Margaret H. Rousseau



Rousseau became the first woman in the U.S. to earn a PhD in chemical engineering in 1937. She studied thin film thermo, synthetic rubbers, and high-octane gas distillation throughout here career. Most notably, applying her experience in synthesis and distillation, she designed the first large-scale production plant to produce penicillin from cantaloupe fermentation during WWII. Her design produced over 2.3 million doses for U.S. soldiers in 1944, saving lives from infectious disease. She became the first woman member of AICHE and earned the Achievement Award of SWE.

The first woman to earn a PhD in chemical engineering from MIT, the first woman member of AIChE, the first female AIChE Fellow, and the first woman to receive AIChE's Founders Award.

Rana el Kaliouby



Rana el Kaliouby was born in Cairo, Egypt in 1978. She obtained her B.S. and Masters at American University in Cairo and her Ph.D. at Cambridge. As a child, her ambition towards science was considered abnormal; however, her family supported efforts and her mother served as a role model. She worked as a research scientist at MIT until co-founding Affectiva. Her work has focused on integrating human emotions with AI response in technology. el Kaliouby focuses on using emotional AI to improve automobile safety, emotion interpretation for autistic or visually impaired individuals, and enable more human interactions through technology. She has been listed as Forbes top 50 women, MIT's innovators under 35, BBC 100 women in 2019.

"I've found that having role models and mentors who I resonate with is so important – a lot of people have so many questions and . . . may not have someone who can relate enough to even answer in the first place."

Susan Picotte



Susan Picotte was a Native American medical doctor and reformer. As a child, she unfortunately watched a sick Native American woman pass away because a local white doctor refused to give her care. Picotte has stated that this event was the inspiration for her becoming a physician to gain the ability to treat people on the Omaha reservation. She was the first person to receive federal aid for professional education and the first Native American in the U.S. to receive a medical degree (WMCP in 1889). Picotte returned to the reservation soon after to work as a physician at the government boarding school, caring for over 1200 patients. In addition to providing medical treatment, Picotte also actively participated in public reform supporting temperance and public health issues. Serving as the chair of the state health committee of the Nebraska Federation of Women's Clubs, she strived to improve education about issues such as hygiene. Due to the widespread nature of tuberculosis during this time, she advocated further for cleanliness and the eradication of houseflies. For her service, the reservation hospital was named after her and declared a National Historic Landmark in 1993. In 2021, a bronze sculpture of Picotte was unveiled on Lincoln's Centennial Mall on Nebraska's first Indigenous Peoples' Day.

"I am a dreamer who dreams, sees visions, and listens always to the still, small voice. I am a trail-blazer.

Lori Alvord



Lori Alvord is a Native American surgeon and author. Alvord earned a double major in psychology and sociology from Dartmouth in 1979. Attaining her M.D. from Stanford University Medical School in 1985, she became the first Diné (Navajo) woman to become board certified in surgery. Dedicated to giving back to her community, she returned to the Navajo reservation in NM to treat patients at the Indian Health Service. Here, while being technically proficient in surgery, her goal was treating patients psychologically and spiritually in addition to physical treatment. She accounted for patient surroundings when treating people and this approach culminated in her book, *The Scalpel and the Silver Bear*. Dedicated to making a broader impact, she served as student affairs faculty at Dartmouth, Johns Hopkins, Central Michigan University, and the University of Arizona and on various advisory councils. For her contributions to public health, she has received three honorary medical degrees and the American Medical Writers Association Award of Excellence. In 2013, she was also endorsed as Surgeon General of the US by the National Indian Health Board and the National Congress of American Indians.

The first Diné (Navajo) to become board certified in surgery.

Mary G. Ross



Mary Ross was a Cherokee engineer from Park Hill, Oklahoma. She earned her bachelor's in mathematics (Northeastern State Teachers' College) and took every astronomy class offered at the Colorado State Teachers College while studying to earn her master's degree. She went on to become the first female engineer hired by Lockheed and the first known Native American engineer in history. While at Lockheed, Ross worked in aerospace design, as she developed numerous design concepts for interplanetary space travel consisting of both crewed and uncrewed Earth-orbiting flights. In 1992, the Santa Clara Valley Section established a scholarship in her name and in 2018, she was chosen to be depicted on the Native American $1 Coin by the U.S. Mint.

The first known Native American engineer and notable engineer in the field of aerospace design.

Carolyn R. Bertozzi



Dr. Carolyn R. Bertozzi is an American chemist who earned her Ph.D. in chemistry at UC Berkeley in 1993. After earning her doctorate, she worked for both UC Berkeley and HHMI, where she founded the field of biorthogonal chemistry. Bertozzi has performed research on the glycobiology of diseases like cancer, tuberculosis and COVID-19. She has also founded several biotechnology startups dedicated to implementing biorthogonal chemistry to specialized fields. Bertozzi went on to receive the MacArthur genius award and in 2010, became the first woman to receive the Lemelson-MIT Prize faculty award. She is also a member of the National Academy of Sciences, the National Academy of Medicine, and the National Academy of Inventors.

The inventor of the field of biorthogonal chemistry.

Kalpana Chawla



Dr. Kalpana Chawla was an Indian-born American astronaut and aerospace engineer. Chawla's passion for aviation originated at a young age from going to local flying clubs to watch planes with her father. She earned a B.S. in aeronautical engineering from Punjab Engineering College, where along her path she was dissuaded by professors due to lack of opportunities of women in India following this career path. Persisting despite this, after becoming a U.S. citizen, Chawla achieved an M.S. from UT-Arlington (1984) and a Ph.D. from the UC-Boulder (1988). Beginning work at NASA upon earning her Ph.D., Chawla performed research on computational fluid dynamics around aircrafts. To provide opportunities for young girls interested in science, Chawla's secondary school was invited to participate in the NASA Summer Space Experience Program. Further, after applying to be an astronaut, she became the first woman of Indian origin to go to space, which she achieved on Space Shuttle *Columbia* (1997) as a mission specialist and primary robotic arm operator. She was also selected for a second flight in 2003, but unfortunately, the crew was killed due to *Columbia* disintegrating upon re-entry into the atmosphere, leading to significant organizational changes at NASA. For her contributions, multiple celestial objects are named after her. Chawla was posthumously awarded the Congressional Space Medal of Honor. Also, numerous institutions in the United States and India have named buildings in her honor and set up scholarship funds to encourage girls to pursue careers in science.

"I never truly thought of being the first or second someone, or being a small-town girl. This is just something I wanted to do. If you want to do something, what does it matter where you are ranked?"

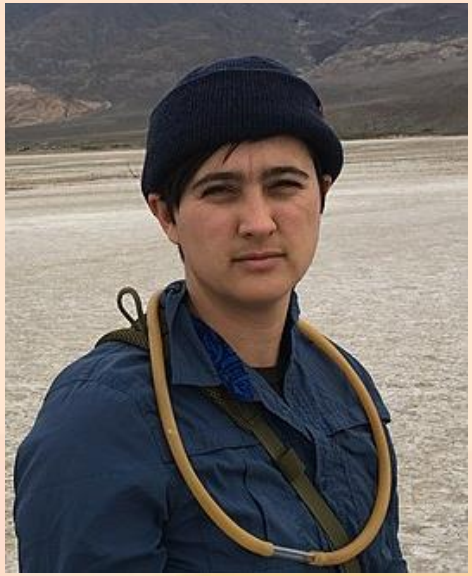
Isabella A. Abbott



Dr. Isabella Abbott was an ethnobotanist from Hawaii. After receiving her undergraduate degree in botany from the University of Hawai'i at Mānoa and her master's degree in botany from the University of Michigan before becoming the first native Hawaiian woman to receive a PhD in science. As a leading expect on Pacific marine algae, she authored over 150 publications and was credited with the discovery of over 200 species of algae. For all her research work, she was awarded the Gilbert Morgan Smith Medal from the National Academy of Sciences and in 2008, received a lifetime achievement award from the Hawaii Department of Land and Natural Resources for coral reef studies. After her passing in 2010, the University of Hawaii established a scholarship to support research in Hawaiian ethnobotany and marine botany.

"I call the endemic plants the first Hawaiians. Gingers and heliconias will grow elsewhere. The endemic plants will not. This is their home. It's like the Hawaiian people - they belong here." – Isabella Abbott

Lauren Esposito



Dr. Lauren Esposito is an entomologist from El Paso, Texas and one of the world's only women scorpion experts. Her passion for studying insects and birds began from a young age, including a first-grade science project studying the Mendelian genetics of pigeon colors. With a growing interest in studying arachnids during undergrad, she earned a PhD in arachnology from the City University of NY (2011). After her graduate studies, Esposito studied scorpion genetic information and studied the use of scorpion venom in cancer research and medication. Currently at UC-Berkeley, her research revolves around the evolution of scorpion venom and distribution of scorpions in the Caribbean. Wanting to make an impact through outreach apart from research, she created the organization 500 Queer Scientists as a network of LGBTQ+ scientists worldwide. Being openly queer herself, Esposito was inspired to create the organizations after learning that over 40% of LGBTQ+ scientists in the US were not 'out' to their colleagues. For her work in outreach, she received the Walt Westman Award by the National Organization of Gay and Lesbian Scientists and Technical Professionals (NOGLSTP), the highest honor that the NOGLSTP awards to a member.

"Visibility is important for mental health, for standing up to injustices, and for mentoring current colleagues and future scientists."

Mae C. Jemison



Jemison is an engineer, doctor, and astronaut from Decatur, AL. As a child, she knew she wanted to study science, yet she was irritated with the lack of women and black scientists—especially on the Apollo Missions. She graduated with a B.S. in chemical engineering in 1977, an M.D. in 1981, and became the first black astronaut in 1992. Jameson faced racial discrimination throughout her studies and demonstrated strength in persisting. She has been inducted into the National Women's Hall of Fame among other honors, and currently leads the 100 Year Starship Project through DARPA.

"You have the right to be involved. You have something important to contribute, and you have to take the risk to contribute it." – Mae Jemison

Marie Maynard Daly



Dr. Marie M. Daly was a biochemist from Queens, NY. She experienced financial struggles throughout her studies and due to this reason, she chose to attend college close to home. She earned a B.S. and an M.S. in chemistry and despite racial and gender biases, became the first black woman to earn a Ph.D. in chemistry in the United States. Daly made substantial contributions in the field of biochemistry, and in addition to research, she was committed to providing opportunities for minority students interested in attending medical schools and graduate programs. She established a scholarship for minority students pursuing science majors at Queens College in 1988 in honor of her father, who was unable to pursue a career in science due to the lack of opportunities available to him. In 1999, The National Technical Association recognized her as one of the top 50 women in Science, Engineering, and Technology.

"Courage is like – it's a habitus, a habit, a virtue: you get it by courageous acts. It's like you learn to swim by swimming." – Marie M. Daly

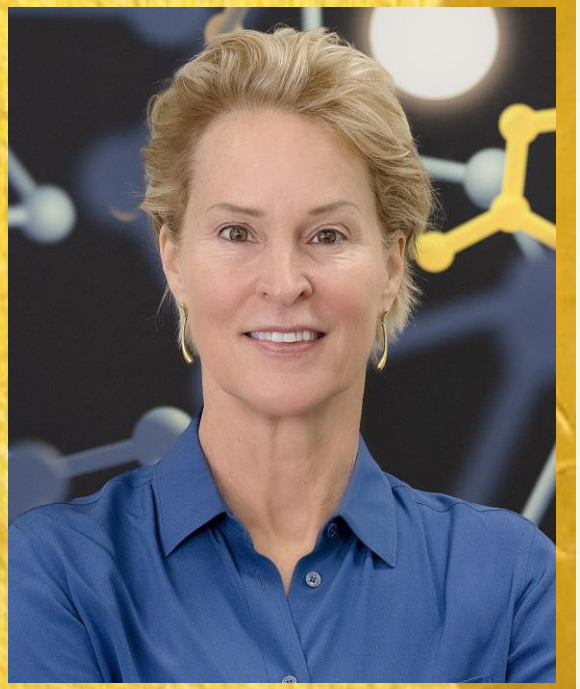
Fe Del Mundo



Dr. Fe Del Mundo (1911-2011) was a Filipina pediatrician. Del Mundo's passion for pursuing a medical career originated from her childhood, as ignorance around pediatric health led to most of her siblings passing away as children. Motivated by grief, del Mundo studied medicine and earned her medical degree as the valedictorian at the University of Philippines (1933). Former President Manuel Quezon offered to pay for her further medical training anywhere in the United States. In the U.S., she earned an M.S. in bacteriology (1940) and completed a research fellowship at Harvard Medical School's Children's Hospital (1939 – 1941). Immediately after her fellowship, she returned to the Philippines motivated to work towards improving pediatric health care. Unfortunately, Japanese occupation of the country delayed her plans to start her practice, as she instead cared to children at an internment camp at the University of Santo Tomas. Caring for over 400 children and earning the moniker "The Angel of Santo Tomas", the Mayor of Manila invited her to run a children's hospital in the city. After her term as the hospital's director from 1943 to 1948, she became the director of the Department of Pediatrics at Far Eastern University. During this time, del Mundo studied cures for conditions such as dengue fever and jaundice and improved accessibility to health care for impoverished families. Later in 1957, she opened her own hospital in Quezon City, which has continued to grow and thrive until today. For her contributions towards the medical field, she was the first Filipino woman to be declared a National Scientist of the Philippines. Dr. del Mundo was also an honorary member of the American Pediatric Society and a consultant for the World Health Organization.

"I feel that if you give the world the best that you can, the best will always come back to you."

Frances H. Arnold



Dr. Frances H. Arnold is an American chemical engineer who earned a BS in mechanical and aerospace engineering and a PhD in chemical engineering. She pioneered the use of directed evolution by introducing mutations in enzymes to improve certain protein functions. For this work, she became the fifth woman ever to win the Nobel Prize in Chemistry in 2018. Additionally, she has also co-invented over 40 U.S. patents and co-founded Gevo, Inc., a company that produces chemicals and fuels from renewable resources. Arnold was also the first woman to be accepted into all three of the United States National Academies: the National Academy of Engineering, the National Academy of Medicine, and the National Academy of Sciences. Currently, she serves as an external co-chair of PCAST.

"Most innovations are not obvious to other people at the time. You have to believe in yourself. If you've got a good idea, follow it even when others say it's not." – Frances H. Arnold

Uma Chowdhry



Throughout her career, Chowdhry made major contributions to ceramic catalysts, conductors, and superconductors at DuPont. She studied physics at the University of Mumbai, then obtained her PhD in Material Science at MIT. At DuPont, she joined the R&D department and helped develop ceramic pastes used in photovoltaics and electronic packaging. Although hesitant to give up lab work, Chowdhry pursued an early opportunity to join management as a lab director, and she eventually led as DuPont's Chief Science and Technology Officer. Chowdhry was elected as an American Ceramic Society Fellow and member of the National Academy of Engineering.

"I had the courage to dream the impossible."

Rosalind Franklin



Born in London on July 25, 1920, Franklin was born to a prominent family and strongly pursued academics. Franklin expertized in chemistry and crystallography, yet faced prejudice from both collogues and family. Still, she attained her B.S. in chemistry and her Ph.D. as a fellow at University of Cambridge. Criticism and opposition from her mentor, however, drove her away from the university. Instead, Franklin fulfilled her thesis work at BCURA. At Laboratoire Central des Services Chimiques de l'État, she familiarized herself with x-ray crystallography and discovered the structure of coal. She applied this to study DNA at King's College with Wilkins, who would eventually give her data to Watson and Crick without her knowledge. She continued to study RNA and the polio virus until her death in 1958 from ovarian cancer.

"Science and everyday life cannot and should not be separated."

Gertrude B. Elion



Gertrude B. Elion was an American biochemist and pharmacologist who earned her bachelor's degree in chemistry from Hunter College (1937). Unable to find a paid research position due to gender bias, she worked as a secretary and high school teacher to fund her master's studies at New York University. In 1944, she began working with scientist George H. Hitchings at the Burroughs-Wellcome pharmaceutical company. As opposed to relying on trial-and-error, Elion and Hitchings discovered new drugs using rational drug design. Studying the difference in biochemistry and metabolism between human cells and pathogens, they developed drugs to treat a variety of conditions, some of which include leukemia, malaria, and hepatitis. For this work, Elion received the Nobel Prize in Physiology or Medicine with Hitchings and Sir James Black (1988). Among numerous honors, Elion also received the National Medal of Science and in the same year, became the first woman to be inducted into the National Inventors Hall of Fame (1991).

Francés Colón



Francés Colón is a Puerto Rican neuroscientist, senior director for international climate policy at CAP, and sits in the president's council of advisors on science and technology. Colón grew up in San Jaun, PR where she also attended the University of Puerto Rico. Although, initially interested in medicine, Colón saw a gap in science and policy and shifted her career focus. With an AAAS fellowship, Colón's first government projects focused on improving K-12 STEM education in Muslim-majority countries. During the Obama administration, she became deputy of science and technology advisor for the US SoS. Colón also advocates for women in STEM, taking part in the White House's "Untold History of Women" project. Her work has earned her multiple fellowships from Yale-OpEd and for government leadership.

"I love the fact that I can use science to directly make people's lives better" – Francés Colón

Rebeca Gerschman



Rebeca Gerschman was an Argentinian biologist and physiologist who earned her Ph.D. from the University of Buenos Aires. After receiving her doctorate, she began research on oxygen poisoning and soon became the first person to link the presence of oxygen free radicals to cell death and aging (1953). Unfortunately, this theory was not widely accepted by the scientific community until 1969, when another group's work on superoxide dismutase enzymes confirmed her theory. In addition to scientific achievements, Gerschman was also a significant advocate for women's rights in the scientific field. In her honor, the Rebeca Gerschman Award was set up for women researchers in Argentina who have made significant contributions towards advancing science and training human resources.

The first person to discover the effects of oxygen free radicals on cell death and aging.

Helen Trías



Helen Trías (1929-2001) was an American pediatrician, educator, and women's rights activist. Although she was born in New York, her family moved to Puerto Rico shortly after her birth and moved back to NY when she was 10 years old. Unfortunately, she experienced discrimination in America within the society and education system, gaining limited access to opportunities simply because of her background. Choosing to pursue a medical career path because she loved working with science and people, she earned her medical degree from the University of Puerto Rico in San Juan (1960). Further, she was a strong advocate for women's rights throughout her career. Trías founded multiple committees focused on abortion rights and drafting guidelines to end non-consented sterilizations targeting minority women. For her work, she was awarded the Presidential Citizen's Medal for her work on behalf of women, children, low-income families, and people with HIV/AIDS (2001). In 2019, New York City commissioned a statue to be built to honor all her contributions creating equitable health care systems.

"We need health, but above all we need to create a grounding for healthy public policy that redresses and salvages the growing inequities. We cannot achieve a healthier us without achieving a healthier, more equitable health care system, and ultimately, a more equitable society."

Ynés Mexía



Ynés Mexía was born on May 24th, 1870 in Washington D.C. She had a turbulent youth at boarding school but grew to enjoy her time alone with science and nature. After her studies, she took over her family business. However, after her father's death and 2 troubling marriages, Mexía moved to California to seek mental health care. She soon became a member of the early environmental movement. Impassioned by preservation efforts, at the age of 51, Mexía enrolled at UC-Berkeley to study botany. After graduating, Mexía joined a specimen collection expedition group at Stanford, but decided to pursue her own studies. She secured her own funding and collected plants in unstudied regions of the Americas alone. She collected near 150,000 specimens and discovered over 500 species over 13 years in Alaska, Mexico, Brazil, Peru, Chile, Ecuador, and Argentina. For her work, Mexía became a member of the Sociedad Geographica de Lima, Peru and the California Academy of Sciences.

"In all my travels I've never been attacked by a wild animal, lost my way or caught a disease… I don't think there's any place in the world where a woman can't venture."

Jane Rigby



Dr. Jane Rigby is awarded as 2022's LGBTQ+ Scientist of the Year by Out to Innovate. She is an astrophysicist at NASA working on the James Webb Telescope and high signal-to-noise IR spectroscopy imaging. As a high school student, Rigby was inspired by astronaut Sally Ride, the first American woman and known LGBTQ+ astronaut. Rigby pursued her bachelor's degree in physics and astronomy at Penn State, then earned her PhD studying galactic nuclei at the University of Arizona. Throughout her career, Rigby has lacked LGBTQ+ peers and representation in the workplace. Rigby often found it difficult to feel included. Today, turning to address these issues, Rigby has co-founded a creative STEM outreach program for LGBTQ+ students and serves on the LGBT equality working group. Dr. Rigby has also been awarded the Robert H. Goddard Award for Exceptional Achievement for Science and listed as Nature 10s Ones to Watch.

"When a person can be their authentic self at work, I strongly believe that they will do more brilliant, creative science." – Jane Rigby

Sally Ride



Sally Ride was the 1st American woman in space. She was born in Los Angeles, CA in 1951. Ride was the only women majoring in physics in her undergraduate class and considers herself lucky to face minimal academic discrimination as a women. However, Sally hid her identity as a lesbian until her death in 2012. At Stanford, Sally graduated with a bachelors in physics and English and a master's and PhD in physics. After graduating, Ride joined NASA and became the youngest astronaut at the time. In 1987, Sally became a professor at UC San Diego and director of the California Space Institute. Ride worked with UCSD to start Sally Ride Science—a company focused on providing fun scientific content to middle and high school girls. Among many awards, Ride was inducted into the National Women's Hall of fame in 1988.

"Studying whether there's life on Mars or studying how the universe began, there's something magical about pushing back the frontiers of knowledge" – Sally Ride

Florence Nightingale



Florence Nightingale was a British nurse, statistician, and social reformer. She served as a nurse in the Crimean war and established St. Thomas's Hospital and the Nightingale Training School for Nurses. She is commonly known as the founder of modern nursing. She was born in 1820, and by the time she was 16, Nightingale became active in volunteering to tend to the old and ill. When she was 17, she refused a marriage proposal from a man, despite her parents' objection, to attend the Lutheran Hospital of Pastor Fliedner. Soon after graduating, she was promoted to superintendent of Middlesex hospital until 1854. She was called upon to help war efforts, so she amassed 34 nurses for 18,000 soldiers-–reducing deaths by 2/3. After the war she worked to found her hospital and school. She also worked on statistical graphics to incorporate a scientific approach to medicine, establishing many modern practices. At the age of 88, she was conferred the merit of honor by King Edward.

"Rather, ten times, die in the surf, heralding the way to a new world, than stand idly on the shore."

Lynn Conway



Lynn Conway was born in Mt. Vernon, NY in 1938. Conway was fascinated with astronomy and math, building her own telescope as a kid, and eventually pursued a B.S. in Physics at MIT. Conway experienced gender dysphoria throughout her youth, and, after an unsupported attempt to transition her gender during college, Conway left MIT in 1957. Conway later earned a B.S. and M.S.E.E. in 1962 and 1963 from Columbia University and began working at IBM in 1964 to design supercomputers. Despite major project contributions, Conway was fired in 1968 when she underwent her gender transition. IBM would apologize to Conway in 2020 after public backlash. Conway would find work as a computer architect at Memorex and Xerox while keeping her past in secret. In her work, Conway developed multi project wafers which allow multiple computer components on a single computer chip and revolutionized computer design and size. In 1978, Conway became a visiting associate professor at MIT and taught computer chip design methodology. Conway would become associate dean of engineering at the University of Michigan in 1985. Conway publicly shared her gender transition in 2000 and, today, is a strong transgender rights activist.

"If you want to change the future, start living as if you're already there."

Sara Josephine Baker



Sara Josephine Baker was born in 1873 in Poughkeepsie, NY and is known for developing new medical practices for infants. Baker decided to pursue a career as a physician at 16 when her father passed away suddenly from typhoid. Despite opposition against woman physicians, Baker graduated from the Women's Medical College of the New York Infirmary in 1894 and joined the New England Hospital for Women and Children. Here, Baker dedicated herself to reducing illness and infant mortality in impoverished New York communities. Baker developed one of the first baby formulas and wax-sealed, single-dose containers for medicinal use. Baker also heavily campaigned to license midwives, improve milk pasteurization, and hiring nurses at every school. Baker eventually went on to teach at New York University Medical School where she also enrolled and became the first woman to obtain a doctorate in public health. She then continued her career beyond medicine as the first woman representative at the League of Nations. Overall, she published over 250 papers and wrote 5 books. Throughout her career, Baker made large strides for women and LGBTQ+ in medicine and government.

"All my life, I have maintained that the prejudice of the world can learn to live together in peace if they are not brought up in prejudice."