

GRAA NEWSLETTER

P.O. Box 1184, Greenbelt, MD 20768-1184

September 2023 <http://GoddardRetirees.org> 39th Year of Publication

UPCOMING LUNCHEONS: We meet at 11:15 AM on the 2nd Tuesday of each month at the American Legion Post #136 at 6900 Greenbelt Road. **Reservations are required;** please contact graalunch@gmail.com (preferred) or call (410)-709-8889 **before Thursday, September 7th.**

Sept 12		Jeremy Werdell , Goddard Oceanographer and Project Scientist of the PACE (Plankton, Aerosol, Cloud, ocean Ecosystem) mission will review the goals of this next ocean color-class satellite, scheduled for launch early in 2024.
Oct 10		Bob Benson , Emeritus in Goddard's Heliophysics Division, will describe conditions and observations in the pioneering geophysical expedition: The First Winter at the Amundsen-Scott IGY South-Pole Station.

COMMENTS FROM TONY COMBERIATE AND ARLIN KRUEGER

Our August speaker was **Alice Bowman**, Mission Operations Manager and Group Leader in the Space Department at JHU Applied Physics Laboratory. Her talk, entitled [New Horizons: NASA's Mission to Pluto and the Kuiper Belt](#) described the discoveries and challenges of interplanetary spacecraft operations that she encountered during the mission. New Horizons was awarded in 2002 and launched on time in 2006 in a very tight launch window necessary to utilize a Jupiter gravity assist. That made it the fastest spacecraft ever flown, saving three years of travel time in its 4 billion mile, 9-year journey to Pluto. The 1054-pound, nuclear-powered spacecraft contains a visible camera, an IR spectrometer to determine composition and surface temperatures, a UV spectrometer for atmospheric composition and structure, plus imagers and charged particle detectors.

Alice described a crisis on July 4th, 2015, *three days* before the 9-day Pluto encounter, when the spacecraft went into safe mode. During the 9-year cruise to Pluto, it operated autonomously with biweekly contacts using deep space antennas. At Pluto's distance, the round-trip light time for communications was almost 9 hours. After uploading commands for the Pluto flyby pointing and science operations, telemetry was lost during the response received 9 hours later. Failing to diagnose and fix the problem would mean a mission failure. Although impact by a space rock was a possibility, the available data showed a possible cause for triggering safe mode. With only a few contacts before the encounter, a crash effort by the Ops team resulted in a successful fix and the mission continued as planned.

New Horizons came within 7800 miles of Pluto at a speed of 31,000 mph and sent back the first beautifully clear pictures of Pluto and its moon Charon. On Pluto, it found glaciers of nitrogen ice, mountains of rock-hard water ice taller than the Rockies, exotic ice volcanoes, and mysterious layers in its atmosphere. On Charon, New Horizons discovered a canyon deeper than any on Earth.

New Horizons' extended mission was another billion miles to the Kuiper Belt, a donut-shaped region containing millions of icy bodies beyond the orbit of Neptune, left over from the solar system's early history. A New Horizons search team identified a target asteroid, MU69/Arrokoth. Out of three expeditions to determine the exact location, size, and shape of Arrokoth, one succeeded. A stellar occultation technique (when an object passes directly in front of a distant star) using twenty-five mobile telescopes deployed to Argentina, augmented by fixed telescopes, was successful. This provided high-precision astrometric constraints for navigating the flyby. Chords from five of the occultations also suggested a complex shape of two lobes, with rough dimensions of 20 by 30 km. New Horizons' cameras produced beautiful pictures of a red, smooth, snowman-shaped object, that constrain theories of the formation of these distant objects.

New Horizons is now heading out of the solar system with enough fuel for another flyby. NASA is searching for the next object. A video of Alice's talk is accessible from <https://goddardretirees.org/presentations> . See <http://www.nasa.gov/newhorizons> or <http://pluto.jhuapl.edu> for more about New Horizons.

SPECIAL NOTICE: The next **Goddard 2-mile Fun Run** is at noon on October 4th. We're looking for GRAA volunteers to be at GSFC at 11:30 AM to marshal the course. A course map is at: https://gewa.gsfc.nasa.gov/clubs/groc/logos_n_maps/NASA%20GROC%20%20Miler%20Certification%20Map.pdf Contact thomas.k.winkert@nasa.gov for instructions.

DIRECTORIES AND NEWSLETTERS: Send your email address to goddardretirees@gmail.com to get our monthly Newsletters, which include synopses of the talks, special community announcements, and obituaries. Past Newsletters and links to videos of the talks are on our website <https://goddardretirees.org>. Multi-month **abstracts of Newsletters** are mailed to the retirees with only residential addresses in our files. We depend on retirees to furnish their home addresses to be listed in the biennial **GRAA Membership Directories** only available as mailed hardcopies to members. These mailings are supported by donations to GRAA, P. O. Box 1184, Greenbelt, MD 20768-1184.

TREASURER'S REPORT: Treasurer Jackie Gasch received donations from Dedra Billings, Karen Halteman, Dick Schneider, James Metzger, Barbara Gilmore, Sally Lee Hunter in memory of Chuck Hunter.

FROM THE GODDARD ARCHIVES: Thirty-five years ago on September 29, 1988, Shuttle Discovery/STS -26 launched TDRS-C, the 2nd successful TDRS launch.

REMEMBERING OUR FORMER COLLEAGUES:

Edward "Ed" Alton Lawless, 84, died on June 9, 2023 in Rock Hill, SC. Ed was born on February 26, 1939, and graduated from Northwestern High School in Hyattsville, MD in 1957. He possessed a fascination with weather as well as space. He spent 1959-1961 in the U.S. Navy where he gained experience in meteorology and communications. This prepared him for a 37-year career with Goddard. Working in the Communications Operation Branch, Ed was known throughout the NASA world as "Goddard Voice," for which he received the NASA Exceptional Service Medal.

Robert Harold Peterson, 100, died on August 3, 2023, in Warrenton, Virginia. Robert was born on August 18, 1922, in Council Bluffs, Iowa, and served in the US Navy before working as an instrument maker/machinist at Goddard Space Flight Center.

Dave Littmann, 60, died on August 8, 2023. Born on October 25, 1963, Dave served NASA for more than 40 years, most recently as the project manager of the Mars Sample Return Capture, Containment, and Return System project in 2021 and as Project Manager for TDRS-M. He was an essential leader for the Space Network and TDRS providing vital real-time data and services required to protect astronauts and safely fly user missions. Dave's dedication to TDRS extends for decades having joined the second-generation TDRS spacecraft development program in 1995.

John Lester "Jack" Parks, Jr., 82, of Melfa, VA, formerly of Parksley, VA, died on August 12, 2023 at Riverside Shore Memorial Hospital. He received his Bachelor of Science in Electrical Engineering from Virginia Military Institute and went to work as a mathematician and engineer for NASA for 34 years, retiring in 1996, then moved to Florida for a few years, contracting with the FAA and the Eastern Range during his time there, but subsequently became a contractor range safety specialist at Wallops. In 2016 he received the NASA Director's Achievement Award for the many ways he influenced and improved range safety, not only for NASA but for the international space launch community.

Thomas Cooper Underwood, Jr, 84, died on August 12, 2023. Tom was born on September 10, 1938, in Reading, Pa., and graduated from Clemson University in 1962 with an EE degree. He had a remarkable 35-yr career with NASA. In the 1970s, Tom was the Telemetry Systems Section Head in the Network Engineering Division. In the 1980s, he was the Systems Integration & Security Branch Head and then the Assistant Chief of the Networks Division for TDRSS. In the 1990s, he was the Chief of the Space Network Project Office and then the Project Manager for the Second TDRSS Ground Terminal Project at Las Cruces, NM GSFC until 1993.

Thomas Kelsall, 89, Astrophysicist, died in Mitchellville, Md., on Aug.13, 2023. Born on Oct. 26, 1933 in Southampton, NY, he earned a BS in physics from Muhlenberg College, a MS in physics at George Washington University, and, in 1971, a Ph.D. in astronomy from the University of Maryland. Working in Goddard's Science Directorate from 1958 to 2003, Dr. Kelsall was a

designer of the Diffuse Infrared Background Experiment for the Cosmic Background Explorer (COBE) mission satellite, which provided extraordinary evidence, in the form of temperature fluctuations that supported the Big Bang Theory.

Francis “Frank” J. Lawrence, 87, of Bowie, MD, died on August 20, 2023, after a brief illness. Born in Hazleton, PA, Frank served in the United States Marine Corps from 1954-1957. After receiving his BS in aerospace engineering from Pennsylvania State University, Frank joined the fledgling space program at Goddard in the tracking and data center. As part of NASA’s Delta Expendable Rocket group, Frank supported over 200 successful launches in his 40-year career in the aerospace industry.