

The 28 Percent

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

By Ruby & Makenna, 12th grade



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UPCOMING SCHOLARSHIPS AND DEADLINES

compiled by Ariana Soto, JMHS Chapter

As the college admissions season comes to a close, it's the perfect time for rising seniors and other high school students to begin thinking about the future, what lies ahead, and how to get through any obstacles that come with it. Some students see themselves in college or vocational school after graduating. But for those who choose this path, there comes mountains of worries concerning their living situation, grade upkeep, job searching, and cost of tuition, among others. This is where scholarships come in- they're there to help students with the monetary struggles of pursuing post-secondary education. Less students than you think apply, so what's there to lose? Of course, winner selection is still competitive as those who do apply are ambitious and dedicated. Nevertheless, scholarships are always worth applying for! With that being said, here is a list of scholarships with impending deadlines available to high school students going into the STEM field!

Some of these deadlines are coming up very soon, so we hope this inspires you to apply. Scholarships are a great way to improve self-advertisement for future jobs and internships, and can even help pay for college. So if you fit the criteria for any of these, don't hesitate to apply! What's there to lose?

Young Women in STEM

Endorsed by: Stephanie Hagopian
Cumulative Amount: \$15,000
(3 winners, \$5,000 each)

Eligibility: low-income high school seniors or undergraduate women planning to engage in a STEM major at a four-year accredited institution.
Deadline: May 23, 2024

Requirements: Answer a handful of short-essay questions for the judges to familiarize themselves with you and your future aspirations.
[LINK](#)

Women at Microsoft Scholarship

Endorsed by: Microsoft
Cumulative Amount: \$35,000
(7 winners, \$5,000 each)
Eligibility: high-school senior girls or nonbinary people in financial need with minimum a 3.0 GPA planning to go into a tech, engineering, math, or computer science related study at an accredited school of secondary education in the US in the upcoming academic year.
Deadline: March 13, 2024
Requirement: upload your transcript and an online recommendation form.
[LINK](#)

Jiang Amel STEM Scholarship

Endorsed by: Carrie Jiang and Joseph Amel
Cumulative Amount: \$8,000
(2 winners, \$4,000 each)
Eligibility: high school seniors passionate about any part of STEM
Deadline: March 15, 2024

Requirements: Write a 400-600 word response talking about yourself and the ways in which you want to contribute to the world via your career in STEM OR talking about your experience in overcoming an obstacle as well as how it has changed you.
[LINK](#)

Women in Healthcare Scholarship

Endorsed by: Live it Up
Cumulative Amount: \$1,020 (1 winner)
Eligibility: high-school seniors, undergraduate, or graduate female-identifying students of US citizenship engaging in studies pertaining to the healthcare field.
Deadline: May 1, 2024
Requirements: Write a 400-600 word response detailing why you've decided to get involved in healthcare and how you strive to make a difference in the field.
[LINK](#)

A Look into the Marine Conservation Club at John Muir!

written by Imani Duran, JMHS Chapter

In late January, the 28% representatives at Muir were joined by the school's newly added club, the Marine Conservation Club! We conducted an interview with the cabinet to increase other students' awareness of it, since it is a new club. Additionally, it's in the interest of STEM-related fields, so I figured the readers of the 28% could benefit from knowing about it as well! The interview was just a couple of easy questions for each of the cabinet members, however we gathered a lot of insight from it and thus hope to answer questions people may have about the club with this article!

The first question that was asked was "What was your inspiration for starting a Marine Conservation Club?"

At first, one of the members jokingly said "fishies" which I thought was humorous and silly, but the more extended answer we got from the club president, Isobel Stott, was that there wasn't a club exactly like it. In her words, she mentions that "...there was nothing centered around Marine Biology and that's something I want to do

and I knew people that would join." Another member of the cabinet, Ellen Samaras, continued with, "We were also inspired by the concept of having beach clean-up field trips, and going to aquariums... we love fish" Helena Korzen, the parliamentarian also adds, "I really like the idea that Marine Conservation Club would be more hands-on... we're cleaning up beaches, we're recycling, and actively participating," Maya, the treasurer of the club gives a more detailed response, "When I realized that the ocean covers like 80% of the world... I [realized that] it's very important and we need to take care of it and I want to be a part of that and I would like there to be marine conservation clubs everywhere [in schools]."

The other question I'm choosing to include is "What first got you interested in Marine Biology?" Like the previous question, we got an answer from the president first; she said "I've always liked animals and that's something I knew that I wanted to have in my future... In 9th grade, I just got this obsession with marine animals, and have always been passionate about the environment, and it's important!" The vice president gives us an anecdote about her childhood and the turning point that made her so interested! Her moment of realization was during her time in preschool, where "...there was this book of animals,



and it was... of life-size versions and pictures of different animals, and one of them was an eye taking up the entire page, and it was a giant squid, and I closed the book because that freaked me out really badly. That developed my life-long fear/intrigue about giant squids and the ocean..." Ellen Samaras, the vice president's interest stemmed more out of curiosity, while, the president, Isobel's stemmed more out of admiration. Helena's interest was less specific to the ocean and more to the environment, she explains, "I'm not really into marine science so much as I am into environmental conservation, and the reason that marine science is such a big part of environmental conservation...is that the ocean is a big part of our environment and holds so many habitats and there is so much to learn." Mia Rodriguez, the secretary had a more humorous answer and talks about how she always saw videos online of "they're going extinct we need to help them" and that's what opened her eyes to the importance of marine conservation.

The last question was, "What's one thing you're looking forward to in the club?" to which we got various responses from everyone, but the main thing everyone seemed to be ready for was hands-on experiences. "I'm really looking forward to getting a group of people out into the world... I'm excited for people to actually be there and see why it's important." Isobel summarized perfectly.



As promised, the club has already done a hands-on trip since their club arrival. Mr. Mauricio, a history teacher at Muir accompanied and supervised about twelve students at the Cerritos Wetlands Habitat Restoration, to help out this past Saturday, March 2nd! Students learned about the wetlands, helped with restoration, and did all of it in the rain! Talk about dedication!

If you want to start a similar club or work with the already established one, their Instagram is @muirmarineclub. I'm sure they'll be happy to answer any questions!



Planned Parenthood Pasadena & San Gabriel Valley Peer Advocates Pt. 1

written by Madeleine Lees

I'm Madeleine Lees, a senior here at PHS and a member of the 28%. Beyond this, I am a member of the Peer Advocates program of Planned Parenthood Pasadena & San Gabriel Valley (PPPSGV).

The Peer Advocates are a group of high school students who are trained by PPPSGV educators to serve as resources for sexual and reproductive health information in their schools and communities. Our program is for high school students who want to become leaders, create a positive change in their community, and build support for reproductive rights and social justice. As a group, we identify a community issue and work to bring awareness and change.

I felt like the difference I could make in the world was restricted due to my age and inexperience when I was a sophomore in high school. After a successful interview process with the PPPSGV Peer Advocates program, I committed for the year because I wanted to help other people my age make educated decisions about their future. Before I joined, I only knew how to advocate for myself. In my first year as a Peer Advocate and as a junior in high school, I learned how to advocate for others.



Our impact project, and the main focus of the Peer Advocates program, was centered on spreading information about abortion rights and access. My group, who all went to different high schools, spent hours designing, writing, and filming our impact project as a collective. One of our finished products was a pamphlet, titled "Teen's Guide to Abortion." The next hurdle was to make it available to schools. I spent months emailing back and forth with various administrators in my district until we finally got permission to distribute them school-wide. It was not easy to work through the bureaucracy and complete my goal of handing out pamphlets before the school year ended. I was given the option to quit because of how much time had passed since the beginning of my journey, but I was determined to go through the right channels and see it out to the end.

At this point, I already knew I wanted to return the following year to continue the work I started. When I was handing our school nurse a rubber-banded stack of pamphlets, he said that there was just someone asking about abortion the other day. It finally hit me that there were actual people who were going to benefit from all the hard work we put into our product - people who I would never even meet. The idea that my pamphlets will outlast my time at the school after I graduate is so rewarding. Now as a senior in high school, I know the difference I can make has nearly unlimited possibilities.

This year, another PHS student, Andrea Ibarra, joined the program. This year's impact project is focused on consent. When researching how to file a sexual harassment and assault complaint, we noticed that it was relatively inaccessible and hard to find on the PUSD site.

Furthermore, we found that 68.1% of high school students in Pasadena and the San Gabriel Valley do not know how the sexual harassment and assault reporting process works at school. This was out of 504 responses that ranged across schools in and out of our district. Contributing to the problem is the fact that students may have noticed a sexual harassment informational poster in the women's restroom, but there is no information in the men's restroom. We are working to rectify these issues and will have more information in part two of this article coming soon.

Since Andrea and myself are graduating this year, we want more PHS students to join and represent our school within PPPSGV. When I initially filled out the interest form, I had no idea where it would take me, and since then, have not regretted my decision. I highly recommend this program to anyone and everyone.

Where to find us: [@pppsgv_peeradvocates](https://www.instagram.com/pppsgv_peeradvocates)

Emails of PUSD's Peer Advocates: maddieplees@gmail.com dreaibarra574@gmail.com

Where to find the pamphlet: <https://bit.ly/teensguidetoabortion>

How to join: <https://bit.ly/interestedpadvocate>

Information about joining: Meetings are every other Wednesday during the school year and alternate from in-person to online. Attending an in-person orientation is required during the last week of July in order to join the program. Applications open in March with interviews in May.

Pasadena Unified School District Staff Cuts

written by Paulina McConnell

On February 16th, 2024, the PUSD Board of Education approved the closure of over two-hundred positions throughout the district. The measure extends to teachers, administrators, and central office jobs.

The staff cuts, mandated by the Los Angeles Office of Education, are the response to a significant reduction in funding. As our enrollment continues to fall, and financial support from the pandemic dries up, PUSD must ready itself for serious changes in the upcoming school year. And on the state level, California's education budget is expected to see a deficit anywhere from \$36-78 billion.

In other words, PUSD has no choice but to make significant budget cuts. Unfortunately, due to our recent low enrollment and lack of cemented programs like IB (at Blair) or early college access (at John Muir), PHS can expect to be impacted the most.

Right now, a lot of the at-risk positions are PHS staff who aren't necessarily teachers, but who play just as important of a role in shaping our high school experiences. These include positions like our librarian, school psychologists, front-desk workers, special education TAs, and even academy teachers. Another targeted group are teachers whose main roles are coordinating special programs, such as BARR or on-site counseling. Because many of these roles aren't officially outlined under contract, they face the greatest risk of removal.

Furthermore, the Board plans to determine who exactly will be cut based on seniority, so many of our younger or newer teachers are most likely to go - regardless of the impacts they may have had on our campus communities.

If you're anything like me, this is a troubling thought. These are the staff members who have supported us through our academics, social lives, and wellbeing more so than most teachers. Time and time again, I have seen these staff taking the time to sit down with my friends who were hurting, coaching us through extracurriculars, or organizing meaningful community events that have defined a lot of our high school experiences. Whether it's the safe space of the Wellbeing Center, the lunchtime pizza parties that celebrate kindness, or the warm and welcoming library, the services that these staff provide make a difference.

To withdraw these positions would deconstruct the backbones of the best things about PHS: our community, our support systems, and our mental health resources.

So what can we, as students, do to protect these staff?

Well, as a student body, we may not be able to influence how much funding our district gets - but what we can influence is what happens to that money.

The Board has already recognized how severely these cuts may impact our school communities, and has vocalized efforts to focus the majority of position removals into the central office - away from our campuses. In other words, this is a Board that wants to do right by student needs.

However, they may be limited by a distant view of the campus. They don't know what it's like to be a student at Pasadena High, but we do.

This is where collaboration comes into play: we are the only people who know what it's like to be students at PHS in 2024, so it is we who must do our best to share this perspective with the Board. From here, it's our duty to pick up the torch and advocate for the positions that we know have made a difference. To protect our librarian, our academy coordinators, our TAs, our school therapists, and so many more.

What's needed right now is collaboration - open, constructive, and meaningful conversations between the Board, the students, and the community. Each group at play has a unique perspective and knowledge that they can contribute, so that together, we can reach an informed decision that is best for every member of the PUSD community.

If we can show the Board how much these positions mean to the students, we can better inform their solutions as to where to make cuts. And likewise, through conversations with staff, administration, and the Board, we can learn more about the financial situation of our district.

Keep your eye out for upcoming opportunities that will gather student voices and stories on this issue. Until then, spread the word to other students and your guardians!

If we stand up right now and meet this challenge with action, we will guarantee a future that works better for us.

Bulldogs fight - and now is our time.

Lyman Alpha Radiation

written by Mallika Sheshadri

Hydrogen is the first element on the periodic table. It has the smallest atomic mass, has one proton and one electron, and can have anywhere between zero and two neutrons, depending on the isotope. Hydrogen's most abundant isotope has no neutrons, making the atom a proton and an electron attracted to each other.

The Lyman series are spectral lines made up of photons emitted when electrons recombine with hydrogen atoms and fall to the ground state. Lyman-alpha photons (Ly- α) are emitted when electrons in a hydrogen atom specifically decay from the first (1s) orbital, when $n = 2$, to $n = 1$, the ground state, and Lyman-beta photons are emitted when an electron moves from $n = 3$ to $n = 1$. The Balmer series encompasses photons that decay to $n = 2$, so Balmer-alpha radiation is emitted by electrons that move from $n = 3$ to $n = 1$.

A given electron in a neutral hydrogen atom must absorb exactly 1215.67 Angstroms to jump to the first orbital, and when an electron moves from the first orbital to the ground state, it emits a photon of wavelength 1215.67 Angstroms (121.567 nm), as given by the Law of Conservation of Energy. 1215.67 Angstroms is the wavelength of Lyman-Alpha radiation.

There are two main ways that Lyman Alpha photons are emitted: ionization and recombination, and collision-induced excitation. Ionization and recombination is the process in which an ionized hydrogen atom, which is essentially a free proton, recombines with a free electron that may directly enter the ground state and emit a photon. This photon would not be of the ly- α frequency; a photon of a shorter wavelength and higher energy is required to be ejected from the atom and a wavelength of that same frequency will be emitted in the form of a photon upon recombination. However, there is a chance (given by Einstein's equation of spontaneous decay) that a free electron may enter the first orbital and emit a different photon, and then decay down to the ground state, emitting a ly- α photon.

A Lyman Alpha photon can be absorbed by a neutral hydrogen atom while traveling through space, exciting the electron in the hydrogen atom to the first orbital ($n = 2$). The electron, now unstable, has a high probability of decaying back to the ground state ($n = 1$), therefore re-emitting the Lyman Alpha photon. However, the photon will not be emitted in the same direction that it was absorbed in, so the photon's initial path is diverted by the hydrogen atom. The photon, now traveling in a different direction, may be absorbed by a nearby neutral hydrogen atom, and the photon could be re-emitted in yet another direction. This is called the "scattering effect;" as a result of this, a Lyman Alpha photon that encounters a patch of neutral hydrogen as it travels through the universe may get stuck bouncing between neutral hydrogen atoms, decreasing the amount of Lyman Alpha radiation that we can see on Earth.

Thus, on a given graph of Lyman Alpha radiation, seeing lower amounts of radiation may mean that there is more neutral hydrogen at that point, showing the distribution of neutral and ionized hydrogen over different redshifts and providing insights into the exact period in which events like reionization or cosmic dawn.

Cosmic dawn is the term for the era in which the universe experienced its first light and the earliest galaxies and stars formed. Immediately after cosmic dawn, much of the matter in the universe was dense and heavy, filled with primordial gas. The epoch of reionization was an era following cosmic dawn where the universe experienced high rates of ionization due to the ultraviolet radiation (including Lyman Alpha radiation) being emitted from the first stars that emerged in cosmic dawn. Reionization created more nebulae of ionized gas, creating more patches of star and galaxy formation and shaping the modern universe.

There are many spectral lines; any element in its unstable state will emit radiation of different properties. Some elements' unstable isotopes are found in abundance in nature, like uranium, but most are stable. Hydrogen is a largely stable element, but in the expansive universe, there are many instances of ionized, radioactive hydrogen. Hydrogen spectral lines, in particular the Lyman series, are the simplest spectral lines (coming from the simplest atom) and are found everywhere in the universe. As such, it is easy to find instances of Lyman Alpha radiation, and data about neutral hydrogen and ionized hydrogen can be found more easily than that of other spectral lines.

Being shorter than 4000 Angstroms, ly- α is an ultraviolet line not on the visible spectrum and is mostly absorbed by our atmosphere. As such, ground telescopes can only observe Lyman-Alpha radiation that has been redshifted into the visible spectrum in traveling from far away. Even photons that have been redshifted into the visible spectrum can be obstructed by external heat and other photons. Being outside of the atmosphere and in very cold conditions, the James Webb Space Telescope (JWST) does not have this constraint and can see more radiation, and has identified several early galaxies at high redshifts, where $z > 1$.

Data from the JWST can provide new information to compare simulated results to, thus contributing to the accuracy of the telescope. Since the telescope has only been sending data to Earth for two years, the possibilities and achievements that will come with the data that JWST will collect have yet to be seen, and discoveries will continue to shape the path of Lyman Alpha radiative transfer research, taking steps forward to pinpoint when cosmic dawn happened.

Endangered Species Spotlight: Matschie's Tree-Kangaroo

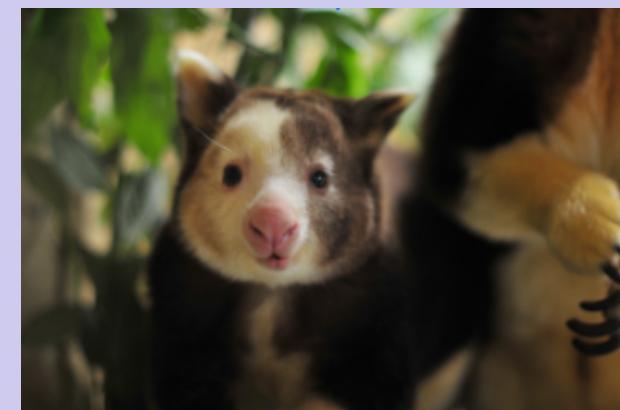
written by Kaley Simkins

Matschie's Tree-kangaroo is one of the largest tree-dwelling mammals in the elevated rainforests of Australia and Papua New Guinea. Known as the "ghost of the forest", the marsupial is evasive and hard to spot as it moves quickly through the treetops, utilizing its long claws to grip bark, strong limbs for climbing, and long tail for balance. Their thick coats are colored with beautiful reddish-browns and creams that help them stay warm in damp weather and act as camouflage against predators.

These tree-kangaroos are folivorous, meaning they primarily feast on leaves but also enjoy flowers, grass, and moss. The males top out at around 22 pounds and can leap up to 60 feet without injury, and they'll live an average of 12 years in the wild (over 20 years in captivity). Similarly to their larger relatives in the outback, the females raise their young in their pouches for about ten months but the joeys won't be fully mature for a little over two years. This specific species of tree kangaroos is listed as endangered on numerous sites with 2,500 individuals remaining - a number that is currently decreasing.

The biggest threat to the Matschie Tree-kangaroo is poaching for food and trade. Humans will unsustainably hunt the mammals using trained dogs to help locate them. Additional predators of the tree kangaroo are large birds of prey, but the dent they leave on the population is nothing compared to humans. Moreover, logging and mining exploration in rainforests are destructive to their habitats and the environment.

The Woodland Park Zoo in Seattle has been documenting the struggle of these creatures and putting in the work to protect them by joining the Tree Kangaroo Conservation Program in establishing a YUS conservation area in Papua New Guinea. The World Wildlife Fund is taking extra steps to bring illegal hunting to justice through their collaboration with the Wildlife Trade Monitoring Network, TRAFFIC. They are also working to eliminate illegal logging, which will ultimately reduce habitat loss by deforestation, and raise awareness about the effects of hunting tree kangaroos and other native species.



A Cool Woman: Natalie Gedeon: User Researcher at Netflix Games

written by Madelyn Wilson

This past month The 28% Women in STEM team got to meet and hear from Natalie Gedeon, to talk about her career in Netflix games. Currently she works as a game researcher and designer at Netflix, bringing her expertise to Netflix's new and improving gaming industry. Prior to working at Netflix, Natalie worked at Riot Games and EA, working on big titles such as The Sims and League of Legends.



Natalie comes from a background in English literature and has a strong passion for 19th-century literature and British literature. During her undergraduate studies those things created the foundation for a career that would bring together both art and technology.

As a Games Researcher, Natalie relays what's best fitting and desired by players to the developers, similar to an analyst or market researcher. She observes players' experiences, engages with them through surveys and interviews, and researches to present onsite to developers and coders. Her role is important to identifying areas for improvement and change, as well as making the gaming experience more appealing to a more diverse audience.

Natalie's favorite part of her job is working on games that she has been playing since she was a little girl. Growing up as a gamer, she now is able to bring her own unique and personal perspective to her work. While becoming a game developer, Natalie also became the first in her family to pursue a postgraduate degree. Her interests include psychology and the social sciences, which provided her with a well-rounded understanding that betters her work as a gaming researcher.

Navigating the landscape of her industry as a woman, Natalie has endured mainly positive experiences. Through her years of work, she has occasionally found herself in predominantly male dominated meetings, but over time she has witnessed a positive shift with increased diversity in both genders and ethnicities entering the field. Natalie mentioned how she makes a great effort to ensure that everyone, regardless of gender, feels welcome at the table.

Reflecting on her career, Natalie holds a special place in her heart for the game "The Sims", which is her favorite game she has worked on. Through her dedication and passion,

Natalie continues to move forward in the world of game development, and being an inspiration for younger generations.



Credits & Contacts

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Check out our website:
www.the28percent.com

Follow the PHS and JMHS teams!



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