and staff; and "Live on Location" spots at all campuses.

The podcast can be found at south.edu/live-from-south-college as well as on Spotify, iHeartPodcasts, Apple Podcasts and many more services. To learn more about South College, visit:

https://www.south.edu/location/atlanta

https://www.south.edu/location/marietta

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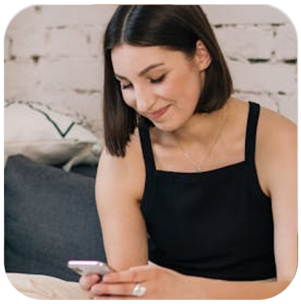

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CognitoSymbiosis:

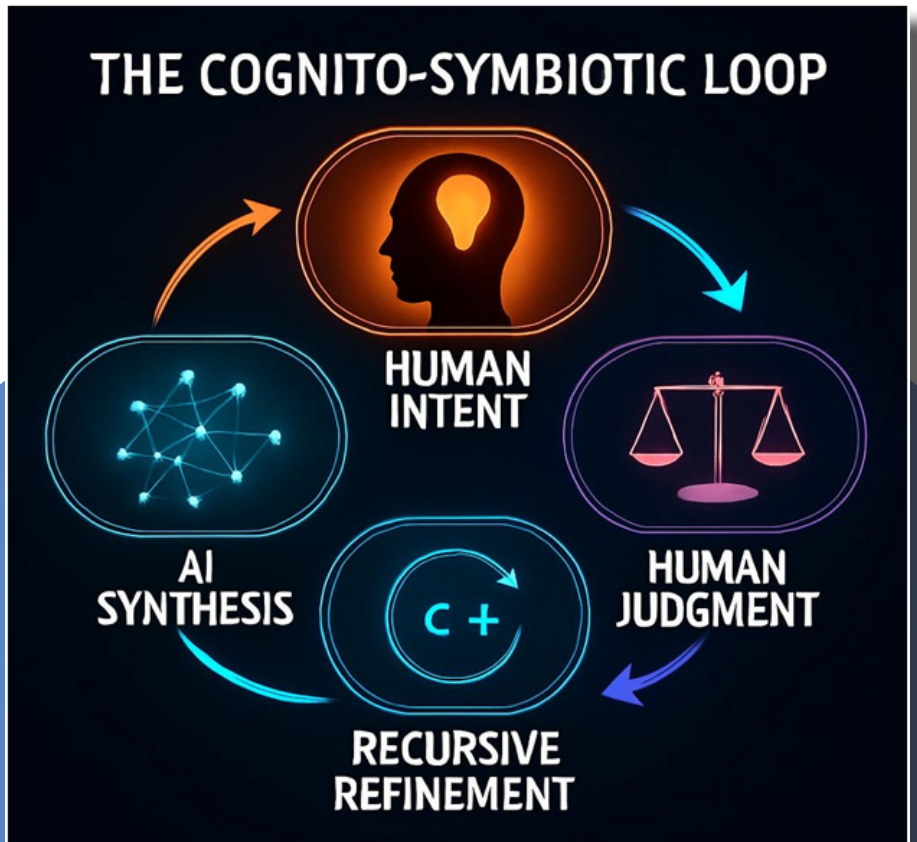
The Next Paradigm in STEM Problem-Solving

By Gene Levinson

We stand at the edge of a new frontier, not of space, but of mind. For generations, our progress in science, technology, engineering, and mathematics has been a testament to human ingenuity, powered by tools that extended our physical reach—the microscope, the telescope, the computer.

But we now face a class of problems that defy these tools and our innate cognitive capacities. Climate change, personalized medicine, quantum system modeling—these "wicked problems" are characterized by such immense scale and complexity that they possess a gyroscopic inertia, resisting solutions from any single discipline, institution, or even nation.

We have reached a cognitive ceiling. The next great leap will not be through a better tool, but through a new kind of partnership. I call this partnership CognitoSymbiosis: the intentional merging of human intelligence with artificial intelligence to form a new, emergent cognitive whole that is greater than the sum of its parts.



From Calculator to Colleague

To understand this shift, consider the evolution of our relationship with computational power. We moved from the abacus, a simple counting frame, to the calculator, a device that could execute functions. Then came the computer, a machine we programmed to perform complex tasks. In each case, the relationship was hierarchical: human to tool.

CognitoSymbiosis is different. It is not about command and control; it is about collaboration and co-creation. The AI is not a sharper pencil; it is a partner that offers a complementary form of intelligence. It brings the ability to process vast datasets, recognize deeply hidden patterns, and generate thousands of potential solutions at lightning speed. We bring the intent, the ethical framing, the intuition, and the crucial ability to ask the right question.

This partnership operates on a recursive loop: the human provides strategic direction and defines the problem's ethical constraints; the AI generates possibilities, models outcomes, and exposes hidden variables; the human then exercises judgment, interprets the output within a real-world context, and guides the next, more refined iteration.

This is not a linear process but a dynamic dialogue, where the final solution is an emergent property of the interaction itself. This is not science fiction. It is a practical methodology being applied today.

Confronting Our Own Inertia

The true test of CognitoSymbiosis is not just solving technical puzzles, but confronting the deeply human barriers

to progress. Take the paramount example of climate change. The problem is not merely a technological one of replacing fossil fuels; it is a deeply human one.

We are wired to respond to immediate, visible threats. We falter when faced with slow-moving, non-linear crises whose worst consequences feel distant. We are addicted to the creature comforts of a carbon-based economy and face enormous political, tribal, and economic barriers to changing entrenched systems. How can AI help us see problems of our own making with clear, yet empathetic, vision?

This is where the partnership moves from calculation to cognition. AI can model not just climate systems, but human systems. It can simulate the second- and third-order effects of policy decisions, predict societal pushback, and identify the most effective messaging to bridge ideological divides. It can help us overcome our own cognitive biases by providing a data-driven mirror to our blind spots.

Furthermore, CognitoSymbiosis can directly accelerate the technical solutions. Imagine AI partners helping scientists design novel materials for carbon capture or optimize next-generation fusion reactors. But this leads to an even thornier question: if such technology becomes feasible, how do we implement it?

How do we "sell" a massive, government-funded carbon capture project—a public good with a staggering cost and no traditional profit incentive—to a society governed by capitalist structures?

The Ultimate Symbiosis

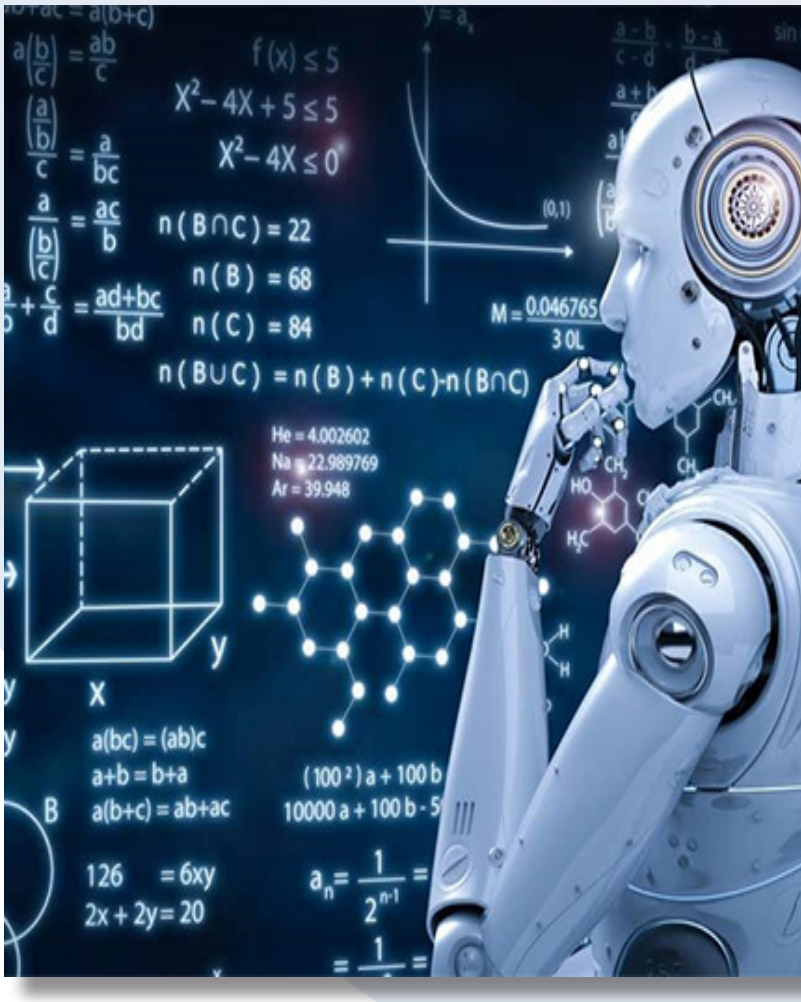
The AI can run thousands of economic models, exploring hybrid public-private partnerships, new forms of incentivization, and global cost-sharing agreements that would be impossible for a human team to conceptualize in a lifetime. It doesn't make the political will happen, but it can provide the actionable pathways and compelling data visualizations that make it easier for leaders to act and for communities to buy in.

Solving Humanity's Most Wicked Problems

Consider a near-future project to revitalize a drought-stricken agricultural region. A Cognito-Symbiotic team wouldn't just design a more efficient irrigation system. The AI would first synthesize decades of climatological, soil, and economic data to model the long-term viability of current crops.

It would then generate a portfolio of alternative crops and agro-economic strategies, each with projected outcomes. Human experts—farmers, ecologists, economists—would then apply their nuanced understanding of the community's needs, cultural preferences, and logistical realities to steer the AI's modeling. Together, they would co-create a resilient, adaptive, and socially viable plan that no party could have developed alone.

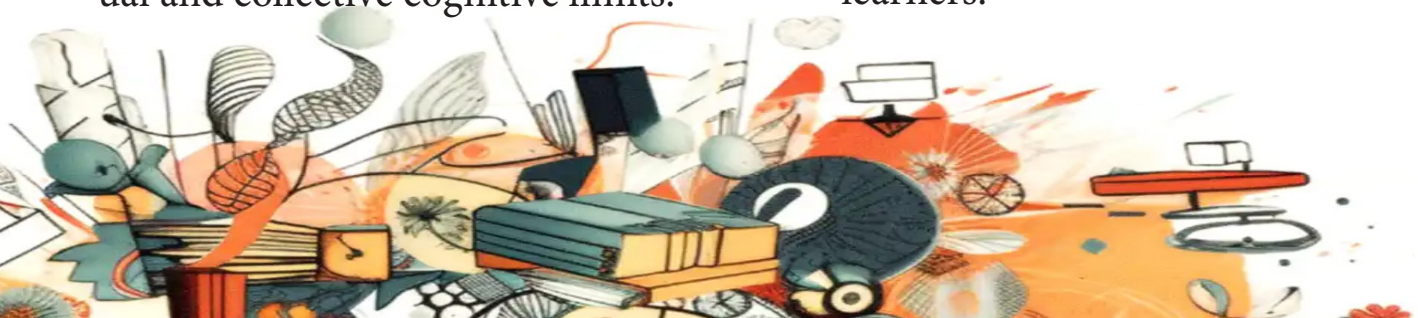
The goal is not for AI to replace human governance, but to give us the cognitive scaffolding to practice governance at the scale and complexity the 21st century demands. It is about using this partnership to finally address problems that have historically exceeded our individual and collective cognitive limits.

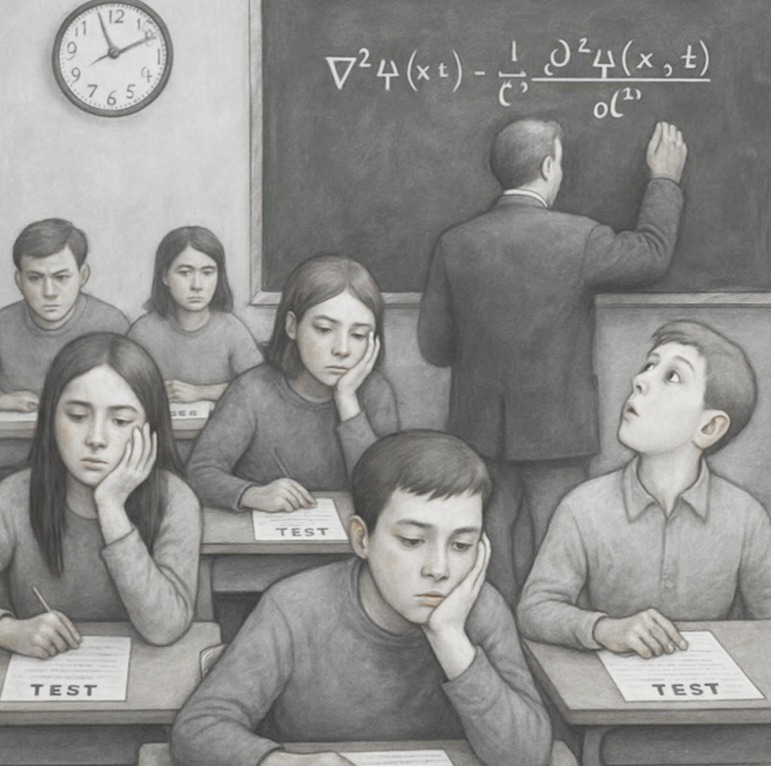


The Cognito-Symbiotic Classroom:

From Conformity to Co-Creation

If we are to solve these wicked problems, we must foster the minds capable of this new kind of thinking. This requires nothing less than a pedagogical revolution, shifting our focus from producing top-tier test-takers to cultivating empowered, curious, and courageous learners.





The role of the teacher evolves from a distributor of information to a role model of intellectual curiosity. They are the guide who demonstrates how to ask profound questions, how to think ethically about technology, and how to collaborate with an AI not as a crutch, but as a partner in discovery. Their goal is to nurture the self-actualized student: the adventurous non-conformist who learns not for a grade, but for the thrill of understanding.

This is where CognitoSymbiosis becomes a practical educational tool. AI can handle the repetitive drilling of fundamentals—freeing up invaluable classroom time for the human work that matters most. Time once spent on rote memorization can now be dedicated to teaching The Art of the Prompt—the meta-cognitive skill of directing AI with clarity and intent. It allows for teaching teamwork over competition, as students learn to work in pods, using AI as a shared resource to tackle complex projects that mirror real-world challenges.

The Hybrid Platform for a New Mindset

The platform for this isn't a solitary student staring at a screen. It's a hybrid, collaborative environment—part digital, part physical. Imagine a classroom where:

1. Students use AI to rapidly prototype and simulate solutions to local environmental problems.

2. The AI serves as a patient, infinite tutor for foundational skills, allowing the teacher to provide targeted, inspirational mentorship.

3. The curriculum values the creative process—the failed experiments, the iterative prompts, the collaborative debate—as much as the final answer.

This is the vision that has always been at the heart of this work. The challenge, as you know, is formidable. Our systems often still teach to the test and reward conformity. But the imperative of our time demands we try. By integrating CognitoSymbiosis into education, we aren't just teaching students how to

use a new tool; we are teaching them how to build a better future. We are giving them the cognitive exoskeleton to become the architects of solutions we ourselves cannot yet fully imagine.

About the author -

Gene Levinson PhD is an expert in both scientific research and technology, with a PhD in Molecular Genetics from the University of California at Irvine and four years of postdoctoral training at Harvard-affiliated biomedical research laboratories, and dozens of peer-reviewed scientific publications.

As a graduate student, he discovered a fundamental mechanism for DNA sequence evolution throughout the biosphere. As a clinical genetics laboratory founder and director, he pioneered the first reliable clinical methods for single-cell preimplantation genetic diagnosis, with zero clinical errors over his eight years as director. He is an award-winning tutor of both Harvard biology undergraduates and gifted and talented students from a leading magnet high school.

He published an award-winning, accessible, comprehensive update describing 21st century advances in molecular, cellular, developmental, and evolutionary biology: “Rethinking Evolution: The Revolution That’s Hiding in Plain Sight” (World Scientific, 2019).

Dr. Levinson has recently turned his attention to the vast creative potential and ethical guardrails for powerful symbiotic cognitive AI-human partnerships.

OAK RIDGE National Laboratory

Article Audio Version

ORNL, AMD and HPE to deliver DOE's newest AI supercomputers: Discovery and Lux

"The next evolution in leadership-class artificial intelligence supercomputing systems"

By Katie L. Bethea / ORNL

Key Points:

- DOE announced the Discovery and Lux supercomputers at ORNL to advance U.S. leadership in artificial intelligence and high-performance computing.
- Discovery and Lux will enable AI-driven research that fuels new advances in energy, manufacturing, medicine and cybersecurity.
- The Lux AI Cluster will be deployed at ORNL in 2026, and Discovery will be delivered in 2028.

The U.S. Department of Energy announced today its newest supercomputers, Discovery and Lux, at Oak Ridge National Laboratory that will expand America's leadership in artificial intelligence for scientific computing, strengthen national security, and drive the next generation of Gold Standard Science and innovation.

"Winning the AI race requires new and creative partnerships that will bring together the brightest minds and industries American technology and science has to offer," said U.S. Secretary of Energy Chris Wright. "That's why the Trump administration is announcing the first example of a new commonsense approach to computing partnerships with Lux. We are also announcing, as part of a competitive procurement process, Discovery. Working with AMD and HPE, we're bringing new capacity online faster

than ever before, turning shared innovation into national strength, and proving that America leads when private-public partners build together."

Discovery and Lux are two powerful computing systems designed to help drive new scientific discoveries using artificial intelligence. Both machines will be powered by AMD and built by HPE. Discovery will be led by HPE and the AMD-led Lux system will leverage Oracle Cloud Infrastructure (OCI) as part of the Lux AI Cluster.

Discovery and Lux will enable researchers to explore innovative AI-centric approaches, supporting a new wave of U.S. technological revolutions in energy, manufacturing, medicine and cybersecurity; advancing national leadership; strengthening prosperity; and improving lives.

"National Labs are perfectly suited to support this unique public private partnership because of our ability to assemble and steward curated data for national priorities that have an inherently federal interest; because of our deep technical expertise in the development and application of AI for science and technology at scale; and because of our demonstrated ability to deploy hardware and software at scale for these missions," said ORNL Director Stephen Streiffer.

Discovery leads the next step in AI supercomputing

ORNL's Discovery system will be based on the new HPE Cray Supercomputing GX5000, a next generation supercomputer built for the AI era, which is powered by a combination of upcoming next generation AMD EPYC™ processors, codenamed "Venice," and AMD Instinct™ MI430X GPUs. The system will be augmented by a new Distributed Asynchronous Object Storage (DAOS)-based HPE Cray Supercomputing Storage Systems K3000, the first factory-built storage system with embedded open source software.

"AMD has a long history of collaboration with the Department of Energy and Oak Ridge National Laboratory, powering some of the world's most advanced supercomputers," said Lisa Su, chair and CEO, AMD. "Building on that legacy — from Frontier to El Capitan — Discovery represents the next major leap in AI and high-performance computing, driving breakthroughs that will strengthen U.S. leadership in science and energy."

Discovery's enhanced computing speeds and bandwidth will directly translate into accomplishing more scientific discoveries faster. With Discovery's computational engine, researchers will be able to generate and analyze

Discovery will be delivered in 2028 with significantly greater performance than Frontier, ORNL's current flagship supercomputer, across every part of the system. Credit: HPE

data at unprecedented speeds, which will expand scientific understanding and accelerate training of AI models built for science.

Insights made possible by Discovery will help realize the full potential of many innovations, including:

- AI modeling to make nuclear energy safer, cheaper and more available
- AI-driven digital twins for precision medicine and patient health
- Aerospace design cycles shortened from years to months for faster, more fuel-efficient aircraft

Discovery will be delivered in 2028 with significantly greater performance than Frontier, ORNL's current flagship supercomputer, across every part of the system. Discovery will continue to advance scientific discoveries via high-performance modeling and simulation integrated with AI, while charting the path to the convergence of high-performance computing (HPC), AI and quantum computing.

"We're proud to continue our collaboration with ORNL and contribute to its legacy of AI and HPC excellence," said Antonio Neri, HPE CEO. "Building on the groundbreaking achievements of Frontier, these new systems will drive new levels of scientific productivity, enable complex simulations, and establish new standards for sovereign AI."

Discovery continues ORNL's and DOE's proven record of HPC leadership. The lab is home to the Oak Ridge Leadership Computing Facility, a DOE Office of Science user facility, which has deployed a total of seven flagship supercomputers since 2004. Each of

the last four machines – Jaguar, Titan, Summit and Frontier – were recognized as the world's fastest system of its time. These leadership-class systems support scientists in achieving cutting- edge breakthroughs and have provided unprecedented computational science capabilities for the nation.

Lux speeds up AI deployment for national priorities

The Lux AI Cluster, to be deployed at ORNL in early 2026, will expand DOE's near-term AI capacity and accelerate progress on critical problems, including fusion, fission, materials, quantum, advanced manufacturing, and the grid. It marks the start of an ambitious scientific journey that draws on deep multi-domain expertise and unique data assets across the entire DOE national laboratory system.

Lux will employ AMD Instinct™ MI355X GPUs, AMD EPYC™ CPUs, AMD Pensando™ advanced networking, and HPE ProLiant Compute XD685 to deliver a secure, open, and efficient AI software stack for U.S. innovation, supporting large-scale AI training and distributed inference. "We are proud to partner with the Department of Energy and Oak Ridge National Laboratory to expand America's AI infrastructure," said Su. "Lux will accelerate progress on critical U.S. research priorities, from fusion and materials

The Lux AI Cluster, to be deployed at ORNL in 2026, will expand DOE's near-term AI capacity and accelerate progress on critical problems. Credit: ORNL, U.S. Dept. of Energy

to quantum, advanced manufacturing, and is a great example of public-private partnership at its best."

DOE's investment in Lux reflects the partners' trusted and proven leadership in advanced computing, including delivery of Frontier, the first supercomputer to break the exascale barrier. "The Discovery and Lux systems will drive scientific innovation faster and farther than ever before," said Streiffer. "ORNL's leadership in supercomputing has dramatically shortened researchers' time from problem to solution across a host of fields and industries. With Discovery and Lux, the integration of high-performance computing and AI promises breakthroughs at the accelerated speed and scale necessary for continued U.S. leadership in an increasingly competitive global environment."

UT-Battelle manages ORNL for DOE's Office of Science, the single largest supporter of basic research in the physical sciences in the United States. The Office of Science is working to address some of the most pressing challenges of our time. For more information, please visit **energy.gov/science.**

Stronger Minds, Stronger Schools:

The Impact of SEL on Students' and Educators' Mental Health

By Rebecca Moschopedis & Breanne Spence

What is SEL and what are some of its benefits? Why is this research important to us?

Schlag et al. (2024) outlined social emotional learning (SEL) as an opportunity to establish strategies for enhancing students' social and emotional competencies through explicit classroom instruction.

Students participating in an SEL program are likely to show growth and development in competencies such as self-awareness, self-management, social awareness, relationship skills, and responsible decision-making. There are studies showing that SEL curriculum can reduce risk taking behaviours and improve academic achievement. This research is fundamental as both of our careers are in the field of education.

We have noticed a rapid increase in mental health concerns and decline in the mental health of students and staff. Students are not the only reason that SEL is needed. Research dating back to at least 2015 has shone a light on the fact that teachers' themselves may be experiencing high levels of depression symptoms, which in turn can negatively impact students' academic outcomes and affect students' overall mental health.

The fact that this has been a rampant issue for over a decade was the catalyst that we needed to delve into this topic. As schools confront increasing mental health needs and educator attrition, SEL offers a sustainable, evidence-based path forward.

Benefits of SEL

We completed a literature review for our research, analyzing over 30 peer-reviewed articles focused on the benefits and challenges of implementing an SEL curriculum, as well as its impact on staff and students' mental health. All of the articles we reviewed were published within the last 10 years.

In general, SEL interventions contribute to long-term developmental outcomes, such as higher graduation rates and reduced negative life outcomes, offering substantial societal and economic benefits (Taylor et al., 2017). They support individuals of all ages in gaining and applying the knowledge, skills, and attitudes needed to build a strong sense of identity, regulate emotions, set and achieve personal and collective goals, demonstrate empathy, foster supportive relationships, and make thoughtful, compassionate decisions (CASEL, 2020). When an SEL curriculum is implemented, students often show improved emotional control, reduced classroom conflict, and increased cooperation (Coelho et al., 2023).

SEL and Academic Outcomes for Students

One aspect we also wanted to investigate was whether an SEL curriculum could improve students' academic outcomes. If students are more engaged and emotionally regulated, does this support their learning?

The research on this is limited and conflicting. Some studies found there was no connection between academic outcomes and implementation of SEL curriculums. Others found that there was a small increase, however it was

not statistically significant. A specific study by Humphrey et al. (2018b) found that implementing an SEL curriculum reduced students' chances of encountering mental health problems later on, which ultimately improved their academic achievements. More research in this area would certainly be beneficial to determine the specific type of impact SEL curriculum does or does not have on students' academic achievements.

SEL and Students' Mental Health

Implementing an SEL curriculum serves as both a preventative and proactive approach to supporting students' mental health. SEL programs have been shown to strengthen emotional intelligence and foster healthier relationships (Wright, 2023). They are also associated with fewer peer conflicts, reduced classroom isolation, and improved sociability and assertiveness (Coelho et al., 2023).

When students develop emotional intelligence, they're better equipped to stay calm under pressure, understand their emotions more deeply, and manage daily challenges with confidence. The ability to build healthy relationships contributes to a more connected and inclusive school environment. Fewer classroom disruptions create a calmer atmosphere where students feel safe, focused, and more willing to take academic and social risks.

Because SEL programs are typically delivered at the class-wide level, all students benefit, not just those already identified as needing support. This ensures that students who may be silently struggling with mental health challenges are not overlooked. Additionally, SEL equips students with skills to navigate mental health concerns that may arise later in life. Ultimately, SEL fosters environments where all students are given the tools to thrive. These programs contribute to healthier, more resilient communities and can improve long-term public health outcomes (Greenberg et al., 2017).

SEL and Educator Mental Health

Implementing an SEL curriculum can have a positive impact on not only students' mental health, but on the mental

health of staff and teachers, too. Studies show that SEL curriculums have the potential to interrupt the burnout cascade which supports teacher wellbeing (Sandilos et al., 2023).

They can improve teachers' self-efficacy and enhance their social-emotional competence (Domitrovich et al., 2016). Specific SEL interventions have been found to successfully enhance the quality of teacher-child relationships, with teachers reporting improved emotional responsiveness and greater empathy toward their students (Rudasill et al., 2020). These improvements were associated with better social-emotional outcomes for students, such as increased engagement and positive behavior in the classroom (Rudasill et al., 2020).

Additionally, interventions have been found to be effective in fostering a more supportive and positive school climate (Rudasill et al., 2020). When teachers feel emotionally supported and confident in their roles, they are more likely to teach SEL content effectively. Investing in SEL doesn't just support student outcomes, it supports building resilient and empowered educators too.

What are Barriers to Implementing an SEL Curriculum?

Although there are many benefits to implementing an SEL curriculum,

there are also significant barriers that can prevent it from being implemented effectively. Ultimately, this can create additional stress for teachers.

In our research, the key drawbacks we identified were related to improper implementation or a lack of recognition of SEL as a meaningful and valued part of the school day by both teachers and students. A study by Humphrey et al. (2018a) found that the quality of SEL lessons had a much greater impact on their effectiveness than the quantity. However, lesson quality is often directly influenced by the training and resources provided to educators. Many teachers report feeling unprepared to deliver SEL effectively due to limited knowledge of the subject (Todd et al., 2022).

When teachers are handed an SEL curriculum without adequate support, time, or resources to understand and integrate it properly, it can contribute to increased workload, stress, and frustration with implementation. Sandilos et al. (2020) found that providing targeted SEL training for teachers can help reduce symptoms of burnout, ultimately benefiting both educators and students in the classroom.

Systemic change is also essential for SEL to be implemented successfully and sustainably. Policy-level support and investment are critical to ensure the widespread adoption and integration of SEL (Greenberg et al., 2017). Without this backing, collaboration between families, school staff (teachers, aides, administrators), and the broader community can be difficult to foster.

Teachers may also face challenges fitting SEL into an already full teaching schedule (Humphrey et al., 2018a). Support from district and school leaders in providing dedicated planning time and flexibility with other curricular demands can make a meaningful difference. Limited resources were also highlighted in our research as a major barrier to effective SEL implementation. This challenge can be addressed by policy makers and school leaders advocating for and allocating specific funding to support SEL programming.

While there is a clear need and genuine enthusiasm for SEL among educators, limited resources and insufficient training continue to hinder its full potential in schools (Kilborn et al., 2024).

Implications of Implementing an SEL Curriculum

The implementation of an SEL curricula is truly a catalyst for systemic and relational change. Through explicit and structured instruction in: self-awareness, relationship skills, and decision-making, SEL has the potential to extend its influence beyond student development into the overall health of classroom and school environments.

While improved emotional regulation, empathy, and decision-making in students are commonly noted and well-documented outcomes, recent research highlights SEL's significant impact on educators. Rudasill et al. (2020) honed in on the notion that teachers' implementation of universal SEL interventions has been linked to their self-reported closeness with students; in return, this enhances both the classroom climate as well as teacher job satisfaction.

Sandilos et al. (2023) further observed that SEL implementation supports teachers' instructional quality, emotional responsiveness, and classroom

organization. These findings suggest that when educators are equipped with SEL tools and support, their professional competence and sense of purpose deepens—helping to reduce burnout and promote resilience.

Soutter (2023) posits that SEL learning comprises a healthy classroom environment that positively influences students' social emotional outcomes. A range of the components projected to stem from this type of programming are as follows: a connection between teachers' social emotional competencies, the building of teacher-student relationships, effective classroom management, and the effective implementation of SEL programming. Soutter also noted that each of the above areas circles back to positively impacting teachers' wellbeing and social emotional competencies. A positive feedback loop, such as the aforementioned, seeks to improve teacher wellbeing and avoid burnout and compassion fatigue.

Ultimately, SEL is not just a student-focused initiative—it's about cultivating a school culture. In return, that school culture is enhanced by fostering empathy, connection, and well-being across all levels. Its implementation reshapes the emotional architecture of classrooms, offering a path forward in education that values both performance and people. As the educational world grapples with rising mental health challenges and teacher attrition, SEL emerges as a compelling, evidence-based solution for both staff and students.

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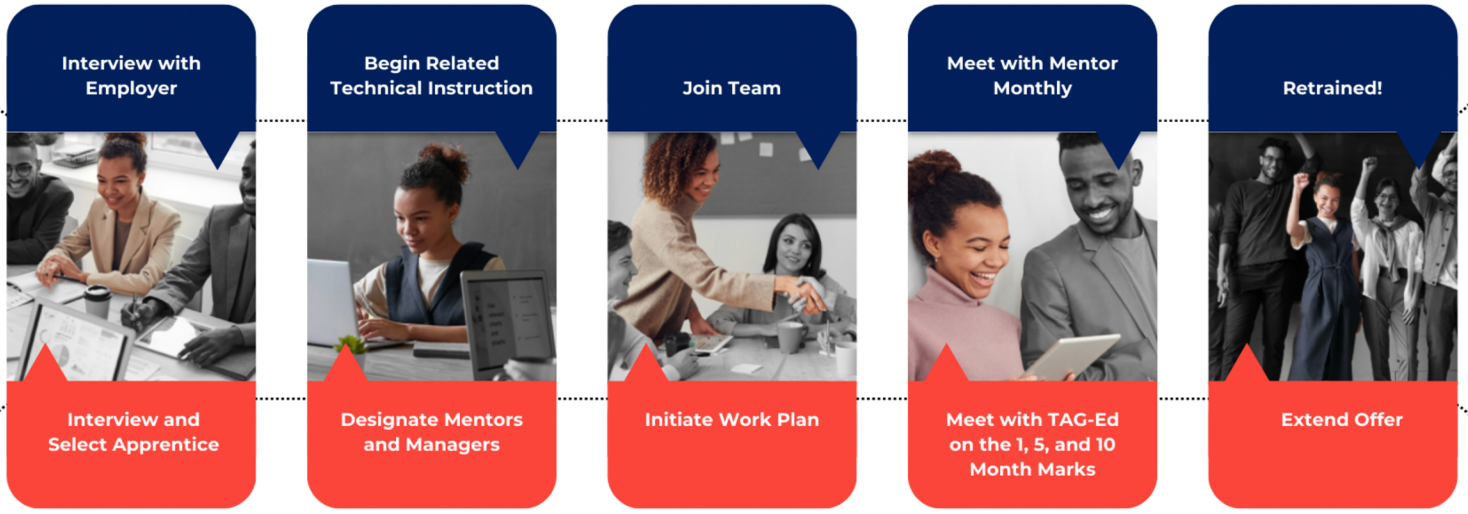
Apprentice Journey



Employer Journey

- Higher retention rates
- No college degree or prior technical experience required
- Save costs over traditionally sourced talent

To understand STEM...

...you must DEFINE STEM. You cannot define an acronym without defining each of the words the letters stand for.

Universities and organizations around the world continue to debate what a STEM career is, but there is no doubt that "every career" uses STEM skills and this observation remains the focus of STEM Magazine.

Science: "The systematic accumulation of knowledge" (all subjects and careers fields)

Technology: "The practical application of science" (all subjects and careers)

Engineering: "The engineering method: a step by step process of solving problems and making decisions" (every subject and career)

Math: "The science of numbers and their operations, interrelations, combinations, generalizations, and abstractions" (every career will use some form[s])

For a moment, set aside any preconceived notions of what you think a STEM career is and use the above dictionary definitions to determine the skills used in any career field you choose.

These definitions are the "real" meaning of STEM and STEM careers.

The STEM of Basketball

Article Audio Version

By Wayne Carley

"*Basketball is a STEM skills sport, making the coach a STEM teacher.*"

In case your coach misses this article, please get them the link. It may bring to light some valuable topics to improve personal and team performance. That may translate into wins....but at the least, a greater appreciation for the sport, the necessary skills and greater enjoyment for all.

Some coaches teach another traditional class which includes them in the STEM conversation, but sports in general have a fascinating and deeply complex STEM exercise happening at lighting speeds in the brain or our kids.

STEM and sports just may be the best example for them to grasp the concepts of personal integration and awareness.

The Science of a Basketball

Science being "the systematic accumulation of knowledge" includes knowledge about the sport, rules, plays, your opponents, your team and yourself... but let's start with basketball construction. The outside covering is made of synthetic rubber, composition, leather or pure rubber. The inside part is a balloon-like structure which holds air and carcass. The bladder is made from a butyl rubber, while the carcass is made of threads of nylon and polyester.

A STEM career in making rubber products can be called rubber manufacturing or rubber production, with specific roles including Rubber Production Machine Operator, Rubber Technologist, or Polymer Engineer. This field involves a variety of jobs, from operating machinery to developing new compounds (chemical engineering) and ensuring product quality.

Basketballs are made of an inflatable butyl rubber bladder, wrapped in layers of nylon or polyester thread, and covered with an outer layer of composite, rubber, or genuine leather. The specific materials determine the ball's intended use, with genuine leather being most common for professional indoor play and synthetic or rubber versions being more durable for outdoor use

The amount of air pressure within the bladder determines its bounce and responsiveness which affects everything about how we use it. This construction is of scientific origin and uses a variety of man-made materials produced in the lab: thus a science career.

Careers in chemical engineering, composite research, aerospace materials, and new applications of old technologies are just a few of the job possibilities available to our students.

Some of the most interesting research and development revolves around Nano Technology that creates new molecules and combinations of molecules on a microscopic scale to produce what we now know as carbon fiber, Kevlar, and others that are revolutionizing every aspect of our society.

Don't think for a moment that we've discovered or created all there is, so I get very "curious" about what our students will discover, create and apply that will make the materials and technology of 2025 seem antiquated.

The systematic accumulation of knowledge (science) is much broader than the ball. It encompasses the entire spectrum of sport regulations, behaviors, ethics, an understanding of "court" responsiveness, teammate and opposition expertise and expectations, in short...anything that has to do with the sport as a whole. Every bit of knowledge available about the sport and materials has to be learned and applied for optimum success. If you've ever wondered by some players seem to excell well beyond the average pro, it's their devotion and application of this scientific knowledge accumulation.

The Physiology of Basketball

The basketball player is certainly the key to excellence on the court, and the

systematic accumulation of knowledge (science) about a players body should never be overlooked.

Professional athletes know their bodies well, and understand how best to maintain their "machine" for maximum performance. Beyond the obvious nutritional concerns, the human body can respond differently from day to day.

Being a good "listener" to your body allows for constant adjustments to hydration, training, rest, flexibility, nutrition, sleep and pain awareness. This science application about yourself is absolutely necessary for success.

Sports physiology, sports medicine, physical therapy, psychology, and sports nutrition are just a few of the STEM careers that apply to basketball and other sports in general.

Sports physiology

Sports physiology is the study of how the body's structure and function respond to exercise and physical activity. This STEM career examines the short-term and long-term effects of exercise on different bodily systems, such as the cardiovascular, respiratory, and musculoskeletal systems, to help optimize performance, improve health, and aid in recovery.

Sports physiologists use technology and scientific testing to understand how a person's body works during physical exertion. They analyze factors like energy systems, muscle fiber types, and physiological adaptations to training.

The knowledge gained is used to help athletes and coaches develop effective training plans, prevent injuries, and manage recovery. Key areas of study include:

- Cardiovascular and respiratory changes during exercise
- Energy production and metabolism
- Muscular system responses to exercise
- Fatigue and recovery processes

The Technology of basketball

Technology is defined as the "practical application of science", (the accumulated knowledge). We've already covered some of the tech with basketball construction and physiology. A few more items include basketball shoe design and construction, court construction, arena design, backboard materials and safety precautions.

All of these "applications" stem from knowledge decades in the making. Failures of all the above have given way to improvements through new materials, experimental design changes, adjustments in sport rules and restrictions, and of course, better decision making, which brings us to the following category.

The Engineering of basketball

Engineering is a decision making and problem solving process. There's no question that basketball is full of decisions by every participant from one moment to the next. The outcomes of those decisions are often instantaneous and the results quickly visible, for better or worse.

What's really interesting is what's going on in the mind of the player moment by moment, often without their know-

ledge. This is where the STEM of engineering in basketball shines, and players need to understand this process to make the strong connection between STEM and basketball.

The **engineering method** is a systematic, iterative process (to refine and improve) for solving problems by designing and building solutions. It begins with defining the problem, followed by researching existing solutions and constraints, and brainstorming potential ideas. The process then involves designing, building a prototype, testing it, and evaluating the results. If the solution is not successful, engineers iterate by repeating the design, build, and test steps until the problem is solved.

For basketball, this STEM process is hammered out in practice along with game after game of experience. The formulation of plays is a great example of the problem solving method, and the team keeps close track of what works or doesn't work in any number of situations against every team they play.

Professional teams often have fewer set plays, relying more on motion and player improvisation, with a focus on a few core offensive sets like the "horns" or "motion offense". This player improvisation requires an amazing understanding of teammates and how they will respond to **"my decision"** right now (science: accumulation of knowledge about teammates). Multiply that by 1,000 times 5 teammates and you have a game.

Decisions to consider:

- What works against this opponent?

- I need to understand how any of the 5 opponents will respond if I go here, or there, or pass, or shoot, or bluff...

- What worked last time we played them?

- How will this opponent respond if I do this? Can I fake them out?

- How am I feeling today?

- What is my level of confidence at this moment?

- Who will be open 5 seconds from now?

- Risk versus reward on this shot?

- Who needs the ball most in this situation?

- What's the clock say?

Decisions in the thousands are made instantly in this sea of movement, and the outcome of **"my decision"** is also instantaneous. Learning moment by moment as outcomes are seen are logged in the mind for future decision making. My basketball brain is exploding with STEM.

The Mathematics of basketball

My favorite part of the STEM equation in basketball is certainly the math. So much of it seems "unlearned" from a scholastic perspective, yet it's instant as if born with math wired into the genes.

Dribbling

As I push down on the basketball my brain instantaneously and mathematically calculates the amount of energy in my shoulder, arm, hand and fingers necessary to have the ball bounce back up to my hand. Based on the results of the first dribble, math and energy adjustments are instantly evaluated and adjusted as necessary for the next dribble. This process changes continuously throughout the dribbling process and I haven't even started running yet.

All of this happens subconsciously, instantly and repeatedly. Ask a basketball player if they like math. Whether it's yes or no, they should. This is the kind of STEM integration needed for a student to understand its importance, presence and wide range of applications.


Engineering Method
Decision Making
Anticipation Cal
Energy calculations
Physiology Adjustments
Geometric angle of attack
Technology Awareness

Running and dribbling

It gets more amazing now as we incorporate the science of physiology, and synchronize the act of running with all of its physical complexities with the previously discussed math and science of dribbling. Now our math and science calculations must be modified due to our forward or sideward motion. I cannot bounce the ball down, but must push it forward at a specific angle instantly calculated based on our speed and direction. The energy requirements to dribble will need adjusting as well to synchronize with our bodies motions.

Mentally I have already begun to make math calculations regarding the process of passing or throwing the ball to another player which requires a completely new set of energy calculations, geometry angles from our present position to a calculated future position of team mates and estimations about outcomes.

Keep in mind, our brain is making these math and science calculations while performing the dribbling process, looking down the court and evaluating opponent responses. ***Amazing.***

Shooting a basket

Now it gets fun. When the player decides to shoot for a basket the following takes place. The player uses the engineering method (a decision making process) to determine which kind of shot they wish to attempt for the best result. Based on their instant conclusions, let's say a 3 point jump shot, they instantly visualize and estimate the distance to the basket and set in motion a complicated sequence.

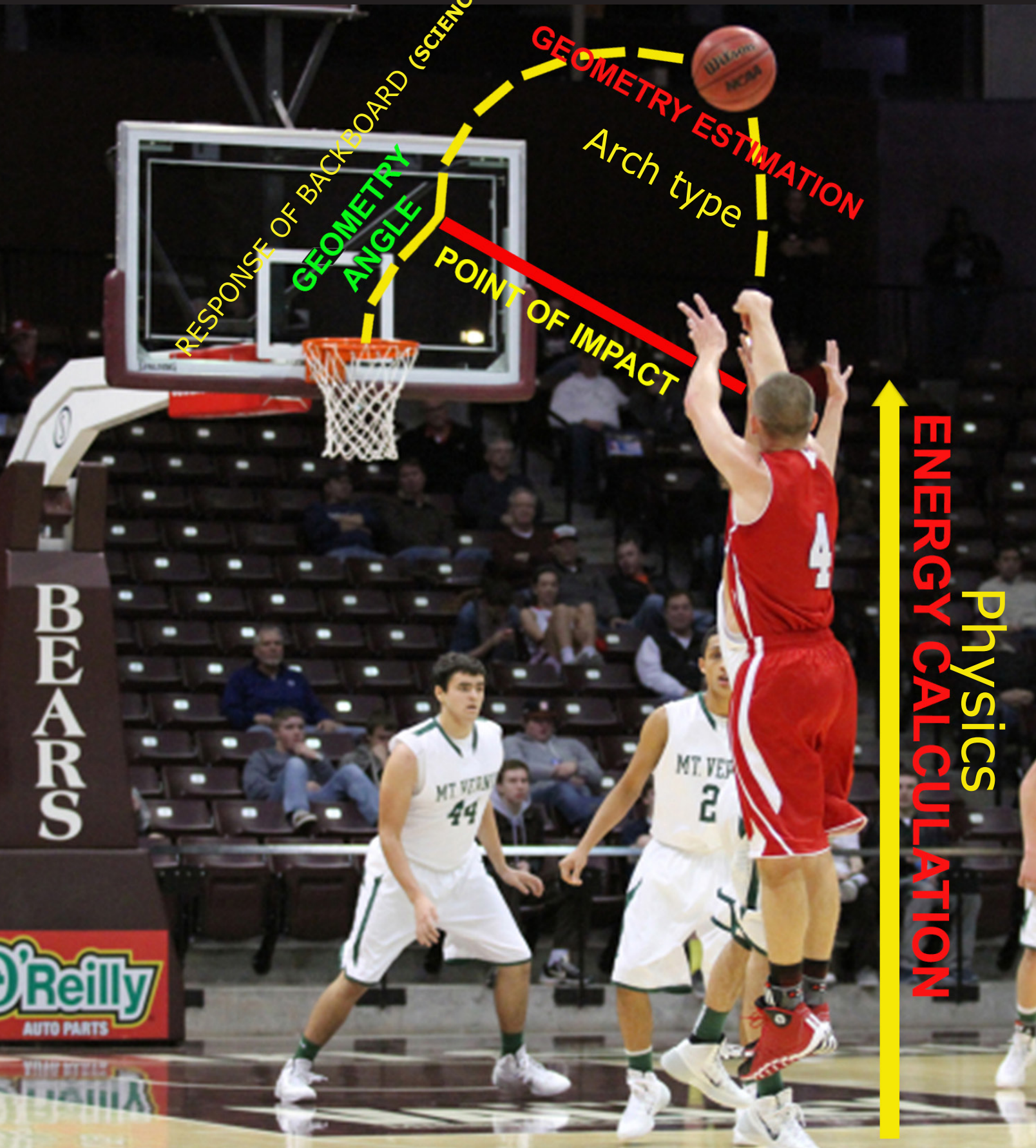
Based on the distance to the basket, the player decides how high they must jump to overcome the defense, the amount of energy required for the hips, knees and legs to reach that height with an estimated knee bend. A quick evaluation of their physiology (science) determines their ability to perform that task (maybe due to a bad knee or tall opponent). The player must estimate the amount of energy required to propel the ball the necessary distance, taking into consideration the geometric arc of the ball (math) to reach the basket.

This is a science and mathematics calculation. You'll make dozens during the course of the game.

If a bank shot is required off the backboard, the geometry of the angle between where the ball strikes the backboard and deflects into the basket must be calculated. I'm exhausted just talking about it. The point is, we are wired for STEM and the awareness of how we already use it daily should be in the front of your mind, regardless of the sport or activity you're participating in.

Consider the fairly simple task of making our students ***aware*** of what they do and how it's STEM. Students want to know how the curriculum connects to everyday activities, both work and play. It makes the integration much easier, logical, necessary and even fun, building confidence and curiosity..... maybe even a better basketball player!

Basketball is STEM



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AI Skills: The New Currency in Today's Job Market

The AI revolution is here. Ever since ChatGPT arrived on the scene in late 2022, artificial intelligence has been reshaping the way we live and work. What does that mean for tech professionals looking to compete in a changing labor market?

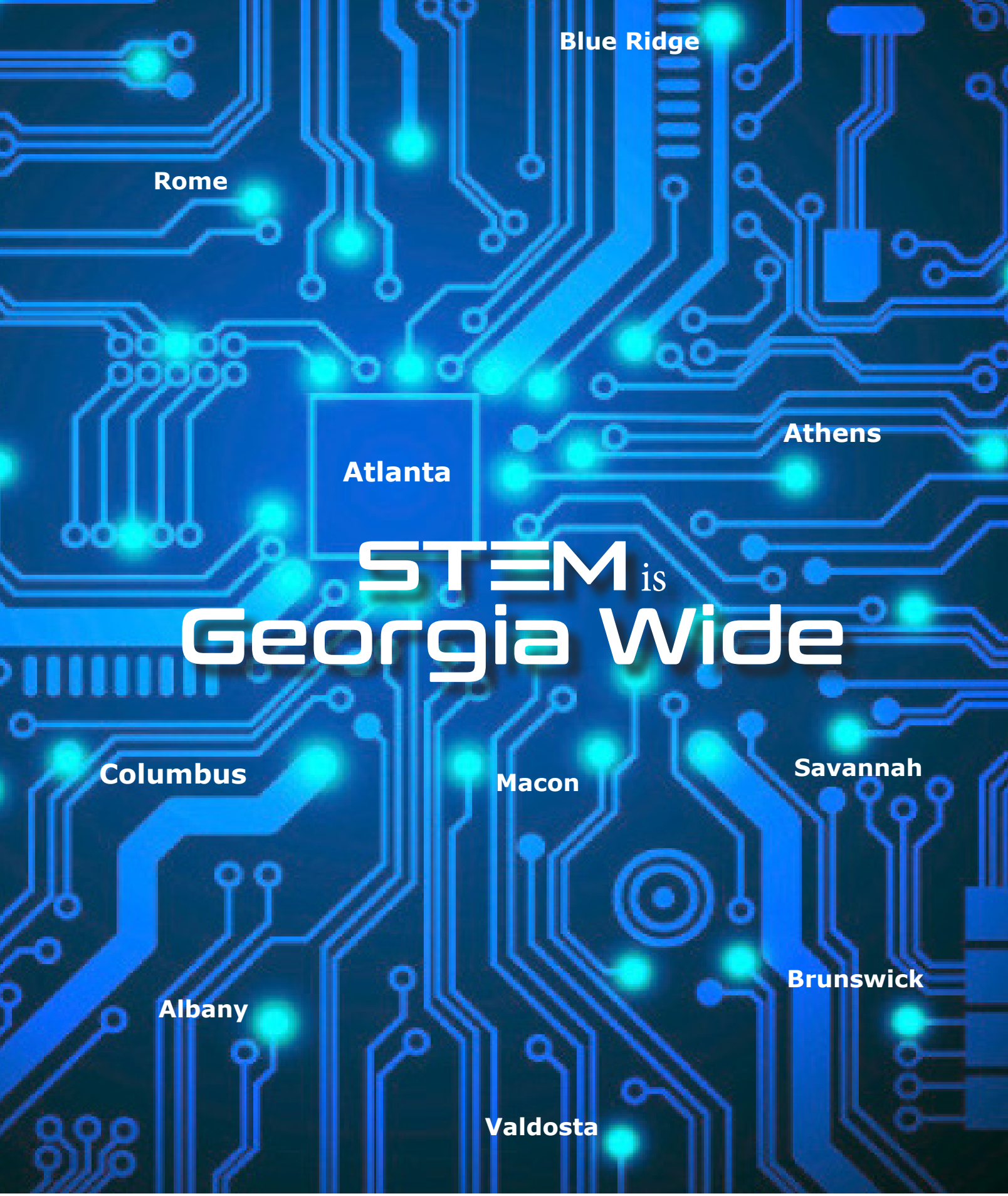
TV pundits and talking heads love to get riled up about whether robots are coming for our jobs — but the truth is that AI will probably create more jobs than it eliminates. And one thing's for sure: understanding how AI works, and mastering AI skills, will be the key to success in tomorrow's ever-changing world of work.

New research shows that a growing number of companies are asking for AI skills in job descriptions — including non-tech roles. And a survey of HR professionals released last month shows that job candidates with AI skills ask for more money during the interview process — and tend to get it once they're hired. Simply put, AI is going to be underpinning nearly every job out there. That's why staying ahead of the latest in AI development is so important.

Building AI skills doesn't just mean learning how to engineer prompts for ChatGPT. It's everything from programming to data modeling and analysis to mastering concepts like machine learning and natural language processing. And if there's anything certain in our fast-paced economy, it's that building AI fundamentals today will translate to career opportunities tomorrow and beyond.

That's where SkillStorm comes in. In partnership with TAG, we offer Microsoft Azure AI courses that are instructor-led, career-aligned tech certification courses and will help you build the AI skills that employers need. From the basics of AI and machine learning to a comprehensive understanding of how to design, deploy, and maintain AI solutions, you'll learn everything you need to accelerate a career in the economy's hottest fields.

It won't be long before all kinds of jobs, all across the economy, require AI skills. And starting now is the best way to accelerate your ascent up the career ladder. Build those skills today and you'll lay the foundation for opportunity for years to come — and set yourself up for success in an AI-driven future of work. Register today to get started with a career in tech.



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