Think Like An Astronaut! How Do Rockets Work

Rocket Man (song)

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"Rocket Man", also known as "Rocket Man (I Think It's Going to Be a Long, Long Time)", is a song written by English musician Elton John and songwriter Bernie Taupin and performed by John. It was originally released on 17 April 1972 in the US, as the lead single to John's album Honky Château. The song first charted in the UK on 22 April, rising to No. 2 in the UK Singles Chart and No. 6 in the US Billboard Hot 100, becoming a major hit single for John.

On 5 April 2024, the song was certified triple platinum by the British Phonographic Industry (BPI) for sales and streams of 1,800,000 digital downloads and streaming equivalent sales. With sales of five million in the US the song was certified 5× platinum by the Recording Industry Association of America (RIAA). Rolling Stone lists it at No. 149 of its 500 greatest songs of all time.

On 6 January 2024, Rocket Man surpassed one billion streams on Spotify.

The song has been covered by many artists, most notably by Kate Bush in 1991 with a reggae-tinged version, and by Portuguese singer David Fonseca in 2007. John himself, alongside producer Pnau and singer Dua Lipa, included the song in his 2021 mashup single "Cold Heart (Pnau remix)". William Shatner's spoken-word version from 1978 has been widely parodied.

Michael Collins (astronaut)

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Michael Collins (October 31, 1930 – April 28, 2021) was an American astronaut who flew the Apollo 11 command module Columbia around the Moon in 1969 while his crewmates, Neil Armstrong and Buzz Aldrin, made the first crewed landing on the surface. He was also a test pilot and major general in the U.S. Air Force Reserve.

Born in Rome, Kingdom of Italy, where his father was serving as the U.S. military attaché, Collins graduated in the Class of 1952 from the United States Military Academy. He followed his father, brother, uncle, and cousin into the military. He joined the United States Air Force, and flew F-86 Sabre fighters at Chambley-Bussières Air Base, France. He was accepted into the U.S. Air Force Experimental Flight Test Pilot School at Edwards Air Force Base in 1960, also graduating from the Aerospace Research Pilot School (Class III).

Selected as part of NASA's third group of 14 astronauts in 1963, Collins flew in space twice. His first spaceflight was on Gemini 10 in 1966, in which he and Command Pilot John Young performed orbital rendezvous with two spacecraft and undertook two extravehicular activities (EVAs, also known as spacewalks). On the 1969 Apollo 11 mission, he became one of 24 people to fly to the Moon, which he orbited thirty times. He was the fourth person (and third American) to perform a spacewalk, the first person to have performed more than one spacewalk, and, after Young, who flew the command module on Apollo 10, the second person to orbit the Moon alone.

After retiring from NASA in 1970, Collins took a job in the Department of State as Assistant Secretary of State for Public Affairs. A year later, he became the director of the National Air and Space Museum, and held this position until 1978, when he stepped down to become undersecretary of the Smithsonian Institution. In

1980, he took a job as vice president of LTV Aerospace. He resigned in 1985 to start his own consulting firm. Along with his Apollo 11 crewmates, Collins was awarded the Presidential Medal of Freedom in 1969 and the Congressional Gold Medal in 2011.

Gravity (2013 film)

by Astronaut Buzz Aldrin". The Hollywood Reporter. October 3, 2013. Retrieved October 7, 2013. Reisman, Garrett. "What Does A Real Astronaut Think Of

Gravity is a 2013 science fiction thriller film directed by Alfonso Cuarón, who also co-wrote, co-edited, and produced the film. It stars Sandra Bullock and George Clooney as American astronauts who attempt to return to Earth after the destruction of their Space Shuttle in orbit.

Cuarón wrote the screenplay with his son Jonás and attempted to develop the film at Universal Pictures. Later, the distribution rights were acquired by Warner Bros. Pictures. David Heyman, who previously worked with Cuarón on Harry Potter and the Prisoner of Azkaban (2004), produced the film with him. Gravity was produced entirely in the United Kingdom, where British visual effects company Framestore spent more than three years creating most of the film's visual effects, which involve over 80 of its 91 minutes.

Gravity opened the 70th Venice International Film Festival on August 28, 2013, and had its North American premiere three days later at the Telluride Film Festival. Upon its release, Gravity was met with widespread critical acclaim, with high praise for its direction, visuals, cinematography, acting, and score. Considered one of the best films of 2013, it appeared on numerous critics' year-end lists, and was selected by the American Film Institute in their annual Movies of the Year list. The film became the eighth-highest-grossing film of the year with a worldwide gross of over $723 million, against a production budget of around $100 million.

Gravity received a leading 10 nominations at the 86th Academy Awards, including Best Picture and Best Actress (for Bullock), and won a leading seven awards, including Best Director (for Cuarón). At the 67th British Academy Film Awards, the film received a leading 11 nominations, including Best Film and Best Actress in a Leading Role (for Bullock), and won a leading 6 awards, including Outstanding British Film and Best Director (for Cuarón). It also received 4 nominations at the 71st Golden Globe Awards, including Best Motion Picture – Drama and Best Actress in a Motion Picture – Drama (for Bullock), with Cuarón winning Best Director.

At the 19th Critics' Choice Awards, the film received 10 nominations, including Best Picture and Best Actress (for Bullock), and won a leading seven awards, including Best Sci-Fi/Horror Movie, Best Director (for Cuarón) and Best Actress in an Action Movie (for Bullock). Bullock also received a nomination for the Screen Actors Guild Award for Outstanding Performance by a Female Actor in a Leading Role, while the film won the 2013 Ray Bradbury Award, and the 2014 Hugo Award for Best Dramatic Presentation. Since its release, it has been cited as among the best films of the 2010s and the 21st century.

Ancient astronauts

Ancient astronauts (or ancient aliens) refers to a pseudoscientific set of beliefs that hold that intelligent extraterrestrial beings (alien astronauts) visited

Ancient astronauts (or ancient aliens) refers to a pseudoscientific set of beliefs that hold that intelligent extraterrestrial beings (alien astronauts) visited Earth and made contact with humans in antiquity and prehistoric times. Proponents of the theory suggest that this contact influenced the development of modern cultures, technologies, religions, and human biology. A common position is that deities from most (if not all) religions are extraterrestrial in origin, and that advanced technologies brought to Earth by ancient astronauts were interpreted as evidence of divine status by early humans.

The idea that ancient astronauts existed and visited Earth is not taken seriously by academics and archaeologists, who identify such claims as pseudoarchaeological or unscientific. It has received no credible attention in peer-reviewed studies. When proponents of the idea present evidence in favor of their beliefs, it is often distorted or fabricated. Some authors and scholars also argue that ancient astronaut theories have racist undertones or implications, diminishing the accomplishments and capabilities of indigenous cultures.

Well-known proponents of these beliefs in the latter half of the 20th century who have written numerous books or appear regularly in mass media include Robert Charroux, Jacques Bergier, Jean Sendy, Erich von Däniken, Alexander Kazantsev, Zecharia Sitchin, Robert K. G. Temple, Giorgio A. Tsoukalos, David Hatcher Childress, Peter Kolosimo, and Mauro Biglino.

Wernher von Braun

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Wernher Magnus Maximilian Freiherr von Braun (US: VUR-n?r von BROWN; German: [?v??nhe??? f?n ?b?a?n]; 23 March 1912 – 16 June 1977) was a German–American aerospace engineer and space architect. He was a member of the Nazi Party and Allgemeine SS, the leading figure in the development of rocket technology in Nazi Germany, and later a pioneer of rocket and space technology in the United States.

As a young man, von Braun worked in Nazi Germany's rocket development program. He helped design and co-developed the V-2 rocket at Peenemünde Army Research Center during World War II. The V-2 became the first artificial object to travel into space on 20 June 1944. Following the war, he was secretly moved to the United States, along with about 1,600 other German scientists, engineers, and technicians, as part of Operation Paperclip. He worked for the United States Army on an intermediate-range ballistic missile program, and he developed the rockets that launched the United States' first space satellite Explorer 1 in 1958. He worked with Walt Disney on a series of films, which popularized the idea of human space travel in the US and beyond from 1955 to 1957.

In 1960, his group was assimilated into NASA, where he served as director of the newly formed Marshall Space Flight Center and as the chief architect of the Saturn V super heavy-lift launch vehicle that propelled the Apollo spacecraft to the Moon. In 1967, von Braun was inducted into the National Academy of Engineering, and in 1975, he received the National Medal of Science.

Von Braun is a highly controversial figure widely seen as escaping justice for his awareness of Nazi war crimes due to the Americans' desire to beat the Soviets in the Cold War. He is also sometimes described by others as the "father of space travel", the "father of rocket science", or the "father of the American lunar program". He advocated a human mission to Mars.

Pete Conrad

Charles "Pete" Conrad Jr. (June 2, 1930 – July 8, 1999) was an American NASA astronaut, aeronautical engineer, naval officer, aviator, and test pilot who

Charles "Pete" Conrad Jr. (June 2, 1930 – July 8, 1999) was an American NASA astronaut, aeronautical engineer, naval officer, aviator, and test pilot who commanded the Apollo 12 mission, on which he became the third person to walk on the Moon. Conrad was selected for NASA's second astronaut class in 1962.

Conrad was born in Philadelphia, Pennsylvania. Despite having dyslexia, he earned his Bachelor of Science degree in aeronautical engineering from Princeton University—being the first Ivy League astronaut—and joined the U.S. Navy. In 1954, Conrad received his naval aviator wings, served as a fighter pilot and, after graduating from the U.S. Naval Test Pilot School (Class 20), as a project test pilot. In 1959, he was an astronaut candidate for Project Mercury.

Conrad set an eight-day space endurance record in 1965 along with his Command Pilot Gordon Cooper on his first spaceflight, Gemini 5. Later, Conrad commanded Gemini 11 in 1966, and Apollo 12 in 1969. After Apollo, he commanded Skylab 2, the first crewed Skylab mission, in 1973. On the mission, he and his crewmates repaired significant launch damage to the Skylab space station. For this, President Jimmy Carter awarded him the Congressional Space Medal of Honor in 1978.

After Conrad retired from NASA and the Navy in 1973, he became a vice president of American Television and Communications Company. He went on to work for McDonnell Douglas, as a vice president. During his tenure, he served as vice president of marketing, senior vice president of marketing, staff vice president of international business development, and vice president of project development. Conrad died in 1999, from internal injuries sustained in a motorcycle accident, aged 69.

José M. Hernández

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José Moreno Hernández (born August 7, 1962) is a Mexican-American engineer and astronaut. He currently serves as a Regent of the University of California.

Hernández was on the Space Shuttle mission STS-128 in August 2009. He also served as chief of the Materials and Processes branch of Johnson Space Center. Hernández previously developed equipment for full-field digital mammography at Lawrence Livermore National Laboratory.

In October 2011, Hernández, at the urging of President Barack Obama, ran for Congress as a Democrat in California's newly redrawn 10th congressional district in the U.S. House of Representatives. He won the Democratic nomination but lost the 2012 general election to freshman Representative Jeff Denham.

Hernández is the subject of the 2023 biopic A Million Miles Away in which he is portrayed by Michael Peña.

Robert H. Goddard

20th-century rocket science. Goddard successfully pioneered modern methods such as two-axis control (gyroscopes and steerable thrust) to allow rockets to control

Robert Hutchings Goddard (October 5, 1882 – August 10, 1945) was an American engineer, professor, physicist, and inventor who is credited with creating and building the world's first liquid-fueled rocket, which was successfully launched on March 16, 1926. By 1915 his pioneering work had dramatically improved the efficiency of the solid-fueled rocket, signaling the era of the modern rocket and innovation. He and his team launched 34 rockets between 1926 and 1941, achieving altitudes as high as 2.6 km (1.6 mi) and speeds as fast as 885 km/h (550 mph).

Goddard's work as both theorist and engineer anticipated many of the developments that would make spaceflight possible. He has been called the man who ushered in the Space Age. Two of Goddard's 214 patented inventions, a multi-stage rocket (1914), and a liquid-fuel rocket (1914), were important milestones toward spaceflight. His 1919 monograph A Method of Reaching Extreme Altitudes is considered one of the classic texts of 20th-century rocket science. Goddard successfully pioneered modern methods such as two-axis control (gyroscopes and steerable thrust) to allow rockets to control their flight effectively.

Although his work in the field was revolutionary, Goddard received little public or financial support for his research and development work. He was a shy person, and rocket research was not considered a suitable pursuit for a physics professor. The press and other scientists ridiculed his theories of spaceflight. As a result, he became protective of his privacy and his work.

Years after his death, at the dawn of the Space Age, Goddard came to be recognized as one of the founding fathers of modern rocketry, along with Robert Esnault-Pelterie, Konstantin Tsiolkovsky and Hermann Oberth. He not only recognized early on the potential of rockets for atmospheric research, ballistic missiles and space travel, but also was the first to scientifically study, design, construct and fly the precursory rockets needed to eventually implement those ideas.

NASA's Goddard Space Flight Center was named in Goddard's honor in 1959. He was also inducted into the International Aerospace Hall of Fame and National Aviation Hall of Fame in 1966, and the International Space Hall of Fame in 1976.

Lisa Nowak

Marie Nowak (née Caputo; born May 10, 1963) is an American aeronautical engineer, former NASA astronaut, and retired United States Navy officer. Nowak

Lisa Marie Nowak (née Caputo; born May 10, 1963) is an American aeronautical engineer, former NASA astronaut, and retired United States Navy officer. Nowak served as naval flight officer and test pilot in the Navy, and was selected by NASA for NASA Astronaut Group 16 in 1996, qualifying as a mission specialist in robotics. She flew in space aboard Space Shuttle Discovery during the STS-121 mission in July 2006, when she was responsible for operating the robotic arms of the shuttle and the International Space Station. In 2007, Nowak was involved in a highly publicized incident of criminal misconduct for which she eventually pleaded guilty to felony burglary and misdemeanor battery charges, resulting in her demotion from captain to commander, termination by NASA, and forced retirement from the Navy.

Born in Washington, D.C., Nowak graduated from the United States Naval Academy in Annapolis, Maryland, in 1985. She was assigned to VAQ-34 at Naval Air Station Point Mugu, California, where she flew the EA-7L Corsair and ERA-3B Skywarrior. She earned a Master of Science degree in aeronautical engineering and a degree in aeronautical and astronautical engineering from the Naval Postgraduate School in Monterey, California. In 1993 she was selected to attend the U.S. Naval Test Pilot School at Naval Air Station Patuxent River, Maryland. After graduation, she remained at Patuxent River, flying in the F/A-18 Hornet and EA-6B Prowler. During her Navy career she logged over 1,500 hours in more than 30 aircraft and was awarded the Defense Meritorious Service Medal, the Navy Commendation Medal and the Navy Achievement Medal.

In February 2007, Nowak was arrested in Orlando, Florida, after she accosted and pepper-sprayed Colleen Shipman, a U.S. Air Force captain romantically involved with astronaut William Oefelein, who had been in a relationship with Nowak. She was released on bail and initially pleaded not guilty to the charges, which included attempted kidnapping, burglary with assault, and battery. Subsequently, her assignment as an astronaut was terminated by NASA. In 2009, Nowak agreed to a plea deal with prosecutors and pleaded guilty to charges of felony burglary of a car and misdemeanor battery. She remained a Navy captain until the following year when a Naval Board of Inquiry voted unanimously to reduce her in rank to commander and to retire her from the Navy under other than honorable conditions after 25 years of service. As of 2017, it was reported that she was working in the private sector in Texas.

Harrison Schmitt

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Harrison Hagan "Jack" Schmitt (born July 3, 1935) is an American geologist, former NASA astronaut, university professor, and former U.S. senator from New Mexico. He is the most recent living person—and only person without a background in military aviation—to have walked on the Moon.

In December 1972, as a crewmember of Apollo 17, Schmitt became the first member of NASA's first scientist-astronaut group to fly in space. As Apollo 17 was the last of the Apollo missions, he also became the twelfth and second-youngest person to set foot on the Moon and the second-to-last person to step off of the Moon (he boarded the Lunar Module shortly before commander Eugene Cernan). Schmitt also remains the only professional scientist to have flown beyond low Earth orbit and to have visited the Moon. Before training for Apollo 17, he was influential in the geology field for supporting the Apollo program and had helped train Apollo astronauts chosen to visit the lunar surface.

Schmitt resigned from NASA in August 1975 to run for election to the United States Senate as a member from New Mexico. As the Republican candidate in the 1976 election, he defeated Democratic incumbent Joseph Montoya. In the 1982 election, Schmitt was defeated by Democrat Jeff Bingaman.