

November 2023

# GEORGIA PATHWAYS

M A G A Z I N E

## Women In STEM

Success in a role

System Upgrade  
Reboot representation

Georgia Highlands College

Brain Changes in Fighter Pilots

The Technology Association of Georgia Education Collaborative (TAG-Ed) strengthens the future workforce by providing students with relevant, hands-on STEAM 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 2000. Later, the organization's name was re-branded to TAG Education Collaborative to facilitate our role as the leaders for K-12 STEAM education in Georgia.

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Georgia Pathways Magazine services the STEAM education industry needs of the state of Georgia. This magazine is viewed by the consumer with the understanding that the information presented is from various sources from which there can be no warranty or responsibility by the Technology Association of Georgia, the Technology Association of Georgia Education Collaborative and/or their affiliates as to legality, completeness or accuracy.

## **Georgia Highlands College**

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## **Brain Changes In Fighter Pilots**

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## **System Upgrade**

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## **STEM Makeover**

SAKEYA DONALDSON

## **Women In STEM**

THE CHARTERED INSTITUTE OF PATENT  
ATTORNEYS



In the dynamic landscape of Georgia, the convergence of technology industries is creating ripples of innovation and opportunity. With great enthusiasm, we present to you an exploration of the interconnected web of technology sectors shaping the state's future. Georgia has become a hub where various technology industries seamlessly intersect, giving rise to endless possibilities. This convergence is not merely a meeting of sectors; it's a fusion that sparks creativity, fosters collaboration, and propels the state toward unprecedented growth.

As you flip through the pages of this magazine, you will witness the transformative journey of technology in Georgia. Georgia is at the forefront of technological evolution, from the bustling developments in information security to the sustainable initiatives in smart homes and smart cities.

Our forward-looking state is not just embracing change; it is driving it. The fusion of technology industries in Georgia is not only about staying ahead but also about pioneering new frontiers. We are witnessing the birth of a tech ecosystem that goes beyond individual sectors, creating a collaborative environment where ideas converge, and innovation flourishes.

To hear and see this innovation in real-time, we invite you to participate in TAG Converge on November 30th at the Woodruff Arts Center, where we explore the intersections and advances realized

from a wide range of inclusive, integrated technologies. This event delves into deep-dive content sessions covering topics such as Smart Homes/Smart Cities, E-Sports, Media & Entertainment, InfoSec, Tech for Good, Cloud, Generative AI, and Workforce & DE&I. TAG Converge is your gateway to understanding how these technologies are shaping our lives and driving strategic business growth. On-site registration will be available at the event.

In the following pages, explore the stories of trailblazing companies, visionary leaders, and the collective spirit that defines Georgia's tech landscape. Discover how the convergence of technology industries is not only reshaping businesses but also influencing the way we live, work, and connect.

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.



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## About IBM® Watson Orchestrate

## Automate Candidate Sourcing

**IBM Watson Orchestrate empowers professionals to be in the driver's seat of their work lives with digital employees designed to turn "to-dos" into done.**

With approximately 11 million open job roles in United States, organizations are struggling to find qualified candidates, placing the burden on existing employees to do more than ever. Between tracking down approvals, preparing requisitions, sourcing candidates, reviewing resumes, setting up interviews and the endless number of emails back and forth, recruiters are asking themselves, "How can I ever get ahead?"

**Introducing IBM Watson Orchestrate, a 2022 CES Innovation Award Honoree, featuring groundbreaking technology designed to free you up to pursue more of your "want-to-dos".**

Recruiters can utilize their digital employee, 'dige'y', to source candidate lists and initiate reach outs to qualified candidates, provided through our strategic partnership with ThisWay® Global. So as the number of open jobs grow, so too does your ability to source the strongest candidates.

1 Source: US Bureau of Labor Statistics

## KEY FEATURES



### Expand your resource pool

Access 169 million diverse candidates at your fingertips.



### Discover strong existing candidates

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Create and post new job opportunities to attract top talent.



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Quickly surface qualified candidates for your open jobs based on your criteria.



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### Learn more

To learn more about ThisWay & IBM Watson Orchestrate, visit: [landingpage.thiswayglobal.com/tag](https://landingpage.thiswayglobal.com/tag)

### In collaboration with:





# Georgia Day of Code Partners Present:

**December 4, 2023**

## Why Code?

Computers dominate our lives but few of us know how they're built or programmed. Georgia Day of Code is an opportunity for teachers, students and individuals of all ages to learn more about these machines we use to work, play, and communicate every day. Code.org features tutorials that allow individuals of all ages to choose from tutorials and get coding!

Join some of the nation's leaders in exploring coding and resources for everyone.



## Agenda

9:00-9:10 / Welcome, Larry Williams, President and CEO, TAG and TAG-Ed

9:10-9:20 / Proclamation presentation, Governor's Office

9:20-9:30 / Georgia's Computer Science Vision, Keith Osborn, CIO, Georgia Dept. of Education

9:30-10:15 / Coding with CEISMC and Constellations, Bryan Cox, Research Associate, Constellations

• Kahoot / • Ask AI / • AI in the classroom

10:15 – 10:25 / Mission of Day and Hour of Code, Codeye Woody, Director of State Government Affairs, Code.org

10:25 – 10:40 / Coding Resources, Lavita Williams, CS Program Lead, Georgia Dept. of Education

10:40 – 11:40 / Hour of Code with Code.org and CEISMC

• Alba C. Gutierrez, Program Director / CEISMC / Georgia Tech

11:40 / Closing from Heather Maxfield, Executive Director, TAG-Ed

[Google Resources](#) / [Microsoft Resources](#) / [Apple Resources](#) / [Amazon Resources](#) / [Code.org Resources](#) / [NASA/Tynker resources](#)

For more information, please visit:

<https://www.tagonline.org/day-of-code>

**Register Today**

**Live YouTube Link**

Thank you to the following partners for their participation and support.



Code with Google





## The Aspen Institute Names **Georgia Highlands College** as a Top 150 U.S. Community Colleges Eligible for the 2025 Aspen Prize

The Aspen Institute named Georgia Highlands College (GHC) as one of the 150 institutions eligible to compete for the \$1 million Aspen Prize for Community College Excellence, the nation's signature recognition of high achievement and performance among two-year colleges.

The institutions selected for this honor stand out among more than 1,000 community colleges nationwide as having high and improving levels of student success as well as equitable outcomes for Black and Hispanic students and those from lower-income backgrounds. "It is an honor for GHC to again be named a Top 150 U.S. Community College and invited to apply for the prestigious Aspen Prize," Provost and Chief Academic Officer Sarah Coakley said. "This national recognition directly reflects the sustained commitment of

our faculty and staff to academic excellence, access and equity, workforce development and student success."

The Aspen Prize spotlights exemplary community colleges in order to drive attention to colleges achieving post-graduate success for all students and is a central way Aspen researches highly effective student success strategies that are shared with the field. The 150 eligible colleges have been invited to submit student success data and narratives about strategies to achieve better and more equitable student outcomes as the next step in an intensive review process that culminates in the naming of the Aspen Prize winner in spring 2025.

The eligible colleges represent the diversity and depth of the community college sector. Located in urban, rural

and suburban areas across 30 states, these colleges serve as few as 169 students and as many as 49,619.

“The Aspen Prize is rooted first and foremost in an assessment of whether colleges are walking the walk,” said Josh Wyner, executive director of the Aspen Institute College Excellence Program. “As community colleges face enrollment variations, enroll students with pandemic-related learning loss and graduate students into a rapidly changing labor market, it is easy to lose track of what matters most.

The best community colleges are continuing to focus on advancing the core mission: making sure as many students as possible graduate with credentials that lead to fulfilling careers and reflect the development of diverse talent that communities, states and our nation need.”

While community colleges are an essential contributor to our nation’s success, student outcomes vary substantially among institutions. Aspen measures those variances using multiple data sources and honors colleges with outstanding achievement in six critical areas: teaching and learning, certificate and degree completion, transfer and bachelor’s attainment, workforce success, equitable access to the college and equitable outcomes for



students of color and students from low-income backgrounds.

“These 150 colleges have achieved high and improving levels of student success for all students, including those who are often failed by our institutions,” Wyner said. “We’re excited to learn over the coming months how they achieved that success so we can share the most impressive practices with others in the field.”

In this first round, eligibility for the



Aspen Prize is based on publicly available data. Colleges must show strong, improving and equitable student outcomes in first-to-second year retention, credentials awarded and completion and transfer rates. Nationwide, about 15 percent of community colleges have been invited to apply (150 of just under 1,000 public two-year colleges assessed for Prize eligibility). The full list can be accessed on the Prize homepage.

The next steps in the process include:

- April 2024: Announcement of 25 semifinalists, selected based on assessments of extensive data and strategy documents by the Prize selection panel, a group of 16 experts in community colleges, higher education and workforce training, and interviews with institutional leadership teams
- June 2024: Announcement of 10 finalists, selected by the Prize selection panel
- Fall 2024: Site visits to each of the ten finalists, during which the Aspen Institute and partners will collect additional information, including employment and earnings data and insights about promising practices
- January 2025: Prize award decisions made by distinguished, independent Prize jury at full-day meeting

- Spring 2025: Announcement of the Aspen Prize winner and celebration of the 10 finalists in Washington, D.C.

The Aspen Prize is generously funded by Ascendium, the Joyce Foundation, JPMorgan Chase and the Kresge Foundation.

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Georgia Highlands College is a multi-campus, state college member of the University System of Georgia. Founded in 1970 as Floyd Junior College, the college now serves thousands of students from over 30 counties in Northwest Georgia. GHC has five sites in Rome, Cartersville, Marietta, and Dallas, as well as a robust online program. GHC offers over 40 areas of study with associate degree and bachelor's degree options both in the classroom and online. GHC is proud to support the local economy with a regional economic impact of nearly \$170 million.







2023 graduate and current student Jonathan Kavuma





TIGER TIGER





# Brain Changes In Fighter Pilots may cast light on astronauts during space travel

By Prof. Floris L Wuyts / University of Antwerp, Antwerp, Belgium.

This study is the first to investigate functional brain connectivity in fighter pilots, finding specific changes that may reveal the effects of space travel. Understanding the effects of space travel will help us to plan long-haul space flights, but getting access to astronauts is not easy. A new study investigates whether F16 fighter pilots demonstrate brain connectivity changes that could be expected in astronauts, based on similar exposure to changes in g-forces.

The study found that the pilots showed key changes in brain connectivity and they may function as suitable test subjects to learn more about space travel.

We cannot explore the profound mysteries of space without being changed by it. This is the message underlying a new study in *Frontiers in Physiology*. The study examined the brains of F16 fighter pilots, which have a lot in common with those of astronauts in terms of adapting to altered gravity levels and rapidly processing conflicting sensory information.

MRI scans revealed that pilots with more flight experience showed specific brain connectivity patterns in areas related to processing sensorimotor information. They also showed differences in brain connectivity compared with non-pilots. The study will help us to understand the effects of space flight on the brain and may aid in providing better training programs for pilots or astronauts.





## Spaceships: a rollercoaster for the brain

Blasting off into space places significant demands on the body and mind. These include altered levels of gravity, from the g-forces present during blast-off to the low-gravity environment in space. Other issues include rapidly interpreting sensory and visual stimuli that are sometimes conflicting, while controlling a complex vehicle at extreme speeds.

These factors are a potent cocktail, and previous research has suggested that the brain may undergo structural and functional changes after space flight and astronaut training, in a process called neural plasticity. Understanding these changes could help us to better prepare astronauts for long journeys, which is crucial if we are ever to reach other planets.

### A pilot study

Given that astronauts are a rare commodity, the researchers behind the current study hypothesized that studying the brain in members of a somewhat similar profession may provide the answers they need. “Fighter pilots have some interesting similarities with astronauts, such as exposure to altered G-levels, and the need to interpret visual information and information coming

from head movements and acceleration (vestibular information),” said Prof. Floris Wuyts of the University of Antwerp, senior author on the study. “By establishing the specific brain connectivity characteristics of fighter pilots, we can gain more insight into the condition of astronauts after spaceflight.”

To investigate this, the researchers recruited 10 fighter jet pilots from the Belgian Air Force, alongside a control group of 10 non-pilots, and performed MRI scans of their brains to establish the first ever study of functional brain connectivity in fighter pilots.

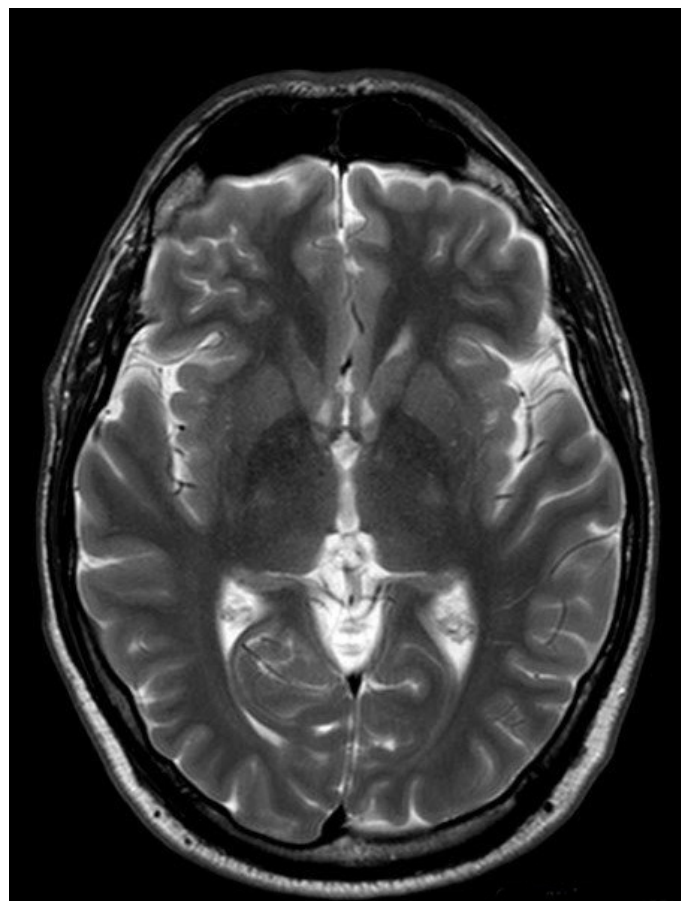
### **Adapting to extreme demands**

Interestingly, the researchers found differences in brain connectivity between experienced and less experienced pilots, suggesting that brain changes occur with an increased number of flight hours. These differences included less connectivity in certain areas of the brain processing sensorimotor information, which may indicate the brain adapting to cope with the extreme conditions experienced during flight.

Experienced pilots also demonstrated increased connectivity in frontal areas of the brain that are likely involved in the cognitive demands of flying a complicated jet. When comparing pilots and non-pilots, the researchers found

that areas of the brain processing vestibular and visual information were more connected in pilots. This may reflect the requirements for pilots to cope with processing multiple and occasionally conflicting visual and vestibular stimuli at once and to prioritize the most important stimuli, such as reading cockpit instruments.

“By demonstrating that vestibular and visual information is processed differently in pilots compared to non-pilots, we can recommend that pilots are a suitable study group to gain more insight into the brain’s adaptations toward unusual gravitational environments, such as during spaceflight,” said Dr Wilhelmina Radstake, first author on the study who conducted a Master’s thesis on this topic in Prof Wuyt’s lab.





# Neuroplasticity

neu·ro·plas·tic·i·ty

noun: neuroplasticity; noun: neuro-plasticity

- the ability of the brain to form and reorganize synaptic connections, especially in response to learning or experience or following injury.

Neuroplasticity is the brain's ability to change and adapt due to experience. It is an umbrella term referring to the brain's ability to change, reorganize, or grow neural networks.

This can involve functional changes due to brain damage or structural changes due to learning.

Plasticity refers to the brain's malleability or ability to change; it does not imply that the brain is plastic. Neuro refers to neurons, the nerve cells that are the building blocks of the brain and nervous system. Thus, neuroplasticity allows nerve cells to change or adjust.

## The 2 Types of Brain Plasticity

### What is Neuroplasticity (aka Brain Plasticity)?



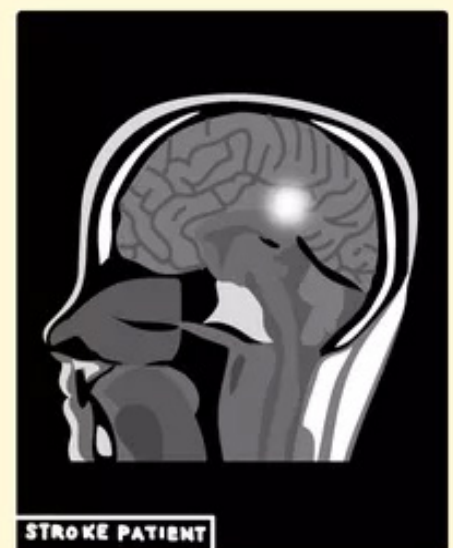
Brain's ability to change and adapt

### Type 1: Structural Plasticity



Experiences or memories change a brain's physical structure

### Type 2: Functional Plasticity



Brain functions move from damaged area to undamaged area

How the brain adapts to overcome the various sensory and sensorimotor challenges during (space) flight requires further research, which is restricted due to the rarity of populations that can be tested in this setting, such as space crew, parabolic flight participants, and fighter pilots. This study aims to contribute to this line of research and investigates whether fighter pilots show altered functional connectivity (FC).

## Conclusion

Taken together, these findings suggest that the conditions to which fighter pilots are exposed during their career (increased g-levels, sensory conflicts, and training) alter their brain functional connectivity, reflecting neuroplasticity. This plasticity can be observed as alterations in visual- and vestibular functional coupling, in higher order spatial processing of the brain, and in frontal regions associated with various cognitive functions.

These results reveal insights to possible adaptation in individuals exposed to altered gravitational forces and may have implications for spaceflight research. This knowledge can be used to eventually fit training programs for fighter pilots to stimulate the desired connectivity/neuroplasticity, and help making choices between for example

training in motion-based flight simulators versus non-motion-based flight simulators. Likewise this can be used for optimal training in space crew.

To read the entire study, please visit: <https://www.frontiersin.org/articles/10.3389/fphys.2023.1082166/full>

## Terms to remember:

***Vestibular*** - particularly that of the inner ear, or more generally to the sense of balance.

***Brain connectivity*** - The concept of connectivity designates the strength of interactions, whether direct or indirect, between different brain areas which locally process information.

***Parabolic flight*** - gravity-free conditions in an aircraft by alternating upward and downward arcs interspersed with level flight.

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# 2024 High School Internship Program

## Program Overview:

The TAG-Ed Internship Program offers exceptional students with a technology career path, the opportunity to learn in a real-world environment and get hands-on experience in a field of study relating to Science, Technology, Engineering or Math (STEM). Students are matched with companies based on related interests and qualifications.

The internship is for a minimum of five (5) consecutive weeks. TAG-Ed's goal this year is to place 100 interns with technology and skills companies.

## Host Companies Can Expect:

- TAG-Ed will help to define the best project plan for the intern that adds value
- Valuable student contributions
- The opportunity to shape and guide interns' career paths
- The chance to strengthen Georgia's future workforce
- Great ROI-adding value to your organization, fast and affordably

## Students Can Expect:

- Valuable workplace experience
- Strong mentoring
- Workforce readiness skills development
- Clarity in future career interests

## Host Company Program Requirements:

- Provide intern with a minimum five week assignment
- Internships can run between June 3<sup>rd</sup> and July 31<sup>st</sup>, 2024
- Investment cost of \$2,000 per intern / completion of 5 weeks / 100 hours

Company and student applications are available online at:  
<https://www.tagedonline.org/summer-internship-program/>

For more information, please visit: [www.tagedonline.org](http://www.tagedonline.org)

For questions: Amber Litzinger / [amber@tagedonline.org](mailto:amber@tagedonline.org)



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students!







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# SYSTEM UPGRADE: REBOOTING CORPORATE POLICIES FOR IMPACT

By Dwana Franklin-Davis / CEO, Reboot Representation



System Upgrade is a practical and data-driven set of nine policies and practices that will help untapped talent enter, thrive, and stay in the workforce. Tech employers: have you ever wondered if your corporate policies and practices are the ones your employees really need? Are these the policies that help your employees not only join your company, but stay there, and excel? A new report asks 1 question: what if companies worked smarter, not harder to keep their talent?

This new report features groundbreaking research from Reboot Representation, conducted by McKinsey & Company, and in partnership with Pivotal Ventures.

## Executive Summary:

All great leaders want and need their people to thrive at work. Companies that consistently invest in their core talent tend to outperform their competitors and are more likely to thrive long term.

For years, companies have invested significant time and resources in improv-



ing representation and inclusion in the workplace. Yet there is still little concrete and lasting progress, particularly when it comes to the inclusion of Black, Latina, and Native American (BLNA) women in the technical workforce. This report is an effort to understand why, as well as what works to change that reality.

When we published the first Rebooting Representation report in 2018, the number of BLNA women receiving computing degrees wasn't just low—it was declining. The collective power of the Reboot Representation Tech Coalition partners and countless others across the ecosystem helped turn those numbers around. The number of computing degrees awarded to BLNA women nearly doubled between 2016 and 2021. That's worth celebrating.

We've come a long way, and we know where to double down next: retention in the workplace. In the same moment that we see an increase in degree conferrals, BLNA women's representation in the technical workforce is shrinking—dropping by more than 10 percent in the past four years (from 4.6 percent in 2018 to 4.1 percent in 2022)<sup>5</sup>—compared with 16.5 percent in the working age population as a whole.<sup>6</sup> To consolidate educational gains and build a workforce of thriving technologists, companies need to act.

Companies must be more intentional about ensuring that their talent strategies explicitly address employee needs at the intersection of gender and race or ethnicity. This is a smart way to prioritize talent efforts and get the most out of the investments companies are already making in their talent, especially at a time in which companies are being asked to stretch resources. When done right, this effort could lay the foundation for a more supportive workplace for additional groups that face steep barriers in the technical workforce and, ultimately, help all employees thrive.

Companies have a clear and tangible opportunity to reverse the decline in BLNA women's representation in the technical workforce. We surveyed more than 2,000 BLNA women in technical roles and their peers from other demographic groups about 38 specific policies and practices at their organizations. In addition to our survey, this report builds on existing research, much of which focuses on the experiences of BLNA women (such as their sense of belonging at work).

We found that, while current policies and practices aren't quite hitting the mark for BLNA women in technology, there are concrete actions employers can take that would positively affect the workplace experience for BLNA women



and all employees—in technical roles. Our research shows the following:

- Companies are offering policies and practices that aren't being used. Only 32 percent of BLNA women said they used more than half of the policies and practices referenced in the survey, compared with 43 percent of all other demographic groups. That means the investments companies are making in offering these policies and practices are not yet achieving their full potential for impact.

- An investment in these cornerstone policies is an investment in employee retention. BLNA women whose organizations offer all nine cornerstone policies and practices reported being more than 75 percent more likely to stay at their companies than BLNA women at companies that do not offer all nine.

- These policies benefit the entire workforce. Employees from all other demographic groups reported being nearly 80 percent more likely to be satisfied with their work experience at organizations that offered all nine cornerstone policies and practices.

Just 36 percent of all respondents reported that their company currently offered all nine cornerstone policies and practices.<sup>8</sup> Offering the full package is

a crucial start for leaders who want to move the needle for BLNA women in the technical workforce.

Companies that do offer the cornerstone policies have an opportunity to take advantage of data disaggregated simultaneously by race or ethnicity and gender. Disaggregated data enables companies to increase the return on their investment in policies and practices by uncovering hidden barriers to impact. Only 46 percent of BLNA women reported that their employer's average existing cornerstone policies were designed to be accessible and effective for them, 16 percentage points lower than what their peers reported.

That might not be surprising: the significant majority of companies surveyed and interviewed for this research had not yet set goals, measured progress, or tracked outcomes at the intersection of race and gender.

By exploring existing policies and practices from both corporate and technologist perspectives, this report provides a road map to help companies prioritize the tactics that will make the most of limited time and resources. It includes key opportunities for action along with tools and resources to support companies in creating environments in which all employees feel supported and contribute fully.



To create lasting progress, business leaders must tap into three familiar (but critical) factors for success: collecting and disaggregating data at the intersection of race or ethnicity and gender to sharpen decision making; delivering results and fulfilling the promises that have been made to employees by focusing on the highest-impact practices; and iterating and improving continuously by centering the needs of BLNA women technologists to create a workplace in which all employees can truly thrive.

[Review full report here](#)



# STEM Gets a Makeover

By Sakeya Donaldson

*T*he beauty industry has been around for centuries. Every ancient culture from Africa to China has used various substances to enhance or alter their appearance. In more modern times, cosmetics have become more complex with a wider range. When we think of cosmetics, very seldom do we think of all of the research and testing that goes into developing these products that we use daily.

From soap to lotion to sunscreen to foundation, there are a team of chemist and scientists in the labs creating the magic. For decades these careers weren't looked at as vital in the industry. Gatekeepers haven't allowed a diverse representation in this space as it relates to gender and race. According to reports (National Science Board) women make up 47% of the entire workforce with only 28% in the science and engineering sector.



Out of that 28% only 5% are women of color. Of that 5% only 2.9% are black women (National Center for Education 2015). Reports state that the lack of confidence and support at the K-12 levels have a significant impact on female students choosing another major instead of one in STEM. The Science of Beauty has set out to change all of that.

The Science of Beauty is a STEM beauty program founded by fashion and beauty expert Sakeya Donaldson. For the past 2 years The Science of Beauty has hosted an annual week long summer camp in Tampa, FL for African American female students ages 10-17 at The Glazer Children's Museum. The mission of the program is to expose young African American girls to STEM careers that exist in the beauty industry through education, interactive learning and product demonstrations. Since its inception in 2021, The Science of Beauty (SoB) has partnered with Neiman Marcus, Chanel and Estée Lauder to bring this plight to the forefront.

“Representation was my biggest issue in this space”, states Donaldson, a 20 year veteran wardrobe stylist and former magazine editor. “I knew in order to peak the girls interest in STEM it had to be presented to them in a way that it was digestible and fun. Nothing is more fun to a teenage girl than beauty products.”



Keynote Speaker Manessa Lormejuste  
Science of Beauty Founder Sakeya Donaldson



Student creating a natural soap

Over the course of history, there has been limited representation in this industry for African American women.

In other STEM sectors you've seen Dr. Gladys West, Astronaut Mae C. Jemison and The Hidden Figures all excel, but not since Dr. Mary McCloud-Bethune has an African American woman been in the forefront of the science and beauty industries.

The six day camp concentrated on four facets of the beauty industry hair, body, skin care and fragrances.

Each day the students learned from industry professionals about their journey into the STEM and beauty spaces as well as the brands that they work for. The students also participated in a daily demonstration where they made a product from whatever category was assigned to the day. They also had a business component to their curriculum and a business presentation that culminated the week long program. The interactive and intensive curriculum and workbooks were developed by Karina Streeter of STEMA, a STEM educator in Tampa, FL.

The program kicked off with Keynote Speaker Manessa Lormejuste, a beauty chemist that has worked with brands like CeraVe, Kiehl's and L'Oréal. Manessa spoke about her trials in navigating in a space that was foreign to her and others around her. "It was extremely important for me to have Manessa kick off the camp. She's a walking, talking representative of what I hope my students will become. She's a top graduate of Rutgers University, a self proclaimed #GirlyNerd, she's African American and she's beautiful" exclaimed Donaldson. "The students called her chemist Barbie, which was so fitting" states Donaldson.

During the six day camp the students learned about the different hair types and textures. They also had a home-



work assignment where they had to test the porosity of their hair. They also developed a leave in conditioner. They learned about preservatives that are used in products and about the strenuous testing that goes into getting these products from the laboratory to consumers.

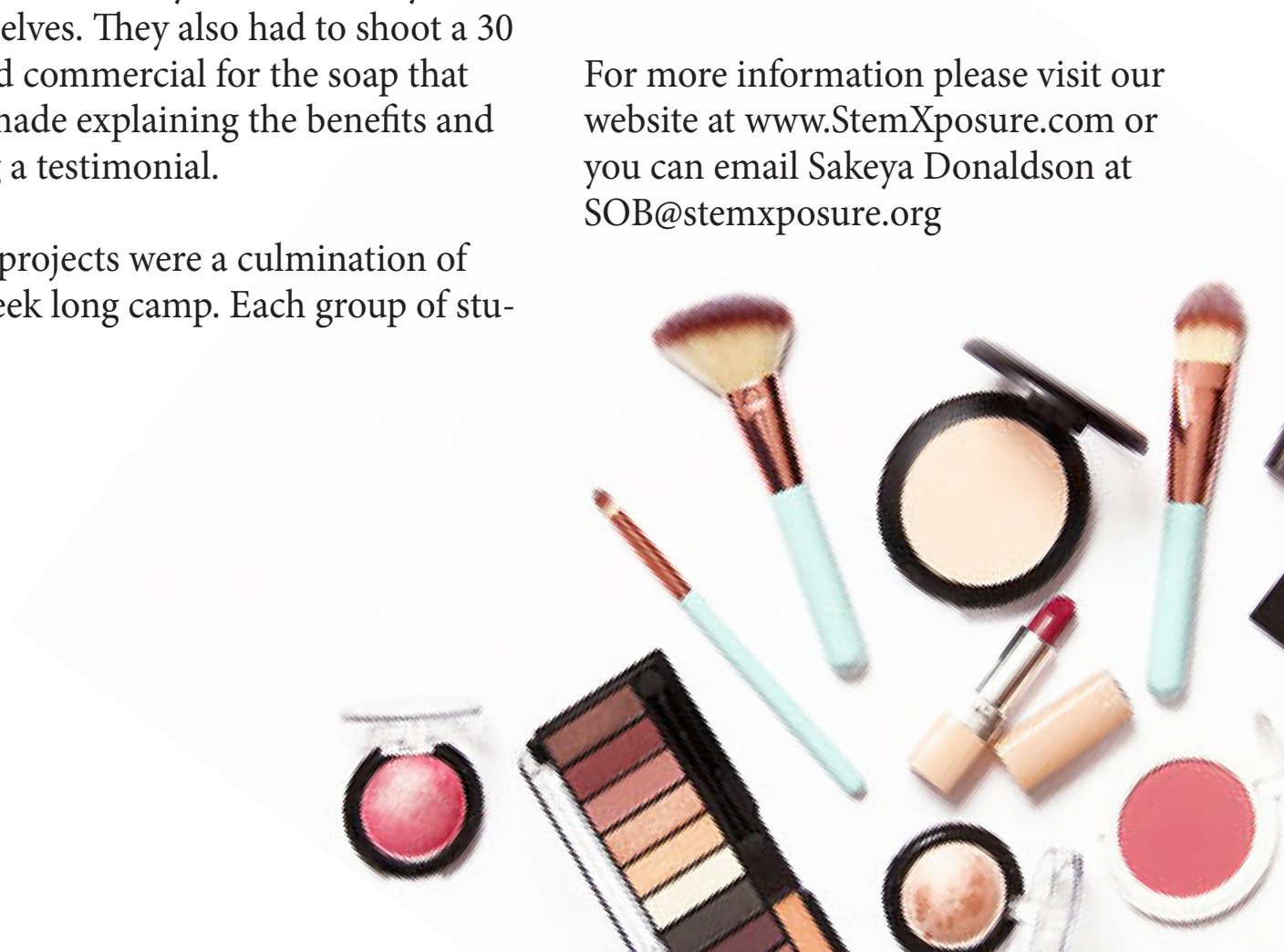
Skin was a topic that was addressed throughout the program as it is our largest organ. They learned about the 3 layers of skin as well as the different types of skin. They learned about UV and UVA rays and the importance of sunscreen from Britta Sevin of Super-Goop. They also made an all natural soap that included essential oils that would combat any skin issue they faced themselves. They also had to shoot a 30 second commercial for the soap that they made explaining the benefits and giving a testimonial.

Their projects were a culmination of the week long camp. Each group of stu-

dents created a logo, 30 second elevator pitch, various marketing strategies and cost analysis for their product. 'STEM is something new for my community. I wanted to offer it to the girls in a way that was digestible and fun' states Donaldson 'I can build more beauty chemist than I can astronauts'.

"My goal for the next year is to create more programming. The Science of Beauty was just the tip of the iceberg. I'm currently developing a pilot program called The Science of Body for Sligh Middle Magnet School in Tampa, FL. There are so many possibilities in this space and I want to explore as many as possible" Donaldson concludes

For more information please visit our website at [www.StemXposure.com](http://www.StemXposure.com) or you can email Sakeya Donaldson at [SOB@stemxposure.org](mailto:SOB@stemxposure.org)





# WOMEN IN STEM

By The Chartered Institute of Patent Attorneys

Women in IP have been working to highlight the benefits of gender inclusion within the profession and work towards greater equality.

## Internet Protocol (IP)

The Internet Protocol is the network layer communications protocol in the Internet protocol suite for relaying datagrams across network boundaries. Its routing function enables internet-working, and essentially establishes the Internet.

## About [Dr. A.K. Ola Hekselman](#)

Dr. A.K. Ola Hekselman is a distinguished scientist, entrepreneur, and visionary in the field of battery science. With a profound commitment to environmental sustainability, her work has redefined the possibilities within battery technology. Dr. Hekselman's academic journey includes a PhD from the University of St Andrews, research fellowships at the University of Oxford, and postdoctoral research at Imperial College London. Her contributions extend beyond academia, as she continues to drive innovation at the intersection of science and business.

Ola was keen to provide a sustainable and efficient alternative, so she worked with Dr Payne on developing an improved, solvent-based method of recycling lead-acid batteries. This prompted the filing of a UK patent application to protect their invention, which has since been used to seek patent protection in multiple countries.

Ola's vision goes beyond innovation; it's about real-world impact. She envisions scaling Solveteq's technology globally, revolutionizing battery recycling while diminishing environmental footprints.



This commitment to progress was recognized with the Innovate UK 'Women in Innovation' award in March 2023.

About **Dr. Fanya Ismail** – CEO, Director and Co-founder of SGMA

Dr Fanya Ismail, Chief Executive Officer, Director, and Co-founder of Sol Gel Materials and Applications (SGMA) Limited, has led an interesting and impactful life.



Fanya founded SGMA in 2017 with the aim of creating sustainable and plastic-free paper packaging using sol-gel technology. Her work was recognised with an Innovate UK 'Women in Innovation' award in 2019.

SGMA has grown rapidly and moved from the small industrial unit in Gillingham which first housed its labora-

tory and office, to a site in Kent Science Park in Sittingbourne. Its initial focus was on providing a waterproof barrier to replace the plastic liner in single-use disposable coffee cups to make them fully recyclable, compostable and biodegradable. Never short of ideas, SGMA's goal is to apply its technology to a wide range of areas including food and drink, textiles and construction.

As the business has grown, SGMA has filed an increasing number of patent applications, all which list Fanya as an inventor. Securing patent protection for her inventions gives SGMA's investors' confidence that the business is protected as it expands, which was key in attracting investment in its early stages. The company's diverse portfolio of patent applications now includes four international patent families.

Here's what their patent attorney Dr. Marianne Privett had to say about her clients;

*"Dr Fanya Ismail and Dr. A.K. Ola Hekselman are truly inspirational scientists and entrepreneurs who are helping pave the way for women in science and technology. It has been a privilege to join Fanya and Ola on their journeys in developing innovative and sustainable products and services to combat key environmental issues and assist them in using intellectual property to support their businesses as they grow."*



About [Siana Zhekova](#) – Computer Science Finalist at The University of Cambridge

Building bridges: Siana Zhekova, and her “necklace” bridge



Student inventor, Siana Zhekova, is the inventor of a temporary “necklace” bridge designed for rapid deployment following a natural disaster. Siana, a visionary student and aspiring engineer, has engineered a ground-breaking solution that stands poised to revolutionize disaster relief efforts.

Her ingenious bridge design, coupled with a user-friendly winch mechanism, could significantly expedite recovery in disaster-stricken areas.

The bridge concept, meticulously crafted by Siana, serves as a lifeline during catastrophe-induced devastation, such as floods or earthquakes, where existing bridges have succumbed. Leveraging cutting-edge technology, the bridge is deployed by launching support cables across riverbanks, anchoring them securely. Subsequent attachment of platform sections onto the cables creates the foundation, followed by the tensioning of cables via a novel winch mechanism.

Collaborating with Beck Greener – a supporter of women in STEM, Siana’s work embodies their shared mission, Beck Greener’s STEM Branching Out Initiative, aimed at introducing STEM careers to students, providing crucial guidance to Siana throughout her intellectual property journey.

Here’s what her patent attorney had to say about her journey:

*“I am always surprised when young people tell me that they are not an inventor, or that patents are not for them.*

*At Beck Greener, we want to show that being an inventor simply means having a good idea to solve a problem. Siana’s bridge is a perfect example. As part of a school project, she came up with an elegant solution to the problem of reaching people in an emergency.*

*The innovative bridge design she devised may be deployed quickly and easily by the emergency services at instances where time is critical. A real lifesaver. We are delighted that we were able to secure a patent for her invention as part of our STEM: Branching Out project."*

### **Erin Reid** – Founder of LU Innovations

Erin Reid (26) is the founder of LU Innovations Ltd, a menstrual health company for adventurers. Erin, a self-proclaimed adventurer, felt uncomfortable and a lack of ease in the products and resources available to her when she participated in outdoor activities on her period. In her final year studying product design, she started researching and designing period kits to truly work in remote environments, without the need for toilets, handwashing facilities or bins, taking pride in thinking about the whole user journey.



With no previous business experience or knowledge in taking a product to market, she has described entering the period care market as fascinating. She said “Being a female inventor with a female orientated product range can be difficult.

As menstrual health isn’t talked about enough and seen as secretive and taboo subject, conveying the pain points and health risks LU solves to those that do not menstruate is time consuming. But it’s really cool getting to call yourself an inventor and CEO of a company that people connect with, even though the foggiest of the menstrual taboo. I take great pride in being able to design products that really make a difference, both socially and environmentally, and being able to play a part in inspiring girls and women to achieve all their goals any time of the month”.

With a huge drive and focus on Fem-Health and female focused innovations recently the importance of having a diverse team in all fields of innovation and patenting is even more significant. Having women represented helps to smooth the journey of bringing a product to market. Erin described:

Quote from patent attorney, *“It has been a wonderful experience working with Erin and LU Innovations, helping to develop and strengthen their IP*



*We are really excited to continue supporting LU innovations as they grow and flourish. While it is fantastic to shine a light on the amazing work ongoing by Erin and LU innovations, it would be remiss not to mention that female inventors like Erin are still in the minority, with only around 13% of EP patent applications having a female inventor.*

Erin O'Connor, HLK

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