

2020

Scientist of the week!

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Scientist of the week!

 sarahisheffield.wordpress.com/scientistoftheweek/

July 16, 2016

This is a weekly segment I run for my classes- I'll update this page weekly during the academic year with a new scientist each week. While I do my very best to make sure all of the information I post here is absolutely accurate, it is possible I might misrepresent something. These are not edited from the ones I give to my classes.

If you choose to use these posts, please link back to this page or credit me.

Summer 2020- these posts are written by USF students:

Posted 6/20, written by Lisette Melendez

Dr. Yi So-yeon. Out of 36,000 hopefuls who competed for the title, Dr. Yi So-yeon is the first South Korean astronaut! She earned her bachelor's and master's degrees in mechanical engineering at the Korea Advanced Institute of Science and Technology, and she was completing her doctorate in biological science when she was selected to be South Korea's first cosmonaut as well as the youngest astronaut ever. She trained during the day and analyzed data and completed her thesis on DNA separation chips at night. When she blasted off into space on board Soyuz TMA-12, she conducted eighteen science experiments for the Korean Aerospace Research Institute as well as contributed to various science channel video lectures, overcoming many societal pressures and opinions along the way. Her experiments included monitoring the effects of changes in gravity on fruit flies and the human body. Scientists even invented a special low-calorie and vitamin-rich kind of kimchi for Yi to take on her mission. She even grew three centimeters during her time in space. After a didactic eleven days aboard the International Space Station, she faced a rocky return to Earth. Upon ballistic re-entry, she was subject to 16-G of force, compared to the usual 4-G, and landed in the steppes of Kazakhstan. After her role in South Korea's space program, she decided to enter an MBA program with an emphasis on Technology and Global Leadership at the Haas School of Business at University of California, Berkeley to pursue new opportunities in the private sector. She now works with the Museum of Flight and Northwest Nuclear Consortium and lectures at various universities about biotechnology. She continues to focus on encouraging the next generation of leaders in STEM and remains an inspiration to try and apply for any opportunity you are interested in, even if the chances seem slim! Read more about her here: <https://www.haaretz.com/yi-so-yeon-the-chance-astronaut-1.5294761>

Posted 6/20, written by Kristin Houdyshell

Dr. Kelsey Leonard is a legal scholar, water scientist and protector, and a citizen of the Shinnecock Indian Nation^[1,2,3,4]. Leonard has been awarded a "Native American 40 Under

40” recipient by the National Center for American Indian Enterprise Development^[3]. Leonard has also been recognized as a 30 under 30 world environmental leader by the North American Association for Environmental Education for her work on water justice and Indigenous rights^[3]. In 2010, Leonard received her Bachelor’s of Arts in Sociology and Anthropology from Harvard University, becoming the first Shinnecock Indian Nation member to graduate from Harvard^[1,2,4]. Leonard also became the first Native American Woman to earn a science degree from the University of Oxford in 2011, when she received her Masters of Science in Water Science, Policy, and Management^[2]. At Oxford, Leonard focused on water quality regulation and the inequity between water quality management for tribal leaders^[1,2]. Her Master’s Thesis was “Water Quality for Native Nations: Achieving a Trust Responsibility.”^[2]

In 2015, Leonard obtained her law degree (J.D) from Duquesne University in Pennsylvania^[1,2]. While there, Leonard worked for the National Congress of American Indians (NCAI) as legislative associate on tribal climate change resilience^[1,2,4]. Following this, in 2019, Leonard obtained her PhD in Comparative Public Policy within the Department of Political Science at McMaster University^[1,2]. This same year, Dr. Leonard was asked to speak at the TED Women 2019 conference in which she addressed “why lakes and rivers should have the same rights as humans.”^[4,5] In this talk, Leonard asks the question: “Who is water?” (rather than “What is water?”) in an effort to stress the need for our collective shift in the way we see and treat our water^[5]. In her talk, Leonard shares that although Indigenous populations contribute some of the lowest amounts of pollution and disruption to neighboring waterways, they are often the most vulnerable and affected by water mis-use and mis-regulation^[5]. Dr. Leonard argues that granting water the same legal rights as humans (i.e. granting them “personhood”) is necessary in our protection of it^[4,5]. Dr. Kelsey Leonard represents the Shinnecock Island Nation on the board of the Mid-Atlantic Committee on the Ocean^[1,4]. Leonard’s main areas of focus are in protecting the United State’s neighboring ocean ecosystems, coasts, and waterways^[1,2,4,5]. With this, Leonard aims to integrate her personal connection to Indigenous Nations and the lives they involve into the existing science and narrative of how we treat water^[1,5]. Her past work on water justice for Indigenous populations received a Peter Benchley Ocean Award for Excellence in Policy Solutions^[1,2,4,5]. As a current Banting Postdoctoral Fellow at McMaster University, Leonard is exploring Indigenous water justice and its personhood through the United Nations Declaration on the Rights of Indigenous People^[1,2,4,5]. Learn more about her here: <http://www.kelseyleonard.com>

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Posted 6/2020, written by Kristin Houdyshell

Dr. Alexa Canady is a pediatric neurosurgeon, neuroscientist, and was the first Black woman to become a neurosurgeon in the United States^[1,2,3]. Dr. Canady was born to civil rights leader and educator Hortense (Golden) Canady and Dr. Clinton Canady Jr.^[1,2]. Both of Dr. Canady's parents attended and met at Fisk University in Tennessee, and her father was later deployed to war during World War II (WWII)^[1]. During high school, in their hometown of Lansing, Michigan, Canady and her brother were the only two Black students at their school and repeatedly faced forms of racism and discrimination^[1]. Racial prejudice was evident among some of her teachers as well^[1]. In one instance, Canady scored highly on tests for intelligence but her parents were shocked because this was incongruent with her grades at school^[1]. Canady's parents later discovered, however, that her teacher had been switching her better grades with that of a poorer performing white student^[1].

In 1971, Canady received her Bachelors of Science in Zoology from the University of Michigan^[1,2,3]. Leading up to this, Canady accounts feeling often discouraged and had low confidence in her ability to succeed^[1,2]. Regardless, when Canady learnt of a scholarship for medical school, she applied and went on to attend the University of Michigan Medical School, in 1975. In medical school, Canady accounts continued discrimination not only for being a student of color but also for being one of few women in her class^[1,2]. Throughout this, Canady continued to build her resume and skill-set in the field of neurology and neuroscience, despite advice given by academic advisors against pursuing the field^[1,2]. In 1975, after graduating Medical School, Canady completed a year of neurosurgical rotations at Yale University^[2,3]. While at Yale, Canady continued to experience forms of discrimination on the basis of both her race and gender, as the only Black woman in the program^[1,3]. Canady was voted one of the top residents in the neurosurgery program at Yale^[3].

In 1984, Dr. Alexa Canady became the first board certified Black woman neurosurgeon in the United States^[1,2,3,4]. Three years later, Dr. Canady became Chief of Neurosurgery at Children's Hospital of Michigan (CHM) in Detroit, Michigan^[2,3]. At CHM, Dr. Canady was devoted to advancing the field of pediatric neurosurgery and giving back to underserved populations surrounding her community^[2,3]. Dr. Canady worked at both CHM and as a

Professor of Neurosurgery at Wayne State University, to train and educate highschool students, medical students, and residents in the Detroit area^[2,3]. In a quote from an AANS Neurosurgeon issue on Dr. Canady, her and her efforts at CHM were described as^[3].

“passionate about providing all patients access to excellent care, regardless of their means. Her approach is patient-centered, with a focus on providing care and resources to empower her patients and their families. She steadily raised money through fundraisers and by recruiting the support of charity organizations and, under her leadership, the division made food and monetary donations to financially disadvantaged patients. To inspire patients, she started support groups and was industrious in her advocacy for their needs to the broader community. “

At Wayne State University, Dr. Canady also conducted research into neurosurgery and neuroscience that led to the development of an antisiphon shunt for treatment of hydrocephalus (water buildup in the brain)^[2,3]. Her work has been life-saving. In 2001, Dr. Canady moved to Pensacola, Florida, where she began work part-time at Sacred Heart Hospital, in addition to her research at Wayne State University^[2,3,4]. Dr. Alexa Canady continues to work at Sacred Heart Hospital in Pensacola, where she is also devoted to minority outreach programs focused on medical education and engagement^[4]. A video interview of Dr. Canady can be watched here:



Watch Video At: <https://youtu.be/H9ujOIsExOw>

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Posted 6/2020, written by Sarah Sheffield

I am reposting this from 2019 for a very important reason. Dr. Bill Jenkins (1945-2019) was an epidemiologist working for the U.S. government during the 1960s and 1970s. Before I talk about what he did, I want to talk about why I chose to highlight Dr. Jenkins for this week. As we speak, there are nationwide protests speaking out against the reality of police brutality and discrimination against Black Americans. Many of my scientific colleagues have remained noticeably silent, and have shared that they believe science is above politics. This could not be further from the truth- in fact, to believe that science isn't political is a viewpoint that completely ignores the history of racism and discrimination that scientists have actively participated in. Many white people in today's society seem to think that racism ended when segregation became illegal-this is not true, not under any stretch of the imagination. It's also not true to say that government-sanctioned discrimination ended when slavery or Jim Crow laws were outlawed; in fact, this story takes place within the lifetime of many of us reading this today. Many people also don't know that many American medical advances were founded on discriminatory ideas or founded on inhumane experiments on Black Americans. Why I say this is because scientists today have a responsibility to know and acknowledge this history of science, and understand that *racial discrimination in science is still happening*. This is a major reason why I started this Scientist of the Week project 2 years ago- because it is critical that students be aware of discrimination in science and know that the history they usually learn in science actively leaves out scientists that aren't white American and European men. Black colleagues in science and all Black people in the United States are subjected to increased police interrogation and violence. **We cannot be silent about this issue. I unequivocally stand with Black Lives Matter.**

With this in mind, I wanted to, again, honor the work that Dr. Bill Jenkins, an American hero that deserves to be remembered, did to affect change in the medical science community to bring attention to and stop racist and inhumane experiments against Black men. The US

Public Health Service authorized an experiment to observe the natural history of syphilis—meaning, how it worked in the human body if left untreated. ~600 Black men from Alabama (Tuskegee) were enrolled in this study; they were told they were receiving medical treatment. The US Public Health Service actively lied to them and they never provided them any medication to treat the infection, even after antibiotics had been found to be effective. Dr. Jenkins learned of this experiment and, against his boss' direct orders and in the face of losing his job and receiving extreme backlash, wrote articles and tried his best to get attention drawn to the story. While it took some time, and others joining in to speak out, for this experiment to be exposed for what it truly was, Dr. Jenkins laid the founding stones for getting this experiment stopped. Further, he was instrumental in getting the men that were in this experiment lifelong healthcare and instrumental in forcing the federal government to issue an apology to the community and to the nation for what they had authorized and done.

Dr. Jenkins didn't stop there. He was one of the first scientists at the Center for Disease Control (CDC) to recognize how AIDS was impacting specifically the Black community and Black men. He led the charge in AIDS prevention research and worked to reduce the number of people contracting AIDS during his work. He also worked to get those who did contract AIDS better access to public health. Dr. Jenkins was an incredible force in affecting change for thousands of people and his work made sure that others would not suffer in the future at the hands of unethical and racist medical treatment. Dr. Jenkins passed away about 1 year ago in South Carolina at 73—his legacy, his actions, however—will live on. You can read his full obituary in the New York Times here: https://www.nytimes.com/2019/02/25/obituaries/bill-jenkins-dead.html?fbclid=IwAR2eSnbMCGxPAXwALrVTGTUuPnkk_wJRe8tmOy3sT3GIymMN2DyHmqVOrYo

Posted 5/2020, written by Lisette Melendez

Dr. Ellen R. Stofan is the John and Adrienne Mars Director of the Smithsonian National Air and Space Museum and held more than a quarter of a century of experience in planetary geology and space organizations beforehand—she is the first woman to hold this position. Her research focuses on the geology of Venus, Mars, Earth, and Saturn's moon Titan. At her job, she shares the greatest collection of space and aviation artefacts and funds research in planetary geology. She was also Chief Scientist at NASA for three years and worked on developing plans for getting humans to the Moon, Mars, and beyond. She has also conducted significant work in science policy and served as co-chair to the World Economic Forum's Council on the Future of Space Technologies and vice president of Proxemy Research. After receiving her bachelor's degree in geology at the College of William & Mary, she earned her master's and doctoral degrees in geological sciences at Brown University. Afterwards, she joined NASA's Jet Propulsion Lab and served as the deputy project scientist for the Magellan Mission to Venus. She's also worked on the Cassini Mission to Saturn and the Mars Express, and became the principle investigator for the Titan Mare Explorer, which was a proposed

mission to send a floating lander to a sea on Titan. Her mission is to open the world of STEM to everyone, and she hopes to inspire others to see themselves reflected in scientists and know that anyone can be a scientist. She works on fulfilling this mission by redesigning the interior of the Washington D.C. museum with diversity in mind, so all kids can walk in and see themselves represented in the museum's exhibits. In 2018, she started the first year of NASM's She Can summer camp, which encourages middle school girls from underrepresented and local communities to pursue careers in STEM. You can learn more about Dr. Stofan here: <https://www.si.edu/about/bios/ellen-stofan!>

Posted 5/2020, written by Mathew Burgos

Dr. Mae Jemison was in 1956 to present day. She studied science at a young age and one of her main inspirations was actress Nichelle Nichols who played Lieutenant Uhura on the Star Trek tv show. Watching Star Trek was a driving force for Jemison to want to travel into space someday. Unfortunately, Dr. Jemison grew up in a time of racial discrimination, so later she would become the president of the Black Student Union. She even put on a production called "Out of the Shadows" about the African American experience. In 1977, she graduated with her Bachelor of Science in chemical engineering and a Bachelor of Arts in African American studies. Jemison went on to attend Cornell Medical school and practice general medicine after going to Cuba and Thailand. She is also fluent in Russian, Japanese, and Swahili. In 1983, she would join the Peace Corps as a private practice doctor, and after Dr. Jemison saw Sally Ride become the first American women in space in 1983, she thought she would apply to a NASA program. Jemison was selected in 1987, and she was one of the fifteen people chosen out of a total of over 2,000 applicants. She received her first mission in 1989 for a mission specialist position on the STS-47 crew, and this was the made her the first African American woman to travel into space. Mae went on to total 190 hours, 30 minutes and 23 seconds in space. After her six years of service in NASA, she went on to found her company called the Jemison group. The Jemison Group was founded to help promote a love for science in students and equip schools around the world with advanced technologies. Mae Jemison is also overseeing the 100-Year Starship program, started by the Defense Advanced Research Projects Agency. This program was created to make human space travel in the solar system and beyond a possibility within the next century, but that involves benefits for all of mankind. Dr. Mae Jemison is both inspirational and legendary in her career as an astronaut and as a woman of science.

Sources: <https://www.space.com/17169-mae-jemison-biography.html>;
<https://www.womenshistory.org/education-resources/biographies/mae-jemison>

Posted 5/2020, written by Kristin Houdyshell: Dr. Kizzmekia Shanta Corbett is an American viral immunologist, infectious disease researcher, microbiologist, and lead researcher against COVID-19 at the National Institutes of Health (NIH). Dr. Corbett grew up in Hurdle Mills, North Carolina (a small town, with less than 4,000 people), with her mom,

Rhonda Brooks, step-father, and six other birth, step, and foster siblings. When Corbett was in third-grade, her mom recounts Corbett's teacher telling them that Kizzmekia needed to be in an academically rigorous environment. To do this, Corbett and her family moved 20 minutes south of Hurdle Mills to Hillsborough, North Carolina. Corbett later went to university at University of Maryland, Baltimore County, as a Meyerhoff Scholar and NIH Scholar, where she also worked on research into health outcomes in diverse communities. While at the University of Maryland, Corbett studied Biological Sciences and Sociology, and graduated with a double major in both areas, in 2008.

After graduation, Corbett worked at the National Institutes of Health's Vaccine Research Center for a year before entering into graduate school. In 2009, Corbett started her PhD in Microbiology and Immunology at University of North Carolina, Chapel Hill (UNC), and graduated with her PhD in 2014. At the start of her PhD program, Corbett received a travel fellowship to travel to Sri Lanka to work on dengue fever virus in children. While in Sri Lanka, Corbett was a visiting scholar at Genentech Research Institute in Colombo. Corbett's PhD dissertation was titled "Dissecting Human Antibody Responses to Dengue Virus Infection," which led to her receiving a Doctoral Merit Award and induction into UNC's Frank Porter Graham Honor Society for her work. After graduating in 2014, Corbett returned to the NIH, where she conducted research into Severe Acute Respiratory Syndrome (SARS) and Middle East Respiratory Syndrome (MERS).

Dr. Corbett's work at the NIH into SARS and MERS, two other coronaviruses, led to her interest and response to COVID-19 last year, before the pandemic began. In a recent interview with Corbett, she notes: "SARS and MERS, two coronaviruses, [have] already caused massive outbreaks. And these big, challenging questions remained, along with the fact that it was clear that it could happen again. It was looming out there and just a matter of time." Corbett is currently working with a group of other scientists at the NIH, as lead researcher into developing a COVID-19 vaccine.

Dr. Corbett has been working with other researchers around the world on the progression of a vaccine for coronavirus, and has recently met with the United States President to aid in the decision to provide funding for the advancement of clinical trials at the NIH. However, Dr. Corbett's work has not been without challenges. In the same interview with Corbett above, she accounts being faced with discrimination on several occasions. Corbett accounts "some scientists around the world double-check her work or ideas with Graham [another member of her team] or direct questions to him — even though Graham makes it consistently clear that Corbett is the scientific lead and the ultimate expert. Corbett said they thank Graham when she answers their questions or provides data, samples and tests." In a recent twitter post, someone even wrote, in reference to Dr. Corbett, that she should "go back to McDonalds where she belongs," even though Corbett has never worked with the company. However, Dr. Corbett remains committed to conducting her research at the NIH and talks with her family, including her two grandmothers, almost every day. Dr. Corbett continues to

work around the clock to develop a vaccine for COVID-19 and share this research with the rest of the world. Andrew Ward, a professor at Scripps Research and colleague of Dr. Corbett accounts in an interview about Dr. Corbett:

“...She’s really great at bringing together groups of people with different skills and understanding the value and contributions of each of them in ways that really maximizes scientific impact.”

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Fall 2019:

Posted 12/2019: Ms. Xiye Bastida and Mr. Vic Barrett

Ms. Bastida grew up in an area outside of Mexico City, one that’s strongly influenced by droughts and flooding, both of which are exacerbated by the effects of climate change. When she was a teenager, her family came to the United States in time to see the devastating effects of Hurricane Sandy, an unusual hurricane that had massive effects in the northeast. It was during this that she realized climate change was something that needed to be addressed- so she did. Now, at 17, she organizes a number of climate action events and has spoken to the United Nation about the concerns of the youth in the US and worked with international leaders in the climate change fight, like Greta Thunberg. Ms. Bastida, a member of the

indigenous Otomí nation, points out that indigenous people need to be heard about matters regarding climate change, as indigenous people have been taking care of the Earth for thousands of years, she says. One of her goals is to make sure that diverse voices are heard on matters regarding climate and sustainability. Read more about her here:

https://www.huffpost.com/entry/xiye-bastida-climate-activism_n_5d8a7ec9e4b0c6docef3023e (Links to an external site.) (Links to an external site.)

Vic Barrett is one of the 21 youths of the United States currently seeking legal action against the US government (*Juliana vs. United States*) to ask them to act more on climate change, by reducing carbon emissions and other regulations. This case is one of the first of its kind and could set a precedent for the future of similar legal cases. Mr. Barrett is a Honduran-American college student and is also a fellow with the Alliance for Climate Education, attended the UN Conference on Climate Change in Paris, and recently testified before the United States Congress- all before the age of 21.

Mr. Barrett has many reasons to be concerned about climate change, as we all do, but his heritage is threatened due to sea level rise. Mr. Barrett belongs to the Afro-Indigenous Garifuna community of Honduras, which settled on the northern coast hundreds of years ago. Currently, sea level rise has dangerously impacted these people, and UNESCO has said that they are critically endangered. Many of the foods the community relies on are becoming threatened or endangered, sea level rise is increasing the severity of storms, and pollution is increasing along these coasts. Mr. Barrett rightly points out that communities of color and low income communities often experience climate change and pollution first, and much more strongly, than higher income or predominantly white communities, due to zoning laws, pollution restrictions, and more (side note: this is happening in Tampa Bay- a USF professor, Martin Bosman studies the impacts of pollution regulation in lower income areas of the bay region and how this affects the health of these communities). Mr. Barrett is seeking to find ways to increase the representation of those people affected more so by climate change (namely, people of color) to make sure that their voices are heard as we move forward in developing policies that will impact all of us. Here's an interview with Mr. Barrett: <http://www.ourclimatevoices.org/2019/vicbarrett> (Links to an external site.)

I chose these two people for scientists of the week because they're not what many would think of as "scientists"- they're teenagers! Many of us think that we can't make a difference in the world until we're educated enough, till we have more money, name recognition or a great job- but that simply isn't true. Each and every single one of you has the power to make change in this world. *All* of you are smart, determined, and ready to make the world around you a better place. You don't have to win a Nobel prize, have a lot of money, a degree from Harvard, or anything like that to make change- and I hope you take that thought with you as you leave this class and leave USF. I can't wait to see what you do!

Posted 11/2019: Dr. Esther Ngumbi

Dr. Esther Ngumbi is an entomologist (a scientist who studies insects) from Kenya, who has an incredible story of how she came to be a scientist. Dr. Ngumbi was born in a small village, where few girls went to school at the time. However, her parents worked extremely hard to send her and her siblings to get an education. As she progressed in her education, she took note of how farming crops could be destroyed by biologic factors- droughts, pests, etc. and the devastating effects that they had on the people relying on the crops. She decided to use this to continue her education. She eventually obtained a B.S. and an M.S. from Kenyatta University. She didn't just stop there. She applied to Auburn University in Alabama, USA (which has a top entomology graduate program) and was accepted. This is where Esther's story and mine overlap a little bit-she and I were graduate students at the same time at Auburn (though she was much further into her degree than I) when she gave an impassioned speech to a women's leadership conference that I was attending. Her parents decided to try to affect change in their village by building a school- one that would encourage more girls, especially, to learn about science. She held book drives and fundraisers to get the school off of the ground at Auburn. Now, the school is a reality, though they are still fundraising for a functioning laboratory and equipment for it.

Dr. Ngumbi has since graduated Auburn with her Ph.D. (and was the first person from her hometown to earn a PhD!) and is now a postdoc at The University of Illinois, splitting her time between her research and her commitments to helping more women and girls (and especially women and girls of color) get engaged in science globally and receive educations. She has been awarded multiple national and international awards recognizing all of the good she has done (including lists like One World's compilation of 100 Unseen Powerful Women who Change the World.). If you're interested in learning more about Dr. Esther Ngumbi or keeping up with the news of the school she and her parents are running, check out these links!

<https://www.nation.co.ke/lifestyle/saturday/-I-want-to-inspire-more-girls-to-science/1216-4590436-x65qbe/index.html> (Links to an external site.)

<https://www.estherngumbi.com/#home> (Links to an external site.)

Posted 11/2019: Dr. Anita Marshall

Dr. Marshall is a lecturer of geology at The University of Florida. She recently finished her Ph.D. degree at The University of South Florida, prior to which she received her Masters and Bachelors degrees from the University of Arkansas! Her research focuses on how to make the geosciences more inclusive and accessible to people with disabilities. This can range from encouraging textbooks publishers to have Braille editions, to making sure that the needs of scientists with physical disabilities are taken into account when planning field work. Because

the geosciences are often thought of as being a heavily field-intensive science (e.g., climbing mountains!), it can be really isolating if that's not something that you can do due to a physical disability. Dr. Marshall is working to restructure: 1) how we view geoscience culture- can we shift from a field- based culture to make sure that a broader variety of people can participate equally? and 2) how we can create field experiences that are accessible to anyone? One way that she has been doing this is by working with students and Virtual Reality headsets. By sending students into the field with VR headsets, other students can participate with the student in the field by using the VR technology- which is really cool! Both students can work together to look at the field site and make their interpretations of the area, without restricting access based on disability. This is so important because our current model of geosciences is NOT accessible to many students with disabilities- a majority of schools in the country require ~6 weeks of field- intensive training for a geoscience degree. A lot of this training happens in areas that are not accessible to students with disabilities (or students who are parents, who work full time, and for so many other students). This means that we are losing critical talent from so many wonderful students who were not able to participate fully, due to barriers put in place by curriculum.

Dr. Marshall is a strong advocate for making science accessible for everyone and making science more inclusive. Here's an article she wrote last year about her personal experiences as a geoscientist who is disabled. <https://speakingofgeoscience.org/2018/10/08/moving-forward-overcoming-our-ideas-about-disability-in-the-geosciences/>

Dr. Marshall is also a member of the Choctaw Nation, a Native American nation. She is also a leading member of the international association for geoscience diversity (IAGD), an organization dedicated to making geology more accessible (<https://theiagd.org>).

Posted 11/2019: Dr. Clayton Visger

Dr. Clayton Visger is an assistant professor at California State University, Sacramento in the department of biological sciences. His research focuses on plant evolution- specifically, he looks at how biology, ecology, and physiology intersect by studying the effects of genome-duplication in plants. His pathway to becoming a scientist is an interesting one- he and I met over Twitter when I put out a call for veterans who became scientists to share their stories with my students, so here goes (what follows are his words exactly)!

“After barely graduating high school I didn't really know what to do with my life, so I hit the snooze button and went to community college with no actual goal. That first fall semester I failed remedial English, remedial math, and even introduction to golf... I decided that school just wasn't for me, so I enlisted in the Air Force and spent the next four years as a loadmaster. Towards the end of my enlistment, I got interested in giving school another shot, and started taking online courses with the eventual goal of going to pharmacy school. When my enlistment ended, I transferred to Cal State Sacramento for my BS in Biology. I started

doing independent research to help pad my application to pharmacy school, but quickly fell in love with research, and ended up wanting to go into academia. My junior year I was lucky enough to get a travel grant through the PLANTS program of the Botanical Society of America, which focuses on enhancing undergraduate diversity (URM, women, and veterans) at the annual Botany scientific meeting (it is a fantastic program and something I've continued to be involved with). There, I met my future PhD advisors and eventually applied to work for them and moved to University of Florida for Graduate school. When I was finishing graduate school I saw Cal State Sacramento was hiring, and I always wanted to return to where this all started, so I applied, got lucky, and have enjoyed my time here for the last two years”.

He has some advice for all students, which is to find something that sparks *your* interest, not just finding a major that might have high paying jobs. It can be really rough if you don't love what you're doing. Clayton advises that you should take as many general education courses as possible to explore areas that you might end up loving (personal note from Sarah Sheffield: this is how I found geology! I took a random general education class (History of Life, essentially) and my entire life changed).

For students who share his veteran background, he has some specific advice: “Both myself, and many of the veteran students that I've worked with, seem have a very different college experience than the average traditional student. They are typically much older than their classmates, treat courses like a job, and often aren't looped into college social networks. This can be a both an advantage and a disadvantage, with the biggest disadvantage I've seen being them not getting some of the word of mouth/institutional knowledge about opportunities (grants, scholarships, etc.), and how to build a competitive application for graduate school (importance of research experience, etc.). I think it is really important that veterans, and any non-traditional students, try to build connections with other students and faculty to make sure they are looped into this sort of knowledge.

For all of my veteran students in my courses, I hope you find something you *love* in college and that your unique experiences help you find the career you've always wanted. Don't forget to reach out and find others who share your experiences or ask for help finding opportunities that might help you in your path!

Posted 10/2019: Dr. Kalpana Chawla

Dr. Kalpana Chawla was the first Indian woman in space. She was born in raised in Karnal, India and received degrees in aeronautical engineering from Punjab Engineering College. She later left India to move to the United States, where she completed her education by earning a doctorate in aeronautical engineering from the University of Colorado in 1988. She began working soon after this at NASA, where she focused her work on developing models for computational fluid dynamics. She was chosen as an astronaut candidate six years later,

in 1994.

Her first flight took place in 1997 aboard the Columbia, which was crewed in order to begin scientific experiments for a host of different fields, but one of which was to study the outer layers of the sun. She went on her second space mission in 2003, which tragically ended in disaster. An integral piece of the shuttle broke off during re-entry into Earth's atmosphere, which caused the shuttle to depressurize, killing all astronauts on board. Dr. Chawla died at the age of 40.

Dr. Chawla, after her first launch, said this: "When you look at the stars and the galaxy, you feel that you are not just from any particular piece of land, but from the solar system." Though her life was cut heartbreakingly short, Dr. Chawla remains a legacy for all of us in STEM, as someone who broke barriers and worked incredibly hard for her entire life to fulfill her goals and her passions.

For further reading on Dr. Chawla (including links to documentaries about her and the missions she took part in), click this link: <https://www.space.com/17056-kalpana-chawla-biography.html>

Posted 10/2019: Dr. Adriane Lam

The (almost) Dr. Adriane Lam is a postdoctoral researcher at SUNY Binghamton in New York- she just turned in her dissertation this past week and will be defending that dissertation this month! Congrats, Adriane- since it's so close, I'll be referring to her as Dr. Lam! Her current research is twofold: the first is micropaleontology, using marine plankton called foraminifera. Second, she studies paleoceanography, where she reconstructs ancient ocean currents and how they changed in response to major climate events in geologic time. Dr. Lam works on many different time scales, from recent rocks in the past 50 million years and all the way back to the Ordovician (she and I are actually working on a project about that right now!). Dr. Lam grew up in rural Virginia and is a first generation college student- she's the first person in her family to attend and graduate a four year college. Dr. Lam hated high school and often skipped class. In her words, her grades weren't so great. So, to figure out what she wanted, she enrolled in community college to explore options. She took a geology course to fulfill her science requirements and that's when life changed for her. She loved it so much, she took another course and in this one, she got to go on a field trip to go fossil collecting. And when she pulled out 15 million year old clam and snails from the ground, she knew she wanted to be a geologist. She wanted to travel, go outside, and work at a stable job. By the time she got to her PhD, she really enjoyed micropaleontology (the study of itty bitty fossils) and so she focused her research there- she's gotten to do some incredible things with this research! She recently was able to work as a research scientist on a two month ocean cruise for the JOIDES Resolution to the Tasman Sea and was able to drill into (and hold) the newly-named continent of Zealandia! Super cool!

She has some amazing advice for students, so here it is! “When I started my academic career, I felt very alone as a first-generation student, like I didn’t belong in academia or in university. I was surrounded by students who often bragged about their family’s wealth, and when at UMass, I often overheard other students brag about attending the ivy league schools. This just amplified my feelings of not being good enough to attend university. However, I pushed through because I loved what I was doing. It was uncomfortable at first, but I began being more vocal about being a first-generation student in my department and on social media (mostly Twitter). I found out that I wasn’t the only first-gen in my department, and that others also felt the exact same way I did. It was such a relief knowing I wasn’t alone and that my feelings of not belonging or not being good enough were valid. So, even if you’re not a first-generation student, but identify as belonging to another underrepresented group in the sciences, **find others who identify like you**. It was great to have a community of folks I could talk to and share our experiences and feelings. The other thing that was (and still is) vital to my survival and success in academia is having advisors and mentors that encourage me, believed in me, and pushed me to pursue opportunities. I was very fortunate to have two women advisors that really changed the way I thought about myself and academia and helped me grow into an independent woman who isn’t afraid to take on new challenges. So, **seek out mentors and advisors who will cheer you on and push you to be the best scientist and person you can be**. Avoid those who try to dull your shine (there’s several out there, unfortunately), and keep moving forward. **Seek out help when you need it, and don’t ever be afraid to ask questions!**” Dr. Lam has a lot of cool hobbies, including going fossil hunting (and dragging her husband with her to do it), going to new breweries and restaurants, archery, reading, and whenever she visits her family, spending time with their horses, chickens, and whatever other critters they’ve acquired.

Dr. Lam is also really engaged in science communication and making sure people from every background have access to good science information- to do this, she runs a blog with co-creator and former scientist of the week Dr. Jen Bauer that focuses on science communication in climate change and evolution (timescavengers.blog) . This blog has thousands of visitors and a rotating panel of scientists who post new science blogs constantly- check it out!!

Posted 10/2019: Dr. Nour Al-muhtasib

Dr. Nour Al-muhtasib is a neuropharmacologist and a postdoctoral researcher at Yale University in Connecticut-this means that she studies the effects that at a range of drugs might have on the brain, which is a pretty broad field. Specifically, Dr. Al-muhtasib studies a range of topics relating to the brain. One of her recent research focuses has been on neurons of the brain that controls movement, whether to start or stop it. Her research has important implications for developing new medical technologies and prescriptions for patients and for understanding more about how our brains respond to a number of different stimuli.

I had the chance to interview her and here is what she said! Dr. Nour Al-muhtasib is an Arab-American, born to parents who immigrated to the United States and is a Muslim woman who wears hijab. Her mom is a teacher and her dad is an accountant- she is the first person in her family to earn a Ph.D. (a doctorate, otherwise known as), which is a huge accomplishment! Often, the “first” in the family to achieve something, whether it be a high school diploma, college diploma, or PhD, can be difficult, but it is tough to learn how to advance in the educational system without help from your family. A lot of times, this might mean that you might make mistakes along the way because you didn’t know something (which is exactly what Dr. Al-muhtasib experienced), but, as she says, mistakes are completely OK. Dr. Al-muhtasib certainly felt these struggles and experienced setbacks throughout her time in graduate school. Her advice to students who might also be “first” in their family is this- don’t be afraid to seek help and find a support system of people who build you up instead of tearing you down.

I asked her to share some personal details about her life as a scientist, and here’s what she had to say! I asked her what her favorite part of her job as a scientist was and she said that it was teaching students (which is something that she and I definitely have in common!) In her spare time, to take a break from her work, she loves to write and paint. If you’d like to learn more about her advice on how to find a good graduate school mentor (and frankly, this would be helpful for finding mentors in any type of field), see a blog she wrote recently here: <https://sisterstem.org/2019/05/09/choosing-a-graduate-mentor/>

Posted 10/2019: Mr. Aaron Yazzie

Mr. Aaron Yazzie was born and raised on a Navajo reservation in Arizona and is a member of the Diné Nation. He attended Stanford University and graduated with a B.S. in Mechanical Engineering in 2008. Currently, he is a mechanical engineer at the NASA Jet Propulsion Laboratory in Pasadena, CA. His focus is primarily on space research missions and has worked on a number of incredible projects, including: the Mars Science Laboratory Rover Mission, Mars2020 Rover Mission, and other projects involving the study of Jupiter and Earth.

Mr. Yazzie is a role model in the STEM community, not only because he does incredible work, but because he truly cares about making the STEM community a more inclusive place for Indigenous people. He is heavily engaged in outreach in STEM, especially when he can work with students from Indigenous communities. Today, in 2019, Indigenous people are underrepresented in STEM, due to a number of systematic barriers that have been put in place through decades of exclusion in science. His work gives Indigenous students a scientist to look up to and brings visibility to Indigenous people already in STEM, both of which are crucial towards increasing the retention of Indigenous talent coming into the sciences. He has received a lot of recognition for his great work, winning the JPL Volunteer Award, the 2017 Navajo Nation Tribal Council award for “contributions to service and inspiration to

Diné youth and citizens”, and more. He is a superior example of a scientist that looks around him, sees work that needs to be done to improve the STEM community, and has a huge impact, both in the science community and the Navajo Nation. My hope is that all of my students will take the time to look around, no matter where they end up in life, and try to do the same in their lives.

You can learn more about Mr. Aaron Yazzie here: <https://www.aaronyazzie.com/about>

Posted 10/2019: Dr. Daniel Cruz

Dr. Daniel Cruz is a senior instructor at The University of South Florida in the Department of Chemistry, where he teaches general and organic chemistry. He also is a collaborator on meaningful research projects, such as Queer In STEM (queerstem.org), which is an organization that seeks to characterize the experience of LGBTQ+ individuals in STEM careers using both quantitative and qualitative data.

Dr. Cruz fell in love with science and math in high school in Puerto Rico, where he was born and raised- he says that many things in nature seemed like magic to him, until he started to learn the underlying scientific processes. He continued his education in Puerto Rico for his undergraduate education. He moved to Indiana to attend Purdue University a few years later for his PhD in chemistry. Dr. Cruz said “the culture shock was scary because I had to speak English 24/7, I had to adjust to a new climate, and a new culture. It was challenging, but I joined some student organizations of people who were like me (Latinos) and it made it much easier.” Dr. Cruz chose his path because he wanted to interact with people and he wanted to have a positive impact on society. Being a teaching-focused faculty member is what he wanted to pursue after his Ph.D. and he says he couldn’t be happier with where he is now in his career. Because of the experiences that have shaped his journey through STEM as a Latino and a member of the LBBTQ+ community, he has worked to use his position of power in academia-the university system- to advocate for underrepresented groups and makes sure to be as visible as possible so that other students who come from similar backgrounds can see that if he made it, others can, too. [Quotes taken from written interview with Dr. Cruz]

Posted 9/2019: Dr. Jennifer Bauer

Dr. Jennifer Bauer works at the University of Michigan Museum of Paleontology, where she curates and manages the invertebrate fossil collections. Her job involves making sure that fossils are properly stored, making sure researchers can come access the museum collections, and organizing new fossil donations. It’s a huge responsibility, when you consider that museums have thousands upon thousands of specimens!

Dr. Bauer studies blastoid echinoderms- these are fossils related to sea stars and sea urchins. She studies their evolutionary history, their biogeography, and how they interacted with their environment when they lived hundreds of millions of years ago. I met Dr. Bauer (my paleo

bff!) when she came to The University of Tennessee, where she did her doctoral degree at the same time as me.

Dr. Bauer is extremely passionate about science communication and access to good science information. A while ago, she got frustrated at all of the bad information concerning science (like climate change and evolution) that was out there, so she decided to do something about it. She, along with co-creator Adriane Lam, created a website called Time Scavengers, that gives good, accurate scientific information to broad audiences that's written in easily understandable terms. This blog is maintained by nearly a dozen scientists (including myself!) and reaches almost every country in the world, with thousands of visitors. What an awesome way to get good science information out to so many people, right!? Definitely go check it out! timescavengers.blog

Posted 9/2019: Dr. A. Kay Behrensmeyer

Dr. Kay Behrensmeyer is a world renowned scientist and currently the Curator of Vertebrate Paleontology at the United States National Museum (the Smithsonian). Her research is in a field called taphonomy, the study of the fossilization process. She received her doctoral degree in 1975, in a time where very few women were in paleontology. Ever since, she has published many papers, worked on many projects, and has recently been heavily involved in the redoing of the Smithsonian's Fossil Hall (which is now open! Go see it!) Some of the research she is really well known for is doing actualistic taphonomy- meaning, watching taphonomic processes as they are happening today to recently dead organisms. She watched recently dead animals in Kenya's Amboseli National Park to document how natural processes affected the potential of these animals becoming fossils (e.g., scavenging, drought, rain, etc). She was named one of the most important women scientists by Discover Magazine in 2002, and as a personal note, she is one of my paleo-heroes and she recently won a series of top prizes in paleontology communities honoring her work. Here's a link to some more information about her: <https://trowelblazers.com/kay-behrensmeyer/>

Posted 9/2019: Mrs. Katherine Johnson

Katherine Johnson showed herself to be a powerhouse in mathematics from an early age. She began high school at 13, at the high school on the campus of West Virginia State College, a historically Black college, where she eventually enrolled in college. She graduated at 19 (!) with her college degree in mathematics. She began her career as a mathematics teacher at a public school in Virginia.

Katherine Johnson's place in history comes in a few areas. First, she was one of three students chosen to begin integrating the flagship school of West Virginia, West Virginia University in the late 1930s. Second, she learned from a relative of an all-Black computing section at the National Advisory Committee for Aeronautics (soon to be NASA) that was

recruiting mathematicians. Katherine worked there for several years and contributed key findings to a number of projects involving the new field of space exploration. She was the first woman in the history of the program to receive credit as an author for her work on her report detailing the equations for determining the landing position of spacecrafts.

Katherine Johnson solidified her place as a NASA legend when she was asked to work on the first mission to have a man orbit in space (John Glenn). John Glenn famously refused to go ahead with the mission until Katherine Johnson confirmed the numbers of where and when he could safely re enter Earth for him, specifically.

Katherine Johnson, along with the many other Black women who worked at the NACA (soon to be NASA) were left out of the public conversation when discussing the amazing women and men who contributed to making space exploration possible. However, she was awarded the Presidential Medal of Freedom, the highest honor for a US citizen, by Barack Obama in 2015 and was written about in the book *Hidden Figures* (Margot Lee Shetterly), which was subsequently made into a hit movie by the same name. A Hidden Figure no longer, Katherine Johnson's achievements are finally being celebrated! Recently, she was included in a Women of NASA Lego set! She is turning 101 years old this August-happy birthday, Katherine Johnson!

Recently, NASA renamed some of its buildings after Katherine Johnson. Read the article here: <https://www.nytimes.com/2019/02/23/science/nasa-hidden-figures-katherine-johnson.html>

Posted 9/2019: Dr. Caroline Solomon

Dr. Solomon is a professor at Gallaudet University in Washington D.C. GU is the world's only university that is *entirely* for students that are Deaf and hard of hearing. Dr. Solomon herself is a Deaf scientist, who focuses her research program on how changes in nutrients in river systems can affect overall microbial communities in these said rivers. She is the department chair of the Science, Technology, and Mathematics and has been since 2018. Dr. Solomon is an amazing advocate for helping to reduce the barriers of Deaf and hard of hearing students that want to pursue careers in the sciences, by mentoring students in her program, as well as working to create more educational resources in American Sign Language. One of the major barriers to full access in science for Deaf students is the lack of vocabulary in ASL. One of her major projects is to create a database of newly created science vocabulary signs so that students can gain access to this resource and continue to build on it. You can see one of these database projects here: <https://aslstem.cs.washington.edu> (Links to an external site.)

There has been a lot of research that shows that a diverse body of scientists has huge, positive impacts on how we approach research. Dr. Solomon made an excellent speech at a national event about how Deaf scientists approach scientific research in a completely different way-by relying strongly on visual cues. She shows through this speech that Deaf

scientists advance science further by relying on their Deafness, NOT succeeding in spite of their Deafness. This is a phenomenon in Deaf culture called “Deaf gain”- the idea that being Deaf gives you a unique, valuable perspective on the world. Watch this speech by Dr. Solomon given at the national March for Science in 2017-March for Science Earth Day 2017 Speaker – Caroline Solomon (Links to an external site.).

Spring 2019

Posted 5/2019: Ms. Greta Thunberg

Greta Thunberg is a 16 year old Swedish student. You might be surprised that we’re talking about her as our scientist of the week, but there’s an important reason why. So many of us look around at things we want to change- things in our city, our country, or even across the world. And so many of us see all of that work and feel like there’s no way they could make a difference, right?

Well, this is why I wanted to introduce you to Greta. She began learning about climate change-the causes and the effects that are already here and soon to be here and was shocked to see the lack of effort to do something about it- adults in her community and adults who have the power to enact change on a governmental level. So she did something about it. In 2018, she began protesting outside the steps of the parliament building alone every day. Then, she was joined by more and more students. Within a few months, this had grown to a nationwide protest (the *Skolstrejk för klimatet* “School strike for climate”). Within a few months, she has managed to get 1.2 million kids across 112 countries to strike as well. When asked why she has decided to do this, she said “we can’t change the world by playing by the rules, because the rules have to be changed”.

Greta has been nominated for multiple awards (including the Nobel Peace Prize-which, if she won, she’d be following in the footsteps of other amazing environmental activists, such as Wangari Maathai, the first environmentalist and the first African woman to win the Nobel Prize). She has been invited to speak at multiple national and international organizations focused on halting the progression of climate change.

Here is a link to a powerful speech she recently made: <https://www.theguardian.com/environment/2019/apr/23/greta-thunberg-full-speech-to-mps-you-did-not-act-in-time>

Posted 4/2019: Dr. Juan Pablo Ruiz

Dr. Juan Pablo Ruiz works as a postdoctoral researcher at the National Research Mentoring Network and has a PhD in biochemistry. He learned during his Ph.D. that he was autistic-he was diagnosed after he began working with a therapist for mental health. Dr. Ruiz speaks openly of the stigma that stops a lot of college students from talking about or seeking help for mental health and especially the stigma that a lot of autistic scientists might feel about

talking about their experiences. He has chosen to speak openly of both of these topics to help other people feel comfortable with themselves. Dr. Ruiz has taken a different path in academia than many. After his experiences, he realized being a biochemistry researcher wasn't for him. Instead, he'd rather work to better understand how we mentor and create the next generation of scientists, through mentoring. Many of you may not know this, but in graduate school, the most important relationship that you have is with your advisor-who teaches you how to research, helps you develop a project, writes your recommendation letters, and more. You generally choose your school based not on the program, but the mentor themselves. Who you choose is critical, because your mentor remains an important part of your career long after you graduate in many cases (my mentor and I work together on multiple projects, years later for example!) Because of this, there are a lot of opportunities for mentoring to go wonderfully or go horribly wrong. The NRMN is working to help identify how to have positive mentoring impacts and is working towards making STEM a better place for underrepresented groups, after many research papers have shown that scientists from racial minorities are awarded fewer grants from national federally funded agencies (yes, even today). Dr. Ruiz is an awesome example of a scientist that is working to make science a better place for many people, but especially for people who are autistic, where many stereotypes make it difficult for scientists to work comfortably, and people who experience mental health illnesses, such as anxiety and depression.

I asked him if he had any advice for students who might relate to his experiences and this is what he said: the one advice I have for them is that their definition of normal is perfect and they can find solidarity in that. For me that meant weekends shut up in lab or at home writing fantasy stories and doing homework because that's what I enjoyed, more so than parties or sporting events. Now I find myself playing Dungeons and Dragons quite often and being comfortable with just being, well, me. I think it comes down to finding support to both learn about yourself and feel comfortable in your own skin, especially since science can be a difficult and lonely path in and of itself, without taking minority or disabilities into account

Here's an article that he wrote about working with mental health diagnoses, being open about mental health, and being in college: <https://chronicallyacademic.blogspot.com/2017/05/breaking-stigma.html> (Links to an external site.)

Posted 4/2019: Dr. Mackenzie Warren

Dr. Mackenzie Warren is a postdoctoral scientist (this means that he has already obtained a PhD and is employed as a researcher) at The University of Michigan in the department of physics and astronomy [note: Dr. Warren has since changed institutions and is now at North Carolina State University]. His research there focuses on creating realistic models of how supernovae occur. Specifically, he works to figure out how different flavors (i.e., types) of neutrinos work in supernovae explosions (neutrinos are subatomic particles that make up things like electrons). His research is funded by the National Science Foundation

postdoctoral grant agency, which is highly competitive and only funds a very small percentage of the scientists who apply to get it.

Dr. Warren is also a big proponent of making colleges inclusive for LGBTQ+ students, staff, and faculty. To accomplish this, he draws on his own experiences as a trans and queer scientist and reaches out to physics and astronomy programs across the US to work with them on developing inclusive policies. This is quite meaningful work because through most of the past, LGBTQ+ scientists have been discriminated against heavily and have often been pushed out or excluded. Science requires full participation from people of every possible background to work—we need creative problem solving and unique critical thinking; this is best accomplished through having a broad diversity of people working together to advance scientific knowledge. Dr. Warren is an excellent example of someone who looked around him, saw problems that needed to be addressed, and has worked to address those issues to make the world around him better.

Dr. Warren also works with astronomy programs like Popscope, which brings telescopes to public events, to draw in a broad diversity of people in an area. Dr. Warren points out that low income students are often not able to get into science as easily because their opportunities are limited when they are young and this is something he wants to change.

To learn more about Dr. Warren, you can check out his website here: <https://www.mackenzie-warren.com/> (Links to an external site.) Links to an external site. and a short bio here: http://aapf-fellows.org/biography/MacKenzie_Warren (Links to an external site.)

Posted 4/2019: Dr. Diego Pol

Dr. Diego Pol is a vertebrate paleontologist that's currently at the Egidio Feruglio Museum of Paleontology in Argentina. He's well-known in the paleontology world for leading and co-leading a number of new dinosaur discoveries, including finding new dinosaurs like *Lorosuchus*, *Manidens*, *Glacialisaurus* and *Eoabelisaurus*. Recently, he co-lead a team that discovered one of the largest sauropods known to date.

He discovered his love of paleontology while he was in high school. In Buenos Aires, where he went to school, he signed up for an internship to work at the Natural Science Museum of Argentina there in the city (side note: I've been there and it's uh-mah-zing. Image attached here is a picture of the display the museum had on the work that Charles Darwin did in Argentina that I took back in 2014.

Here's an article about one of the largest dinosaurs ever known (Dr. Pol is interviewed in the article): <https://news.nationalgeographic.com/2017/08/largest-dinosaur-ever-titanosaur-fossil-patagotitan-science/>

Posted 4/2019: Dr. Michele Cooke

Dr. Michele Cooke is a geology professor at The University of Massachusetts at Amherst; she focuses primarily on how geologic structures (like fractures and faults) develop in the upper crust of Earth's surface. She looks at how fractures within rocks can control the transport of hydrocarbons and groundwater, among many other things. Her research uses a lot of 3D data visualization, too.

March 15-April 15 is Deaf History Month! Dr. Cooke is hard of hearing and part of the Deaf community (note: Deaf with a capital D is correct- this means I am referring to cultural and community aspect of being Deaf, not medical (which is deaf)). Dr. Cooke wanted to work to promote STEM in Deaf education, so she developed programs to work with schools for the Deaf around the country and teach students about 3D geologic concepts. She had great success with this-she pointed out that American Sign Language (ASL) is a very 3D visual language. It would make sense to her, then, that ASL users might be very well equipped to learn complex 3D visual concepts, like those that she studies for her research. This is an awesome project because the Deaf community has been traditionally underrepresented in science, and this is especially true for geology! Her project shows that geology is losing an incredible amount of talent by not being more inclusive to all communities of people.

Dr. Cooke made a video explaining why her Deafness has contributed positively so much to her science (in the Deaf community, this is called Deaf gain). Take a look at this video, where she discusses the benefits that she gets from being a Deaf scientist:

<https://www.youtube.com/watch?v=mNMrTPDAkBw>

Dr. Cooke also spearheaded a project where she writes a blog for academics that are Deaf or hard of hearing themselves to give advice on common challenges Deaf academics might face and to create a network of Deaf academics to provide better support for one another. She is an awesome role model in geology and the science community for making sure to make science a better place for *all* of the people within it! Check out her blog here: <https://themindhears.org>

Posted 3/2019: Dr. Sandy Kawano

Dr. Sandy Kawano, our scientist of the week, is an assistant professor at The University of California, Long Beach. I wanted to talk about Sandy for a bunch of reasons this week-first, her research fits really well with our topic: fish slowly moving onto land. Second, there are a lot of people that have an idea in their head that community college is a less valid option for students. Sandy got her Associates Degree in biology at De Anza College and then took her credits and finished her Bachelors Degree at The University of California, Davis! Community college is an *awesome* option for students that want to take credits at a smaller institution, who may not want to pay the high tuition at a lot of larger 4 year colleges, or want a 2 year

degree (of which there are tons of options that are really rewarding!) Many amazing scientists (like Sandy) that I know today got their start at community colleges. Sandy also was part of the McNair Scholars program, which works with amazing students from all over the US to prepare them for entrance into a Ph.D. program-the McNair program specifically works with students who are low-income, first generation in college, or people who are otherwise underrepresented in academia.

Sandy's research is varied and super cool: she studies the biomechanics (meaning, how bodies actually move!) of how the first vertebrates would have walked on land, how escape responses to avoid predators have evolved in fish, and a bunch of other projects. She's had numerous publications on her research and her work with collaborators has been featured on a bunch of different news sites (like this one: <https://www.news.gatech.edu/2016/07/04/robot-helps-study-how-first-land-animals-moved-360-million-years-ago> (Links to an external site.)) (Links to an external site.) or this radio show!: <https://www.abc.net.au/radionational/programs/scienceshow/how-vertebrates-first-moved-from-water-to-land/7673226#transcript> (Links to an external site.)).

Sandy is an excellent mentor and educator in STEM. I've known Sandy for quite a few years and she is one of my scientist role models! She is always ready to lend advice or to pitch in to help another person out (fun fact-she once mailed me a box of Harry Potter themed candy when I was really stressed out in graduate school). I mention this personal story because as you progress in your field (whatever it may be), you should always look out for people that you can look up to, or people that are willing to cheer you on and help you along your path to success! It makes a huge difference.

Posted 3/2019: Dr. Bill Jenkins

Dr. Bill Jenkins (1945-2019) was an epidemiologist working for the U.S. government during the 1960s and 1970s. Before I talk about what he did, I want to talk about why I chose him for this week. Many people in society seem to think that racism and racial discrimination ended when slavery was outlawed or when Jim Crow laws were repealed-this is not true, under any stretch of the imagination. It's also not true to say that government-sanctioned discrimination ended when slavery or Jim Crow laws were outlawed; in fact, this story takes place within the lifetime of many of us reading this today. Many people also don't know that many American medical advances were founded on discriminatory ideas or founded on inhumane experiments on Black Americans. Why I say this is because scientists today have a heavy responsibility to know and acknowledge this history of science, understand that racial discrimination in science is still happening (for example, the men we already talked about this semester-James Watson), and work to make sure history cannot repeat itself.

With this in mind, I wanted to honor the work that Dr. Bill Jenkins, an American hero that deserves to be remembered, did to affect change in the medical science community to stop

racist and inhumane experiments against Black men. The US Public Health Service authorized an experiment to observe the natural history of syphilis- meaning, how it worked in the human body if left untreated. ~600 Black men from Alabama (Tuskegee) were enrolled in this study; they were told they were receiving medical treatment. The US Public Health Service actively lied to them and they never provided them any medication to treat the infection, even after antibiotics had been found to be effective. Dr. Jenkins learned of this experiment and, against his boss' direct orders and in the face of losing his job and receiving extreme backlash, wrote articles and tried his best to get attention drawn to the story. While it took some time, and others joining in to speak out, for this experiment to be exposed for what it truly was, Dr. Jenkins laid the founding stones for getting this experiment stopped. Further, he was instrumental in getting the men that were in this experiment lifelong healthcare and instrumental in forcing the federal government to issue an apology to the community and to the nation for what they had authorized and done.

Dr. Jenkins didn't stop there. He was one of the first scientists at the Center for Disease Control (CDC) to recognize how AIDS was impacting specifically the Black community and Black men. He led the charge in AIDS prevention research and worked to reduce the number of people contracting AIDS during his work.

Dr. Jenkins was a huge force in changing the lives of 1000s of vulnerable people and his work made sure that others would not suffer in the future at the hands of unethical and racist medical treatment. Dr. Jenkins passed away about 2 weeks ago in South Carolina at 73-his legacy, his actions, however- will live on. You can read his full obituary in the New York Times here: https://www.nytimes.com/2019/02/25/obituaries/bill-jenkins-dead.html?fbclid=IwAR2eSnbMCGxPAXwALrVTGTUuPnkk_wJRe8tmOy3sT3GIymMN2DyHmqVOrYo

Posted 2/2019: Mr. George Washington Carver

George Washington Carver is a very well known scientist-but what he's most well known for is something he didn't actually do! He did *not* invent peanut butter. What he did was much greater than that.

Mr. Carver was born into slavery in Missouri in the mid-1860's. His date of birth is not known, exactly. Slavery was abolished when he was a child and he was able to be raised by his parents, also freed from slavery. He attended a number of schools until he began applying for colleges. He had difficulty being accepted to college due to being Black. In fact, he was actually accepted to a college (Highland University) in Kansas, but when he arrived to begin classes, he was rejected after the university learned that he was Black. For a short time after this, he worked in a conservatory to take care of plants and flowers, as well as earned money by farming large fields; this likely influenced his path into agricultural science later on.

Mr. Carver finally was able to fulfill his goals of attending college, despite the barriers that a racist society had put in his way, by becoming the first Black student at Iowa State, where he earned a degree in Agriculture. He earned his M.S. degree next, and was hired as the first Black faculty member at Iowa State.

Later, the famous Booker T. Washington (who headed Tuskegee University) invited Mr. Carver to work at Tuskegee and head the Agricultural Department. There, he worked for nearly half a century, teaching methods of crop rotations, and developing techniques to improve soils that had been depleted of nutrients by seasons of planting cotton. His work here had effects that were incredibly long lasting-he is a large part of why many people in the south did not go hungry after generations of unsustainable farming practices. His work also spawned countless other agricultural scientists and encouraged an untold number of Black students under his tutelage at Tuskegee to succeed in their own fields (including Saint Elmo Brady, our previous scientist of the week). A lot of his work that he developed, he distributed for free to farmers who needed them.

Here's a biography of Mr. Carver's works: <https://www.sciencehistory.org/historical-profile/george-washington-carver>

Posted 2/2019: Mrs. Henrietta Lacks

Henrietta Lacks was not a scientist; however, her contributions to science are among the most important contributions to medical research in modern history. Mrs. Lacks was a tobacco farmer and mother-she worked on a family's farm and was the great-great-granddaughter of slaves. She went to Johns Hopkins, a hospital a good distance from her home, because it was one of the few hospitals that would treat Black people during the period of segregation and Jim Crow laws in the United States.

Doctors diagnosed her with cervical cancer and began radiation treatment (in the 1940s, 50s cervical cancer was almost always fatal). When they took samples of her cells, however, they noticed that the cells behaved differently than other cervical cells-they multiplied themselves quickly. Doctors had never seen this before. They sent her cell samples to other doctors (without her knowledge or consent). Doctors began studying her cells all over-by the time she passed away, other doctors had even gone on TV talking about her cells, though still no one told her that they had done this. These cells, named the HeLa (hee-la pronounced) are one of the most famous lines of cells in the world today-their existence has allowed medical researchers worldwide to develop vaccines for deadly diseases like polio; treatments of leukemia, herpes, hemophilia (a blood clotting disorder), and countless others. The HeLa cells have literally saved millions of lives.

It wasn't until much after her death (1951) that her children found out that their mother's cells were being used-in 2001, her daughter actually visited Johns Hopkins and was able to

see her mother's cell samples. In fact, doctors had said that the cells were named after Helen Lane (a made up name) to make sure that Mrs. Lacks remained anonymous (due to privacy laws). Now, by 2019, companies that do pharmaceutical research have made millions of dollars from Mrs. Lacks' cells, without credit or compensation to her or her family.

This is a famous case of medical ethics, of course-and now it is illegal to take samples without consent and it's even not allowed to name cell lines after people, in case their identify is discovered. However, Mrs. Lacks' legacy through her HeLa cells is an incredible one-she is quite literally one of the most important figures in the history of modern medicine.

Here's an excellent piece written about Mrs. Lacks' life in the New York Times: <https://www.nytimes.com/interactive/2018/obituaries/overlooked-henrietta-lacks.html> (Links to an external site.)Links to an external site.

If you find this interesting, I would highly recommend reading *The Immortal Life of Henrietta Lacks*, a book that was published fairly recently about her life and the HeLa cells.

Posted 2/2019: Dr. Saint Elmo Brady

Dr. Saint Elmo Brady (1884-1966) is the first Black chemist with a Ph.D. in the United States. His degree is from The University of Illinois (graduated 1916).

Dr. Brady was born in Kentucky and went to college in Nashville, TN, a Historically Black College (HBCU). During his time at Fisk, his professor of chemistry approached him and encouraged him to pursue higher education in that field. After he graduated, he took a job teaching at the Tuskegee Normal and Industrial Institute (now called Tuskegee University) in Alabama. During that time, he was mentored by incredible senior scientists (such as George Washington Carver) and leading educators (such as Booker T. Washington, who established Tuskegee University).

Dr. Brady left his post at Tuskegee to attend The University of Illinois for graduate school. He was the only Black student admitted to the program. He graduated with his PhD and went on to teach at multiple HBCUs, mentor countless students at these institutions, revitalize chemistry education for these undergraduate programs, and was instrumental in raising funds to develop state of the art chemistry laboratory spaces for teaching and research. He founded the first ever graduate program for chemistry at an HBCU at his alma mater, Fisk, which now bears his name. His research was varied, but his most recognized work is in infrared spectroscopy (investigating how infrared light interacts with molecules). He also wrote books on Household Chemistry for Girls, which are a collection of household chemistry experiments.

If you want to learn a little more about Dr. Brady's life and achievements, read these articles: <https://www.sciencemag.org/careers/2005/05/ancestors-science-st-elmo->

brady?r3f_986=https://www.google.com/ (Links to an external site.)

| Saint Elmo Brady (1884-1966)

Posted 1/2019: Dr. Nancy Roman

Dr. Nancy Roman, ‘Mother of the Hubble Telescope’ got her start in science when she joined an astronomy club as a child. She was fascinated by stars and space. She decided to make astronomy her future career path, and even had to convince her guidance counselor that she should take more science and math, instead of Latin (the more traditional educational path for girls at that point). This led her to pursue astronomy in college and eventually in graduate school, where she received her Ph.D. from the University of Chicago in the 1940s.

She was recruited to work at NASA, just a year after it was founded-her research thus far had focused on radio astronomy. At NASA, she had the opportunity of a lifetime-to establish an astronomy program and lead it. She’s given credit for being the major reason behind some of the most famous astronomical advances-namely, convincing Congress to fund and getting engineers and astronomers to build the famous Hubble Telescope (which has become an integral part of our astronomy research).

She was also a major reason behind the development and execution of the Cosmic Background Explorer satellite that solidified the evidence supporting the Big Bang Theory (something we’ll talk more about in class).

After she retired from NASA, she chose to spend her time going to schools in the greater Washington D.C. area to encourage young girls to continue to learn and to enjoy science. She passed away a few months ago, in October of 2018. Her achievements for astronomy cannot be overstated. LEGO even put her in the Women of NASA set they recently released! The link below is to her obituary that has a much longer summary of her life:

Posted 1/2019: Dr. Rosalind Franklin

Dr. Rosalind Franklin (1920-1958) developed an early talent for science and math and entered college to study it; some accounts say that her family wasn’t very supportive of her choice to be a scientist, although the degree to which they did not support her isn’t clear. She became a physical chemist and x-ray crystallographer. She worked in multiple labs throughout her life and discovered many different things; arguably, her most famous discovery came from her work at King’s College in London, UK. She and a graduate student at the time discovered that the structure of DNA was helical and in fact, it was a double helix.

James Watson and Francis Crick were shown her work (both images and her unpublished study) without her knowledge or consent; they used her work to finish their study of the structure of DNA and then published it, without acknowledging her contributions to their

study in 1953 (she published her data in the same journal as Watson and Crick, though). Rosalind Franklin died of ovarian cancer a few years after. When Watson and Crick won the Nobel Prize for their work on the structure of DNA, she was not included on the award (both due to her accomplishments being overshadowed and due to the Nobel committee not giving awards posthumously).

For many decades, her accomplishments went largely unknown, but her contributions to science are now being understood. She also published a large body of other work on a range of topics- if she had not died from cancer, most people agree that her scientific career would have likely included many awards for her work, especially for her work on viruses.

Fall 2018

Posted 12/2018: Dr. Fatimah Jackson

Dr. Fatimah Jackson is a professor at Howard University and the director of the Cobb Research Laboratory (which houses the largest collection of African American skeletal and dental remains used for scientific research)-she received all of her degrees from Cornell University in New York. She has an incredible impact on science, mentoring nearly 200 students each year, from undergrad to Ph.D. Her research career has been a highly productive one, starting at the University of North Carolina, University of Maryland, and finally at Howard-all of which are powerful research and teaching universities.

Dr. Jackson's research focuses on understanding how plants have affected human evolution and how plants and humans have co-evolved through time. Particularly, she studies how compounds found in plants affect human metabolic processes; this work has the potential to identify how certain aspects of human health can be expressed differently across populations of people; her work has primarily taken place in Africa. Her research has won her a host of awards, regional, national, and international.

Watch this cool video of her talking about her work at the American Museum of Natural History (in NYC): <https://www.amnh.org/explore/news-blogs/podcasts/scicafe-how-plants-domesticated-humans-with-fatimah-jackson>

Posted 11/2019: Mr. Cody Sifford

Mr. Cody Sifford is a member of the Diné Nation and was born and raised in Montana. He grew up with a deep love for nature, as he and his family were very involved in activities like camping and fishing. These experiences shaped his college career, as he majored in Environmental Science at Salish Kootenai College and then got a M.S. at The University of Washington, also in Environmental Sciences with a focus on geographic information system technology (i.e., GIS-technology used for mapping a wide range of things).

Mr. Sifford has done research that analyzes the impacts on human health that burning

biomass (e.g., trees) can have. This research has a very important place in today's society, where forest fires are presenting an increasing danger every year with climate instability.

Mr. Sifford was chosen this week for a number of reasons-one, his work has direct implications for current natural disasters like the wildfires in California; two, being a scientist does NOT require a Ph.D.- you can be a scientist with a number of educational backgrounds and you can do incredible work with or without these degrees; and three, November is Native American heritage month, so I wanted to honor Native scientists doing great work. Read a short interview here and see his advice to aspiring scientists: <http://www.nativesinstem.org/profiles/cody-sifford>

Posted 11/2019: Dr. Rene Shroat-Lewis

In honor of Veterans Day, this week it's my wonderful friend and US Navy veteran, Dr. Rene Shroat-Lewis! She was in the navy, both active service and reserves, for a number of years on board the USS Prairie and SIMA (Shore Intermediate Maintenance Activity) in Longbeach, CA. After her time in the military, she moved to NC with the hopes of going to school for marine biology. While she was taking courses at Cape Fear Community College, however, she took a physical geology course and fell in love with geology-she transferred to UNC-Wilmington a year later and got her B.S. and M.S. at UNCW, where she studied echinoderms, the group that includes sea stars and sea urchins. After she got her Ph.D., she was hired as a professor at The University of Arkansas at Little Rock, where she mentors students, teaches geology courses, and researches fossil echinoderms and their paleoecology (how organisms interacted with other species in the past). Dr. Shroat-Lewis has won awards for her excellent teaching and has advice for veterans in college or thinking about going back/to college: "I'd tell veterans to not give up on their dreams and to explore all of the possibilities out there. You honestly just never know where you'll end up and what you'll be doing. Oh, and professors LOVE working with Veterans because we understand how regimented their lives are."

Posted 10/2018: Dr. Maggie Aderin-Pocock

Maggie Aderin-Pocock is a British space scientist and science-educator. She struggled through her early years in school, due to her dyslexia, especially in reading and writing. However, once she discovered her passion for science and she learned to work with her dyslexia, she began excelling in school, eventually getting an undergraduate degree in physics and a Ph.D. in mechanical engineering.

She has developed multiple advancements for many different pieces of scientific equipment (e.g., she worked with a group of scientists to develop a spectrograph for the Gemini Telescope in Chile) and developed technology to develop hand-held instruments to detect the presence of landmines.

Dr. Aderin-Pocock also specializes in science education. She has visited nearly 30,000 school-aged kids in the United Kingdom to talk to them about being a scientist, where she shows them that anyone, regardless of race, class, disability, gender, can be a scientist. She has even been a science advisor for the immensely popular British show Doctor Who!

For her work in science education and inclusion, she was made a member of the Member of the Order of the British Empire in 2009, among a long list of other incredibly impressive awards.

Here is a great interview with her, where she talks about her science, dyslexia, and the importance of having role models in science: <https://dyslexia.yale.edu/story/maggie-aderin-pocock-ph-d/>

Posted 10/2018: Dr. Geerat Vermeij

Dr. Vermeij is a world-renowned scientist at UC-Davis, where he is a professor of marine biology and paleoecology-he is most famous for his work on mollusks (the group that includes snails and clams) and his work on the “arms race” hypothesis-the idea that predators and prey evolve in response to one another, something that we can see both in the fossil record and in the modern biological world.

Dr. Vermeij went blind at the age of three and studies snails and clams by feeling the unique shapes that each species has. He has worked with science organizations to help teach blind students interested in science how to develop specific tactile skills for biology and geology. Watch this video here to learn more about what he studies:

<https://www.shapeoflife.org/video/geerat-vermeij-evolutionary-biologist-reading-shell's-story>. I'd encourage you to check out his autobiography, Privileged Hands, which I've heard is quite good!

Posted 10/2018: Ms. Mary Anning

Scientist of the Week: Mary Anning! Since National Fossil Day is also coming up (10/17), I thought it would be a great week to highlight an amazing paleontologist! Mary Anning discovered an incredible number of important fossil finds: among them, some of the first ichthyosaur and plesiosaur skeletons, some of the first pterosaur skeletons, and changed our interpretations of fossilized cephalopods (the group that contains octopuses and squids). Although she was considered an expert in her field, and was consulted by many well-known paleontologists, she was not allowed to join the Geological Society of London, because she was a woman, nor was she often given credit for her fossil finds by scientists who bought them from her. Her work on ichthyosaurs was debated at a Geological Society meeting (with famous scientists like George Cuvier insisting her work couldn't be correct; he later accepted it)-she was not invited to attend the meeting.

Fun fact: “She sells sea shells by the sea shore”, the famous tongue twister, is rumored to

have been written about her.

For more info on Mary Anning, check out this site: <http://www.nhm.ac.uk/discover/mary-anning-unsung-hero.html>

Posted 9/2019: Dr. Donna Strickland

Our scientist of the week is Donna Strickland, the 3rd woman to ever win the Nobel Prize in physics (she won it last week!) Dr. Strickland, who is faculty at The University of Waterloo in Canada, shares the award with her colleagues and they were awarded it based on their work on lasers and generating high-intensity and very short optical pulses, which have aided in delicate surgical techniques (e.g., optical surgeries).

Wikipedia had previously rejected an article written about her because they didn't feel she had gained enough notariety as a scientist. They have reversed their decision as of last week. This prize is very meaningful because it highlights the implicit biases in STEM in who is being nominated for these prestigious awards. A lot of research has shown that women are passed over for top awards, even when their merits are equal to male colleagues. The Nobel Prize committee has only awarded 48 of their 892 prizes to women since its creation-since people are usually awarded for their research from decades ago, this gender gap can be partially explained due to women being excluded across the board from STEM fields until recently, although significant barriers for women (and other underrepresented groups) still exist.

Congratulations on your incredible win, Dr. Strickland!

The point of these weekly posts is to introduce you both to incredible scientists from all walks of life and to introduce you to how society has shaped scientific history. I hope you're enjoying them as much as I am!

<https://www.osa.org/en-us/history/biographies/donna-t-strickland/>

Posted 10/2018: Mr. Vivien Thomas

Today's scientist of the week is Vivien Thomas! He was born in 1910 in Louisiana and moved to Nashville, TN a little bit later. He graduated high school in Nashville and tried to attend college-however, the Great Depression made that impossible at the time for financial reasons. He was able to get a job a bit later, however, as a surgical assistant to a doctor at Vanderbilt University. Within a few years, he was given freedom to pursue his own surgical research; however, due to structural racism present in the 1930s, he was paid for and listed as a janitor. Later, after the doctor for whom he worked accepted a job at Johns Hopkins, Thomas moved with him to continue his work-there, he continued to face extreme racism, especially because he was the only Black scientist at the medical school, as segregation was very much in effect across the country.

Through all of these obstacles, he persisted in making some incredible advances in medical

research. Thomas is credited with such accomplishments as: surgical procedures to increase oxygen in infants (“blue baby syndrome”); when this groundbreaking work was published, Thomas’ name was not included on the research, only his supervisors (this has since been revised to give him the credit deserved); and alleviating “crush syndrome” (where bodies undergo shock/organ failure due to being crushed), something that thousands of soldiers fell prey to during war. Just these two accomplishments saved estimated 1,000s of lives!

He was promoted to an instructor of surgery at Johns Hopkins, received an honorary doctorate, and is forever memorialized as one of the most impactful faculty members to have worked there.

This link will tell you more about his story and will direct you to even more resources:
<http://www.cpnas.org/aahp/biographies/vivien-thomas.html>

Posted 9/2018: Dr. Wangari Maathai

Today’s scientist of the week is Wangari Maathai, the first African woman to win the Nobel Peace Prize. Besides becoming the first woman to hold a Ph.D. in the greater eastern African region (she was born in the 1940s, so women were barred/discouraged from entering higher education all over the world during this time), she also became one of the first women department heads, too. She cared deeply about economic justice and environmental justice, so she began the Green Belt Movement, where women across Kenya received money for planting trees-her movement resulted in 20 million trees being planted AND an incredible amount of economic growth in women across her country. Her movement has been expanded to *many* other nations now and is an international model for how we can make small changes to enact large scale change. She has been recognized by the UN and other global organizations for her work that combines environmental conservation and human rights- for this, she was awarded the Nobel Prize.

Here’s a video of her telling a story of how even the smallest changes might do a lot of good (and I want you to think about this video when you do your extra credit project [note: students were asked to look around their lives and see where they could make small changes to their carbon footprints and encourage others to do the same]!) and a short biography of her life and achievements from the Nobel society:

<https://www.nobelprize.org/prizes/peace/2004/maathai/biographical/> I will be a hummingbird – Wangari Maathai (English) (Links to an external site.)

Posted 9/2018: Dr. Eqbal Dauqan

Here’s Dr. Eqbal Dauqan, a Yemeni scientist that fought tooth and nail to earn her Ph.D. in an area that didn’t encourage higher education for women and then turned around and became the department head at her university (by 35!). During the civil war in Yemen, a large number of her family was killed in a bombing. She was able to get to Malaysia safely as

a refugee, where she runs a well-known biochemistry lab and works hard at making sure girls and women worldwide have equal access to science and education. Learn a little more about her in this article below!

<https://www.npr.org/sections/goatsandsoda/2017/06/20/530803655/she-may-be-the-most-unstoppable-scientist-in-the-world>

Posted 9/2018: Dr. Wanda Diaz Merced

Meet Wanda Diaz Merced! An astronomer from Puerto Rico, she studied gamma ray bursts and star brightness levels. She lost her eyesight after she became a scientist. To continue her research, she developed a new software that translates the data received from her equipment into sound, so she can hear the different frequencies and make scientific interpretations. Here's her TED Talk: Wanda Diaz Merced: How a blind astronomer ... – TED.com

Bonus: she even made a music album of her scientific data!