

FROST Celebrating American Innovation

Resource Guide

It's time to celebrate! This year is the 250th anniversary of the Declaration of Independence, a milestone known as the Semiquincentennial or America250.

The Phillip and Patricia Frost Museum of Science (Frost Science) is excited to champion the American spirit of creativity and discovery by highlighting 250 American scientists, change-makers, and innovators. In this resource guide, we share how American curiosity, collaboration, and innovation have shaped the way we understand our world and beyond.

This resource guide accompanies a poster exhibit on view at Frost Science beginning in April 2026. This exhibit highlights American innovation, from navigating the seas and skies to uncovering Earth's past and improving human health. These key narratives demonstrate how scientific exploration is a deeply human endeavor, built over time, across cultures, and through connection. By understanding where American exploration has taken us, we gain insight into where it may lead next.

Both the poster exhibit and resource guide explore unique and thematic stories aligned to the core science disciplines found at Frost Science: marine science, paleontology, astronomy, aeronautics and flight, and human health.

MARINE SCIENCE

Breaking the Surface

From early navigation, mapping, and seafaring technologies to modern tools like submersibles and sonar, American innovation has pushed the boundaries of ocean exploration. These breakthroughs have enabled scientists to “break the surface,” transforming how we study and protect the ocean resources.

These scientists and innovators are grouped into four categories based on their contributions to the field of marine science, with a focus on ocean exploration:



**Powered
Vessels**



**Mapping
the Oceans**



**Exploring
the Deep**



**Ocean Stewardship
and Protection**



1. Timothy Folger (1768)

Timothy Folger, a cousin of Benjamin Franklin, was a hydrographer and captain of a merchant ship. Drawing on his years of whaling experience, Folger helped Franklin chart the Gulf Stream in 1768, work that contributed to the first scientific study of the ocean current in 1775.



2. Robert Fulton (1807)

Robert Fulton was an inventor and engineer best known for developing the first successful commercial steamboat service in 1807. His achievement helped launch the era of powered watercraft, reducing dependence on wind-driven water transport.



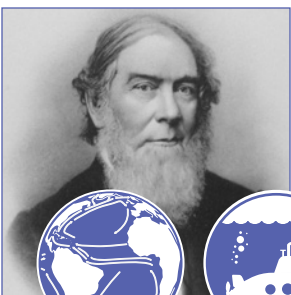
3. Lieutenant Charles Wilkes (1838)

Lieutenant Charles Wilkes was a naval officer in command of the exploratory expedition that discovered the part of Antarctica now known as Wilkes Land. Wilkes' explorations proved Antarctica was a continent, shaping the way we understand Earth's geography.



4. John Ericsson (1843)

John Ericsson, a Swedish American inventor and mechanical engineer, developed one of the first practical screw propellers and oversaw the construction of the U.S. Navy's first screw-propelled ship, launched in 1843. The adoption of the screw propeller marked a major advance in naval engineering. This technology is still used as the primary form of high-speed marine propulsion today.



5. Alexander Dallas Bache (1845)

Alexander Dallas Bache was a scientist and engineer who served as the second superintendent of the United States Coast Survey. In 1845, he issued detailed surveys of the Gulf Stream, building upon the work of his great-grandfather, Benjamin Franklin. The survey's findings not only advanced the understanding of America's coastal waters but also helped contribute to the identification of the continental shelf break and the continental slope.



6. Commander Matthew Fontaine Maury (1855)

Commander Matthew Fontaine Maury was a naval officer and hydrographer who published the first American oceanography textbook in 1855. His book, *The Physical Geography of the Sea*, along with his other contributions, has led to him being widely regarded as one of the founders of modern oceanography.



7. Rear Admiral James Alden Jr. (1857)

Rear Admiral James Alden Jr. was a naval officer that discovered the first known seafloor canyon in 1857. This deep submarine valley, off the California coast, is called Monterey Canyon.



8. Louis François de Pourtalès (1867)

Louis François de Pourtalès emigrated from Switzerland to the United States in 1847. When he joined the United States Coast Survey in 1848, he took an interest in the deep sea and began questioning the previously held notion that life did not exist past 300 fathoms (1,800 feet). His dredging operations through the United States Coast Survey discovered life in depths of over 1000 fathoms (6,000 feet).



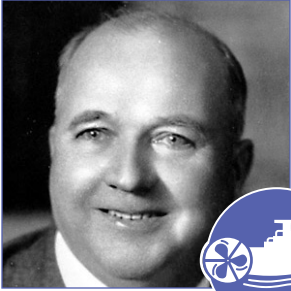
9. Captain Charles Dwight Sigsbee (1875)

Captain Charles Dwight Sigsbee was a hydrographer and inventor who designed several devices to explore the depths of the ocean. His most notable invention, the Sigsbee sounding machine, was the first to measure the deepest point in the Gulf of Mexico and remained the standard instrument for deep-sea measurement for the next 50 years.



10. Rear Admiral John Elliott Pillsbury (1891)

Rear Admiral John Elliott Pillsbury was an engineer and author, publishing *The Gulf Stream: Methods of the Investigation and Results of the Research* in 1891. This book presented foundational information about the Gulf Stream and shared Pillsbury's findings from studying ocean currents using his invention, the Pillsbury current meter.



11. Ole Evinrude (1911)

Ole Evinrude was a Norwegian American inventor, engineer, and entrepreneur best known for creating the first commercially successful outboard marine internal combustion engine, which he patented in 1911. His outboard motor revolutionized boat travel and helped make recreational boating accessible to the general public.



12. Ernest Everett Just, Ph.D. (1912)

Dr. Ernest Everett Just was the first Black American to work and study at the University of Chicago's Marine Biological Laboratory in Woods Hole, Massachusetts. During his time there, he published foundational work on the cell biology of marine invertebrate eggs.



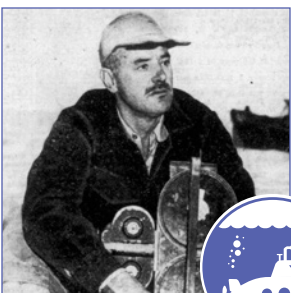
13. Herbert Grove Dorsey, Ph.D. (1923)

Dr. Herbert Grove Dorsey was an engineer, physicist, and the inventor of the fathometer, the first practical water depth measuring device used on ships. The Dorsey fathometer worked by sending a high-pitched sound through the water and measuring the time it took for the sound to travel from the ship to the ocean floor and back.



14. Henry Bryant Bigelow (1930)

Henry Bryant Bigelow was an oceanographer who scientifically described over 100 new marine species. He founded the Woods Hole Oceanographic Institute in 1930 to fulfill his vision and belief in the importance of taking an interdisciplinary approach to studying our oceans.



15. Frederick Otis Barton Jr. (1930)

Frederick Otis Barton Jr. invented two deep-sea submersibles, the Bathysphere and Benthoscope. In 1934, the Bathysphere descended to a depth of 3,028 feet; In 1949, the Benthoscope, which could withstand more pressure, descended to 4,500 feet below the ocean's surface.

Credit: Woods Hole Oceanographic Institute



Credit: Wildlife Conservation Society



16. Gloria Hollister Anable (1932)

Gloria Hollister Anable was an explorer and scientist who worked for the Department of Tropical Research at the New York Zoological Society. During a 1932-1933 oceanographic expedition in Bermuda, she developed a new method for preparing fish specimens that made the skin and internal organs transparent. This made it much easier for scientists to study the skeletons of both reef and deep-sea fish. In 1934, she set the record for the deepest dive completed by a woman by descending 1,208 feet in a submersible called the Bathysphere.



17. Athelstan Frederick Spilhaus, Ph.D. (1937)

Dr. Athelstan Frederick Spilhaus, a South African American oceanographer, invented the bathythermograph in 1937. This technology allowed scientists to record water temperatures at different depths, leading to the discovery of a rapid change in temperature between the surface and the deep ocean (the thermocline). Scientists still use modified versions of this technology to understand changes in ocean temperatures.



18. Captain Elliott B. Roberts (1938)

Elliott B. Roberts was a captain of the United States Coast and Geodetic Survey. In 1938 he invented the Roberts radio current meter, which allowed ocean current data to be received via radio signals.



19. Martin Wiggo Johnson, Ph.D. (1945)

Dr. Martin Wiggo Johnson was a marine ecologist who used sonar to discover that the deep scattering layer, a region of the ocean's water column that reflected sonar, was due to a large number of marine organisms migrating towards the surface to feed.



20. Marie Tharp (1952)

Marie Tharp was a geologist and oceanographic cartographer who produced the first scientific map of the Atlantic Ocean floor in partnership with geologist Bruce Heezen. In 1952, Tharp used sounding profiles from the research ship Atlantis to map the Mid-Atlantic Ridge, a monumental discovery that ultimately helped scientists accept the theories of plate tectonics and continental drift.



Credit: Woods Hole Oceanographic Institute



21. Allyn Vine (1956)

Allyn Vine was an oceanographer and avid supporter of deep-sea exploration. Vine advocated for the development of submersibles that allowed for human exploration of the deep sea, work that was green-lighted in 1956. He helped design the first deep-sea submersible, which his coworkers named Alvin in his honor.



22. Captain George Foote Bond (1957)

Captain George Foote Bond was a United States Navy physician known as the “Father of Saturation Diving.” In 1957, Bond began the Genesis project to research whether humans could breathe different gases under increased environmental pressure for an extended period of time. This project led to the Navy’s Man-in-the-Sea Program. In 1963, three participants in the Genesis project successfully completed the world’s first saturation dive, staying 100 feet underwater for 6 days straight.



Credit: Wildlife Conservation Society



23. Jocelyn Crane (1959)

In 1959, Jocelyn Crane was the first woman to receive a National Geographic Society grant. This grant was awarded to Crane because of her extensive and thorough research on over 200 species of fiddler crabs. She also worked alongside Gloria Hollister at the New York Zoological Society Department of Tropical Research.



24. Harold Eugene “Doc” Edgerton, Ph.D. (1960)

Dr. Harold Eugene “Doc” Edgerton was an electrical engineer known for his work with French inventor Jacques-Yves Cousteau. By the 1960s, his developments in sonar technology, including the “thumper” and “boomer,” enabled scientists to observe the locations and shapes of objects and geological structures on the ocean floor.



25. Harold “Bud” Froehlich (1964)

Harold “Bud” Froehlich was an American engineer who helped design the deep-sea submersible Alvin. With Froehlich as project manager, Alvin was a success, capable of carrying up to three people and diving over 14,000 feet. Alvin expanded the field of deep-sea research and is still being used today.



26. Emmett W. Chappelle (1966)

Emmett W. Chappelle was a NASA scientist and the first person to identify the chemical reaction behind bioluminescence. He was inducted into the Inventors Hall of Fame in 2007 and held numerous patents for his work on bioluminescence and fluorescence.



27. Robert Treat Paine III, Ph.D. (1966)

Dr. Robert Treat Paine III was an ecologist who first described the concepts of keystone species (1966) and trophic cascades (1979). His work revealed why some species have a huge impact on the biodiversity and health of their ecosystems and remains foundational for the field of ecology today.



28. Patricia Louise Dudley, Ph.D. (1968)

Dr. Patricia Louise Dudley was a marine biologist who used electron microscopy to research copepods. The electron microscope allowed Dudley to study the eyes, sensory receptors, and other organs of copepods in new detail, among the first to do so. Copepods are an important food source for many marine species, including Right and Bowheadwhales.



29. Edwin Albert Link Jr. (1970)

Edwin Albert Link Jr. was an aviator and inventor who focused on making underwater exploration safer. In 1970, he invented the Johnson Sea Link submersible for deep-sea diving and research. In 1973, Link lost his son in a submersible-related accident. This tragedy led Link to invent the CORD, or Cabled Observation and Rescue Device, which had lights, cameras and cutters to rescue a trapped submersible.



30. Roger Payne, Ph.D. (1970)

31. Katy Payne (1970)

Dr. Roger Payne and Katy Payne (husband and wife) were recording whale sounds with a hydrophone in Bermuda when they discovered that humpback whales were singing complex songs. They recorded these whale songs and released them on an album titled *Songs of the Humpback Whale* in 1970. This LP is the bestselling nature sound recording of all time.

Credit: Ocean Alliance



Credit: Mote Marine Laboratory



32. Eugenie Clark, Ph.D. (1973)

Dr. Eugenie Clark, also known as the “Shark Lady,” was an ichthyologist who discovered sharks sleeping in caves, disproving the long-held myth that sharks had to keep swimming to breathe. She also became the founding director of Cape Haze Marine Laboratory, now known as Mote Marine Laboratory, in 1955.



Credit: Para la Naturaleza



33. Álida Ortiz Sotomayor, Ph.D. (1976)

Dr. Álida Ortiz Sotomayor founded the Coastal Marine Biology Program at the University of Puerto Rico in 1976 after becoming the first Puerto Rican woman to receive a Ph.D. from the university. Since then, Sotomayor has trained and mentored hundreds of educators and marine scientists, making immense contributions to marine conservation programs across Puerto Rico.



34. Robert Duane Ballard, Ph.D. (1977)

Dr. Robert Duane Ballard is an oceanographer and ocean explorer who, in 1977, was the first person to discover active hydrothermal vents, revealing entire new communities of organisms to science. Ballard also developed the Argo, an uncrewed, towed, underwater sled outfitted with cameras and lighting that allowed scientists and explorers to view footage of the sea floor in real-time. Ballard used the Argo to find the Titanic in 1985.



35. Sylvia Earle, Ph.D. (1979)

Dr. Sylvia Earle, also known as “Her Deepness,” is an oceanographer and marine biologist who holds the world record for the deepest untethered dive. In 1979, she used the JIM diving suit to descend 1,250 feet and walk along the sea floor. She was also the first woman to serve as chief scientist at the National Oceanic and Atmospheric Administration.



36. Joan Murrell Owens (1986)

Joan Murrell Owens, who grew up in Miami and graduated from Booker T. Washington High School, was a coral biologist and expert on button corals. Despite being unable to dive due to a sickle cell anemia diagnosis, Owens identified a new genus of button corals, Rhonbosammia, through meticulous study of specimens in the Smithsonian collections in 1986.



37. **Cindy Lee Van Dover, Ph.D. (1989)**

Dr. Cindy Lee Van Dover is a deep-sea biologist and was named the first woman director of the Duke University Maine Laboratory in 2006. She made history in 1989 as the first female pilot of the deep-sea research submersible Alvin. During her many dives as pilot-in-command of Alvin, she discovered numerous new species of mussels, shrimp, tube worms, and bacteria.



Credit: Doug Perrine

38. **Samuel Harvey Gruber, Ph.D. (1990)**

Dr. Samuel Harvey Gruber was a shark biologist, long time professor at the University of Miami, and an avid lover of sharks, which he studied for over 50 years. Gruber also founded the Bimini Biological Field Station in 1990, which is still used to study sharks and rays.



Credit: ESRI

39. **Dawn Jeannine Wright, Ph.D. (1991)**

Dr. Dawn Jeannine Wright is an oceanographer and the current chief scientist of the Environmental Systems Research Institute, a global leader in the application of geographic information systems (GIS) to understanding our planet. In 1991, Wright was the first black woman to dive to the seafloor in the submersible Alvin, where she used GIS to map the sea floor. Wright has since mapped significant areas of the deep-sea, including the Tonga Trench and the Juan de Fuca Ridge. In 2022, Wright also became the first Black person to dive to Challenger Deep, the deepest point in the Mariana Trench.



40. **Isabella Abbott, Ph.D. (1997)**

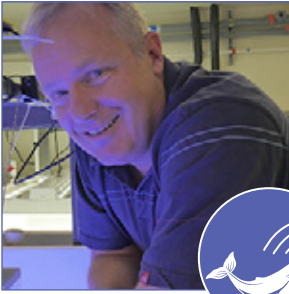
Dr. Isabella Abbott was an ethnobiologist who grew up in Hawaii learning about culturally-relevant, edible species of marine algae. The first native Hawaiian to earn a Ph.D. in science, Abbott discovered over 200 species of marine algae and is internationally recognized as an authority on marine plants. In 1997, she received the Gilbert Morgan Smith Medal from the National Academy of Sciences, the highest award for marine botanists.



41. **Barbara Block, Ph.D. (2000)**

Dr. Barbara Block is an oceanographer and Stanford University professor recognized for her pioneering work in wildlife telemetry. Since the late 1990s, Block and her team have developed and deployed innovative tracking and tagging technologies. These include advanced electronic tags for tuna, sharks, and other pelagic species, revealing important information for the conservation of these iconic animals.

Credit: Peter Benchley Ocean Awards



42. Chris Langdon, Ph.D. (2000)

Dr. Chris Langdon is a coral biologist, oceanographer, and professor in the Department of Marine Biology and Ecology in the Rosenstiel School of Marine, Atmospheric, and Earth Science at the University of Miami. In the late 1990s and early 2000s, he demonstrated that changes in pH significantly affect coral growth. This foundational work helped identify ocean acidification as a major threat to coral reefs.



Credit: The Nature Conservancy

43. Nancy Knowlton, Ph.D. (2001)

Dr. Nancy Knowlton is a coral reef biologist whose research focuses on marine diversity and conservation. In 2001, she founded the Center for Marine Biodiversity and Conservation at the Scripps Institution of Oceanography in San Diego. Knowlton also wrote *Citizens of the Sea* in 2010, a National Geographic book which highlights marine organisms discovered during the decade-long Census of Marine Life project.



44. Frances Gulland, Ph.D. (2001)

Dr. Frances Gulland is a marine mammalogist who co-authored the CRC Handbook of Marine Mammal Medicine in 2001, setting the standard for marine mammal medicine and health. Gulland was appointed as one of three commissioners on the Marine Mammal Commission by President Obama and continues to serve in this role, providing oversight on the protection and conservation of marine mammals.



45. Dean Grubbs, Ph.D. (2007)

Dr. Dean Grubbs has worked at Florida State University since 2007, studying the smalltooth sawfish, an endangered species that lives primarily in Florida's coastal waters. Grubbs's research focuses on protecting smalltooth sawfish by designating critical habitat in the United States and the Bahamas and reducing sawfish bycatch.



46. Jillian Morris (2012)

Jillian Morris is the founder and president of Sharks4Kids. Sharks4Kids is a non-profit organization that cultivates hands-on learning experiences for children with the goal of inspiring them to be shark advocates. Morris resides in Bimini, Bahamas where she works as an educator, sharing her love and knowledge of sharks. (icon: Ocean Stewardship and Protection)



47. Mya Breitbart, Ph.D. (2013)

Dr. Mya Breitbart is a professor of biological oceanography at the University of South Florida who specializes in virology. Breitbart and her team were the first scientists to discover evidence of viruses infecting marine zooplankton. (icon: Ocean Stewardship and Protection)



48. David Gruber, Ph.D. (2015)

Dr. David Gruber is a marine scientist and conservationist whose research led to the 2015 discovery the first biofluorescent sea turtle, a hawksbill turtle in the Solomon Islands. In 2020, Gruber founded Project CETI (Cetacean Translation Initiative), an interdisciplinary initiative to decode whale song. (icon: Ocean Stewardship and Protection)



49. Michael Ford, Ph.D. (2015)

50. Allen Collins, Ph.D. (2015)

Dr. Michael Ford and Dr. Allen Collins, NOAA Fisheries scientists, were leading an expedition off the coast of Puerto Rico using the remotely operated vehicle Deep Discoverer when they spotted a never-before-seen comb jelly. This was the first time NOAA scientists used high-quality video to identify a new species. This

comb jelly was 4,000 meters down and bringing it to the surface to study was not possible, making video and imaging crucial in the identification process.



51. Kakani Katija, Ph.D. (2015)

Dr. Kakani Katija is a Hawaiian bioengineer who was integral in the development of DeepPIV in 2015. The DeepPIV uses lasers to illuminate particles in the water and find small currents around tiny, deep-sea marine animals called larvaceans. This made it possible for scientists to study larvaceans and how they feed. (icon: Exploring the Deep)



52. Ruth Gates, Ph.D. (2015)

Dr. Ruth Gates was a marine biologist and director of the Hawai'i Institute of Marine Biology where she was one of the first scientists to attempt to improve coral resilience through selective breeding. In 2015, Gates selected corals who had thrived during a local heat wave to reproduce, with the hope that they would produce baby corals more resilient to a warming ocean. She was successful in breeding coral offspring with a higher thermal tolerance and laid the foundation for future scientists to continue with this work.



53. Cristiana Castello Branco, Ph.D. (2017)

Dr. Cristiana Castello Branco has discovered several new species of sponges, including a deep-sea sponge called the "Alien Sponge." This sponge was discovered more than 6,500 feet beneath the ocean's surface with the remotely operated vehicle Deep Discoverer.



Credit: Marcus Branch

54. Ayana Elizabeth Johnson, Ph.D. (2018)

Dr. Ayana Elizabeth Johnson is a marine biologist, policy expert, and writer. In 2018, she co-founded Urban Ocean Lab, a think tank focused on creating and implementing policies for coastal cities to help improve climate resilience.



55. Catherine MacDonald, Ph.D. (2018)

Dr. Catherine Macdonald is a marine biologist and the Director of the Shark Research and Conservation Program at the University of Miami's Rosenstiel School of Marine, Atmospheric and Earth Science. In 2018, she led research surveys documented the first-known great hammerhead nursery on the east coast of the United States, a breakthrough that continues to provide vital guidance for protecting this critically endangered species.



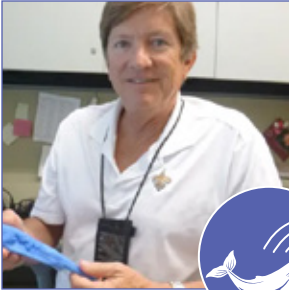
56. Jeanette Davis, Ph.D. (2019)

Dr. Jeanette Davis, a marine microbiologist and assistant professor at Hampton University, Virginia, is known for studying bacteria in sea slugs. Her 2014 research laid the foundation for discovering the connection between marine bacteria and anticancer compounds. This could lead to the sustainable production of anticancer compounds for medical use.



57. Anela Choy, Ph.D. (2019)

Dr. Anela Choy is a biological oceanographer and assistant professor at Scripps Institution of Oceanography. In 2019, Choy discovered plastics in the stomachs of lancetfish, a species that lives around 1,000 feet below the surface. She also led a team of scientists in designing a remotely operated vehicle to track microplastic pollution in Monterey Bay. They found that the highest concentration of microplastics occurred between 650 and 1,000 feet deep.



58. Mark Grace (2019)

Mark Grace was a fisheries biologist with NOAA in 2019 when he found an unusual-looking specimen of small shark. After confirming it was a previously undescribed species—known only from one other specimen found in Peru in 1979—the shark was aptly named the American Pocket Shark for its small size and tiny ‘pockets’ near its gills.



59. Tiara Moore, Ph.D. (2020)

Dr. Tiara Moore is the Founder and CEO of Black in Marine Science (BIMS). Moore’s career goals focus on enhanced equity in the marine science field, and BIMS aims to foster diversity and inclusion in the marine science world by providing community and resources to scientists around the world.



60. Amy Phung (2021)

Amy Phung is an Asian American roboticist who developed a VR app that may help improve the piloting of underwater remotely operated vehicles. Phung worked with pilots to get feedback on the project and is now in the process of collecting data to demonstrate the app’s utility.



61. Alicia Bitondo (2022)

Alicia Bitondo was a senior aquarist at the Monterey Bay Aquarium in 2022 when the institution was preparing for its groundbreaking “Into the Deep” exhibit. She was the first aquarist to breed salmon snailfish, a species of deep-sea fish. The offspring of these salmon snailfish would go on to be featured in the exhibit, along with other deep-sea species that had never been on exhibit before.



- 62. Paul Melovidov (2023)**
- 63. Dallas Roberts (2023)**
- 64. Aaron Lestenkof (2023)**

Paul Melovidov, Dallas Roberts, and Aaron Lestenkof are Unangan (an Indigenous group in the Aleutian Islands) scientists who have been working since 2022 to save entangled northern fur seals. The disentanglement program they work for is run by the Tribal Government of the Aleut Community of St. Paul Island, in partnership with the U.S. National Oceanic and Atmospheric Administration. Melovidov, Roberts, and Lestenkof disentangle about 50 of these protected seals from fishing nets and other marine debris every year.

HUMAN HEALTH

Human Connection in Healthcare

In healthcare, human connection matters at every level, from the relationships between patients and their doctors to the collaborations behind new treatments, medical equipment, and discoveries. Across American history, scientists have worked together to develop vaccines, improve blood transfusions and transplants, and transform lives.

These scientists and innovators are grouped into four categories based on based on the role of collaboration and human connection in their accomplishments:



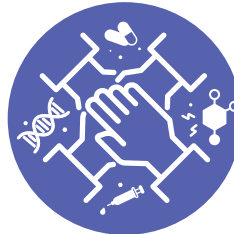
**Patient-Provider
Partnerships**



**Peer Connection
& Mutual Support**



**Community
Voice &
Experience**



**Family
Connections
in Health**



65. Benjamin Franklin, D.Hon (1784)

Benjamin Franklin, a well-known scientist and inventor, was tired of switching between two pairs of glasses and asked his optician to cut his glasses in half and combine them into a single pair. These glasses, which he called “double spectacles” and we call “bifocals,” allowed him to see things both near and far.



66. Horace Wells, D.Hon (1844)

Horace Wells, a dentist, noticed during a nitrous oxide demonstration that people who got hurt while using the gas did not notice the pain until later. Wells began to give nitrous oxide to his patients to reduce the pain of dental procedures, becoming the first dentist to use nitrous oxide in his practice.



67. William Bradley Coley, M.D. (1891)

Dr. William Bradley Coley believed that the immune system was able to shrink or destroy some types of cancer. In 1891, to test his theory, he injected Streptococcus bacteria into a cancer patient for the first time. While a few died, many patients had their tumors shrink or disappear. To make the procedure safer, Coley extracted toxins from several bacteria and used these toxins to produce the same immune response. He is now considered the “Father of Immunotherapy” for this groundbreaking work.



68. Daniel Hale Williams, M.D. (1893)

In 1893, Dr. Daniel Hale Williams rushed a man named James Cornish into surgery without any X-rays or surgical prep after he was stabbed in the chest. Williams successfully repaired his damaged arteries, completing the first open heart surgery. Cornish survived the surgery and left the hospital less than two months later.



69. Anna Wessels Williams, M.D. (1894)

Dr. Anna Wessels Williams worked in Dr. William Hallock Park’s lab studying antitoxin (an antibody that fights a toxin) for diphtheria. She was able to isolate a strain of the diphtheria bacteria, later known as the Park-Williams strain, to cultivate an antitoxin that saved countless lives. A few years later, Williams developed the first rabies vaccine.



70. William Hallock Park, M.D. (1894)

Dr. William Hallock Park used the Park-Williams strain of diphtheria, which he developed with Dr. Anna Williams, to mass produce antitoxins. He helped ensure that over 25,000 injections of diphtheria antitoxin were given in New York City in the first year of production. Park is also one of the first scientists to identify that healthy individuals can be carriers of a virus.



71. Walter Reed, M.D. (1901)

Dr. Walter Reed studied the spread of yellow fever and on a trip to Cuba, tested Cuban scientist Dr. Carlos Finlay's theory that yellow fever is spread by infected mosquitos. Reed hatched mosquitos from Finlay's collection and had them bite yellow fever patients before biting several volunteers, who included his own medical staff. Sadly, Reed's coworker Dr. Jesse Lazear passed away from yellow fever after volunteering for the experiment. Through this research, Reed proved that mosquitos could spread yellow fever.



72. Francis Peyton Rous, M.D. (1916)

73. Joseph R. Turner Jr. (1916)

Dr. Francis Peyton Rous and Joseph R. Turner Jr. worked together to develop the Rous-Turner solution, a blood preservative made from citrate and glucose. This solution could keep blood preserved for up to 28 days after it was collected, allowing Dr. Oswald Robertson to create the world's first blood bank during World War I.



74. Alice Augusta Ball (1916)

Alice Augusta Ball studied how to treat Hansen's disease, also known as leprosy, and tested the validity of chaulmoogra oil as a treatment. By chemically modifying the oil's active ingredient, she created a way it could be injected safely into the body. This method, the Ball method, worked much better than traditional treatments for leprosy. Unfortunately, Ball died at age 24 before she could publish her findings, but her collaborator Dr. Harry Hollmann did so six years after her death, giving her full credit.



75. Gerty Theresa Cori, M.D. (1929)

76. Carl Ferdinand Cori, M.D. (1929)

Dr. Gerty Theresa Cori and Dr. Carl Ferdinand Cori (husband and wife) worked together to study carbohydrate metabolism. They learned that the body stores sugar in muscles as glycogen, which is turned into glucose by the liver and sent back to the muscles for energy. They named this process the Cori cycle and shared the Nobel prize in medicine for this discovery.



77. Grace Eldering, Ph.D. (1932)

78. Loney Clinton Gordon (1932)

79. Pearl Louella Kendrick, D.Sc. (1932)

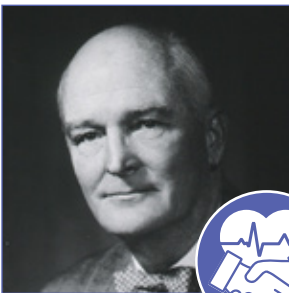
Dr. Pearl Louella Kendrick and Dr. Grace Eldering worked in the same laboratory studying *Bordetella pertussis*, also known as whooping cough. Together, they grew and inactivated the

bacteria, creating the first pertussis vaccine. As the lab continued to try and improve the vaccine, chemist Loney Clinton Gordon tested different strains of *B. pertussis* to successfully isolate a very aggressive strain. Vaccines created using this aggressive strain were much more effective.



80. Rebecca Craighill Lancefield, Ph.D. (1933)

Dr. Rebecca Craighill Lancefield studied *Staphylococcus* bacteria. At the time, doctors believed that the diseases caused by these bacteria were all caused by different types of *Staphylococcus*. Lancefield developed a way to identify different *Staphylococci* and discovered that a single type of *Staphylococcus* could cause several different diseases. The identification system she developed is called Lancefield Grouping.



81. John Heysham Gibbon Jr., M.D. (1935)

Dr. John Heysham Gibbon Jr. designed the heart-lung machine, which could take blood from a patient, oxygenate it, and return it back to the patient. Gibbon successfully used this machine for the first time on Cecilia Bavolek, a patient who suddenly developed symptoms of heart disease, in 1953. During her heart surgery, the heart-Lung machine kept her blood circulating and oxygenated, and she survived the surgery.



82. Max Theiler, M.D. (1935)

Dr. Max Theiler developed a vaccine for yellow fever in 1937—contracting and recovering from the disease himself along the way. His efforts, which were built on advances made by other scientists, directly led to the elimination of yellow fever as a major global disease. In 1951 he received the Nobel Prize in Physiology or Medicine for this work.



83. William Warrick Cardozo, M.D. (1937)

Dr. William Warrick Cardozo was the first physician to identify that sickle cell is an inherited trait most common in people of African descent. Cardozo discovered that not all cases of sickle cell cause anemia or are fatal. A pediatrician by training, Cardozo also studied growth, development, and diseases in children.



84. Karl Landsteiner, M.D. (1937)

85. Alexander Solomon Wiener, M.D. (1937)

Dr. Karl Landsteiner studied blood and discovered the blood types we use today: A, AB, B, and O. Later, Landsteiner and Dr. Alexander Solomon Wiener discovered that some blood transfusions caused the body to produce antibodies. This discovery led them to identifying the Rhesus factor, which

established positive and negative blood types. Together, these scientists made blood transfusions safer and more successful.

Dr. Solomon image credit:
National Library of Medicine



86. Edwin Joseph Cohn, Ph.D. (1940)

Dr. Edwin Joseph Cohn was asked by the U.S. military to develop blood-based medical products to treat soldiers in World War II. In his research, Cohn learned how to separate blood plasma into different components, including albumin, which could be used to treat shock. The procedures he developed saved the lives of thousands of soldiers.

Photo: American
Philosophical Society



87. Jane Hinton, VMD (1941)

88. John Howard Mueller, Ph.D. (1941)

Dr. Jane Hinton and Dr. John Howard Mueller were colleagues studying two different bacteria and needed a medium that could grow both at the same time. They created Mueller-Hinton agar, which can grow many different types of bacteria. Mueller-Hinton agar is still used today to isolate and test bacterial cultures for antibiotic resistance.



89. Alfred Blalock, M.D. (1944)

90. Helen Brooke Taussig, M.D. (1944)

91. Vivien Theodore Thomas, D.Hon (1944)

Vivien Theodore Thomas developed a surgical procedure, later known as, the Blalock-Thomas-Taussig shunt procedure to treat a heart condition in infants that causes blood

to bypass the lungs, preventing oxygenation. He performed the surgery on over 200 dogs, proving that the surgery could be executed safely. When a young infant with the heart condition was brought to Dr. Alfred Blalock by Dr. Helen Brooke Taussig, Thomas guided Blalock through the procedure one step at a time.



Credit: University of Michigan School of Public Health

92. Thomas Francis Jr., M.D. (1945)

Dr. Thomas Francis Jr. collected samples from people experiencing flu-like symptoms. From these samples, Francis isolated the human influenza B virus, a few years after a trio of British scientists identified human influenza A. He also demonstrated that different influenza strains have distinct antigens. This helped contribute to the development of the influenza vaccine.



93. Albert Vinicio Báez, Ph.D. (1948)

94. Paul Harmon Kirkpatrick, Ph.D. (1948)

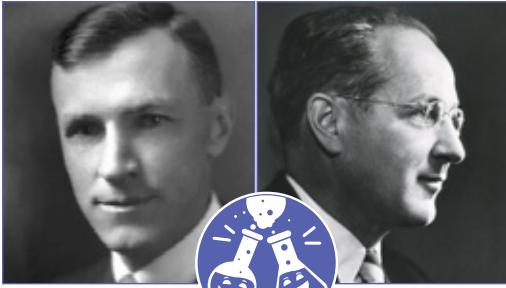
Dr. Albert Vinicio Báez and Dr. Paul Harmon Kirkpatrick theorized that they could use mirrors and X-rays to make stronger microscopes. Together, they designed the X-ray reflection microscope. This microscope was used in labs to observe living cells.



Credit: GlaxoSmithKline Inc. Heritage Center

95. Gertrude "Trudy" Belle Elion (1950)

Gertrude "Trudy" Belle Elion developed a drug that put leukemia patients into temporary remission. As she continued to develop this drug, she created others capable of suppressing immune responses and reducing uric acid production. She also created the first antiviral medication.



96. William Parry Murphy Jr., M.D. (1950)

97. Carl Waldemar Walter, M.D. (1950)

Dr. Carl Waldemar Walter and Dr. William Parry Murphy Jr. developed plastic bags for blood collection. These bags made it easier to remove air from blood storage containers and reduced the chance of contamination. Murphy continued on to create single-use and sterilizable surgical equipment that reduced the risk of infection during surgery; Walter later established one of the world's first blood banks.



98. Herman Russell Branson, Ph.D. (1951)

Dr. Herman Russell Branson used X-ray data to identify different protein structures, including the alpha and gamma helices. This work was later published by Dr. Linus Pauling, who received much of the credit for the discovery.



99. Paul Maurice Zoll, M.D. (1952)

Dr. Paul Maurice Zoll was the first person to use external electric shocks to resuscitate patients whose hearts had stopped. Zoll also developed the first external pacemaker, which restored regular heart rhythms.



100. Virginia Apgar, M.D. (1952)

Dr. Virginia Apgar developed the Apgar score as an indicator of newborn health. This score is determined by measuring and assessing five different criteria at one and five minutes after birth: Appearance, Pulse, Grimace, Activity, and Respiratory effort (APGAR).



101. Joseph Edward Murray, M.D. and D.Sc. h.c. (1954)

102. David Milford Hume, M.D. (1954)

Dr. Joseph Edward Murray and Dr. David Milford Hume worked together to perform the first successful organ transplant, a kidney transplant from one identical twin to his brother.



103. Marie Maynard Daly, Ph.D. (1955)

Dr. Marie Maynard Daly was one of the first people to explore how high cholesterol and hypertension damage blood vessels and contribute to heart disease. Her research demonstrated that diet and hypertension (high blood pressure) could increase the risk of a heart attack.



104. Jonas Edward Salk, M.D. (1955)

Dr. Jonas Edward Salk developed a vaccine for polio, one of the most alarming diseases of his time because of its debilitating and deadly effects on children. Salk initially tested the vaccine on himself along with members of his lab and family. The vaccine was determined to be safe and effective and Salk chose to not patent or seek profit from the vaccine to maximize its global distribution.



105. Arthur Kornberg, M.D. (1956)

Dr. Arthur Kornberg was researching DNA when he discovered the enzyme DNA polymerase, which builds copies of existing DNA using nucleotides. This discovery unlocked exciting new possibilities for the field of biotechnology.



106. Edward Donnall Thomas, M.D. (1956)

107. Dorothy “Dottie” Thomas (1956)

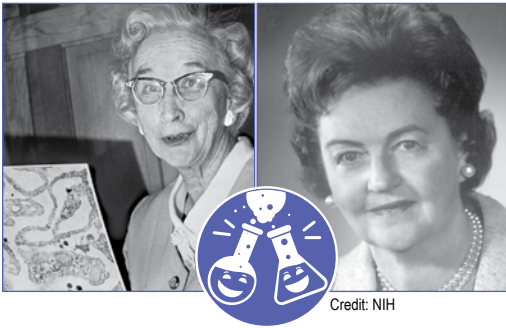
Dr. Edward Donnall Thomas and Dottie Thomas were married and worked in the same lab studying bone marrow transplantation as a treatment for leukemia. In 1956, Edward performed the first successful bone marrow transplant, between two identical twins. The couple eventually identified how to perform the transplant between two unrelated individuals.



108. Jewel Plummer Cobb, M.D. (1957)

109. Jane Cooke Wright, M.D. (1957)

Dr. Jewel Plummer Cobb and Dr. Jane Cooke Wright were the first to repurpose the drug methotrexate, which was already used to treat leukemia, to treat other types of cancer. This discovery helped develop treatments for breast cancer, head and neck cancers, lung cancer, and some lymphomas. Wright is known among cancer researchers as the “mother of chemotherapy.”



Credit: NIH

110. Sarah Elizabeth Stewart, M.D., Ph.D. (1958)
111. Bernice Eddy, Ph.D. (1958)

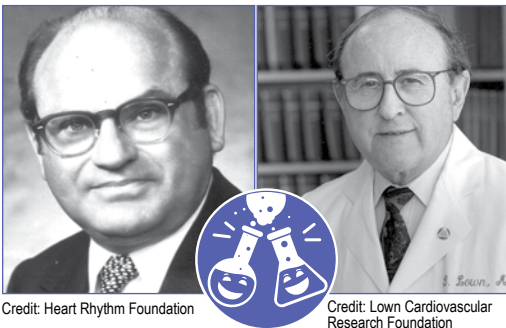
Dr. Sarah Elizabeth Stewart and Dr. Bernice Eddy were among the first scientists to discover the polyomavirus, which could cause cancer. They were also the first to show that cancer-causing viruses could spread between animals. Their findings linked the field of oncology with virology, creating a new field of research.



Credit: National Academy of Sciences

112. Rosalyn Sussman Yalow, Ph.D. (1960)
113. Solomon Aaron Berson, M.D. (1960)

Dr. Rosalyn Sussman Yalow and Dr. Solomon Aaron Berson discovered that they could use radioactive isotopes to track hormones like insulin through a person's body and measure how much of a chemical was present in a blood sample. This helped scientists and doctors better understand how minor changes in hormones affected people's health.



Credit: Heart Rhythm Foundation

Credit: Lown Cardiovascular Research Foundation

114. Baruch Vojtěch Berkovits (1962)
115. Bernard Lown, M.D. (1962)

Dr. Bernard Lown worked with electrical engineer Baruch Vojtěch Berkovits to develop the direct current (DC) defibrillator. DC defibrillators deliver one large shock to the chest to treat irregular heartbeats. DC defibrillation is still used today to treat heart attacks and help restart patients' hearts after open heart surgeries.



116. Thomas Earl Starzl, Ph.D. (1963)

Dr. Thomas Earl Starzl is considered "the father of modern transplantation" for performing the first successful human liver transplant. Starzl developed a protocol for using corticosteroids and immunosuppressant drugs to help prevent rejection, improving the success rate of organ transplants.



117. Judith Ethel Graham Pool, Ph.D. (1965)

Dr. Judith Ethel Graham Pool developed a process for producing a concentrated blood product called cryoprecipitate by observing frozen plasma separate into different components when thawed. At that time, cryoprecipitate was used as treatment for hemophilia. Today it is still used for life-threatening bleeding episodes.



118. Maurice Ralph Hilleman, Ph.D. (1967)

Dr. Maurice Ralph Hilleman created a Japanese encephalitis vaccine to protect U.S. troops during World War II, helped prevent an influenza pandemic, and later led vaccine development at Merck & Co. His team produced vaccines for measles, mumps, rubella, chickenpox, hepatitis A and B, pneumonia, and meningitis. The widely used mumps vaccine he created was based on a strain of the mumps he collected from his daughter, the Jeryl Lynn strain. Dr. Hilleman's research and vaccines continue to save millions of lives each year.



119. Baruj Benacerraf, M.D. (1972)

Dr. Baruj Benacerraf had asthma as a child. As he grew older, he decided to study immunology to learn why conditions like asthma could be triggered by allergies. In his research, he learned how genes were responsible for causing different immune responses.



120. John Michael Bishop, M.D. (1976)

121. Harold Eliot Varmus, M.D. (1976)

Dr. Harold Eliot Varmus and Dr. John Michael Bishop discovered that some genes in healthy cells could become cancerous through mutations or other changes. Once they become cancerous, these genes are called oncogenes. They won the Nobel prize in physiology or medicine 1989 for this discovery.

Credit: Matthew Septimus



122. Lydia Villa-Komaroff, Ph.D. (1978)

Dr. Lydia Villa-Komaroff genetically engineered bacteria to insert a human gene for insulin production into them. This development helped make mass-production of insulin for medication more efficient, saving the lives of countless diabetic patients.



123. Herbert Leroy Needleman, M.D. (1979)

Dr. Herbert Leroy Needleman studied lead exposure and observed that even small amounts of lead can have long-lasting impacts on children, affecting their cognitive and behavioral development. Before this discovery, scientists believed that children could fully recover from lead toxicity. Needleman’s discoveries helped reduce lead use in the United States.

Photo: Steve McCraw Image Associates



124. Stanley Ben Prusiner, M.D. (1982)

Dr. Stanley Ben Prusiner’s significant accomplishments were sparked by a patient with Creutzfeldt-Jakob disease. As he began to closely study the disease, he discovered that it was not caused by a virus, bacteria, or genetics. Instead, it was caused by a protein he called a prion, or proteinaceous infectious particle.



125. William Alan Haseltine, Ph.D. (1984)

Dr. William Alan Haseltine proposed that AIDS was caused by human immunodeficiency virus (HIV) and not transmitted through casual contact with infected individuals. During the beginning of the AIDS epidemic, he sequenced the HIV genome and helped develop one of the first AIDS treatments. Haseltine now lives in Miami, Florida.



126. Elizabeth Helen Blackburn, Ph.D. (1985)

127. Carol Widney Greider, Ph.D. (1985)

Dr. Elizabeth Helen Blackburn discovered that telomeres, the regions of DNA on the end of each chromosome, contain unique DNA that helps protect the chromosome. Later, she worked with Dr. Carol Widney Greider to discover telomerase, an enzyme that helps rebuild telomeres as they age and degrade.



128. Patricia Era Bath, M.D. (1986)

Dr. Patricia Era Bath helped found the American Institute for the Prevention of Blindness after observing racial differences in vision problems. The Institute provides routine eye care and surgeries for people around the world. She also invented the laser phacoprobe, which made cataract surgeries safer and less invasive.



129. Margaret Fischl, M.D. (1986)

Dr. Margaret Fischl worked as a doctor during the beginning of the AIDS epidemic and helped identify that HIV could be transmitted by anyone, not only gay men or drug users. Later, Fischel led the clinical trial for AZT, the first effective HIV treatment. She is currently a professor at the University of Miami’s School of Medicine.



130. Mary-Claire King, Ph.D. (1990)

Dr. Mary-Claire King showed that breast cancer can be inherited and passed down in some families due to mutations in the dBRCA1 gene. King’s research added to scientific understanding of how our genetics directly influence our health.



131. Katalin “Kati” Karikó, Ph.D. (2005)

132. Drew Weissman, Ph.D. (2005)

Dr. Katalin Karikó and Dr. Drew Weissman discovered that mRNA, or messenger RNA, can trigger an immune response. mRNA serves as a blueprint cells use to build proteins. Karikó and Weissman’s work highlighted mRNA as a potential tool for vaccine development. In 2020, mRNA was used to develop vaccines against COVID-19.

Credit: Christopher Michel



133. Ivan Owen (2013)

Ivan Owen posted a video of a puppet hand he crafted online. The video was seen by Richard Van As, a carpenter in South Africa who had recently lost four of his fingers. Van As reached out to Owen and together they created a new, affordable prosthetic hand. They also created a prosthetic hand for a 5-year-old boy named Liam, then posted the 3D-printable files for their design online for anyone to use for free.



134. Vipul Patel, M.D. (2025)

Dr. Vipul Patel performed the first FDA-approved transcontinental robotic telesurgery from Florida, operating on a prostate cancer patient almost 7,000 miles away in Angola. Patel is currently the medical director of the Global Robotic Institute at Advent Health in Orlando, Florida.

ASTRONOMY

Earthbound Observations to Interstellar Exploration

American space exploration began with observing the cosmos from Earth. Tools like observatories, telescopes, and planetariums have allowed us to learn about the universe from the safety of the ground. American ingenuity has driven major advances in space exploration, from taking mankind to the Moon and the International Space Station to sending rovers to far away planets and taking photos of black holes.

These scientists and innovators are categorized by how their contributions have impacted how we explore Earth and beyond:



**Observing
the Universe
from Earth**



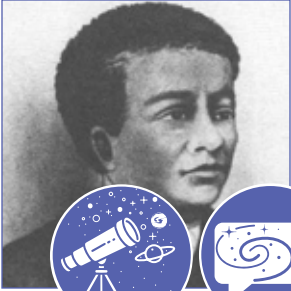
**Building Tools for
Space Science**



**Leaving
Earth**



**Sharing Science
with the Public**



135. Benjamin Banneker (1791)

Benjamin Banneker used astronomy and mathematics to publish almanacs that predicted eclipses and tides, helping early Americans understand the skies through scientific observation.



136. Maria Mitchell (1847)

In 1847, Maria Mitchell discovered a comet by spotting a small blurry object in the sky that did not appear in her charts through her telescope. After this discovery, she became a professor of astronomy and helped found the Association for the Advancement of Women. In her role as a professor, she inspired her female students to believe that they could accomplish the same things as their men counterparts.



137. Gregory Ellery Hale (1908)

In 1908, Gregory Ellery Hale transformed astronomy by building what was then the world's largest telescope in Mount Wilson, California. He broke this record twice, first with a 100-inch telescope in 1917 and then a 200-inch telescope, which was completed in 1948 after his death. Using these telescopes, he discovered that the spots on the sun are the centers of strong magnetic fields, the first magnetic fields detected beyond Earth.



138. Henrietta Swan Leavitt (1912)

Henrietta Swan Leavitt discovered that the luminosity (brightness) and pulsation periods of a Cepheid star—a type of star that brightens and dims on a predictable rhythm—was directly related to its distance from Earth. This realization shaped the future of astronomy by changing how scientists measure the distance of celestial objects.



139. Annie Jump Cannon, Ph.D. (1922)

Dr. Annie Jump Cannon developed the Harvard spectral system for classifying stars by their spectra. In 1922, this classification system was adopted by the International Astronomical Union. In 1931, Cannon became the first woman to be awarded the Henry Draper Medal of honor from the National Academy of Sciences. She classified an astonishing 350,000 stars over the course of her career.



140. Edwin Hubble, Ph.D. (1924)

Dr. Edwin Hubble discovered that galaxies exist beyond the Milky Way and that the universe is constantly expanding, completely changing our understanding of space. He also coined Hubble's Law, which states that the further a galaxy is from Earth, the redder its light appears.



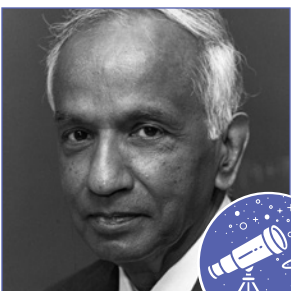
141. Cecilia Payne-Gaposchkin, Ph.D. (1925)

Dr. Cecilia Payne-Gaposchkin was a British American astronomer who was the first scientist to describe the chemical composition of stars, which are composed mainly of hydrogen and helium. Her work was of fundamental importance in developing the study of stellar atmospheres, and her observations and analyses of variable stars laid the foundation for their use as indicators of galactic structure.



142. Robert H. Goddard, Ph.D. (1926)

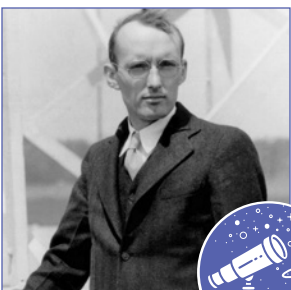
Dr. Robert H. Goddard is considered one of the founding fathers of modern-day rocketry. In 1926, Goddard successfully launched the world's first liquid-propelled rocket. In 1959, 15 years after Goddard's death, NASA established the Goddard Space Flight Center in his memory.



143. Subrahmanyan Chandrasekhar, Ph.D. (1931)

In 1931, Dr. Subrahmanyan Chandrasekhar published research that showed that the maximum mass a white dwarf star can reach before collapsing into a neutron star or black hole is about 1.4 times the mass of our Sun. This is now known as the Chandrasekhar Limit. This discovery earned Chandrasekhar the Nobel Prize in Physics in 1983.

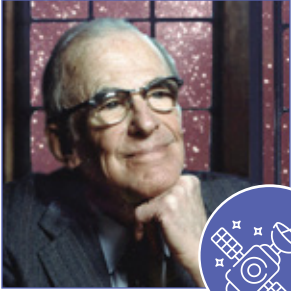
Credit: American Institute of Physics



144. Karl Guthe Jansky (1933)

Karl Guthe Jansky was a radio engineer working at Bell Laboratories when he was tasked with finding the source of some static interference. He discovered that the source of the static was radio waves coming from the center of the Milky Way galaxy. Today, Jansky is considered one of the founders of radio astronomy and has a unit of radio wave emission strength named after him.

Credit: National Radio Astronomy Observatory



145. Lyman Spitzer, Ph.D. (1946)

Dr. Lyman Spitzer came up with the idea of sending a telescope into orbit around Earth to better observe space. He hypothesized that light would be able to reach a telescope in space more easily than it can reach the ground, due to the distorting effect of Earth’s atmosphere. Spitzer’s legacy is to help us see more clearly and farther than before.



146. James A. Van Allen, Ph.D. (1958)

In 1958, Dr. James A. Van Allen was asked to install a Geiger-Müller tube, a type of Geiger counter, onto the American satellites Explorer 1 and Explorer 3. Data collected from these satellites showed that two circular belts of charged particle radiation wrapped around the Earth. These radioactive areas were named the Van Allen radiation belts. Over the course of his career, Van Allen provided similar detectors to 20 other spacecraft projects, which helped him discover that Jupiter and Saturn also had strong radiation belts.



147. Eugene Newman Parker, Ph.D. (1958)

Dr. Eugene Newman Parker mathematically predicted the existence of solar wind in 1958. In 1962, his prediction was confirmed with data taken from the Mariner 2 spacecraft. Parker went on to discover other phenomena that occur on the Sun and was known as the “Father of Heliophysics.” In 2018, he became the first living person to have a spacecraft named after him, the Parker Solar Probe.



148. Nancy Grace Roman, Ph.D. (1959)

Dr. Nancy Roman, also known as the “Mother of Hubble,” spearheaded the concept for the Hubble telescope, secured its funding, and oversaw its planning. As NASA’s first Chief of Astronomy, Roman established the entire framework for space-based observatories. In 1959, she proposed that space telescopes could be used to find planets outside our solar system. This paved the way for missions like the upcoming Roman, which will launch the Nancy Grace Roman Space Telescope into space to investigate dark matter and dark energy.



149. Eugene Merle Shoemaker, Ph.D. (1960)

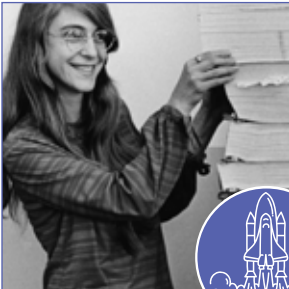
Dr. Eugene Merle Shoemaker helped pioneer the field of astrogeology by founding the Astrogeology Research Program with the U.S Geological Survey. In his work, he studied impact craters and was involved in lunar missions, helping the scientific community better understand the vast number of impact craters on the Moon's surface.



Credit: American Institute of Physics

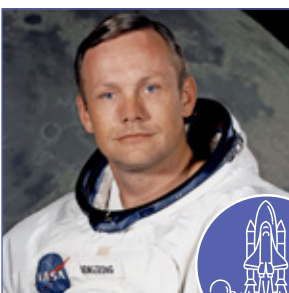
150. Vera Florence Cooper Rubin, Ph.D. (1968)

Dr. Vera Florence Cooper Rubin was an astronomer best known for her discovery that galaxies contain a massive amount of unseen matter, now called dark matter. She provided key evidence that showed that stars in the outer parts of galaxies orbit the center of their galaxy just as fast as stars near the center, which would not be possible with the amount of visible matter in these galaxies. Her research established that visible matter makes up only a small portion of the universe's total mass, fundamentally changing our understanding of the cosmos.



151. Margaret Hamilton (1969)

Margaret Hamilton took a job as a programmer at MIT after graduating with an undergraduate degree in mathematics. NASA contracted with MIT to develop software for its Apollo program in 1961, and by 1965, Hamilton was spearheading onboard flight software for the Apollo computers. She and her team developed the Apollo program's guidance system which helped land humans on the moon for the first time in 1969. Hamilton also created the term "software engineering," positioning her field as a science.



152. Neil A. Armstrong (1969)

Neil Armstrong was a naval aviator before becoming an aeronautical research pilot for NASA's High-Speed Flight Station, now known as the Armstrong Flight Research Center. In 1966, Armstrong commanded his first mission, Gemini 8, and in 1969, he commanded the Apollo 11 lunar landing mission. On July 20, 1969, Armstrong became the first man on the Moon.



153. Judith Love Cohen (1970)

Judith Love Cohen is famous for her work on NASA's Abort Guidance System for the Apollo program, which helped safely return the Apollo 13 astronauts to Earth after an explosion on board. After Apollo, she helped develop guidance systems for the Minuteman missile and ground systems for the Hubble Space Telescope. Later, she wrote children's books to inspire girls to enter STEM fields through her publishing company, Cascade Pass.



154. Jack Horkheimer (1976)

Jack Horkheimer was a pioneering astronomy educator and the longtime director of the Miami Space Transit Planetarium, which later became Frost Science. Through his planetarium programs and TV series Star Hustlers, later renamed Star Gazers, he made observing the universe accessible and engaging for millions of people. His legacy lives on through all the programs shown at the Frost Planetarium.



155. Carl Sagan, Ph.D. (1980)

Astronomer Dr. Carl Sagan was the director of the Laboratory for Planetary Studies at Cornell and produced a television series, Cosmos, that translated complex space science into stories that helped millions connect emotionally to the universe. Sagan also proposed that NASA take a photograph of the Earth from over 3.5 billion miles away, resulting in the famous photograph titled Pale Blue Dot from the Voyager 1 Space Probe.



156. Sally Ride, Ph.D. (1983)

Dr. Sally Ride was chosen to be part of NASA Astronaut Group 8, the first group of astronauts to include women, in 1978. In 1983, she became the first American woman in space, flying in the Space Shuttle Challenger. Ride later founded the nonprofit Sally Ride Science to promote STEM literacy and inspire children to pursue careers in STEM.



157. Kip Stephen Thorne, Ph.D. (1984)

Dr. Kip Stephen Thorne is known for co-founding the Laser Interferometer Gravitational-Wave Observatory (LIGO) project in 1984. LIGO made history in 2015, when it detected gravitational waves that showed two massive black holes spiraling into each other, to become one large black hole 62 times the mass of the Sun. Today, LIGO continues to help us "see" space in a way we have not before, helping scientists unveil the mysteries of the universe.



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Photo: A. Mahmoud



158. Rainer Weiss, Ph.D. (1984)

Dr. Rainer Weiss developed the concept for a laser-based interferometer that he believed could detect gravitational waves and shared his invention with Dr. Kip Thorne. Together, Weiss and Thorne co-founded the Laser Interferometer Gravitational-Wave Observatory (LIGO) project. Weiss and his co-workers prototyped and produced a full-scale interferometer that was successfully able to detect gravitational waves. Weiss, Thorne, and their colleague Dr. Barry Barish won the 2017 Nobel Prize in Physics for this work.



159. Barry Clark Barish, Ph.D. (1984)

Dr. Barry Clark Barish is a physicist and the former director of the LIGO Scientific Collaboration, where he detected and observed cosmic gravitational waves for the first time. These observations validated part of Einstein's Theory of General Relativity. He and his colleagues, Dr. Kip Thorne and Dr. Rainer Weiss, won the 2017 Nobel Prize in Physics for their gravitational wave discoveries.



160. Olga D. González-Sanabria (1988)

Olga D. González-Sanabria is a Puerto Rican American scientist and inventor. As the former Director of Engineering and Technical Services at the NASA Glenn Research Center, she was responsible for planning and directing engineering, fabrication, testing, facility management, and aircraft services. She also played a significant role in the development of long-cycle nickel-hydrogen batteries, which have been used for energy storage on the International Space Station.



161. Mae Carol Jemison, M.D. (1992)

Dr. Mae Carol Jemison was a medical doctor and Peace Corps officer who, in the wake of the Challenger tragedy, applied to become an astronaut candidate. She was one of 15 out of 2,000 applicants chosen for NASA Astronaut Group 12. In 1992, she was assigned to the STS-47 crew as a mission specialist. She became the first African-American woman in space when she flew on the Space Shuttle Endeavour.



162. Ellen Ochoa, Ph.D. (1993)

Dr. Ellen Ochoa is a Mexican American engineer, former astronaut, and the former director of the Johnson Space Center. Her research focused on how to use light to process information, making computers more effective at analyzing images. While working for NASA, Ochoa co-invented three optical devices for information processing. In 1993, Ochoa became the first Latina in space when she served on a nine-day mission aboard the Space Shuttle Discovery.



163. William Sanford Nye (1993)

William Sanford Nye is most well-known for producing, writing, and hosting his award-winning TV show, *Bill Nye the Science Guy*, which ran from 1993 to 1999. Today, Nye continues to share his passion for science communication and space exploration by leading the Planetary Society as CEO. He continues to inspire and entertain audiences and is a fierce advocate for science.



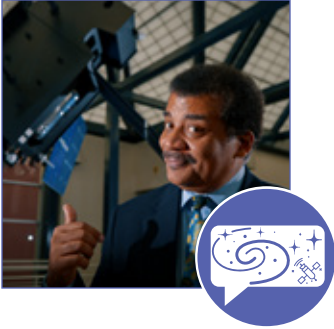
164. Beth Anne Brown, Ph.D. (1994)

Dr. Beth Anne Brown compiled the first large sample of X-ray observations of elliptical galaxies and helped improve scientific understanding of black holes and galactical formations. She also expanded public access to astronomy by developing NASA education and outreach programs that brought space discoveries to a wider audience.



165. Captain Winston Elliott Scott (1996)

Captain Winston Elliott Scott flew two Space Shuttle missions (STS-72 & STS-87), performed three spacewalks totaling over 19 hours, and logged 24 days in space. In his time with NASA, Scott helped develop assembly techniques used in the construction of the International Space Station. Scott is also an accomplished pilot and wrapped up his influential career as a leader in aerospace education at the Florida Institute of Technology in Melbourne, Florida.



166. Neil deGrasse Tyson, Ph.D. (1997)

Dr. Neil deGrasse Tyson's early research focused on stellar evolution and galactic structure, and, in 1997, he founded the Department of Astrophysics at the American Museum of Natural History. While Tyson has published dozens of scientific papers, he is most well-known as a prolific science communicator, bringing complicated scientific content to the general public.



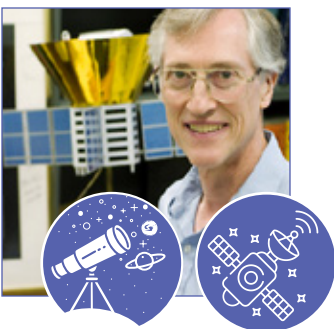
167. George Fitzgerald Smoot III, Ph.D. (1997)

Dr. George Fitzgerald Smoot III and his colleague, Dr. John Mather, worked on the Cosmic Background Explorer (COBE) satellite, which was used to detect small changes in the temperature of the cosmic microwave background for the first time. Cosmic microwave background is radiation present throughout the observable universe. The data collected from COBE helps support the Big Bang Theory.



168. Wanda Diaz-Merced, Ph.D. (2005)

Dr. Wanda Diaz-Merced developed techniques to read and share space data with sound. At the same time she was doing this research, she was losing her eyesight, and hearing space gave her a new way to engage with data. Her work expanded how people can experience and understand astronomical information and helped create more accessible astronomy programs.



169. John Cromwell Mather, Ph.D. (2006)

Dr. John Cromwell Mather is the senior astrophysicist for the Observational Cosmology Laboratory at NASA's Goddard Space Flight Center. In 2006, he and his colleague Dr. George Smoot won the Nobel Prize in Physics for their work on cosmic background radiation using the Cosmic Background Explorer (COBE) satellite. Their data showed that there was cosmic background radiation in the universe leftover from a large creation event, supporting the Big Bang Theory.



170. Nergis Mavalvala, Ph.D. (2015)

Dr. Nergis Mavalvala is a Pakistani American astrophysicist whose major scientific contributions focused on enhancing gravitational wave detection. Most of Mavalvala's pioneering work was on quantum states of light, which significantly improved the sensitivity of Laser Interferometer Gravitational-Wave Observatory (LIGO) detectors. Her research led to more precise measurements and a higher rate of discoveries, including the first direct detection of gravitational waves from the merging of two black holes.



171. Diana Trujillo (2020)

Diana Trujillo is an aerospace engineer, the 108th Flight Director in NASA’s history, and the first Flight Director born in a Spanish-speaking country. She had key leadership roles in the Mars Perseverance, Curiosity, and Ingenuity missions. Trujillo also created NASA’s first ever Spanish broadcast of a major mission, viewed by millions of people around the world, and advocates for diversity in STEM.



172. Darlene Lim, Ph.D. (2020)

Dr. Darlene Lim is an exobiologist and geobiologist who ensures astronauts are prepared for future exploration of the Moon, Mars, and deep space. In 2020, Lim joined NASA’s VIPER lunar rover mission team, which was supposed to help search the Moon for ice and other potential resources. The mission was canceled in 2024 because of funding issues but revived in 2025. Lim currently serves as the deputy lead project scientist for the project.



173. Jane Rigby, Ph.D. (2023)

Dr. Jane Rigby was named senior project scientist for the James Webb Space Telescope (JWST) in 2023. Rigby’s work with the JWST has helped the telescope produce clearer and brighter images and create images of gravitationally lensed light for the first time. Rigby has also advocated for LGBTQ+ scientists in the astronomy field since 2000, supporting efforts to make the field more welcoming for underrepresented groups. (Icon: Observing the Universe from Earth)



174. Nancy Y. Kiang, Ph.D. (2024)

Dr. Nancy Y. Kiang’s research focuses on the interactions between the biosphere and atmosphere on Earth. Kiang also uses what she learns about these interactions on Earth to look for “biosignatures,” potential signs of life that could be detected using telescopes, on other planets.

AERONAUTICS AND FLIGHT

What it Takes to be Airborne

How did we become airborne, and how did flight change the way we experience the world? From the laws of physics to bold inventions and creative problem-solving, humanity's path to flight transformed how we travel, communicate, and connect. Driven in part by the ingenuity and engineering feats of American scientists, this journey led to a more global and connected society.

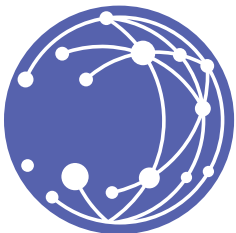
The innovators in this section are grouped into three connected categories:



**Understanding
Motions and Forces**



Engineering the Sky



**Making Flight a
Global System**



175. Octave Chanute (1900)

Octave Chanute advised and championed many early aviation enthusiasts and, at their request, became the main advisor to the Wright brothers in 1900 after they had begun testing a powered flight glider. While Chanute believed that people should patent their inventions, he also firmly believed in sharing aviation knowledge.



176. Orville Wright (1903)

177. Wilbur Wright (1903)

The Wright brothers helped launch the aviation age on December 17, 1903 when Orville piloted their aircraft 120 feet through the air in 12 seconds. Together, they proved that sustained flight was possible by inventing, building, and flying the world's first successful airplane.



178. Charles Wesley Peters (1906)

Charles Wesley Peters was the first African American man to design, build, and fly an airplane. He flew for the first time at 17 years old in a glider that he designed and built himself, traveling the length of a football field. Later, he attached an air-cooled automobile engine to his motorized airplane to create a plane capable of flying for up to 12 minutes at a time.



179. Lucean Arthur Headen (1910)

Lucean Arthur Headen was an inventor, entrepreneur, and one of the earliest African American aviators. Headen invented an automatic stabilizer for aircraft, a cloaking system for ships during World War I, and a method to de-ice the wings of airplanes that continues to inspire aviation technology today.



180. Glenn Hammond Curtiss (1911)

Glen Hammond Curtiss was an inventor who helped advance the aeronautics field. He started working in aviation by inventing the first ever four-cylinder engine for airships and eventually became one of the top aircraft manufacturers in the United States. He also ran five flight schools across North America, including one in Miami.



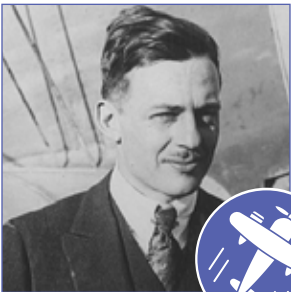
181. Bessie Coleman (1921)

Bessie Coleman broke racial and gender barriers in aviation by earning her pilot's license in France after schools in the United States denied her applications. Coleman was the first American woman, first African American person, and first Native American person to be awarded an international pilot's license. Dubbed "Queen Bess," Coleman became a stunt pilot and performed airshows across the United States until she was killed in a tragic aviation accident.



182. Amelia Earhart (1932)

Amelia Earhart was the first woman and the second person to complete a solo transatlantic flight. Earhart also set a world record for the highest altitude for a rotary-wing aircraft, flying it at an altitude of over 18,000 feet. She holds numerous other records. Her 1937 disappearance during a flight over the Pacific Ocean remains a mystery today, though the most likely explanation is that her plane ran out of fuel and crashed into the ocean.



183. Donald Wills Douglas Sr. (1935)

As a fresh engineering graduate, Donald Wills Douglas Sr. worked at the Massachusetts Institute of Technology (MIT) to design and build the first wind tunnel. After leaving MIT, Douglas designed a wide variety of military and commercial aircraft known for their reliability and safety. The safety protocols he developed in his aircraft production greatly influenced the public's perception of aircraft safety, expanding global air travel.



184. Mary Golda Ross (1942)

Mary Golda Ross worked for the Lockheed Aircraft Corporation to improve the design of fighter jets used by the United States Army Air Forces. Along with her work in aviation, Ross also helped develop the preliminary concepts for space travel, created the flight paths to Venus and Mars, and contributed heavily to the NASA Planetary Flight Handbook Vol. 3, which is still used for modern space travel. Ross was the first female Native American (Cherokee Nation) aerospace engineer.



185. Theodore von Kármán, Ph.D. (1944)

Dr. Theodore von Kármán was a physicist and laboratory lead at the California Institute of Technology. Under von Kármán's direction, his lab developed a jet-assisted takeoff rocket and solid and liquid propellants. His research also contributed to the development of supersonic flight, or flight faster than the speed of sound. In 1944, von Kármán co-founded the NASA Jet Propulsion Laboratory.



186. Brigadier General Charles E. Yeager (1947)

Brigadier General Charles E. Yeager was a United States Air Force officer who, in 1947, became the first person to fly faster than the speed of sound. Nine years later, Yeager made history again when he became the first person to fly twice the speed of sound. Over his 70-year career, he piloted more than 360 types of aircraft.



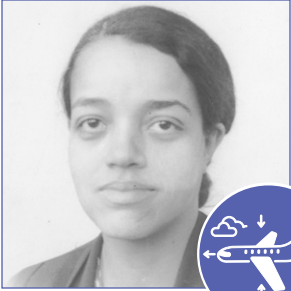
187. Mary Winston Jackson (1953)

Mary Winston Jackson, who had a dual degree in math and physical science, was hired by engineer Kazimierz Czarnecki in 1953 to run experiments in the Supersonic Pressure Tunnel (a super strong wind tunnel). Czarnecki believed in Jackson's ability and invited her to take graduate classes as part of an engineering training course. These graduate classes were segregated, but she fought for her spot, and completed the training, and became NASA's first Black female engineer.



188. Clarence Leonard "Kelly" Johnson (1955)

Clarence Johnson kicked off his career by pointing out a crucial design flaw in one of the new airplane models produced by Lockheed Aircraft Corporation. Lockheed then hired Johnson as a tool designer. He continually worked his way up at the company, where he was responsible for leading the design of over 40 different aircraft. These included several record-breaking aircraft like the fastest and highest-flying aircraft in the world, the Lockheed SR-71 Blackbird, and the first U.S. jet fighter.



189. Dorothy Vaughan (1958)

Dorothy Vaughan was a mathematician and worked as a “computer”, or a person who performed mathematical calculations, in a segregated department for the National Advisory Committee for Aeronautics (NACA). As NACA moved to electronic computing, Vaughan became a programming language expert and taught her colleagues a computer programming language to prepare them for the future. When NACA became NASA, segregation ended and Vaughan joined its Analysis and Computing Division. Her calculations were used for the Apollo Program.



190. Katherine Johnson (1961)

Katherine Johnson was an African American mathematician whose orbital trajectory calculations were critical to Project Mercury, which put NASA astronauts in orbit around the Earth. Her calculations were also crucial for both the Apollo Program and early shuttle missions. Her story, along with that of Dorothy Vaughan and Mary Jackson, was detailed in the 2016 film *Hidden Figures*.



191. Alan Bartlett Shepard Jr. (1961)

Alan Bartlett Shepard Jr. became the first American to travel into space aboard the Freedom 7 Mercury capsule in 1961. His suborbital flight marked a critical step in human spaceflight. Shepard later became the commander for Apollo 14, which put the United States back on the moon.



192. Colonel John Herschel Glenn (1962)

Colonel John Herschel Glenn became the first American to orbit the Earth in 1962, helping establish the United States as a serious contender in the space race. His expertise as a test pilot also informed spacecraft cockpit design and control systems, improving their safety and performance.



193. Christine Mann Darden, Ph.D. (1989)

Dr. Christine Mann Darden developed tools for air traffic management and computer programs for predicting and minimizing sonic booms (thunderous noises produced when an object travels faster than the speed of sound). During her foundational work with supersonic aircraft, she redesigned aircraft shapes and wing flaps to reduce the severity of sonic booms, paving the way for modern supersonic transport efforts.



194. Eileen Marie Collins (1995)

Eileen Collins learned to fly at the age of 19 and, after earning her undergraduate and master's degrees, became a professor of mathematics at the Air Force Academy and a test pilot at Edwards Air Force base. In 1990, Collins was selected by NASA as part of NASA Astronaut Group 13. In 1995, she became the first woman to pilot a U.S. Space Shuttle, the Discovery, and the first woman to command a U.S. Space Shuttle mission. Collins logged nearly 900 hours in space during her career.

PALEONTOLOGY

The Puzzle of Earth's Past

From uncovering new fossils to developing emerging technologies that deepen our understanding of the past, the story of paleontology is one of exploration and collaboration across centuries. Efforts to piece together Earth's history have been fueled by curiosity and a shared pursuit of knowledge, each discovery building upon the last. Along this journey, American innovation has helped identify new frontiers in natural history, paving the way for new ways of seeing and studying our planet's past.

The explorers in this section are grouped into three connected categories:



**Breaking Ground
on Discovery**



**Imagining
Earth's past**



**Emerging Technologies,
New Understandings**



195. Caspar Wistar (1799)

Caspar Wistar was America’s leading expert on human anatomy, but he also specialized in paleontology. While working as a doctor, he stayed involved in early American paleontology by assisting Charles Peale with the assembly of mastodon bones and Thomas Jefferson with his study of giant sloth bones. Wistar’s analysis of these sloth bones was the first study in vertebrate paleontology completed by an American.



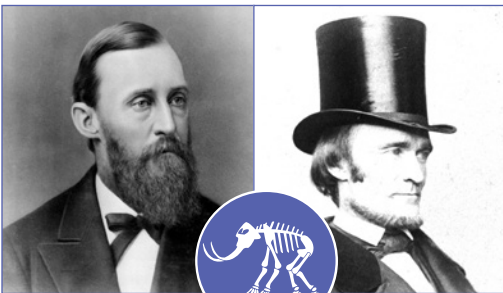
196. Charles Willson Peale (1801)

Charles Willson Peale was one of the forefathers of North American natural history and scientific fossil study. He organized the first paleontological expedition in United States history, excavating mammoth bones in upstate New York. Together with Thomas Jefferson, Peale studied Ice Age megafauna, displaying them in his Philadelphia museum to show North America’s unique history.



197. Thomas Jefferson (1804)

Thomas Jefferson is also known by some as “the Father of American Paleontology.” Jefferson had an interest in fossils, collecting and studying the fossils that had been given to him by friends. In 1804, he was credited as discovering the *Megalonyx*, a member of the sloth family. In 1822, the extinct animal was given the scientific name *Megalonyx jeffersonii*. Jefferson even asked Lewis and Clark to search for living mammoths on their expedition to the American West, eventually confirming their extinct status. Through his expeditions and collaborative studies with Charles Willson Peale, Jefferson established paleontology as a scientific field in the United States.



198. Ferdinand Vandever Hayden (1854)

199. Fielding Bradford Meek (1854)

Ferdinand Vandever Hayden and Fielding Bradford Meek discovered the first dinosaur fossil in America on an 1854 trip to the upper Missouri Basin. While the two published many papers on their discovery together, Meek eventually went on to do his own research. Meek’s publications addressed Cretaceous fossils from Nebraska, and he has several organisms named after him, such as the ammonite *Meekoceras*.



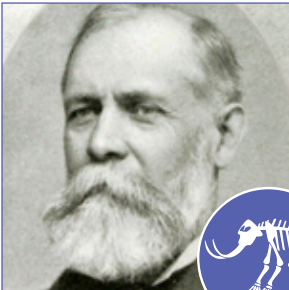
200. William Parker Foulke (1858)

William Parker Foulke discovered the first near-complete dinosaur fossil found in North America, a specimen of *Hadrosaurus foulkii*, or “Foulke’s big lizard.” The fossil, nicknamed “Haddy,” was presented to the Academy of Natural Sciences in December 1858, where it remains on display for the public.



201. Joseph Leidy, M.D. (1869)

Dr. Joseph Leidy, known as the founder of American vertebrate paleontology, studied fossil deposits in the western United States. Leidy’s research showed that horses had lived in North America before going extinct and being reintroduced by the Spanish. He also proved the prehistoric presence of the lion, tiger, camel, and rhinoceros in the western United States. In 1869, he published *On the Extinct Mammalia of Dakota and Nebraska*, later described as possibly the most important paleontological work produced in the United States.



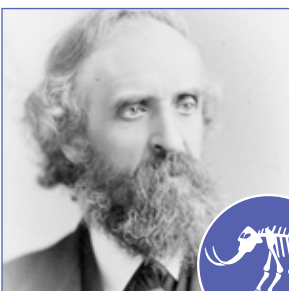
202. Albert Smith Bickmore (1869)

Albert Smith Bickmore was an American naturalist, museum curator, and the founder of the American Museum of Natural History. At the American Museum of Natural History, he worked to expand educational offerings and lectures, making natural history and paleontology more accessible to the public.



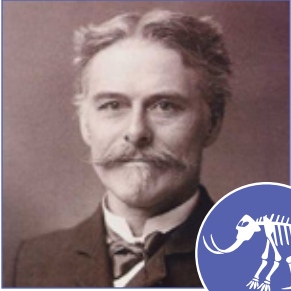
203. Eliza Cecilia Beaux (1875)

Cecilia Beaux was an artist and scientific illustrator that created lithographs of fossils for Edward Drinker Cope’s publications. While her name only appears one page of illustrations in his book, she is believed to have contributed much more, as most of the illustrations in his books are not credited to an artist.



204. William Denton (1875)

William Denton was the first person to scientifically identify that one of the fossils found at California’s La Brea Tar Pits was from a “species of *Machairodus*,” or a saber-toothed cat. His discovery led to more protections and paleontology research for the La Brea Tar Pits and a greater scientific understanding of Ice Age ecosystems.



205. Edward Drinker Cope (1879)

Edward Drinker Cope was known in his time for his rivalry with Othniel Charles Marsh in the “Bone Wars,” a vicious competition over fossils and paleontological fame. Cope discovered about thousand species of extinct vertebrates in the United States and his sketches served as the base for many of the paintings created by paleo-artist Charles Robert Knight.



206. Othniel Charles Marsh (1879)

Othniel Charles Marsh was a pivotal figure in making paleontology a respected scientific discipline, as well as his fierce rivalry with Edward Drinker Cope during the “Bone Wars.” Marsh organized and led several expeditions to the western United States in search of new fossils. His competitive tendencies with Cope often caused him to misidentify fossils. Despite this, it was Marsh who first described the iconic dinosaurs Stegosaurus and Triceratops.



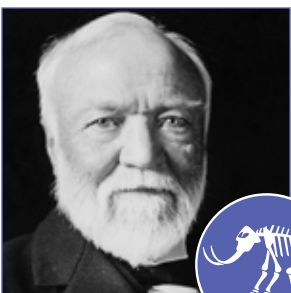
207. Charles Robert Knight (1897)

Charles Robert Knight’s paintings helped many people visualize what prehistoric animals and environments may have looked like at the same time as paleontology was becoming very popular in the United States. Knight’s paintings and sculptures can be found in many natural history institutions across the United States.



208. William Warren Orcutt (1901)

William Warren Orcutt’s was a geologist whose fossil discoveries highlighted the great value of the fossil beds in the La Brea Tar Pits. He is credited with bringing the site to the attention of the Department of Paleontology at the University of California. As of 2026, an estimated 4 million fossils have been found in the La Brea Tar Pits, providing paleontologists with a 50,000-year timeline of life in the region.



209. Andrew Carnegie (1901)

Andrew Carnegie funded many paleontological expeditions in the western United States to find fossils for the Carnegie Museum of Natural History. One of these expeditions resulted in the 1899 discovery of the dinosaur *Diplodocus carnegii*, later nicknamed “Dippy.”



210. Barnum Brown (1902)

Barnum Brown was a paleontologist and became an assistant curator at the American Museum of Natural History in 1897. During an expedition to the Hell Creek Formation in Montana in 1902, he discovered and excavated the first *Tyrannosaurus rex* fossil.



211. Annie Montague Alexander (1903)

Annie Montague Alexander organized, funded, and participated in many paleontological expeditions in the United States and around the world. In 1903, she discovered a new lizard-like marine reptile from the Triassic period during an expedition in California. This reptile was named *Thalattosaurus alexandrae*. Alexander was the driving force behind the creation of the Museum of Vertebrate Paleontology at the University of California, Berkeley and contributed over 20,000 fossil specimens to the institution.



212. Elmer Samuel Riggs (1903)

Elmer Samuel Riggs was a paleontologist for the Field Columbian Museum of Chicago (now called the Field Museum of Natural History), tasked with procuring dinosaur fossils for their collection. Riggs designed a pneumatic chisel for use in fossil preparation, an early predecessor to the air scribes used today. Riggs was also the first person to describe and name the *Brachiosaurus*.



Credit: Chemical Heritage Foundation

213. Bertram Borden Boltwood, Ph.D. (1907)

Dr. Bertram Borden Boltwood was inspired by physicist Ernest Rutherford's work on radioactive decay, and in 1907 he invented uranium-lead dating. This dating method uses the ratio of lead and uranium in rocks to estimate their age. Boltwood's work was not readily accepted because he estimated Earth's age at 2.2 billion years, far older than any previous estimates—but much younger than our best estimate today of 4.54 billion years.



214. Arthur Holmes (1911)

Arthur Holmes continued to work with the uranium-lead dating techniques invented by Bertram Boltwood, eventually publishing the first radiometric-based geological timescale that assigned ages to the Paleozoic and Mesozoic periods. This geological timescale was used to develop a basic timeline for dinosaur evolution.



215. Johanna Gabrielle Otilie “Tilly” Edinger, Ph.D. (1921)

Dr. Johanna Gabrielle Otilie “Tilly” Edinger founded the field of paleoneurology. While studying an extinct reptile, she discovered that casts of fossil braincases could be used to study the brains of extinct animals. Later in her career, Tilly studied abnormal bone growths found in some modern and fossilized fish species. These abnormal growths were later named “Tilly bones” after her. In 1963, she became the first woman president of the Society of Vertebrate Paleontology.



216. Winifred Goldring (1923)

Winifred Goldring, a trailblazer in Devonian paleontology, studied the Gilboa fossil forest in New York state and helped save many of its fossils during dam construction in the region. She identified and described over 150 species of crinoid (a marine invertebrate related to sea urchins) in her research. Goldring also served as New York’s first woman State Paleontologist, president of the Paleontological Society, and vice president of the Geological Society of America.

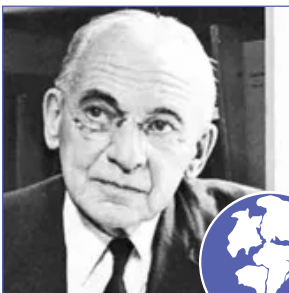


217. Esther Applin (1925)

218. Alva Ellisor (1925)

219. Hedwig Kniker (1925)

Esther Applin, Alva Ellisor, and Hedwig Kniker published a 1925 paper on forams, a type of single-celled organism. The paper shared their discovery that foram microfossils could be used to determine the age of rock samples collected during oil exploration. Their discovery made it easier to search for fossil fuels and to determine the ages of fossils found in layers of sedimentary rock.



220. Alfred Sherwood Romer, Ph.D. (1933)

Dr. Alfred Sherwood Romer’s research focused on comparing the anatomy and phylogenetics of different vertebrates to determine their relationships and learn about the evolution of various extinct species. Romer also wrote the textbook Vertebrate Paleontology, which classified all the known genera of vertebrates at the time of the book’s publication.



221. Margaret Matthew Colbert (1942)

Margaret Matthew Colbert was a scientific illustrator commissioned to paint murals depicting prehistoric ecosystems at several museums across the United States. These murals inspired many, including Michael Crichton, the author of Jurassic Park. In 1942, Colbert designed the logo for the Society of Vertebrate Paleontology.



Credit: American Museum of Natural History Library

222. George Gaylord Simpson, Ph.D. (1944)

Dr. George Gaylord Simpson is considered one of the most influential paleontologists of the twentieth century. Over the course of his life, Simpson published over 700 scientific papers and volumes, in which he supported the theory of evolution and described the intercontinental migrations of prehistoric animals.



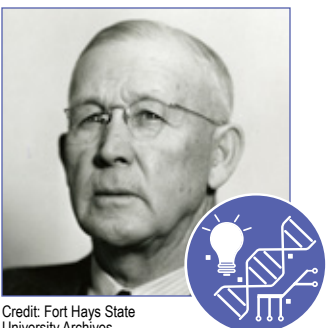
223. Edwin Harris Colbert, Ph.D. (1947)

Dr. Edwin Harris Colbert was the curator for the American Museum of Natural History, published over 400 papers, and wrote several educational books, some of which are still used today. On one expedition to Antarctica, Colbert found the fossils of three early mammal relatives, one of which could not swim. This discovery suggested Antarctica was once connected to other land masses, supporting the theory of continental drift.



224. Willard Libby, Ph.D. (1949)

Dr. Willard Libby was a physical chemist who revolutionized the paleontological field when he developed radiocarbon dating. Unlike uranium-lead dating, which is used to determine the age of the rocks around fossils, radiocarbon dating is used to determine the age of organic materials.



Credit: Fort Hays State University Archives

225. George Fryer Sternberg (1952)

George Fryer Sternberg discovered a unique fossil while on an expedition in Kansas. This fossil showed a Xiphactinus audax with a virtually complete Gillicus arcuatus in its gut cavity. This fossil is commonly called the “fish-within-a-fish” fossil and is a rare example of a fossil that tells a story.



226. John Ostrom, Ph.D. (1964)

In 1964 paleontologist Dr. John Ostrom discovered a new dinosaur in Montana in, which he named Deinonychus. As he studied it, he realized that its skeletal structure had some characteristics similar to bird skeletons and implied that the dinosaur had endothermic (warm-blooded) behaviors. These discoveries supported the theory that dinosaurs are ancestors to birds.



227. Donald Johanson, Ph.D. (1974)

Dr. Donald Johanson discovered the partial skeleton of an early hominid in Ethiopia, which he named “Lucy.” Lucy is dated to be over 3 million years old. The fossils showed that hominids became bipedal (walked upright) before they evolved large brains.



228. Mary Dawson, Ph.D. (1975)

Dr. Mary Dawson discovered prehistoric mammals during a trip to the Arctic. These fossils supported the hypothesis that a land bridge used to be present in the area, connecting North America to Europe. They also indicated that the Arctic was much warmer in the past than it was in 1975.

Credit: Society of Vertebrate Paleontology



229. Robert Thomas Bakker, Ph.D. (1975)

Dr. Robert Thomas Bakker was an undergraduate student when he was examining a fossil at Yale and noticed that the legs did not look like they were placed correctly. After studying the anatomy of different reptiles, amphibians, and birds, Bakker concluded that dinosaurs were evolutionarily closer to birds than reptiles.



230. Anita Harris, Ph.D. (1977)

Dr. Anita Harris noticed that conodonts (tiny, tooth-like fossils from an extinct group of eel-like organisms), were different colors based on the type of rock where they were found. As she studied the conodonts, she realized that the color of the conodonts could be used to determine the temperature rocks reached during their formation.



Rendering of *Maiasaura*



231. Robert Makela (1978)

Robert Makela and his crew discovered the first nest of baby dinosaurs found in the Western hemisphere on an expedition in Montana. They named the dinosaur species *Maiasaura*, meaning “good mother lizard,” and found evidence that the species cared for its young like birds.



232. Luis Alvarez, Ph.D. (1980)

233. Walter Alvarez, Ph.D. (1980)

Dr. Luis Alvarez and his son, Dr. Walter Alvarez, co-authored a paper that proposed the theory that the extinction of the non-avian dinosaurs was caused by a massive asteroid impact. This theory was called the Alvarez Hypothesis. It remains the leading theory about the cause of this mass extinction event.

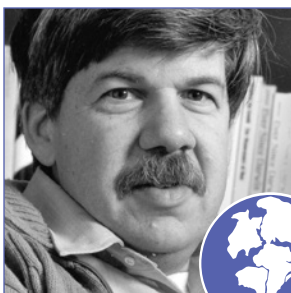


Dromidia bedetteae



234. Barbara Bedette (1980)

Barbara Bedette organized the Museum of Natural History’s vast collection and created a reference file of index cards for over 30,000 Cenozoic mollusks. This painstaking organization has helped thousands of scientists complete their research and field work. Two fossils were named in her honor: a crab, *Dromidia bedetteae*, and a mollusk, *Bathrotomaria bedetteae*.



Credit: Harvard University



235. Stephen Jay Gould, Ph.D. (1982)

Dr. Stephen Jay Gould’s theory of punctuated equilibrium proposed that evolution happened in quick bursts followed by long periods of little change. He also theorized that some traits were used by organisms for more than just their original purpose. For example, a species may have evolved feathers for insulation, but the feathers could also later be used for flight.



236. Kary Mullis, Ph.D. (1983)

Dr. Kary Mullis is the inventor of the polymerase chain reaction (PCR) technique that allows scientists to amplify tiny quantities of DNA. While PCR is used in healthcare, it also made the field of ancient DNA possible, enabling molecular paleontology.



237. David Malcolm Raup, Ph.D. (1984)

Dr. David Malcolm Raup and his colleague Dr. Jack Sepkoski, suggested that the extinction of the dinosaurs was part of a 26-million-year cycle of mass extinctions as shown in the marine fossil record. The pair also recognized five time periods with elevated extinction rates, introducing the concept of the “Big Five” mass extinctions in Earth’s history.



238. Alan Cyril Walker, Ph.D. (1984)

Dr. Alan Cyril Walker was a key American anthropologist whose detailed analysis of a 1.5-million-year-old *Homo erectus* skeleton provided detailed descriptions of the anatomy, growth, and behavior of the species.



239. Jacques Gauthier, Ph.D. (1986)

Dr. Jacques Gauthier made cladistics the standard for dinosaur classification, grouping dinosaurs based on the number of physical characteristics they share. Using cladistics became the standard approach in paleontology for determining how closely two organisms are related.



240. Rebecca Cann, Ph.D. (1987)

Dr. Rebecca Cann proposed that all living humans trace their maternal ancestry to one woman who lived in Africa less than 200,000 years ago, based on mitochondrial DNA comparisons. She came to this conclusion because mitochondrial DNA is passed from mother to offspring in most animals.



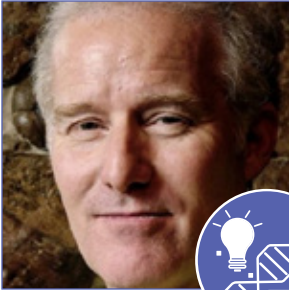
241. F. James Rohlf, Ph.D. (1990)

Dr. F. James Rohlf created the “TPS” software suite that helped make paleontological measurements more efficient. His research interests were in morphometrics, or the quantitative analysis of an organism’s size and shape.



242. Daniel C. Fisher, Ph.D. (1991)

Dr. Daniel C. Fisher developed and popularized methods for extracting hormones and other chemical traces from the material found in the center of mammalian teeth, which is called dentin. In some cases, like in woolly mammoth tusks, dentin grows in rings. By studying the chemical makeup of these layers, Fisher has learned that mammoths had similar hormonal cycles to modern elephants and would likely have exhibited similar behavior.



243. Timothy Rowe, Ph.D. (1998)

Paleontologist Dr. Timothy Rowe pioneered the use of X-ray computed tomography, an advanced type of CT scan, for the high-resolution study of fossils. This technology allows for non-destructive, 3D visualizations and reconstructions of internal anatomy, including braincases, inner ear structures, and teeth.



244. Kevin Padian, Ph.D. (2001)

Paleontologist Dr. Kevin Padian used microscopic structures in bones to show that dinosaurs were endothermic (warm-blooded) and had rapid growth rates.



245. Mary Higby Schweitzer, Ph.D. (2005)

Dr. Mary Higby Schweitzer found that some soft tissues could be preserved inside of fossils when she discovered blood vessels inside the bones of a 68-million-year-old *Tyrannosaurus rex*. She is currently a professor in the Department of Biological Studies at North Carolina State University and a research curator of paleontology at the North Carolina Museum of Natural Science.

Credit: Roger Winstead, N.C. State University



246. Benjamin M. Eagle (2007)

Benjamin M. Eagle is a fossil preparator and collector for the Standing Rock Sioux Tribe, the first tribe in the United States to enact its own formal paleontology code (Title 38). This code helps the tribe keep ownership of the fossils found on reservation land and creates a legal framework to prevent looting and unauthorized commercialization.

Credit: Julie Florio



247. Richard Prum, Ph.D. (2009)

Dr. Richard Prum is an ornithologist who developed the method of using Scanning Electron Microscopy to identify and analyze fossilized melanosomes (cellular structures that contain pigment) in fossilized feathers, skin, and nails. This method allows scientists to identify the color and patterns of extinct organisms, including dinosaurs.



248. John Scannella, Ph.D. (2010)

Dr. John Scannella, the current John R. Horner curator of paleontology at the Museum of the Rockies, proposed that the horned dinosaur *Torosaurus* is just a fully mature *Triceratops*. He has also published research about how *Triceratops* evolved over a 2-million-year period.



249. Eran Elhaik, Ph.D. (2011)

Dr. Eran Elhaik developed advanced computational and statistical tools for analyzing highly fragmented and degraded ancient DNA to pinpoint where and when it originated, advancing paleogenomics.



250. Pedro M. Monarrez, Ph.D. (2021)

Dr. Pedro M. Monarrez has found evidence that mass extinctions and recoveries from these extinction events cause a different long-term evolutionary pattern than observed during periods of time where there is no recent extinction event. He also co-authored a foundational review on the history of racism and colonialism in Western paleontology, advocating for systemic change.

Scientist Timeline



1768	Timothy Folger	Marine Science
1784	Benjamin Franklin, D.Hon	Human Health
1791	Benjamin Banneker	Astronomy
1799	Caspar Wistar	Paleontology
1801	Charles Willson Peale	Paleontology
1804	Thomas Jefferson	Paleontology
1807	Robert Fulton	Marine Science
1838	Lieutenant Charles Wilke	Marine Science
1843	John Ericsson	Marine Science
1844	Horace Wells, D.Hon	Human Health
1845	Alexander Dallas Bache	Marine Science
1847	Maria Mitchell	Astronomy
1854	Ferdinand Vandever Hayden	Paleontology
	Fielding Bradford Meek	Paleontology
1855	Commander Matthew Fontaine Maury	Marine Science
1857	Rear Admiral James Alden Jr.	Marine Science
1858	William Parker Foulke	Paleontology
1867	Louis François de Pourtalès	Marine Science
1869	Joseph Leidy, M.D.	Paleontology
	Albert Smith Bickmore	Paleontology
1875	Captain Charles Dwight Sigsbee	Marine Science
	Eliza Ceclia Beaux	Paleontology
	William Denton	Paleontology
1879	Edward Drinker Cope	Paleontology
	Othneil Charles Marsh	Paleontology
1891	William Bradley Coley, M.D.	Human Health
	Rear Admiral John Elliott Pillsbury	Marine Science
1893	Daniel Hale Williams, M.D.	Human Health
1894	Anna Wessels Williams, M.D.	Human Health
	William Hallock Park, M.D.	Human Health
1897	Charles Robert Knight	Paleontology
1900	Octave Chanute	Aeronautics and Flight
1901	Walter Reed, M.D.	Human Health
	William Warren Orcutt	Paleontology
	Andrew Carnegie	Paleontology
1902	Barnum Brown	Paleontology
1903	Orville Wright	Aeronautics and Flight
	Wilbur Wright	Aeronautics and Flight
	Annie Montague Alexander	Paleontology
	Elmer Samuel Riggs	Paleontology
1906	Charles Wesley Peters	Aeronautics and Flight
1907	Bertram Borden Boltwood, Ph.D.	Paleontology

1908	Gregory Ellery Hale	Astronomy
1910	Lucean Arthur Headen	Aeronautics and Flight
1911	Glenn Hammond Curtiss	Aeronautics and Flight
	Ole Evinrude	Marine Science
	Arthur Holmes	Paleontology
1912	Henrietta Swan Leavitt	Astronomy
	Ernest Everett Just, Ph.D.	Marine Science
1916	Francis Peyton Rous, M.D.	Human Health
	Joseph R. Turner Jr.	Human Health
	Alice Augusta Ball	Human Health
1921	Bessie Coleman	Aeronautics and Flight
	Johanna Gabrielle Otilie "Tilly" Edinger, Ph.D.	Paleontology
1922	Annie Jump Cannon Ph.D.	Astronomy
1923	Herbert Grove Dorsey, Ph.D.	Marine Science
	Winifred Goldring	Paleontology
1924	Edwin Hubble, Ph.D.	Astronomy
1925	Cecilia Payne-Gaposchkin, Ph.D.	Astronomy
	Esther Applin	Paleontology
	Alva Ellisor	Paleontology
	Hedwig Kniker	Paleontology
1926	Robert H. Goddard, Ph.D.	Astronomy
1929	Gerty Theresa Cori, M.D.	Human Health
	Carl Ferdinand Cori, M.D.	Human Health
1930	Frederick Otis Barton Jr.	Marine Science
	Henry Bryant Bigelow	Marine Science
1931	Subrahmanyan Chandrasekhar, Ph.D.	Astronomy
1932	Amelia Earhart	Aeronautics and Flight
	Grace Eldering, Ph.D.	Human Health
	Loney Clinton Gordon	Human Health
	Pearl Louella Kendrick, D.Sc.	Human Health
	Gloria Hollister Anable	Marine Science
1933	Karl Guthe Jansky	Astronomy
	Rebecca Craighill Lancefield, Ph.D.	Human Health
	Alfred Sherwood Romer	Paleontology
1935	Donald Wills Douglas Sr.	Aeronautics and Flight
	John Heysham Gibbon Jr., M.D.	Human Health
	Max Theiler, M.D.	Human Health
1937	William Warrick Cardozo, M.D.	Human Health
	Karl Landsteiner, M.D.	Human Health
	Alexander Solomon Wiener, M.D.	Human Health
	Athelstn Frederick Spilhaus, Ph.D.	Marine Science
1938	Captain Elliott B. Roberts	Marine Science

1940	Edwin Joseph Cohn, Ph.D.	Human Health
1941	Jane Hinton, VMD	Human Health
	John Howard Mueller, Ph.D.	Human Health
1942	Mary Golda Ross	Aeronautics and Flight
	Margaret Matthew Colbert	Paleontology
1944	Theodore von Kármán, Ph.D.	Aeronautics and Flight
	Alfred Blalock, M.D.	Human Health
	Helen Brooke Taussig, M.D.	Human Health
	Vivien Theodore Thomas, D.Hon	Human Health
	George Gaylord Simpson, Ph.D.	Paleontology
1945	Thomas Francis Jr., M.D.	Human Health
	Martin Wiggo Johnson, Ph.D.	Marine Science
1946	Lyman Spitzer, Ph.D.	Astronomy
1947	Brigadier General Charles E. Yeager	Aeronautics and Flight
	Edwin Harris Colbert, Ph.D.	Paleontology
1948	Albert Vinicio Báez, Ph.D.	Human Health
	Paul Harmon Kirkpatrick, Ph.D.	Human Health
1949	Willard Libby, Ph.D.	Paleontology
1950	Gertrude "Trudy" Belle Elion	Human Health
	William Parry Murphy Jr., M.D.	Human Health
	Carl Waldemar Walter, M.D.	Human Health
1951	Herman Russell Branson, Ph.D.	Human Health
1952	Paul Maurice Zoll, M.D.	Human Health
	Virginia Apgar, M.D.	Human Health
	Marie Tharp	Marine Science
	George Fryer Sternberg	Paleontology
1953	Mary Wintston Jackson	Aeronautics and Flight
1954	Joseph Edward Murray, M.D. and D.Sc. h.c.	Human Health
	David Milford Hume, M.D.	Human Health
1955	Clarence Leonard "Kelly" Johnson	Aeronautics and Flight
	Marie Maynard Daly, Ph.D.	Human Health
	Jonas Edward Salk, M.D.	Human Health
1956	Arthur Kornberg, M.D.	Human Health
	Edward Donnall Thomas, M.D.	Human Health
	Dorothy "Dottie" Thomas	Human Health
	Allyn Vine	Marine Science
1957	Jewel Plummer Cobb, M.D.	Human Health
	Jane Cooke Wright, M.D.	Human Health
	Captain George Foote Bond	Marine Science
1958	Dorothy Vaughan	Aeronautics and Flight
	Eugene Newman Parker, Ph.D.	Astronomy
	James A. Van Allen, Ph.D.	Astronomy

1958	Sarah Elizabeth Stewart, M.D., Ph.D.	Human Health
	Bernice Eddy, Ph.D.	Human Health
1959	Nancy Grace Roman, Ph.D.	Astronomy
	Jocelyn Crane	Marine Science
1960	Eugene Merle Shoemaker, Ph.D.	Astronomy
	Rosalyn Sussman Yalow, Ph.D.	Human Health
	Solomon Aaron Berson, M.D.	Human Health
	Harold Eugene "Doc" Edgerton, Ph.D.	Marine Science
1961	Alan Bartlett Shepard Jr.	Aeronautics and Flight
	Katherine Johnson	Aeronautics and Flight
1962	Colonel John Herschel Glenn	Aeronautics and Flight
	Baruch Vojtěch Berkowitz	Human Health
	Bernard Lown, M.D.	Human Health
1963	Thomas Earl Starzl, Ph.D.	Human Health
1964	Harold "Bud" Froehlich	Marine Science
	John Ostrom, Ph.D.	Paleontology
1965	Judith Ethel Graham Pool, Ph.D.	Human Health
1966	Emmet W. Chapelle	Marine Science
	Robert Treat Paine III, Ph.D.	Marine Science
1967	Maurice Ralph Hilleman, Ph.D.	Human Health
1968	Vera Florence Cooper Rubin, Ph.D.	Astronomy
	Patricia Louise Dudley, Ph.D.	Marine Science
1969	Margaret Hamilton	Astronomy
	Neil A. Armstrong	Astronomy
1970	Judith Love Cohen	Astronomy
	Edwin Albert Link Jr.	Marine Science
	Roger Payne, Ph.D.	Marine Science
	Katy Payne	Marine Science
1972	Baruj Benacerraf, M.D.	Human Health
1973	Eugenie Clark, Ph.D.	Marine Science
1974	Donald Johanson, Ph.D.	Paleontology
1975	Mary Dawson, Ph.D.	Paleontology
	Robert Thomas Bakker, Ph.D.	Paleontology
1976	Jack Horkheimer	Astronomy
	John Michael Bishop, M.D.	Human Health
	Harold Eliot Varmus, M.D.	Human Health
	Álida Ortiz Sotomayor, Ph.D.	Marine Science
1977	Robert Duane Ballard, Ph.D.	Marine Science
	Anita Harris, Ph.D.	Paleontology
1978	Lydia Villa-Komaroff, Ph.D.	Human Health
	Robert Makela	Paleontology
1979	Herbert Leroy Needleman, M.D.	Human Health

1979	Sylvia Earle, Ph.D.	Marine Science
1980	Carl Sagan, Ph.D.	Astronomy
	Luis Alvarez, Ph.D.	Paleontology
	Walter Alvarez, Ph.D.	Paleontology
	Barbara Bedette	Paleontology
1982	Stanley Ben Prusiner, M.D.	Human Health
	Stephen Jay Gould, Ph.D.	Paleontology
1983	Sally Ride, Ph.D.	Astronomy
	Kary Mullis, Ph.D.	Paleontology
1984	Kip Stephen Thorne, Ph.D.	Astronomy
	Rainer Weiss, Ph.D.	Astronomy
	William Alan Haseltine, Ph.D.	Human Health
	David Malcolm Raup, Ph.D.	Paleontology
	Alan Cyril Walker, Ph.D.	Paleontology
1985	Elizabeth Helen Blackburn, Ph.D.	Human Health
	Carol Widney Greider, Ph.D.	Human Health
1986	Patricia Era Bath, M.D.	Human Health
	Margaret Fischl, M.D.	Human Health
	Joan Murrel Owens	Marine Science
	Jacques Gauthier, Ph.D.	Paleontology
1987	Rebecca Cann, Ph.D.	Paleontology
1988	Olga D. Gonzalez-Sanabria	Astronomy
1989	Christine Mann Darden, Ph.D.	Aeronautics and Flight
	Cindy Lee Van Dover, Ph.D.	Marine Science
1990	Mary-Claire King, Ph.D.	Human Health
	Sameul Harvey Gruber, Ph.D.	Marine Science
	F. James Rohlf, Ph.D.	Paleontology
1991	Dawn Jeannine Wright, Ph.D.	Marine Science
	David C. Fisher, Ph.D.	Paleontology
1992	Mae Carol Jemison, M.D.	Astronomy
1993	William Sanford Nye	Astronomy
	Ellen Ochoa, Ph.D.	Astronomy
1994	Beth Anne Brown, Ph.D.	Astronomy
1995	Eileen Marie Collins	Aeronautics and Flight
1996	Captain Winston Elliott Scott	Astronomy
1997	George Fitzgerald Smoot III, Ph.D.	Astronomy
	Neil deGrasse Tyson, Ph.D.	Astronomy
	Isabella Abbott, Ph.D.	Marine Science
1998	Timothy Rowe, Ph.D.	Paleontology
2000	Chris Langdon, Ph.D.	Marine Science
	Barbara Block, Ph.D.	Marine Science
2001	Nancy Knowlton, Ph.D.	Marine Science

2001	Frances Gulland, Ph.D.	Marine Science
	Kevin Padian, Ph.D.	Paleontology
2005	Wanda Diaz-Merced, Ph.D.	Astronomy
	Katalin "Kati" Karikó, Ph.D.	Human Health
	Drew Weissman, Ph.D.	Human Health
	Mary Higby Schweitzer, Ph.D.	Paleontology
2006	John Cromwell Mather, Ph.D.	Astronomy
2007	Dean Grubbs, Ph.D.	Marine Science
	Benjamin M. Eagle	Paleontology
2009	Richard Prum, Ph.D.	Paleontology
2010	John Scannella, Ph.D.	Paleontology
2011	Eran Elhaik, Ph.D.	Paleontology
2012	Jillian Morris	Marine Science
2013	Ivan Owen	Human Health
	Mya Breitbart, Ph.D.	Marine Science
2015	Barry Clark Barish, Ph.D.	Astronomy
	Nergis Mavalvala, Ph.D.	Astronomy
	David Gruber, Ph.D.	Marine Science
	Mike Ford, Ph.D.	Marine Science
	Allen Collins, Ph.D.	Marine Science
	Kakani Katija, Ph.D.	Marine Science
	Ruth Gates, Ph.D.	Marine Science
2017	Cristiana Castello Branco, Ph.D.	Marine Science
2018	Ayana Elizabeth Johnson, Ph.D.	Marine Science
	Catherine MacDonald, Ph.D.	Marine Science
2019	Jeanette Davis, Ph.D.	Marine Science
	Anela Choy, Ph.D.	Marine Science
	Mark Grace	Marine Science
2020	Darlene Lim, Ph.D.	Astronomy
	Diana Trujillo	Astronomy
	Tiara Moore, Ph.D.	Marine Science
2021	Amy Phung	Marine Science
	Pedro M. Monarrez, Ph.D.	Paleontology
2022	Alicia Bitondo	Marine Science
2023	Jane Rigby, Ph.D.	Astronomy
	Paul Melovidov	Marine Science
	Dallas Roberts	Marine Science
	Aaron Lestenkof	Marine Science
2024	Nancy Y. Kiang, Ph.D.	Astronomy
2025	Vipul Patel, M.D.	Human Health

MARINE SCIENCE

Breaking the Surface

1768	Timothy Folger
1807	Robert Fulton
1838	Lieutenant Charles Wilke
1843	John Ericsson
1845	Alexander Dallas Bache
1855	Commander Matthew Fontaine Maury
1857	Rear Admiral James Alden Jr.
1867	Louis François de Pourtalès
1875	Captain Charles Dwight Sigsbee
1891	Rear Admiral John Elliott Pillsbury
1911	Ole Evinrude
1912	Ernest Everett Just, Ph.D.
1923	Herbert Grove Dorsey, Ph.D.
1930	Frederick Otis Barton Jr. Henry Bryant Bigelow
1932	Gloria Hollister Anable
1937	Athelstan Frederick Spilhaus, Ph.D.
1938	Captain Elliott B. Roberts
1945	Martin Wiggo Johnson, Ph.D.
1952	Marie Tharp
1956	Allyn Vine
1957	Captain George Foote Bond
1959	Jocelyn Crane
1960	Harold Eugene “Doc” Edgerton, Ph.D.
1964	Harold “Bud” Froehlich
1966	Emmet W. Chappelle Robert Treat Paine III, Ph.D.
1968	Patricia Louise Dudley, Ph.D.
1970	Edwin Albert Link Jr. Roger Payne, Ph.D. Katy Payne
1973	Eugenie Clark, Ph.D.

1976	Álida Ortiz Sotomayor, Ph.D.
1977	Robert Duane Ballard, Ph.D.
1979	Sylvia Earle, Ph.D.
1986	Joan Murrel Owens
1989	Cindy Lee Van Dover, Ph.D.
1990	Samuel Harvey Gruber, Ph.D.
1991	Dawn Jeannine Wright, Ph.D.
1997	Isabella Abbott, Ph.D.
2000	Chris Langdon, Ph.D. Barbara Block, Ph.D.
2001	Nancy Knowlton, Ph.D. Frances Gulland, Ph.D.
2007	Dean Grubbs, Ph.D.
2012	Jillian Morris
2013	Mya Breitbart, Ph.D.
2015	David Gruber, Ph.D. Michael Ford, Ph.D. Allen Collins, Ph.D. Kakani Katija, Ph.D. Ruth Gates, Ph.D.
2017	Cristiana Castello Branco, Ph.D.
2018	Ayana Elizabeth Johnson, Ph.D. Catherine MacDonald, Ph.D.
2019	Jeanette Davis, Ph.D. Anela Choy, Ph.D. Mark Grace
2020	Tiara Moore, Ph.D.
2021	Amy Phung
2022	Alicia Bitondo
2023	Paul Melovidov Dallas Roberts Aaron Lestenkof

MARINE SCIENCE (by category)

Breaking the Surface

Exploring the Deep



1857	Rear Admiral James Alden Jr.
1867	Louis François de Pourtalès
1875	Captain Charles Dwight Sigsbee
1923	Herbert Grove Dorsey, Ph.D.
1930	Frederick Otis Barton Jr.
1932	Gloria Hollister Anable
1956	Allyn Vine
1957	Captain George Foote Bond
1964	Harold "Bud" Froehlich
1970	Edwin Albert Link Jr.
1977	Robert Duane Ballard, Ph.D.
1989	Cindy Lee Van Dover, Ph.D.
1991	Dawn Jeannine Wright, Ph.D.
2015	Michael Ford, Ph.D.
	Allen Collins, Ph.D.
	Kakani Katija, Ph.D.
2017	Cristiana Castello Branco, Ph.D.
2021	Amy Phung
2022	Alicia Bitondo

Mapping the Oceans



1768	Timothy Folger
1838	Lieutenant Charles Wilke
1845	Alexander Dallas Bache
1855	Commander Matthew Fontaine Maury
1891	Rear Admiral John Elliott Pillsbury
1937	Athelstan Frederick Spilhaus, Ph.D.
1938	Captain Elliott B. Roberts
1945	Martin Wiggo Johnson, Ph.D.
1952	Marie Tharp
1960	Harold Eugene "Doc" Edgerton, Ph.D.

Ocean Stewardship and Protection



1912	Ernest Everett Just, Ph.D.
1930	Henry Bryant Bigelow
1959	Jocelyn Crane
1966	Emmet W. Chappelle
	Robert Treat Paine III, Ph.D.
1968	Patricia Louise Dudley, Ph.D.
1970	Roger Payne, Ph.D.
	Katy Payne
1976	Álida Ortiz Sotomayor, Ph.D.
1977	Eugenie Clark, Ph.D.
1979	Sylvia Earle, Ph.D.
1986	Joan Murrel Owens
1990	Samuel Harvey Gruber, Ph.D.
1997	Isabella Abbott, Ph.D.
2000	Chris Langdon, Ph.D.
	Barbara Block, Ph.D.
2001	Nancy Knowlton, Ph.D.
	Frances Gulland, Ph.D.
2007	Dean Grubbs, Ph.D.
2012	Jillian Morris
2013	Mya Breitbart, Ph.D.
2015	David Gruber, Ph.D.
	Ruth Gates, Ph.D.
2018	Ayana Elizabeth Johnson, Ph.D.
	Catherine MacDonald, Ph.D.
2019	Jeanette Davis, Ph.D.
	Anela Choy, Ph.D.
	Mark Grace
2020	Tiara Moore, Ph.D.
2023	Paul Melovidov
	Dallas Roberts
	Aaron Lestenkof

Powered Vessels



1807	Robert Fulton
1843	John Ericsson
1911	Ole Evinrude

HUMAN HEALTH

Human Connection in Healthcare

1784	Benjamin Franklin, D.Hon	1954	Joseph Edward Murray, M.D. and D.Sc. h.c. David Milford Hume, M.D.
1844	Horace Wells, D.Hon	1955	Marie Maynard Daly, Ph.D. Jonas Edward Salk, M.D.
1891	William Bradley Coley, M.D.	1956	Arthur Kornberg, M.D. Edward Donnall Thomas, M.D. Dorothy "Dottie" Thomas
1893	Daniel Hale Williams, M.D.	1957	Jewel Plummer Cobb, M.D. Jane Cooke Wright, M.D.
1894	Anna Wessels Williams, M.D.	1958	Sarah Elizabeth Stewart, M.D., Ph.D. Bernice Eddy, Ph.D.
1894	William Hallock Park, M.D.	1960	Rosalyn Sussman Yalow, Ph.D. Solomon Aaron Berson, M.D.
1901	Walter Reed, M.D.	1962	Baruch Vojtěch Berkowitz Bernard Lown, M.D.
1916	Francis Peyton Rous, M.D. Joseph R. Turner Jr. Alice Augusta Ball	1962	Thomas Earl Starzl, Ph.D.
1929	Gerty Theresa Cori, M.D. Carl Ferdinand Cori, M.D.	1963	Thomas Earl Starzl, Ph.D.
1932	Grace Eldering, Ph.D. Loney Clinton Gordon Pearl Louella Kendrick, D.Sc.	1965	Judith Ethel Graham Pool, Ph.D.
1933	Rebecca Craighill Lancefield, Ph.D.	1967	Maurice Ralph Hilleman, Ph.D.
1935	John Heysham Gibbon Jr., M.D.	1972	Baruj Benacerraf, M.D.
1935	Max Theiler, M.D.	1976	John Michael Bishop, M.D. Harold Eliot Varmus, M.D.
1937	William Warrick Cardozo, M.D. Karl Landsteiner, M.D. Alexander Solomon Wiener, M.D.	1978	Lydia Villa-Komaroff, Ph.D.
1940	Edwin Joseph Cohn, Ph.D.	1979	Herbert Leroy Needleman, M.D.
1941	Jane Hinton, VMD John Howard Mueller, Ph.D.	1982	Stanley Ben Prusiner, M.D.
1944	Alfred Blalock, M.D. Helen Brooke Taussig, M.D. Vivien Theodore Thomas, D.Hon	1984	William Alan Haseltine, Ph.D.
1945	Thomas Francis Jr., M.D.	1985	Elizabeth Helen Blackburn, Ph.D. Carol Widney Greider, Ph.D.
1948	Albert Vinicio Báez, Ph.D. Paul Harmon Kirkpatrick, Ph.D.	1986	Patricia Era Bath, M.D. Margaret Fischl, M.D.
1950	Gertrude "Trudy" Belle Elion William Parry Murphy Jr., M.D. Carl Waldemar Walter, M.D.	1990	Mary-Claire King, Ph.D.
1951	Herman Russell Branson, Ph.D.	2005	Katalin "Kati" Karikó, Ph.D. Drew Weissman, Ph.D.
1952	Paul Maurice Zoll, M.D. Virginia Apgar, M.D.	2013	Ivan Owen
		2025	Vipul Patel, M.D.

HUMAN HEALTH (by category)

Human Connection in Healthcare

Peer Connection & Mutual Support



1784	Benjamin Franklin, D.Hon
1894	Anna Wessels Williams, M.D. William Hallock Park, M.D.
1901	Walter Reed, M.D.
1916	Francis Peyton Rous, M.D. Joseph R. Turner Jr. Alice Augusta Ball
1932	Grace Eldering, Ph.D. Loney Clinton Gordon Pearl Louella Kendrick, D.Sc.
1933	Rebecca Craighill Lancefield, Ph.D.
1937	Karl Landsteiner, M.D. Alexander Solomon Wiener, M.D.
1941	Jane Hinton, VMD John Howard Mueller, Ph.D.
1944	Alfred Blalock, M.D. Helen Brooke Taussig, M.D. Vivien Theodore Thomas, D.Hon
1948	Albert Vinicio Báez, Ph.D. Paul Harmon Kirkpatrick, Ph.D.
1950	Gertrude "Trudy" Belle Elion William Parry Murphy Jr., M.D. Carl Waldemar Walter, M.D.
1951	Herman Russell Branson, Ph.D.
1952	Paul Maurice Zoll, M.D. Virginia Apgar, M.D.
1954	Joseph Edward Murray, M.D. and D.Sc. h.c. David Milford Hume, M.D.
1955	Marie Maynard Daly, Ph.D.
1956	Arthur Kornberg, M.D.
1957	Jewel Plummer Cobb, M.D. Jane Cooke Wright, M.D.
1958	Sarah Elizabeth Stewart, M.D., Ph.D. Bernice Eddy, Ph.D.
1960	Rosalyn Sussman Yalow, Ph.D. Solomon Aaron Berson, M.D.
1962	Baruch Vojtěch Berkowitz Bernard Lown, M.D.

1972	Baruj Benacerraf, M.D.
1976	John Michael Bishop, M.D. Harold Eliot Varmus, M.D.
1985	Elizabeth Helen Blackburn, Ph.D. Carol Widney Greider, Ph.D.
2005	Katalin "Kati" Karikó, Ph.D. Drew Weissman, Ph.D.

Patient-Provider Partnerships



1844	Horace Wells, D.Hon
1891	William Bradley Coley, M.D.
1893	Daniel Hale Williams, M.D.
1935	John Heysham Gibbon Jr., M.D.
1945	Thomas Francis Jr., M.D.
1963	Thomas Earl Starzl, Ph.D.
1982	Stanley Ben Prusiner, M.D.
2025	Vipul Patel, M.D.

Family Connections in Health



1929	Gerty Theresa Cori, M.D. Carl Ferdinand Cori, M.D.
1955	Jonas Edward Salk, M.D.
1956	Edward Donnall Thomas, M.D. Dorothy "Dottie" Thomas
1967	Maurice Ralph Hilleman, Ph.D.

Community Voice & Experience



1935	Max Theiler, M.D.
1937	William Warrick Cardozo, M.D.
1940	Edwin Joseph Cohn, Ph.D.
1965	Judith Ethel Graham Pool, Ph.D.
1978	Lydia Villa-Komaroff, Ph.D.
1979	Herbert Leroy Needleman, M.D.
1984	William Alan Haseltine, Ph.D.
1986	Patricia Era Bath, M.D. Margaret Fischl, M.D.
1990	Mary-Claire King, Ph.D.
2013	Ivan Owen

AERONAUTICS AND FLIGHT

What it Takes to be Airborne

1900	Octave Chanute
1903	Orville Wright
	Wilbur Wright
1906	Charles Wesley Peters
1910	Lucean Arthur Headen
1911	Glenn Hammond Curtiss
1921	Bessie Coleman
1932	Amelia Earhart
1935	Donald Wills Douglas Sr.
1942	Mary Golda Ross
1944	Theodore von Kármán, Ph.D.
1947	Brigadier General Charles E. Yeager
1953	Mary Winston Jackson
1955	Clarence Leonard "Kelly" Johnson
1958	Dorothy Vaughan
1961	Alan Bartlett Shepard Jr.
	Katherine Johnson
1962	Colonel John Herschel Glenn
1989	Christine Mann Darden, Ph.D.
1995	Eileen Marie Collins

AERONAUTICS AND FLIGHT (by category)

What it Takes to be Airborne

Engineering the Sky



1903	Orville Wright Wilbur Wright
1906	Charles Wesley Peters
1910	Lucean Arthur Headen
1911	Glenn Hammond Curtiss
1935	Donald Wills Douglas Sr.
1953	Mary Winston Jackson
1955	Clarence Leonard "Kelly" Johnson
1989	Christine Mann Darden, Ph.D.

Making Flight a Global System



1921	Bessie Coleman
1932	Amelia Earhart
1961	Alan Bartlett Shepard Jr.
1962	Colonel John Herschel Glenn
1995	Eileen Marie Collins

Understanding Motion & Forces



1900	Octave Chanute
1942	Mary Golda Ross
1944	Theodore von Kármán, Ph.D.
1947	Brigadier General Charles E. Yeager
1958	Dorothy Vaughan
1961	Katherine Johnson

ASTRONOMY

Earthbound Observations to Interstellar Exploration

1791	Benjamin Banneker
1847	Maria Mitchell
1908	Gregory Ellery Hale
1912	Henrietta Swan Leavitt
1922	Annie Jump Cannon Ph.D.
1924	Edwin Hubble, Ph.D.
1925	Cecilia Payne-Gaposchkin, Ph.D.
1926	Robert H. Goddard, Ph.D.
1931	Subrahmanyan Chandrasekhar, Ph.D.
1933	Karl Guthe Jansky
1946	Lyman Spitzer, Ph.D.
1958	Eugene Newman Parker, Ph.D.
1958	James A. Van Allen, Ph.D.
1959	Nancy Grace Roman, Ph.D.
1960	Eugene Merle Shoemaker, Ph.D.
1968	Vera Florence Cooper Rubin, Ph.D.
1969	Margaret Hamilton
1969	Neil A. Armstrong
1970	Judith Love Cohen
1976	Jack Horkheimer
1980	Carl Sagan, Ph.D.
1983	Sally Ride, Ph.D.
1984	Kip Stephen Thorne, Ph.D.
1984	Rainer Weiss, Ph.D.
1984	Barry Clark Barish, Ph.D.
1988	Olga D. Gonzalez-Sanabria
1992	Mae Carol Jemison, M.D.
1993	William Sanford Nye
1993	Ellen Ochoa, Ph.D.
1994	Beth Anne Brown, Ph.D.
1996	Captain Winston Elliott Scott
1997	George Fitzgerald Smoot III, Ph.D.
1997	Neil deGrasse Tyson, Ph.D.
2005	Wanda Diaz-Merced, Ph.D.
2006	John Cromwell Mather, Ph.D.
2015	Nergis Mavalvala, Ph.D.
2020	Darlene Lim, Ph.D.
2020	Diana Trujillo
2023	Jane Rigby, Ph.D.
2024	Nancy Y. Kiang, Ph.D.

Earthbound Observations to Interstellar Exploration

Building Tools for Space Science



1946	Lyman Spitzer, Ph.D.
1958	James A. Van Allen, Ph.D.
1959	Nancy Grace Roman, Ph.D.
1984	Kip Stephen Thorne, Ph.D.
1984	Rainer Weiss, Ph.D.
1988	Olga D. Gonzalez-Sanabria
2005	Wanda Diaz-Merced, Ph.D.

Leaving Earth



1926	Robert H. Goddard, Ph.D.
1969	Margaret Hamilton
1969	Neil A. Armstrong
1970	Judith Love Cohen
1983	Sally Ride, Ph.D.
1992	Mae Carol Jemison, M.D.
1993	Ellen Ochoa, Ph.D.
1996	Captain Winston Elliott Scott
2020	Darlene Lim, Ph.D.
	Diana Trujillo

Observing the Universe from Earth



1791	Benjamin Banneker
1847	Maria Mitchell
1908	Gregory Ellery Hale
1912	Henrietta Swan Leavitt
1922	Annie Jump Cannon Ph.D.
1924	Edwin Hubble, Ph.D.
1925	Cecilia Payne-Gaposchkin, Ph.D.
1931	Subrahmanyan Chandrasekhar, Ph.D.
1933	Karl Guthe Jansky
1958	Eugene Newman Parker, Ph.D.
1960	Eugene Merle Shoemaker, Ph.D.
1968	Vera Florence Cooper Rubin, Ph.D.
1984	Barry Clark Barish, Ph.D.
1997	George Fitzgerald Smoot III, Ph.D.
2006	John Cromwell Mather, Ph.D.
2015	Nergis Mavalvala, Ph.D.
2023	Jane Rigby, Ph.D.
2024	Nancy Y. Kiang, Ph.D.

Sharing Science with the Public



1976	Jack Horkheimer
1980	Carl Sagan, Ph.D.
1993	William Sanford Nye
1994	Beth Anne Brown, Ph.D.
1997	Neil deGrasse Tyson, Ph.D.

PALEONTOLOGY

The Puzzle of Earth's Past

1799	Caspar Wistar	1977	Anita Harris, Ph.D.
1801	Charles Willson Peale	1978	Robert Makela
1804	Thomas Jefferson	1980	Luis Alvarez, Ph.D.
1854	Ferdinand Vandever Hayden		Walter Alvarez, Ph.D.
	Fielding Bradford Meek		Barbara Bedette
1858	William Parker Foulke	1982	Stephen Jay Gould, Ph.D.
1869	Joseph Leidy, M.D.	1983	Kary Mullis, Ph.D.
1869	Albert Smith Bickmore	1984	David Malcolm Raup, Ph.D.
1875	Eliza Ceclia Beaux		Alan Cyril Walker, Ph.D.
	William Denton	1986	Jacques Gauthier, Ph.D.
1879	Edward Drinker Cope	1987	Rebecca Cann, Ph.D.
1879	Othneil Charles Marsh	1990	F. James Rohlf, Ph.D.
1897	Charles Robert Knight	1991	David C. Fisher, Ph.D.
1901	William Warren Orcutt	1998	Timothy Rowe, Ph.D.
	Andrew Carnegie	2001	Kevin Padian, Ph.D.
1902	Barnum Brown	2005	Mary Higby Schweitzer, Ph.D.
1903	Annie Montague Alexander	2007	Benjamin M. Eagle
	Elmer Samuel Riggs	2009	Richard Prum, Ph.D.
1907	Bertram Borden Boltwood, Ph.D.	2010	John Scannella, Ph.D.
1911	Arthur Holmes	2011	Eran Elhaik, Ph.D.
1921	Johanna Gabrielle Ottilie "Tilly" Edinger, Ph.D.	2021	Pedro M. Monarrez, Ph.D.
1923	Winifred Goldring		
1925	Esther Applin		
1925	Alva Ellisor		
	Hedwig Kniker		
1933	Alfred Sherwood Romer		
1942	Margaret Matthew Colbert		
1944	George Gaylord Simpson, Ph.D.		
1947	Edwin Harris Colbert, Ph.D.		
1949	Willard Libby, Ph.D.		
1952	George Fryer Sternberg		
1964	John Ostrom, Ph.D.		
1974	Donald Johanson, Ph.D.		
1975	Mary Dawson, Ph.D.		
	Robert Thomas Bakker, Ph.D.		

PALEONTOLOGY

The Puzzle of Earth's Past (by category)



Breaking Ground on Discovery

1799	Caspar Wistar
1801	Charles Willson Peale
1804	Thomas Jefferson
1854	Ferdinand Vandever Hayden
1854	Fielding Bradford Meek
1858	William Parker Foulke
1869	Joseph Leidy, M.D. Albert Smith Bickmore
1875	Eliza Ceclia Beaux William Denton
1879	Edward Drinker Cope Othneil Charles Marsh
1897	Charles Robert Knight
1901	William Warren Orcutt
1901	Andrew Carnegie
1902	Barnum Brown
1903	Annie Montague Alexander Elmer Samuel Riggs
1907	Bertram Borden Boltwood, Ph.D.
1911	Arthur Holmes
1947	Edwin Harris Colbert, Ph.D.
1952	George Fryer Sternberg



Imagining Earth's Past

1921	Johanna Gabrielle Otilie "Tilly" Edinger, Ph.D.
1923	Winifred Goldring
1925	Esther Applin Alva Ellisor Hedwig Kniker
1933	Alfred Sherwood Romer
1942	Margaret Matthew Colbert
1944	George Gaylord Simpson, Ph.D.
1949	Willard Libby, Ph.D.
1964	John Ostrom, Ph.D.
1974	Donald Johanson, Ph.D.
1975	Mary Dawson, Ph.D. Robert Thomas Bakker, Ph.D.
1977	Anita Harris, Ph.D.
1978	Robert Makela
1980	Luis Alvarez, Ph.D. Walter Alvarez, Ph.D. Barbara Bedette
1982	Stephen Jay Gould, Ph.D.
1984	David Malcolm Raup, Ph.D.
2010	John Scannella, Ph.D.
2021	Pedro M. Monarrez, Ph.D.

Emerging Technologies, New Understandings



1983	Kary Mullis, Ph.D.
1984	Alan Cyril Walker, Ph.D.
1986	Jacques Gauthier, Ph.D.
1987	Rebecca Cann, Ph.D.
1990	F. James Rohlf, Ph.D.
1991	David C. Fisher, Ph.D.
1998	Timothy Rowe, Ph.D.
2001	Kevin Padian, Ph.D.
2005	Mary Higby Schweitzer, Ph.D.
2007	Benjamin M. Eagle
2009	Richard Prum, Ph.D.
2011	Eran Elhaik, Ph.D.