Eugene F. Lally

Eugene F. Lally is a Space Age pioneer born in South Boston, Massachusetts in 1934. He became first interested in science and space travel at the South Boston Boy's Club while enrolled in the Photography Club and watching Flash Gordon serial movies at the Club in the 40s. His grandmother gave him a Kodak box camera at age 10 and he became fascinated with photography and all areas of science. Educated as an electrical engineer at Northeastern University in Boston with additional education in celestial mechanics, rocket propulsion, astrophysics, aerodynamics, planetary science, astronomy, archaeology and economics.
Lally's technical papers were presented at national meetings of a variety of societies and published by: the American Rocket Society, American Institute of Aeronautics and Astronautics, IEEE, in journals and magazines such as: Astronautics, Astronautica Acta, Design News, Aviation Weekly, and national and local newspapers.
He published technical papers about rockets and space flight while in college in the mid 1950's before the launch of Sputnik. Upon graduation he went to California to help start up the space program.

Lally published initial papers outlining the exploration of the Moon, Venus, Mars, Jupiter, Saturn, comets, asteroids, solar system escape probe, earth satellites and Direct TV. He conceived technologies for the space program and transferred technology to consumer product applications. Lally proposed Manned Mars Missions using nuclear propulsion and designed optical guidance and navigation for astronauts' onboard use and simulated gravity to protect them from bone mass loss during the long weightlessness trajectory.
One paper introduced digital photography in 1961 while at the Jet Propulsion Laboratory for NASA. It was titled, "Mosaic Guidance for Interplanetary Travel" presented at the annual convention of the American Rocket Society, 1961. It proposed manned Mars missions including the design of cameras employing mosaic arrays of photodetectors with their output processed in the digital domain to provide onboard guidance and navigation. This was the first presentation of a digital photography concept and digital camera.
His gravity simulation for manned Mars missions was published in 1962 titled "To Spin or Not to Spin".
He worked and studied under Krafft A. Ehricke, a German rocket scientist at Peenemünde, who came to America after WWII. They worked together at Convair Astronautics in San Diego. Ehricke taught Lally orbital and celestial mechanics from his newly published book "Space Flight" that became the premier reference book for orbital mechanics in the new space business.
Lally was a major contributor to the pioneering phase of the space age creating concepts that were applied to planetary exploratory missions initially and later over decades. His concept of onboard use of digital photos of planets, asteroids and comets during space trajectories for navigation purposes was adopted by the Jet Propulsion Laboratory for NASA. This system named AutoNav, ushered in a new era of low cost spacecraft missions starting with Deep Space 1 in 1998. This concept also was used on the European Space Agency's Rosetta Spacecraft to refine the approach distance to an asteroid in 2008.
His asteroid landing concept is used on Rosetta scheduled in 2014 to fasten a spacecraft to a comet having essentially no gravity by firing a harpoon into the comet's surface and reeling itself onto the surface. This same concept is proposed for missions to deflect asteroids headed for a collision with Earth by attaching a nuclear device to the asteroid or for position control of gravity tractor spacecraft.
NASA continued developing his onboard digital camera concept and it progressed to the Kepler Mission launched in March 2009. The Kepler digital camera/photometer is designed to stare at 100,000 stars for several years. Its design could greatly accelerate the discovery of planets orbiting distant stars beyond the few hundred already discovered. The camera will monitor changing star intensity data if planets transit the stars. Long term data will be recorded and interpreted. This could help determine the probability of additional extrasolar planets and understand their size and distance from the stars transited. In addition if earth-size planets are found, their distance from their stars will be determined and the possibility of their location in habitable zones investigated.
Lally continues to create by introducing industrial, consumer, automotive and photography products. He writes for space, photography, travel, archaeology and economics publications.
Publications
* Lally, Eugene F. at Convair Astronautics, San Diego, California. "Abstract- Mosaic Guidance for Interplanetary Travel". American Rocket Society, February, 1961.
* Lally, Eugene F. at the California Institute of Technology, Jet Propulsion Laboratory, "Mosaic Guidance for Interplanetary Travel", Space Flight Report to the Nation, pp 2249-61, American Rocket Society, New York, October 9-15, 1961.
* Lally, Eugene F. at the California Institute of Technology, Jet Propulsion Laboratory, "Space Report - Guidance Concepts". Electronic Design, October 25, 1961.
* Lally, Eugene F. at the California Institute of Technology, Jet Propulsion Laboratory, "Mosaic Guidance for Interplanetary Travel". American Rocket Society, Astronautics, June 1962.
* Lally, Eugene F. at the California Institute of Technology, Jet Propulsion Laboratory. "Mosaic Space Guidance Systems". Electronics, June 6, 1962.
* Lally, Eugene F. at the California Institute of Technology, Jet Propulsion Laboratory. "Mosaic Star Trackers for Guidance of Manned Spaceships". Electronics Design, August 16, 1962.
* Lally, Eugene F. at the California Institute of Technology, Jet Propulsion Laboratory. "To Spin or Not To Spin", (Manned Mars Missions). American Rocket Society, Astronautics, September 1962.
* Lally, Eugene F. at Space-General Corporation/Aerojet-General. "Conceptual Spacecraft Designs for Exploration of

Mecury". First Annual Meeting, American Institute of Aeronautics and Astronautics. June 28-July 2, 1964, Washington, DC.
* Lally, Eugene F. at Space-General Corporation/Aerojet-General. "Conceptual Spacecraft Designs for the Exploration of Jupiter". Second Annual Meeting, American Institute of Aeronautics and Astronautics, July 26-29, 1965, San Francisco, Califiifornia.
* Lally, Eugene F. at Space-General Corporation/Aerojet-General. "Conceptual Spacecraft Designs for the Exploration of Jupiter". Astronautica Acta, July-August 1965.
* Lally, Eugene F. at Lally Photography, "Camera Bodies". Anthropology News, American Anthropological Association. September 2002.
* Lally, Eugene F. at Lally Photography, "Photography Ethics Collaborating with American Indians". Anthropology News, American Anthropological Association. November 2004.
* Lally, Eugene F. at Lally Photography, "Photographer's Guide to Protecting the Use and Misuse of Images". Anthropology News, American Anthropological Association. December 2004.
* Lally, Eugene F. at Lally Photography, "State-of-the-Art of Digital Photography". Anthropology News, Vol. 47, Number 9, American Anthropological Association, December 2006
* Lally, Eugene F. at Dynamic Development Co. "How Spaceflight was Born". Discusses the accomplishments of the five space pioneers: Goddard, Oberth, von Braun, Ehricke and Lally. Search for Extraterrestrial Intelligence Institute (SETI), Carl Sagan Center, University of California, Berkeley, at Mountain View, California. Colloquium Series, Scientific Lectures, November 12, 2008.