ISSUE #6

ORIGINS

STEM Origins Foundation

October 2025

Ali Peterson: Student of the Month

Every month of the school year, we select a STEM student in recognition of those who most reflect our core values of Passion, Diligence & Aptitude for STEM, while also demonstrating Collaboration with others. On 23 September 2025, the STEM Origins Foundation presented our monthly STEM Student of the Month award to **Ali Petersen of Tyndall Academy**. Ali received a medal, a certificate suitable for framing, and a $50 gift certificate to Margaritaville Restaurant in Pier Park. Because outstanding teachers produce outstanding students, we also recognized her teacher, **Crystal Lee**, with a $50 gift certificate from San Marcos Mexican Grill in Pier Park, along with a copy of Ali's award to display in her classroom. Congratulations to Ali on her achievement! Ali's STEM teacher provided the following nomination:

Ali Peterson exemplifies the core values of passion, diligence, aptitude, and collaboration in ways that go beyond what is expected of a typical 13-year-old student.

Passion – Curiosity and enthusiasm for STEM: Ali demonstrates a genuine excitement for STEM learning. She eagerly participates in projects, asks thoughtful questions, and constantly seeks to deepen her understanding. Her volunteer work with the Thunderbird Tech Club for 3rd–5th grade students reflects her love for technology and her desire to inspire younger learners.

See: Ali Peterson, page 2

In this issue:

Ali Peterson (continued)

Diligence – Persistence, patience, and focus: Ali consistently takes pride in her work, showing persistence in refining her assignments through self-editing and careful evaluation. She is patient when faced with challenges, maintaining focus until she finds solutions. Her dedication is also evident in her long-term commitment to the school ITV crew, where she has served since elementary school.

Aptitude – Rational, objective, and logical thinking: Ali applies strong critical thinking skills to her STEM work. She approaches tasks methodically, evaluates evidence, and makes logical decisions. This ability allows her to not only solve problems effectively but also to assist peers and younger students in understanding complex concepts.

Collaboration/Cooperation – Works and communicates well with team members and faculty: Ali is a respectful and reliable team member who communicates clearly and listens to others' ideas. Whether supporting the ITV crew or mentoring students in the Thunderbird Tech Club, she shows maturity and responsibility in cooperative settings.

Excellence - Beyond the Norm: Ali excels in STEM beyond the expectations of her grade level by applying her skills in real-world, school-wide settings. Her involvement in both the ITV crew and the Thunderbird Tech Club demonstrates leadership, initiative, and an advanced ability to share knowledge. By combining her enthusiasm, persistence, logical thinking, and teamwork, Ali is not only excelling academically but also serving as a role model for her peers and younger students.

Brian Maxwell: Volunteer

Brian Maxwell is a STEM Origins volunteer and Organic Chemist. Brian started with a B.S. in Chemistry from the University of Tennessee, Knoxville. Brian then worked for two years at Oak Ridge National Lab before getting his PhD in Organic Synthesis from the University of California, Berkeley.

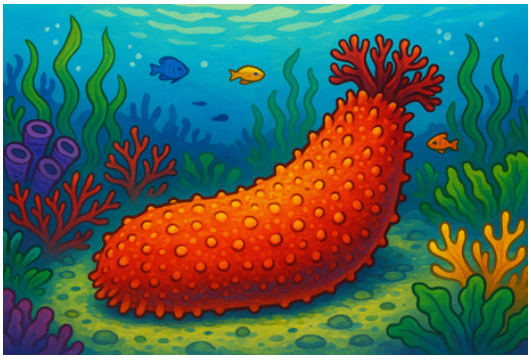
With over 40 years of experience as an Organic Chemist, Brian says, "I was fortunate to work in Research and Development for my entire career. I have designed and made many types of chemical compounds and polymers from dyes and colorants to radiolabelled compounds to polymers for adhesives, paints and protective coatings. I also managed groups of chemists to design new products that made paints easier and safer to apply and tires that got better traction and better gas mileage.

Throughout my career, I enjoyed using my natural curiosity to identify and solve problems to make better and safer products."

Cancer Fighter from the Sea

Scientists at the University of Mississippi have discovered that sea cucumbers—those soft, tube-shaped cleaners of the ocean floor—may also help fight cancer. Researchers found a special sugar molecule in these creatures that blocks Sulf-2, an enzyme cancer cells use to spread. Even better, the compound doesn't trigger blood clotting like many current drugs. If scientists can reproduce it in the lab, this natural sugar could inspire a new, safer class of cancer-fighting medicines drawn from the sea.

Attribution: Science Daily



Chieko Asakawa: Opening the Internet to Everyone

When Chieko Asakawa lost her sight at age 14, she also lost her independence—or so it seemed. Decades later, her determination to restore that independence for herself and others would reshape how millions of people experience the internet.

Asakawa, born in Osaka, Japan, in 1958, became blind after a childhood accident. Determined to live fully, she mastered Braille and earned a degree in English literature from Otemon Gakuin University. While typing her own Braille textbooks by hand, she realized how powerful access to information could be.

That idea became her life's work. After training in computer programming, Asakawa joined IBM Research in Tokyo, where she developed the Home Page Reader (HPR) — the world's first practical voice browser. Released in 1997, HPR allowed blind and visually impaired users to navigate the web through a computer's keypad, transforming websites into speech. It could describe images, tables, and links with remarkable accuracy and was soon translated into 11 languages.

Asakawa's innovations didn't stop there. She went on to pioneer systems that digitized Braille, built online library networks for the visually impaired, and helped developers design more accessible websites. Her recent project, NavCog, uses AI, sensors, and smartphone technology to guide visually impaired users through real-world spaces — helping them move confidently and independently.

Now a professor at Carnegie Mellon University's Robotics Institute and chief executive director of Japan's Miraikan science museum, Asakawa continues to push the boundaries of accessibility.

Her philosophy remains simple and powerful: "Accessibility is about enabling human capability through innovation," she says, "so that everyone can reach their full potential."

U.S. Patent No. 7,197,462
Inducted in 2019
Born 21 November 1958

Attribution: https://www.invent.org/inductees

The Amazing Eye

The human eye is a true marvel of biology. Researchers at ZEISS estimate that our eyes can process over ten million bits of visual data every second, far more than once believed. This incredible organ doesn't just detect light; it converts it into electrical signals that the brain interprets as images. Able to distinguish about 10 million colors and instantly adjust to changing light, our eyes continuously refresh our view of the world. Every blink is a tiny update to our amazing visual database.

Attribution: Beauty of Nature

Hot STEM Careers to Watch in 2025

STEM careers are expanding faster than almost any other sector, fueled by rapid innovation and society's growing dependence on technology. Labor forecasts project more than 10% growth by 2033. That's nearly double the rate of overall job expansion while unemployment across STEM fields remains low, under 3%. From designing advanced medical devices to developing sustainable cities, STEM work transforms bold ideas into practical progress.

Many of today's most exciting opportunities lie where technology meets real-world needs. Fields like artificial intelligence ethics, renewable energy, climate modeling, and biotechnology are reshaping how we solve global challenges. Below are highlights of fast-growing STEM careers, along with average annual salaries (2025 data) and entry routes; some accessible through certifications, apprenticeships, or two-year degrees rather than traditional four-year programs.

- **Software Developer** ($130,000)
  - Builds apps and AI tools. Remote-friendly with opportunities in multiple industries.
  - Bachelor's degree in Computer Science or bootcamp (6-12 months).

- **Data Scientist** ($140,000)
  - Analyzes big data for business or climate decisions. Powers everything from Netflix to disaster prediction.
  - Bachelor's degree in statistics or math and Python/R skills.

- **Cybersecurity Analyst** ($120,000)
  - Protects against hacks in an AI-driven world. Critical for finance and national security.
  - Certifications like CompTIA Security+. An Associate's degree is optional.

- **Civil Engineer** ($95,000)
  - Designs sustainable infrastructure like resilient bridges amid climate change.
  - Bachelor's degree in engineering. A Professional Engineer (PE) license for advancement.

- **Bioinformatics Specialist** ($110,000)
  - Merges biology and computing for drug discovery or genomics. Rapid growth post-pandemic.
  - Bachelor's degree in biology/computer science. Graduate certifications helpful.

- **AI/Machine Learning Engineer** ($150,000)
  - Creates smart systems for autonomous vehicles or personalized medicine.
  - Master's degree in Computer Science/Artificial Intelligence. A solid portfolio of projects showing application of AI also necessary.

- **Environmental Engineer** ($100,000)
  - Tackles pollution and renewables. A key role to achieve net-zero goals by 2050
  - Bachelor's degree in Environmental Engineering. Also requires fieldwork experience.

- **Nurse Practitioner - STEM Track** ($125,000)
  - Uses technology in diagnostics or telehealth roles. The fastest-growing healthcare role.
  - Master of Science in Nursing and clinical hours. Bridges both science and care.

The highlights above draw from U.S. News rankings and BLS projections, emphasizing growth (10-20% or more annually) and flexibility.

Fun(d)raising

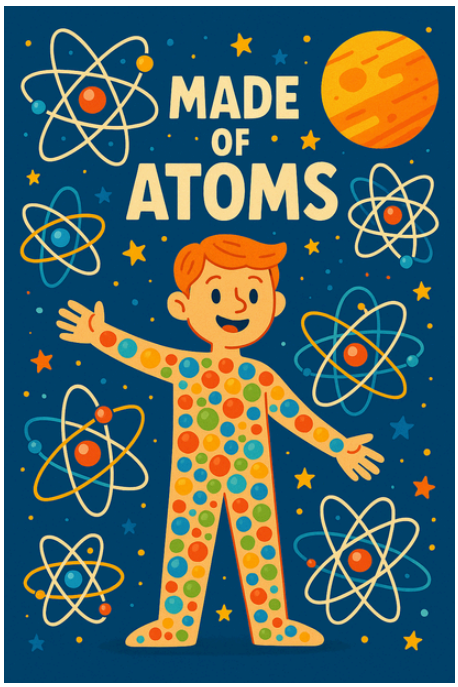
In September, we hosted an event at Top Golf at Pier Park to raise awareness of (and funds for) STEM Origins. Many thanks to all 115 of you who enjoyed a beautiful day of golfing fun, food, and camaraderie while supporting education in Bay County.

And thank you to Top Golf of Panama City Beach for partnering with us to give away a Platinum Elite Membership which we will raffle off at a future event to will benefit our Rising Star Scholarship Program.

You are Older than You Think you Are

The atoms that make up your body are far older than Earth itself. The hydrogen in your cells was created during the Big Bang more than 13.8 billion years ago, making it the oldest matter in existence. Heavier elements (like carbon, nitrogen, and iron) were born later inside massive stars and scattered across the cosmos when those stars exploded. As Carl Sagan said, “We are made of star stuff.” Every atom in your body has existed in countless other forms—flowing through oceans, drifting in air, and building other living things—before becoming part of you. One day, those same atoms will return to nature, ready to begin new journeys. In the grand cycle of matter, we’re all temporary cosmic assemblies.

Attribution: Science Pulse



Upcoming Events

15 November, 9-11 am
BDS Future Physicist Program. We are looking for volunteers to connect with Future Physicists at Florida State University in Panama City.

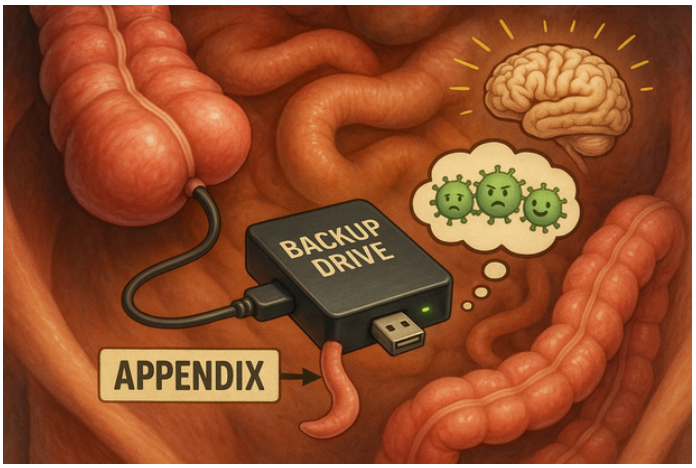
18 November, 6-7 pm
Deane Bozeman school is opening their library and hosting a *Family Reading Night* with guest readers, activities, food, and fun! We are looking for volunteers who would be interested in doing a STEM activity with students that evening at their event.

12 April 2026, all day
STEM Event at the Thunderbirds Air Show. We have been invited to provide our hands-on demonstrations at the upcoming Air Show.

Your Appendix: Biological Backup Drive?

Research from Duke University upended centuries of medical belief about the human appendix. Dismissed as a useless organ, it turns out the appendix may be a vital "safe house" for beneficial gut bacteria, and a key player in gut-brain communication. Advanced imaging showed that the appendix has over 200 million neurons, more than the spinal cord. These nerve cells appear to help the body "remember" past infections and coordinate immune responses independently of the brain. Surprisingly, people without an appendix show different gut-brain communication patterns and higher rates of intestinal infections. The appendix may act like a biological backup drive, storing bacteria and neural information.

Attribution: Sci Corner



About Us

Our mission is to support local education in science, technology, engineering, and mathematics (STEM) with projects that inspire students and teachers at every level of the academic ladder from kindergarten through college.

We seek to increase the quantity, quality, and diversity of high school and college STEM graduates. Our approach involves engaging students early (K-5) to foster interest in STEM subjects and maintaining engagement throughout middle school, high school, and college with progressively advanced activities.

Programs include providing hands-on experiences, classroom equipment, and access to STEM professionals through visits, virtual presentations, and coaching on innovation and long-term goals. We plan to offer scholarships for college STEM fields and STEM camps for all grade levels overtime. Additionally, we support STEM teachers through grants for career development, professional growth, and innovative classroom experiments to enhance student learning experiences.

The STEM Origins Foundation is a 501(c)(3) nonprofit organization in Bay County, Florida. IRS Certification, Articles of Incorporation, and By-Laws are available on our website. Also visit us on Facebook.