GRAA NEWSLETTER

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

***July* 2024 https://goddardretirees.org 40th 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, July 4.**

July 9	 **Bob Menrad,** Associate Director of Flight Projects for Exploration and Space Communications, "**GSFC Comm & Nav: A Decade of Accomplishments"**
August 13	 **Dr. Makenzie Lystrup,** Goddard Center Director, **"Goddard 2040: Current and Future Vision of the Center"**

COMMENTS FROM TONY COMBERIATE AND CARL STAHLE:

"How (and Why) NASA Moved an Asteroid: Planetary Defense and the DART Mission".

Dr. Thomas Statler, the Lead Scientist for Solar System Small Bodies in the Planetary Science Division at NASA Headquarters, and Program Scientist for multiple missions, discussed our solar system's asteroids, which ones could threaten the Earth, and what NASA is doing about it. He also vividly described the Double Asteroid Redirection Test (DART) mission, which successfully altered the orbit of the Dimorphos asteroid. Dimorphos orbits a larger asteroid called Didymos and both orbit the Sun in a Near Earth orbit. Asteroids in a Near Earth orbit are the only ones (as opposed to the Main Asteroid belt between Mars and Jupiter, and the Kuiper Belt Objects) that can threaten a collision with Earth. The Nation's Planetary Defense effort has detected and characterized over 30,000 asteroids in our Solar System since 2000. Only a few are large enough (> 1km) to destroy Earth, but they are typically not in orbits that could intersect Earth. The 10,000 asteroids, which are up to 140 km long, could destroy a city on Earth.

The DART mission was part of the Planetary Defense mitigation effort to test the capability to deflect an asteroid, altering its orbit in a measurable way, and led the way for future missions to deflect asteroids that could damage the Earth. The DART mission, built by the Johns Hopkins University Applied Physics Laboratory, was dedicated to investigating and demonstrating the ability to change an asteroid's motion in space through kinetic impact. The 610 kg DART spacecraft was launched on November 24, 2021 and impacted Dimorphos on

September 26, 2022. DART contained a telescope imager, a star tracker, and the LICIACube CubeSat which was designed to measure the change of Dimorphos' orbit after the DART impact. Tom described DART's development and the challenges of mounting and operating the star tracker in a manner that could keep the guide stars and the asteroid in the field of view, while rotating, and keep DART on the proper collision course.

Scientists knew the size of Dimorphos, but not its composition or density, so a measurement of the asteroid's ejected material after the impact had to be made to determine the orbital impact after collision. The ejected material, which was seen by LICIACube, was in the reverse direction of the impact and increased the momentum delivered by more than a factor of two. Post impact measurements showed an orbital period change of 33 seconds or 1%, and the DART mission was a major success.

Election of GRAA Board of Directors for 2024-2026: The Board selected the officers for the following positions: President - Tony Comberiate, Vice President - Carl Stahle, Treasurer - Jackie Gasch, Secretary - Babara Hamilton, and Directors at Large - Jan Kalshoven, Ron Browning, and Jim Cameron**.** A special thanks to Arlin Krueger, who stepped down from the Board after serving eight years as Vice-President and was instrumental in generating and editing both the electronic and hardcopy newsletters as well as getting speakers for our monthly meetings. Arlin will continue to support the new board members.

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 Susan Sparacino, Elaine Shell, George Roach, Patrick Melia, Nancy Ryder donated in memory of Ralph Ryder, and Gretchen Burton donated in memory of Connie Gross.

FROM THE GODDARD ARCHIVES: Twenty years ago on July 15, 2004, Delta II launched the AURA satellite as part of the Earth Observatory System to study the Earth's atmosphere. It is still providing scientific data. AURA was a collaborative effort between NASA the Netherlands, UK and Finland.

REMEMBERING OUR FORMER COLLEAGUES:

William H. Browne, Jr., 82, of Rock Spring, GA died on Tuesday, April 30th.
He was born on June 27, 1941. After working at Westinghouse, he joined Goddard as a Mechanical Engineer in 1964. His work at Westinghouse included participation in the

development of the first lunar TV used on the first moon landings and the Phantom F4 radar employed by the Air Force during the Vietnam War. He retired from NASA in 2008.

Ernest "Buz" Busboso, 90, died on May 31, 2024, at his home in Durham Ridge. Buz was born on July 6, 1933, in Honolulu, HI. He joined Goddard in 1969 as an Electronics Engineer and Verification Manager working on satellite payloads, rocket payloads, and space shuttle payloads. Buz also participated in the initial concept for the space station and the investigation of the destruction of the Challenger. His most memorable project was the Get Away Special (GAS) Program. In cooperation with students from Utah State University, he designed an apparatus to contain their experiments which was to go on the Maiden voyage of the Space Shuttle Columbia on June 27, 1982.

Anne F. Harris, 82, died on May 25, 2024. Anne had a long career working in the federal government with NASA at the Goddard Space Flight Center and later with the Social Security Administration.

Paula Emilie Jones, 94, died on June 12, 2024. Born in Linthicum Heights, MD, she was a Hampton resident for over 60 years. A 35-year civil servant, she worked as a secretary at Fort Monroe and then retired from Goddard in 1984.

Mark Alan Roberts, 57, died on June 11, 2024 at his home in Cape St. Claire, MD. Mark was born on November 20, 1966 in Washington DC. He was an Aerospace Engineer at Goddard, originally working for Computer Sciences Corporation. Over the next several years, he went on to work for McDonnell Douglas, Swales Aerospace, and as a NASA civil servant supporting the Launch Services Program. In 1997, Mark became a founding stakeholder in a.i. solutions, an aerospace startup company, where he worked for 25 years.

Larry Downing Salter, 89, died on June 3, 2024. Larry was born in Birmingham, Alabama on October 15, 1934. He was a Mechanical Engineer, whose NASA career spanned almost 40 years working at the Marshall, Goddard, and Kennedy Space Center, where he retired in 1998. During his tenure at NASA, Larry worked on many programs including all manned programs; Mercury, Gemini, Apollo, Space Shuttle and both Space Stations; Skylab and the International Space Station.

Albert Arthur Whalen, age 90, of Westminster, MD, died on Saturday, June 8, 2024. Born July 15, 1933, in Philadelphia, PA. Albert was a veteran of the Korean conflict, serving in the US Navy from 1950 to 1954. After working for Westinghouse and Weinschel Engineering, Al joined Goddard in 1962. He received the NASA Exceptional Service Medal in 1974 and Special Achievement Awards in 1977 and 1984. Albert worked on communication satellite earth stations and the Landsat, Nimbus, and Applications Technology Satellites (ATS) 1, 3, 5, 6 programs. He was the Project Manager for AIDSAT. Albert was the Integration Test Manager, responsible for developing the plans and procedures required to establish the readiness of the Tracking and Data Relay Satellite System (TDRSS) Network. He retired from NASA in 1984.