The 28 Percent

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

By Ruby Chew



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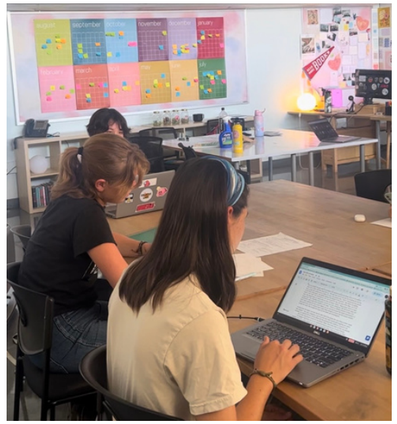
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The 28% Retreat Recap

Our team hosted hosted our first annual retreat at PHS on Sunday, September 10! We came together to plan the upcoming year, collaborate on this months newsletter, play some games, and bond with the cabinet of the new John Muir High School chapter!



We started with a brunch and a cool woman themed charades game. Then we headed up to the classrooms, where writing, layout, and outreach teams met to plan upcoming events, fundraisers, and newsletter themes. Artists also got together to create some of the art you see in this newsletter!

We also got to spend time with the founders of the new 28% JMHS chapter - a team that will be working with us to put out their own newsletter at JMHS!

Ms. Beverly Rodriguez, the lead teacher of the Engineering and Environmental Science Academy, will be advising them. We will be meeting with them monthly and hope to continue working with them on events and upcoming issues. The article on page 10 is written by Ariana Soto - one of these cofounders. We are very excited to feature their work and continue working with this new team.



College Admissions and Women in STEM

written by Madeleine Lees

My goal over the summer was to reach out to multiple admissions officers from women's colleges and STEM heavy schools for an interview. A few colleges responded and here's what I found out.

UCLA admissions officer Ms. Villanueva said, "Our website provides many detailed stories and current research that our students are currently conducting. As a research one institution we are definitely dedicated to promoting students to pursue their passions and dig deeper with their educational interests – which includes STEM related subjects. I would encourage you to take a peek at this web page - https://sciences.ugresearch.ucla.edu/." UCLA is a public research university that has 32 thousand undergraduate students and 60% of those are women. They offer many options to major in as well as a beautiful campus.

I had the opportunity to take a tour of Caltech over the summer. Caltech is one of the leading STEM focused institutions with a thousand undergraduates and 28 majors. Our tour guide was a female student who mentioned that she did not feel like an outsider at all when I asked how the ratio of women to men was. Caltech has 45% female students. The shirt pictured is an inside joke as Caltech students pranked incoming MIT students by passing out the shirt with the MIT logo on the front at an orientation event, and the oblivious freshman did not see the wording on the back. It should be noted there was an abundance of squirrels on campus. Caltech admissions officer Ms. Stills said, "You can also visit our What We Look For page on our admissions website. Lastly, I would love to encourage all of the members of the 28% Newsletter to apply for next year's WiSTEM (Women in STEM)



or Caltech Up Close, our visit programs. WiSTEM is reserved for juniors and seniors, and Caltech Up Close is reserved only for seniors (and is all expenses paid!). I hope this helps, let me know if you have any other questions."

With the same group I toured Caltech with, we had an overnight trip to the Claremont Colleges which is a group of small colleges that together make a wider campus. They do not have graduate students which means that you do not have to compete with those students for research opportunities.

Scripps is the woman's college. On the tour, the nature, fountains, and architecture were a visual highlight. They have a rose garden that started when Harvey Mudd students were picking roses for Scripps students from the dean's private garden.

In response, the dean created a new rose garden stating, "Scripps women can pick their own roses." I was able to interview the Claremont college admissions officer of Scripps, Mr. Stallings. When I asked for any advice he might have, he said to keep your options open, and that big research schools are not the only ones that could be the right fit for you. I asked how many students have STEM related majors and he said that it was about 25-30% and it was an equal amount when weighed with other majors. He mentioned there are many club options for women and minority voices to gather and have that space. One thing I learned is that the Claremont colleges have the ability to cross register, meaning if you want to take a class at a separate college, that option is available to you.



He talked about how there was a STEM Living Learning Community, which for those who don't know, is a hall or community specifically reserved for students with a common academic interest or a shared identity experience. The last thing we talked about was the Wednesady tea time when everyone pauses and has tea together, which is a tradition specific to Scripps. The focus on community seemed apparent.

Overall, the three colleges were vastly different and all had unique strengths. To any prospective students I would still suggest doing their own tours and research. To my fellow Seniors, good luck.

Takeaways from Caltech's WiSTEM Program

written by Paulina McConnell

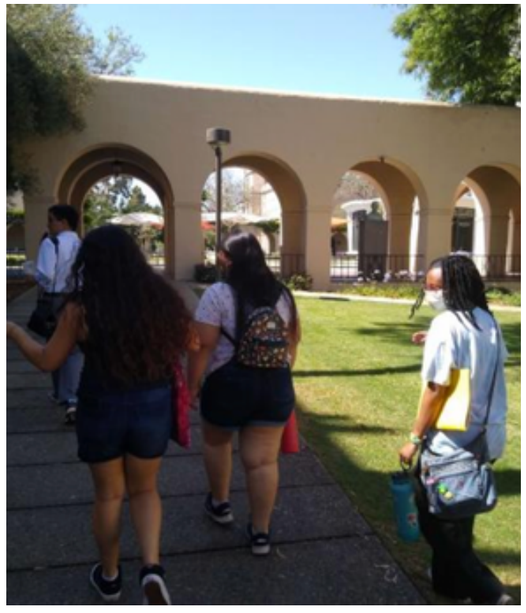
This summer, I had the opportunity of attending the Women in STEM program at Caltech (California Institute of Technology). From August 2nd to August 4th, the shaded, modern campus was flooded with over one thousand attendees and their families. Female, nonbinary, and gender expansive students from dozens of states, and even countries, gathered outside Beckman Auditorium for a day of college application tips and sharing passions for STEM.

The program opened with a keynote address by Katherine (Katie) L. Bouman, who delivered an inspiring account of her work on the project that generated the world's first photo of black hole Sagittarius A. For the remainder of the day, attendees were offered three or four events per time slot, and could attend the ones that interested them. Students were also able to engage with professors during mealtime.

I've composed a summary of the key takeaways from my visit. If you are interested in applying to a college for STEM, or curious about the application process in general, I encourage you to consider the information below!

How do students claim space at Caltech?

- Find a "brave space" - somewhere where you feel not only safe to, but encouraged to, express yourself, your emotions, and your opinions.
- Engage in study sessions and support systems! Collaboration, especially as an undergrad, helps you find your footing and community at the college.
- Find a mentor/femtor/demtor to guide you. Caltech offers many mentor opportunities, with a 3-to-1 student-to-teacher ratio.



Beyond extracurriculars in the application



- STEM universities (like Caltech) want to know about your quirky hobbies and non-stem activities. This includes anything - being an older sister, crocheting a giant onion, or even working at Chipotle. If there's an activity that prohibits you from involving yourself further in STEM, such as working to provide for your family, talk about this.
- Don't just list your activities, give an in-depth account of your role in each. Why do you spend so much time doing what you do?

- Be human; moreover, be you. They want to know who you are as a person.
- Caltech and other schools practice holistic review. This means that they look at absolutely everything on your application. Therefore, use every section provided!
- Supplemental essays should complement and augment what you put in other parts of the application. Here, don't forget to show how you've grown as a person.
- For any questions about applying to Caltech or other colleges, you can reach out to the Head of Admissions Office at Caltech. Her email is listed here: melissar@caltech.edu

Junior year: life is a marathon, not a sprint!

- Explore other programs and majors. If you're tunnel-visioned on STEM, you might miss out on other interesting things.
- Figure out your non-negotiables: Do you want to go to college on the East Coast, or perhaps somewhere with tuition under $70,000 a year, or a big school?
- Begin networking with adults that can write you letters of recommendation.
- Think about internships for the upcoming summer, especially ones that relate to what you're interested in applying to colleges for.
- "Fall Fly-in" programs are offered by many different colleges for free. Consider participating in this program if you're looking to tour campuses.
- Create a spreadsheet with deadlines, pros and cons, and requirements for each college you're looking at.
- College apps open in August - don't write before then, you'll leave things out.

Overall, WiSTEM was an incredibly positive and informative experience. I highly recommend applying for anyone who is interested in STEM, or who just wants to learn more about the college application process. Applications for WiSTEM 2024 open in the spring, and more information can be found on Caltech's website.

Endangered Species Spotlight: Gray Bat

written by Kaley Simkins

Bats have been associated with Halloween for decades, whether that's concerning vampires or spooky attics and caves. What a lot of people don't know is that bats are crucial to the function and preservation of our environment through pollination and seed dispersion. The Gray Miyotis in particular is insectivorous and keeps the pest population of its habitat in check by feeding on bugs around streams and reservoirs. It uses echolocation primarily to locate the insects and communicates with other bats through tactile and vocal communication.

Gray bats reside in cave regions in the Southeastern United States, specifically in limestone karsts, which are landscapes defined by sinking streams and ground. More than 95% of the species hibernate in the same nine caves with the number shrinking more every year due to natural cave-ins and flooding. Gray bats are extremely selective with their summer residences because to effectively hibernate they require a temperature of 14-25 degrees Celsius, as well as a water source relatively close by.

They are among the slowest reproducing animals for their size as female bats can't produce offspring until they're two years old. Additionally, they are limited to one pup per pregnancy and have a lifespan of about 15 years. The Gray Myotic was officially listed as endangered in 1976, and though their population is increasing, there are new threats arising to all bats.

The fall of the gray bat is due mainly to human disturbance and the vandalization of caves. When the mammals hibernate, they build up fat reserves to keep them full in the summer. Upon disturbance, bats will panic and use up their reserves more rapidly, often leading to starvation. Moreover, mothers will abandon and drop their babies to their deaths in alarm.

Another combatant has been recently introduced to the Gray Myotis in 2019 but has been killing other American bat species since 2006. White-nose syndrome is a fungal disease that infects unsuspecting bats during hibernation as it thrives in the cold. Affected bats will be more sensitive to warm temperatures, causing them disturbance during hibernation and running through their fat reserves. A white fungal growth will appear on the bat's wings and muzzles and cause extensive damage since it invades deep tissue.

According to an article by The Nature Conservancy, Cory Holliday, the organization's cave and karst director in Tennessee, took on a project to restore significant caves in 2021.

This particular roosting cave was located on private property and filled to the brim with waste from years of vandalization. Holliday and his team cleaned out the pounds of trash and built a gate at the cave's entrance to prevent further disturbance, and to his surprise, 14,500 gray bats had returned to the cave within a year. By 2023 there were over 24,500 calling this once inhabitable Tennessee roosting cave their home. Efforts like these contribute majorly to the restoration of gray bat habitats and populations.



Bat Conservation International is another organization committed to making change. They focus on restoring habitats that have fallen victim to natural cave-ins and floods as well as vandalization, moderate threats at roosting sites, and protecting economically valuable colonies. They support students in their bat conservation education and conduct research to get closer to a solution for white-nose syndrome. These are just a couple of the operations making waves, but they have so much importance in the grander picture. Bats are just one of the many species that make our world so biodiverse and beautiful, and it's important to take care of our ecosystem. Personally, I can't imagine October without them.

Overshoot Day

written by Mallika Sheshadri

The Earth, our beautiful planet, has long provided us with a bounty of resources allowing us to expand and reach great technological heights. But the Earth has its limits. Earth Overshoot Day marks when our demand for ecological resources and services in a given year surpasses what Earth can regenerate in that year. Since 1971, the Global Footprint Network has been tracking the annual world overshoot day and calculates each country's overshoot day. In the 1970s, Overshoot Day consistently fell in December, but since then, it has steadily fallen earlier and earlier in the year. The 2023 Overshoot Day fell on August 2nd, 2023, meaning that humanity's demands are 1.7 times what the Earth can produce. The Global Footprint Network calculates Overshoot Day by determining the biocapacity (what the environment's population can produce in a year), and the ecological footprint (what the population uses in a year). By finding the difference between these two numbers they find the Overshoot Day of each country and average it out to determine the global Overshoot Day.

Although World Overshoot Day fell in August this year, the Overshoot Day of the United States of America, Canada and similar first-world countries happened far earlier, on March 13th, meaning these countries used up all of the resources their country could naturally restore in one year in a little over three months, meaning that these countries' use of resources s is nearly four times what it should be.

Even though Overshoot Day is reached before the end of the year, society keeps operating as normal with the same greed for natural resources. But how? Now that the Earth's budget of resources for the year has been exceeded, we have officially encroached on 2024's resource budget. Actually, if you add up the resources used up past the allotted yearly budget from the last fifty years, we are now using natural resources from 2035. Because of the fact that we keep reaching into the future to sustain our inefficient system, we are unable to see the immediate effects of overshooting; rather, we are chipping away at the end of our life on earth, ripping pages out of the back of the notebook so to speak.

This bears the question; what can an individual do to help? Unfortunately, not much., but educating yourself on the topic is a good start. Commit yourself to a couple of environmentally-conscious habits (ie; replace plastic water bottles with a metal one), and more importantly, encourage the people around you to do the same. Adopting the habit is great, but it makes little difference unless you're loud about it. Writing letters or emails to your local legislative representatives is another way be proactive about the climate crisis. Being environmentally aware can make you a target for bullying, and it can be emotionally taxing to stand your ground. Some habits are a difficult undertaking and may be hard to keep up with; others may feel like a financial burden. Whatever habits you may take on, I encourage you not to give up, for the sake of the only planet we have.

My Experience on an Inspiring Girls* Expedition Part 1: Homer to KBay

written by Morgan Gaskell

The way I found out about Inspiring Girls* Expeditions was rather odd. I think it was the topic of an article that I had to analyze for an English state test back in 8th grade. When I finally met the age requirement (16-18 years old) and Covid had died down enough, I began my application. Inspiring Girls* Expeditions is a free summer expedition for girls and gender nonconforming youth to explore STEM and art topics while learning outdoor skills in the backcountry. Expeditions are 12 days and take place all over the world, including multiple U.S. states, Canada, New Zealand, Kyrgyzstan, Austria, and Switzerland. When I applied, I was able to choose and rank the three expeditions I was interested in. I selected Girls* On Water as my first choice, which focuses on sea kayaking and marine life in the intertidal zone. Additionally, I had to answer questions on my application about my experiences in school, my life outside of school, my physical abilities, and a creative component (I chose field sketching). A few months later, I learned I had gotten into the Girls* On Water expedition! By the end of June, I was taking a plane flight to Homer, Alaska.

Homer is a small town located in Southcentral Alaska filled with Sitka spruce, small bakeries, and sandhill cranes in the summer. It has a small airport, marshes, lots of moose, and a healthy number of tourists who hang out on the spit. Each of the 9 expedition participants arrived at the Kenai Peninsula College Homer campus by the afternoon of June 31st.



Three including myself were from Southern California, two from Alaska, two from New York, and one from Louisiana. At the campus, we met our three instructors for the expedition: Laura, Emily, and Tyler, and played rounds of Taboo and Jenga. Then we transferred our essential clothing and other gear from our suitcases into drybags and learned to compress every last breath of air from them for compactability. After lunch, ice breakers, and Covid tests that all came back negative, we headed off to a former Girls* On Water instructor's home to camp for the night. There we learned how to set up tents, made dinner, played charades, and got to know each other better in our three person tent groups.

After an early wake up the next morning, we broke down camp and headed to the Homer Spit where we boarded a water taxi that took us across Kachemak Bay to the Kasitsna Bay Laboratory. The lab and field station is jointly managed by the University of Alaska Anchorage and the National Oceanic and Atmospheric Administration (NOAA) and would be our home for the next day and a half. Once there, we geared up in dry suits, spray skirts, and Crocs for the first time, lifted the seven sea kayaks to the tideline, and entered the water for paddle school. We practiced using the rutter to steer by paddling a short distance around the harbor before finally performing a wet exit in which we flipped the kayaks over and had to get out while submerged under water. Following that, we collected water at the dock in the hopes of finding phytoplankton, which we then observed under a microscope. We ended the day by delegating our roles for the backcountry (which would rotate every day) and getting the high and low tides for tomorrow's paddle.

The next day, we left any remaining gear that we didn't need in the backcountry at K Bay Labs like soap, towels, and other bulky and unessential items and packed everything else in tightly compressed dry bags. We then walked out to where the sea kayaks were stored and brought them down to the tideline once again. Within an hour and a half, we had geared up and strategically crammed tents, sleeping bags, sleeping pads, our packed dry bags, all our food, and camp stoves into the seven kayaks we would be setting out with- two singles that instructors would use and five tandems that had two people each. Then, we were off! The weather was cloudy and rain would soon ensue. We were paddling against the current and our boats were at their heaviest weight for the whole trip. But we pushed on and within another hour and a half, we had paddled 2 miles to tranquil Jakalof Bay. First paddle: crushed. The sun was peeking through the clouds creating dramatic shadows as we unloaded the kayaks and put them to sleep on a bed of dunegrass.



Short Chats – Women In STEM: Future MD., Kissia Repalda

written by Ariana Soto, John Muir HS Chapter

October is Filipino History Month! It celebrates the arrival of the first Filipinos to the US in 1857. There's no denying the major influence and impact they've had in American history. Thus, we've set up an interview with a Filipino student aspiring to major in STEM for more insight into her life and how she feels regarding her culture and career path.

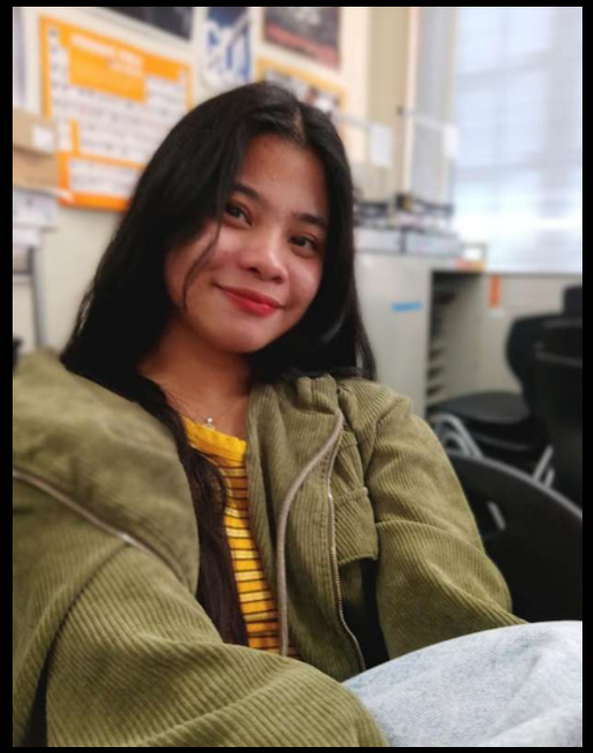
Kissia Calyn C Repalda is a sophomore at John Muir currently in the Engineering and Environmental Science Academy (EESA), studying to become a surgeon. She's known as amiable, communicative, and eagere to learn by those around her. Kissia was born in Pasay City, Philippines. Her favorite cultural dishes include adobo, sinigang, and sisig. When asked about cultural norms, she noted respect was a big thing and that people are usually really friendly and have a strong sense of community.

What's an accomplishment you're really proud of?

"I'm really proud of having made it safely to the US to continue my education and pursue my career. My journey to the US had a lot of ups and downs, it was a sudden change and i had culture shock. My surroundings were different, the people were different. It's not at all the same for how I grew up."

What have been your biggest challenges and how do you deal with them?

"My biggest challenge is having the discipline to get things done because I struggle with time management. Additionally, being involved in multiple activities stresses me out because I get overwhelmed with all the work.



I cope with challenges by sorting my tasks from most to least important. I tend to work independently because I know I'll get distracted if I study with others."
When asked why she remained in several extracurriculars despite the stress, she stated it was because "it can help me get future jobs that I want and help me develop new skills as well as [build connections] and network with more people."

What motivates you now academically/personally? Do you have any ideals on contributions to the STEM field?

"A lot of people, especially in the Philippines, don't get the health care they need at costs they can afford, so I want to help change that. I want to give them the help they need without them worrying about money. Thinking about that makes me want to be better at school and improve my skills. My [ideal] contribution would be making surgical discoveries that would aid people all around the globe."

Are you in any clubs?

"Yes, I'm the secretary of the AANHPI Club, Asian American and Native Hawaiian/Pacific Islander, at our school and part of the Upward Bound Math/Science program. In the AANHPI Club, we're currently sending letters to the students affected by the Maui fires. I like this activity because we're able to reach out to others and let them know they're not alone."

Kissia is one of many young women aspiring to build a career in STEM and contribute something beneficial to the world. Uniquely for a teen, she's incredibly self-aware and has devised strategies to keep charging towards her path. A study by the Philippines' Science Education Institute (SEI) stated that from 1990 to 2015, there's been an increase in women taking up careers in science, engineering, technology, and ICT. Of the 3.7 million people with a bachelor's degree in STEM accounted for in the study, around 45% of them were women. That's almost half! However, it's important to note that the Philipine Business Coalation for Women Empowerment (PBCWE) finds that the gender gap between Filipino individuals pursuing careers in STEM in particular has seen an increase over these past 25 years. Given this, it's imperative now more than ever for the Filipino community to continue supporting girls and women that show interest in this field.

To all the Kissias in the Philippines and those here in the United States, remember that you are the change necessary in STEM. Just like Fe Del Mundo, a Filipino pediatrician and the first woman to get accepted into Harvard University, you too can be the "faith of the world".

Credits & Contacts

Paulina Mcconnell
Daniella Novo
Adeline Peterson
Alissa Santana
Maxine Scott
Mallika Sheshadri
Kaley Simkins
Patil Tajerian
Marley Thach
Maliha Syeed-Miller

Celeste Acosta
Jadyn Addicott
Avery Aldoroty
Cecelia Bichette
Jaidyn Carroll
Violet Chandler
Ruby Chew
Morgan Gaskell
Gianna Gullon
Emma Thatcher

Chloe Vuong
Tracey Willard
Hudson Zortman
Makenna Morrisey
Emma Hungerford
Madeleine Lees
Cam Leyva
Olivia Lopez
Elena Hatcher
Margaret Matthews

Ms. Orret, Advisor
& everyone else on the WIS newsletter team

Check out our website:
www.the28percent.com

HAVE QUESTIONS? WANT TO GET INVOLVED?
WANT TO BE FEATURED IN A FUTURE NEWSLETTER?

Email Ms. Orret!
orret.deborah@pusd.us

