Throughout history, women have made many groundbreaking contributions to science, from programming the first computers to determining the makeup of stars. But for centuries, women were discouraged or outright barred from working in science, technology, engineering, and math (STEM) fields. Often, female scientists weren’t given credit for the discoveries they made. “It took an amazing mind, incredible talent, and a great degree of resilience and grit to overcome the obstacles that early women scientists faced,” says Gloria L. Blackwell, chief executive officer of the American Association of University Women.

Read about some of the scientific advances made by inspiring women throughout history and how their modern counterparts are following in their footsteps.

As you read, think about the challenges women historically faced when pursuing careers in science.

Discoveries made by female scientists continue to change the world.

Marie Curie
Conducted some of the first research into radioactivity. A chemist and a physicist, she found that certain elements break down over time and, in the process, release energy. In 1903, Curie became the first woman to win a Nobel Prize for her discovery of the radioactive element polonium (Po). She later won a second Nobel for isolating radium (Ra)—another radioactive element. Curie’s work opened new possibilities in the field of medicine. For example, X-ray images that show the inside of people’s bodies rely on radiation. The discovery of radioactivity also led to new ways to produce energy.

Anne White
A physicist at the Massachusetts Institute of Technology, is a leading expert in nuclear fusion—a reaction in which atoms fuse together and release energy. Nuclear fusion could produce an almost unlimited amount of power. And it wouldn’t create hazardous waste like current nuclear power plants that rely on nuclear fission, or splitting atoms to create energy, do. Nuclear fusion generates temperatures up to six times as hot as the sun’s core. This amount of energy is extremely difficult to contain. White, though, thinks nuclear fusion has the potential to become a revolutionary energy source and is developing ways to make that possible.

Rachel Carson
Launched the modern environmental movement. Born in Pennsylvania in 1907, she started her career as an aquatic biologist working for the U.S. Bureau of Fisheries. She was also an avid nature writer. In 1962, she released the book Silent Spring, in which she discussed the harmful effects of insect-killing pesticides on the environment. Though chemical companies tried to discredit her findings, Carson’s efforts inspired a conservation movement that led to the banning of some of the most harmful pesticides. It also led to the creation of the U.S. Environmental Protection Agency, which is responsible for enforcing environmental regulations.

“Rachel Carson took on huge industries and powerful people in order to protect the environment,” says Corina Newsome. “I think we face similar challenges today.” Newsome is an ornithologist, or bird scientist, who works as the community engagement manager for the conservation group Georgia Audubon. There, she develops educational programs and works to get people involved in conservation efforts. An important part of her job is to balance environmental initiatives with the needs of local communities. “My goal is to make conservation as diverse and equitable as possible,” she says.
most abundant elements in the universe. Now we know that hydrogen and helium are, in fact, the most abundant elements in the universe. Thanks to Payne-Gaposchkin, we confirmed her conclusion a few years later and took most of the credit. Modern astronomers like Munazza Alam, a researcher at the Carnegie Earth and Planets Laboratory in Washington, D.C., are still seeking to understand the composition of objects in space. Alam studies the chemicals that make up the atmospheres of exoplanets. To date, scientists have located nearly 5,000 of these planets outside our solar system. “Many of these worlds are more exotic than we could ever have imagined,” says Alam. “My goal is to figure out how these planets formed and evolved.” Ultimately, Alam would love to find an Earth-like exoplanet—one with a climate like that of our own world that could potentially harbor life.

Grace Hopper is considered one of the most influential computer scientists in history. In 1945, during World War II, she joined the U.S. Naval Reserves. There, she worked on the MARK I—one of the first computers. The machine took up an entire room and read code, or instructions, consisting of lines of holes punched in paper tape. After the war, Hopper created the first compiler. This computer program translates text-based instructions into a mathematical language that a computer can understand. Hopper’s ideas formed the basis for how people communicate with computers. Today, billions of people rely on computer programs like those devised by Hopper to run cell phones, video game systems, and other electronic devices. Computer engineers like Yoky Matsuoka are pushing computers’ capabilities even further. Matsuoka is a robotics expert and tech entrepreneur who recently launched a personal-assistant company. In 2007, she won the prestigious MacArthur “Genius Grant” for developing a prosthetic arm that allows wearers to move the fingers in a lifelike way. She’s also one of the founders of Google’s research and development group that’s creating cutting-edge technologies like self-driving cars and virtual reality.