

VOLUME XVIII// SEPTEMBER 2022
welcome back PHS!

THE 28 PERCENT

Women make up only 28% of the STEM workforce.
This newsletter aims to change that.

By Ruby for the November 2020 issue



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Sally Ride

Written by Violet for the June 2021 Issue



If you're looking for another amazing scientific woman to worship (which you inevitably are), look no further! Sure, you may have heard of Sally Ride, but do you really know the extent of her contributions and accomplishments in the field of STEM? Most famously, Ride made history on June 18, 1983 by being the first American woman in space, but she worked hard throughout her life to get there. Ride was born in California on May 26, 1951. Though neither of her parents were physical scientists, she credits them with investing an interest in exploration in her from a young age. Ride attended high school on a partial tennis scholarship, eventually leading her to be accepted into Stanford, one of the most prestigious colleges in the US. After finishing her studies at Stanford, Sally bested thousands of applicants and was selected as one of NASA's first 6 female astronauts. Her first and most iconic trip to space occurred as a specialist on Challenger, NASA's 7th shuttle mission. Ride launched a second time on a different Challenger mission, making history again. Even after her time in space was cut short, she still continued to work at NASA as an accident investigator and play a role in discovering what happened in the tragedies of 1986 Challenger and 2003 Columbia. After her NASA days, Sally became a professor at San Diego State College, and used her influence to co-found a charity to support children - especially girls - in their interest in STEM with her partner Tam O'Shaughnessy.

Sally Ride died at age 61 in 2012 after a 17-month-long battle with pancreatic cancer.

Though Ride only officially came out as gay in her obituary, she has also made a large impact as a representative for the LGBT+ community in the field of STEM. Sally Ride lived an impactful, inspiring life and it's incredibly sad that it was cut short by disease. I hope this biography on the life of the first female astronaut Sally Ride was informative and inspiring, proving that anyone really can do anything.

Rocket Science Made Easy - My Conversation with Dianna Velez

Written by Gianna for the December 2021 Issue

*Dianna Velez grew up in the Hudson Valley of New York. In 2003, she graduated from a public school, Pine Bush High School, where she cites listening to bands like Coheed and Cambria as her favorite pastime. As a high school student, she worked at a music and movie store, went to concerts, and had never heard of Jet Propulsion Laboratories. She is a first-generation college student. After graduating from high school, she attended Worcester Polytechnic Institute (WPI), a project-based engineering school in Massachusetts. As a student at WPI, she worked full time for two semesters at Draper Laboratory as a Student System Design Engineer. She graduated from WPI in 2013 with a Bachelor of Science in Aerospace Engineering with high distinction. She then worked at Draper Laboratories full-time a year before attending the Massachusetts Institute of Technology (MIT) and earned a Masters Degree in Aerospace Engineering. She continued to work at Draper Laboratory until 2017. In 2017, she got a job offer from Jet Propulsion Laboratories (JPL) in California where she currently works as a Systems Engineer and Guidance Navigation Controller. **[JPL is owned by NASA and managed by the nearby California Institute of Technology (Caltech). The laboratory's primary function is the construction and operation of planetary robotic spacecraft.]***

When something is easy, people like to say “It's not rocket science.” But what if it is? How does a person even become a rocket scientist? How does a first-generation college student become a rocket scientist? I got to find out by talking with Dianna Velez, a Systems Navigation Engineer at JPL (that's what she calls herself, I call her a rocket scientist). She shared with me her obstacles, challenges, advice, and what steps she took to get to where she is now. All of it helped me answer my question, what leads women in STEM to success in a field dominated by men?

Aerospace engineering is a field dominated by men. For example, in 2017, women made up 34.2% of all employees at NASA and only about 16% were at the senior level. Currently, in many graduate programs, women make up about 37% of student enrollment. Dianna Velez found this to be true as well. She described her class at WPI as having a “stereotypical engineering ratio,” or “three guys to every girl.” So, when asked if it was challenging working in a field dominated by men, she described that it wasn't. “Everyone got along [at WPI] so well that it never really felt like that to me, whatever those numbers are.” Despite the unbalanced ratio, in her words, “I loved WPI. I had a phenomenal time.” She related two of the reasons her experience was positive. First, she said that amongst women who go that route, there is a lot of camaraderie. Next, she described her family, “I had a lot, a lot, a lot, of cousins. The ones who were my age, it was probably like five to one guys to girls, so three to one didn't even phase me.”

Rocket Science Made Easy - My Conversation with Dianna Velez (continued)

In fact, she and her all female team in the aerospace department, were one of only three teams (out of about 12 teams) to win an award for their major qualifying project at WPI. Each woman on the team now works for an aerospace company.

Throughout Ms. Velez's journey, she brought up many people who have helped her along the way. Bosses, friends, and most importantly, mentors. When asked, what makes a good mentor, she described a good mentor as someone who "provides you with perspective that only comes with experience." She portrayed the role as being filled by someone who can meet with you, offer support, answer questions, and provide their insight along the way. One of Ms. Velez's mentors is her current boss at JPL, Shyam Bhaskaran. I asked Ms. Velez how her mentors have helped her. In response, she recounted that her mentors had met with her one-on-one and helped her make decisions regarding her career. One example she shared was how her mentor helped her with the decision between continuing to work at Draper Laboratory or moving to Los Angeles to work at JPL. Ms. Velez stated her mentors helped her choose "what would make me [Ms. Velez] happiest and would be the best for my career."

Her next piece of advice, "don't waste your own time." I had asked Ms. Velez what advice she would give to future generations of women in STEM. Ms. Velez had two major pieces of advice for the future generation. First, to meet people. She said to get out of your comfort zone, even if you're introverted. Talk to people. "Take your time to meet people both your peers and all sorts of potential mentors, take the time to have those one-on-one conversations." Ms. Velez said to ask people their story, "that's one way to get in with someone. You learn about what things are like and people's perspectives. You hear about the times in people's lives that were the hardest professionally and personally, and then when you have those moments in your life, you have the concept and tools to get through it too." The second piece of advice she gave was to ask questions. She counsels, "when you're in college and grad school if things aren't coming naturally to you, go to all the help sessions, go to the quiet hours, go to the office hours, go to the TA hours, go to them, get the help." She reminds students to remember that everyone is learning, that if you have a question, it is likely that at least two other people in the room have the same question. Even if you feel like you're doing fine, go reinforce the idea for yourself.

I feel very lucky to have interviewed Dianna Velez and learn what might help lead the future generation of women in STEM to succeed. That you must ask questions, find mentors, put yourself out there, and meet people. I appreciated talking to Ms. Velez because she made it sound so easy, like something other than rocket science.

Modern Math Maven: Eugenia Cheng

Written by Morgan for the March 2021 Issue

Dr. Eugenia Cheng is a famous mathematician, concert pianist, educator, author, public speaker, columnist, and artist. She was born in Hampshire, England and her family is originally from Hong Kong. Her mother was a statistician who worked at an accounting firm in London. Her father had a child psychiatry practice near their home. Dr. Cheng was used to her mother as the one who carried a briefcase and her father making dinner. Even from an early age, Cheng was in love with mathematics. She describes a time at age 6 when her mother showed her how by simply raising a number to a power, you can get graphs with curved lines.



Cheng attended Cambridge University and received her PhD in pure mathematics. She has done much research in higher-dimensional category theory, a branch of math that she summarizes as “the mathematics of mathematics”. Put simply, category theory is used to depict how different structures are related to one another. It has much use in topology, programming language theory, and even in philosophical study, incorporating concepts such as space, systems, and truth. Eugenia Cheng is currently a scientist in residence at the School of the Art Institute of Chicago. There, she teaches art students high level abstract math, showing them the application of math in subjects including art.

While she was senior lecturer of pure mathematics at the University of Sheffield, she hosted a YouTube series called *Mathster Chef*, in which she explains mathematical concepts using food. Such videos include how to make the perfect cream tea using a formula that involves the thickness of cream compared to the scone and the total thickness of the dressed scone itself. She uses math to prove that putting clotted cream on a scone is much better than putting whipped cream. Other videos include *The Perfect Way to Share a Cake* and *The Perfect Puff Pastry*. Cheng is also the author of many fascinating books such as *How to Bake π* , *Beyond Infinity*, *The Art of Logic: How to Make Sense in a World that Doesn't*, and *$x + y$: A Mathematician's Manifesto for Rethinker Gender*.

Math is for everyone! One of Cheng's main goals in life is to rid the world of math phobia. After all, math wasn't created to make humans' lives harder, but to give us a foundation for solving problems through logical reasoning. Visit Dr. Eugenia Cheng's website at: <http://eugeniacheng.com>

Morgan Gaskell

Written by Mallika for the Chronicle
Collaboration

The COVID-19 pandemic was the reason for many people to take up various hobbies.

Morgan Gaskell is a student at PHS who took this time to explore the depths of ornithology, the study of birds. “I’ve always been a big wildlife enthusiast,” she said to me. “When I moved to my home in Southern California, wildlife was everywhere! I was so lucky to spot wildlife such as the American black bears and California mule deer wandering through my yard”. When quarantine began, she found herself turning to the most abundant wildlife in her yard—birds. “I put up two bird feeders and the birds came!” she said, “Quarantine really became a time for me to learn about my local species.”

What impressed me the most about Morgan was her knowledge and passion for the subject. She has her own website called the News for the Dedicated Zoologist, where she writes a bi-monthly newsletter about her discoveries and experiences. “I created News for the Dedicated Zoologist in February of 2018. *“I was in 6th grade at the time and had a wonderful math and science teacher who sparked my interest in STEM. I also had a fantastic English teacher who inspired me to share my writing.”*



Last May, Morgan joined a bird banding group made up of individuals interested in ornithology from all over the LA area. “Every other week, I’m waking up at 3:30 am to get to Zuma by sunrise. For the next six hours, we’re catching birds in nets and processing them—taking measurements, determining sex and age from feathers, etc. Watching birds is one thing, but holding them in your hand lets you learn about the bird’s life.” she wrote in News for the Dedicated Zoologist.

Her website also includes documentation of birds she’s seen and nests she’s tracked in the last few years. Her publications are detailed and interesting, complete with phenomenal photography of her own experiences. Morgan Gaskell is truly a treasure to the world of STEM and biology.



Donna Bailey

the first woman video game designer

Written by
Emma for the
November 2021
Issue



Dona Bailey, hired in 1980 as the first woman programmer in the coin-op department at Atari, is the creator of Centipede, a classic arcade game that is still well known today.

This genius woman started college at the age of 16 and graduated by the time she was 19, with a Psychology major and English, Math, and Biology minors. Throughout her college years and even after them Bailey learned all different kinds of programming languages. While she worked at General Motors (GM), she played her first arcade game, Space Invaders. Playing the game made her realize that she wanted to do something more enjoyable than working on cars. She wanted to create games, and that is exactly what she did. After six weeks of playing Space Invaders, she quit her job at GM, and aimed to work for Atari, who had few experienced 6502 programmers. She had gained a lot of experience in 6502 while at GM, writing microprocessor code so much so that it became natural to her.

Bailey didn't know that there weren't any women in the coin-op department, but she got through the interview process and started working in June of 1980. After around two weeks, the manager of software engineers stopped by Bailey's cubicle and suggested she find an idea in the brainstorm notebook, a binder filled with maybe 40 pages of lined paper each with an idea for a game on it. With most of the ideas having something to do with lasers, which for some reason nobody could spell with an "s" instead of a "z", one idea, titled "Centipede" caught her eye. She could actually visualize how it would look on the screen and seemed similar to Galaga, which was Bailey's favourite game at this time. Because of this she always viewed Centipede as an "homage to Galaga". She also thought that the appeal of Centipede's visual is what made it special.

Dona Bailey left the video game industry after 4 years and moved to Arkansas in 1997. 11 years later she worked as a teacher in the department of Rhetoric and Writing at the University of Arkansas until she retired. She is now working on a screenplay about her experience working on Centipede at Atari.

Mary Shelley

written by Madeleine for the October 2021 issue

Mary Shelley is most known for inventing the science fiction genre with her novel *Frankenstein*. Although her impact can be easily seen today, her own life is not as well known.

She was born in 1797, London, England. Her mother, Mary Wollstonecraft, was a feminist and she died shortly after giving birth to Shelley. She also wrote works of her own. Her father was a political philosopher and novelist. As a child, Shelley and her half sister were raised by their father until he remarried. Her stepmother did not let her go to boarding school, so Mary's education came largely from her father's extensive library and visits by his educated friends.



Mary Shelley (continued)



In 1812, Shelley met the poet Percy Shelley, who was married. In 1814, they fell in love. Learning of the affair, her father threw twenty-year-old Percy out of the house, and seventeen-year-old Shelley was torn between the two. Her love for the poet won out. They ran away to France later that same year. However, because Percy already had a wife, the two could not marry.

The two traveled throughout Europe and returned to England in the fall. Shelley wove her experiences into a travel memoir, *History of Six Weeks' Tour*, published in 1817. Percy had come from a wealthy family, but hearing of his son's elopement, his father cut him off. As a result, the couple suffered many years of financial hardship. The first of many personal tragedies then began. In 1816, Shelley's half sister Fanny and Percy's wife both died within weeks of each other. The couple's first child was born prematurely and lived only 12 days.

In the summer of 1816, the Shelleys traveled to Switzerland. Trapped inside by rain, her friend group decided to make up their own ghost stories. Shelley finally got the idea for what would become her masterpiece, *Frankenstein*. It is the story of a young doctor named Frankenstein who builds a human monster. The monster, shunned by every human contact, turns to revenge on Frankenstein. Although it has been simplified and retold countless times, Shelley's tale is one of great depth, an exploration of the nature of life and love. It was published at the beginning of 1818. The novel was alternately praised for its creativity and rejected for its gruesomeness.

After the premature passing of more children and the death of Percy in 1822, continued financial hardships with some success, she was still able to indulge her passions of writing and traveling. Shelley's final work was just that; entitled: *Rambles in Germany and Italy*. Shelley lived with her son and daughter-in-law until she died from a brain tumor on February 1, 1851.

Like many great artists, she was ahead of her time. Out of the typical Halloween monsters that come to mind, *Frankenstein's* is the only one to come from a single book and not inspired by folklore. Maybe the next time you see a green zombie with bolts in their neck, you'll think about the woman behind his creation, Mary Shelley.



10 // JOIN THE 28% TEAM!

JOIN THE 28%

If you enjoyed reading this newsletter and are interested in being a part of the team that makes it possible - come join us!

Everyone is welcome!

We are looking for WRITERS, LAYOUT DESIGNERS, PHOTOGRAPHERS, ARTISTS, SOCIAL MEDIA MANAGERS, AND EVENT COORDINATORS!

We meet **MONDAYS** at **LUNCH** in **Room E208**! Learn more at our first new member meeting - **MONDAY SEPTEMBER 12!**

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***the people that made this newsletter
possible:***

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***have a question or suggestion ? want to get involved?
want to be featured on a newsletter?***

Email Ms. Orret!

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