



Indonesia Launches Palapa

A 600-year-old dream of national unity became reality for Indonesia with the launching of a communications satellite, Palapa-A, for that country by NASA from Cape Canaveral, Florida, on July 8.

The spacecraft was placed in synchronous orbit 35,800 kilometers (22,300 miles) above the equator by a Delta rocket, marking 25 consecutive successful launches for Goddard's Delta launch vehicle, 23 of which were within three-sigma of perfect orbit. This ties the previous Delta record of 25 straight successes that has stood since 1968. The current string of successes includes Delta 101 through 125 and the introduction of the TRW-201 engine in the second stage and the Model 2000 and 3000 series of vehicles.

The Palapa-A was drifted at a rate of two to three degrees a day to its on-station position just below the tip of India at 83 degrees E. longitude. It will be demonstrated on August 17

when Indonesia celebrates its 31st anniversary of independence.

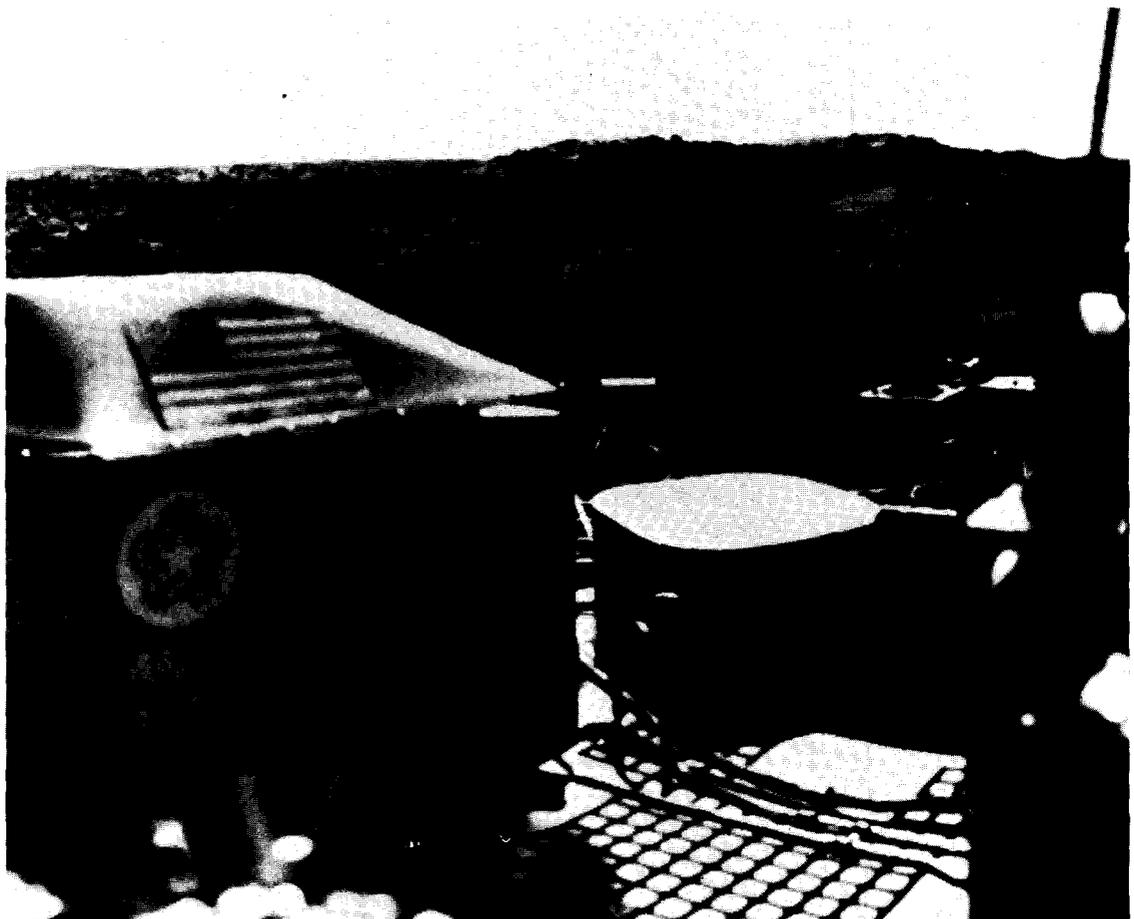
At that time some 3000 inhabited islands among the 13,000 islands in the archipelago will be united with instantaneous telephone, radio, TV, telex and data communications via the satellite. This was the reason Indonesian authorities decided on satellite communications—to provide immediate and nationwide unity via satellite communications.

There is one earth station in each of Indonesia's 26 provinces which can transmit and receive from Palapa thus binding the 120 million Indonesian people together in a way impossible to achieve without the satellite.

Indonesian officials selected satellite communications because of the tremendous problems to be overcome in establishing communications links among the islands by conventional means.

MARS

PHOBOS (above) was photographed by the Viking Orbiter I on July 25. The large crater near the North Pole is approximately 5 kilometers (3 miles) across, while craters only a few hundred meters wide are also visible. Only about one-half of the surface of Phobos facing the camera was illuminated. An American flag (right) stands on the surface of Mars mounted on the housing of Viking I's nuclear power system. The bright, flat surface near the center is the seismometer container. This view of low hills west of the spacecraft was taken July 23 at about 2:30 p.m. Mars time.



Key Personnel Appointments



Dr. Alan M. Lovelace

President Ford announced on June 21 his intention to nominate Dr. Alan M. Lovelace of Severna Park, Maryland, as Deputy Administrator of NASA. Dr. Lovelace, 46, is currently NASA's Associate Administrator for Aeronautics and Space Technology, where he has served since September 1974.

Dr. Lovelace has held various research management positions in the U.S. Government since joining the Department of Defense in 1954. He served at the Air Force Materials Laboratory, Wright-Patterson Air Force Base, Ohio, from 1954 through 1972. He was named Director of that Laboratory in 1967. From 1972 to 1974 he served as Director of Science and Technology with the Air Force Systems Command at Andrews Air Force Base. From October 1973 to September 1974 he also served as Acting Deputy Assistant Secretary of the Air Force (Research and Development).

Born in St. Petersburg, Florida, Dr. Lovelace holds bachelors, masters, and doctorate of philosophy degrees in chemistry from the University of Florida. He has received numerous awards and has authored many technical papers.

Dr. Lovelace and his wife, Kathryn, have two children, William and Denise.



Robert A. Newman

NASA Administrator Dr. James P. Fletcher has named Robert A. Newman as NASA's Assistant Administrator for Public Affairs, effective July 26. Newman was previously Vice-President of Community Affairs for TRW, Inc., and is President of the TRW Foundation, Cleveland.

In his new position Newman will report to the Associate Administrator for External Affairs as the official responsible for all of the information services of the space agency except for technical publications.

Newman's career includes public relations, advertising, marketing and corporate relations with Caterpillar Tractor Company, Brunswick Corporation, General Electric and TRW. He has been serving as a member of the Board of Directors of John Carroll University, Women's Federal Savings and Loan of Cleveland, Government Research Institute, Western Reserve Historical Society, Cleveland Scholarship Program and the Air Force Academy Foundation.

Newman received a bachelor's degree in journalism in 1955 and a bachelor's degree in sociology in 1956 from the University of Missouri.

Newman was born in Childress, Texas, on April 17, 1930.



Puleo Attends IMAGE

Dora Puleo of Goddard's Equal Opportunity Programs Office was one of NASA's Spanish-speaking program coordinators in attendance at the fourth annual meeting of IMAGE held recently in Dallas. A national organization, IMAGE is concerned with broadening employment opportunities for Spanish-speaking Americans in federal, state and local governments.

NASA program coordinators pictured above are, from left: Rudolfo Barraza, Marshall Space Flight Center; Hermilio Gloria, NASA Headquarters; Alfonso J. Lundi, NASA-wide Spanish-speaking program coordinator; Ruben Ramos, Ames Research Center; Dora Puleo; Emilio Alfaro-Boa, Langley Research Center; and Fernando Esparza, Kennedy Space Center.

Trombka Named to Lunar Mission Team

Dr. Jacob I. Trombka, a Space Scientist in Goddard's Spectroscopy Branch of the Laboratory for Solar Physics and Astrophysics, was one of eight scientists recently chosen by NASA's Office of Space Science to study and develop experiments for a proposed unmanned lunar mission in 1980.

The first U.S. lunar mission since 1972, the moon flight would be carried out with a low-cost, instrument polar-orbiting spacecraft and a smaller companion subsatellite launched together from Cape Canaveral by a single Delta launch vehicle.

The spacecraft would orbit the Moon for a year, examine nearly all of the lunar surface with a battery of scientific instruments. From the data, scientists would be able to measure the Moon's gravity, magnetism, and heat flow and



Dr. Jacob I. Trombka

to determine the chemical and mineral composition of the Moon's surface.

Dr. Trombka's X-ray spectrometry experiment and two similar experiments would use advanced remote sensing techniques based on gamma-ray, X-ray, and reflection spectroscopy to create chemical maps of the lunar surface.

GSFC Hosts International Gamma-ray Symposium

Scientists from around the world were at Goddard from June 2 through June 4 for the second international gamma-ray astronomy symposium entitled "The Structure and Content of the Galaxy and Galactic Gamma Rays." The three-day affair, held in the Building 26 auditorium, was organized by a committee co-chaired by Dr. Carl Fichtel, head of the SAS-2 team, and Dr. Floyd Stecker of the Theoretical Studies Group. Other members of the committee were Dr. Carol Crannell and Dr. Jacob Trombka of the Laboratory for Solar Physics and Astrophysics, Dr. Frank Jones of the Theoretical Studies Group, and Dr. Donald Kniffen and Dr. David Thompson of the Laboratory for High Energy Astrophysics.

Since the first international symposium in 1973, there have been significant theoretical and experimental advances in gamma-ray astronomy, due in large part to Goddard's highly successful SAS-2 satellite experiment.

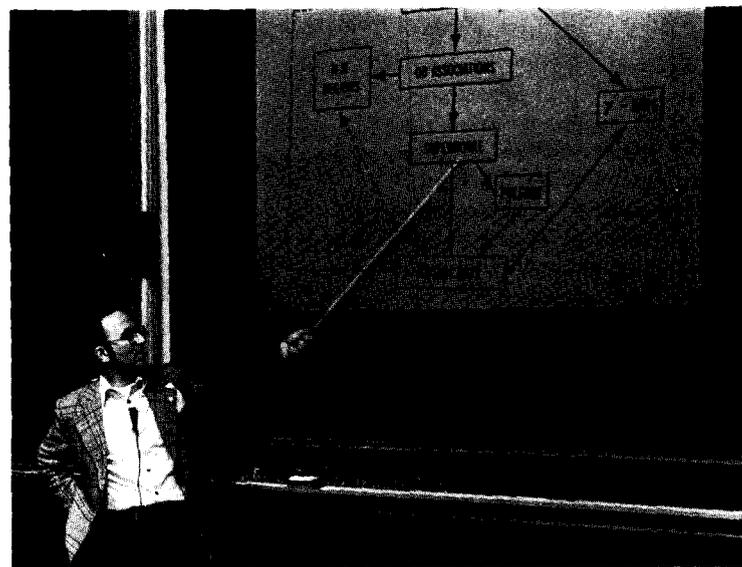
In particular, gamma-ray astronomy is unique among all the branches of observational astronomy in allowing us to study the distribution of high energy cosmic rays in the galaxy. The interactions of these cosmic rays with interstellar gas produce most of the gamma-rays which have been observed. Already, a big breakthrough appears to have been made, with the participants of the symposium generally agreeing that the gamma-ray results from SAS-2 have provided strong evidence that most cosmic rays which bombard the Earth originate in our own galaxy rather than in extragalactic objects.

Among the speakers from Goddard at the symposium were David Thompson and Robert Hartman of the Laboratory for High Energy Astrophysics, who presented an up-to-date summary of the SAS-2 results. Donald Kniffen and Floyd Stecker discussed the theoretical implications of the gamma-ray results for large-scale galactic structure studies.

Dr. Carl Fichtel and Dr. Jacob Trombka took part in a panel discussion on future gamma-ray astronomy missions.

New results reported by Thompson and Hartman include sky maps of the Milky Way as seen in gamma-rays and evidence of gamma-ray pulses from four pulsars, one of which is the famous pulsar in the heart of the Crab Nebula.

Kniffen discussed possible SAS-2 evidence for gamma-rays being produced primarily by concentrations of cosmic rays in spiral arms of the galaxy. A detailed model worked out by the SAS-2 team based on this assumption was compared with the newly presented SAS-2 data. Stecker showed that the galactic gamma radiation is coming from the regions of the galaxy which are richest in the dense molecular clouds from which form the hot, young, super-giant stars which evolve into supernovae. Supernova remnants are also abundant in the regions of the galaxy having the strongest gamma-ray emission. Stecker's analysis



DR. FLOYD STECKER discusses the relationship between gamma-ray astronomy and various galactic phenomena.

of the gamma-ray observations suggests that the vast majority of the cosmic rays which bombard the Earth are produced either in our own galaxy as the result of supernova explosions or from pulsars that result from supernova explosions.

Stecker's findings provide new support for a view held by many astrophysicists, one first suggested by Baade in the

1930s, that cosmic rays originate in supernova explosions. The work of both Kniffen and Stecker supports the galactic origin hypothesis for cosmic rays. The opposing viewpoint, held by many distinguished astrophysicists, that cosmic rays are extragalactic and are produced in strong extragalactic radio sources, now appears to be highly unlikely.

O'Keefe Publishes Book on Tektites

Tektites—those fascinating glass pebbles that fall from the sky, are featured in a new book titled, "Tektites and their Origin" by NASA/Goddard geophysicist Dr. John A. O'Keefe. In the book, Dr. O'Keefe says that you can literally buy a piece of the moon for just a few dollars.

Dr. O'Keefe emphasizes that tektites are ejected from lunar volcanoes, not splashed by meteorite impact from the moon or the earth as was previously suggested. The lunar missions which have disclosed tektite-like glass in the dust at some sites, the study of microscopic tektites from the seabottom, and the volcanic appearance of some layered tektites have caused this change of ideas.

Dr. O'Keefe graduated from Harvard where his paper on clouds of soot around certain carbon-rich stars suggested the idea that some interstellar dust



Dr. John A. O'Keefe

is soot. His Ph.D. is from Chicago. He received the Meritorious Civilian Service award from the Corps of Engineers for disentangling the geodesy of China during World War II and designed the technical aspects of the military coordinate system used by the U.S. and NATO. He helped Carl Aslaksen overthrow the Michelson-

Anderson value of the velocity of light and devised the array of trihedral reflectors used in distance measurements. He was one of the authors of the proposal from the American Rocket Society to the National Science Foundation which led to the Vanguard project. He led teams which obtained, from Vanguard, first the theory of the flattening of the earth, and then the theory of the third harmonic (the pear-shaped earth). This helped initiate the geodetic use of satellites.

Dr. O'Keefe used the results of the Mercury project to write the first papers on manned space science. In a joint paper with Nobelist Harold C. Urey, he used the data from the Apollo program to draw the conclusion that the moon came out of the earth.

Dr. O'Keefe lives with his wife, Martha, and nine children in Chevy Chase.

Bendix Sponsors Loss Prevention Course

ADA-3

Fire, Safety and health specialists from space tracking stations around the world were at Goddard during May and June for an intensive loss prevention training course conducted by Bendix Field Engineering Corporation.

The fourteen course participants came from stations and support elements of the Spaceflight Tracking and Data Network (STDN), the worldwide system of NASA tracking stations. Bendix operates 12 of these stations.

The term "loss prevention" is used by Bendix to include all activities relating to safety and health. During the five-week course at Goddard's Network Test and Training Facility, students learned and practiced the latest techniques in emergency medical care, fire prevention and firefighting, defensive driving, drug and alcohol abuse prevention and other subjects related to industrial safety.

Safety is an important part of the operation of the space tracking network, and NASA and Bendix give particular emphasis to having well-qualified personnel at each station who can handle any emergency. Because many of the stations are located in remote areas with no nearby medical facilities, immediate care may mean the difference between life and death.

The course, the most intensive loss prevention training ever conducted at the Bendix-operated training facility, was



STDN LOSS PREVENTION SPECIALISTS learn that controlling a fire hose can be hard work. This part of the Bendix training course was conducted at the University of Maryland.

designed by STDN Loss Prevention Program Specialist Bruce Hursey under the cognizance of the Goddard Health and Safety Engineering Office, to enable the participants to return to their stations fully qualified as instructors.

At graduation ceremonies, special recognition was given to the loss prevention course participants by NASA and Goddard management. James C. Bavely of the NASA Office of Tracking and Data Acquisition gave the keynote address, and Captain Reuben P. Prichard, Jr., NASA Director of Safety and Environmental Health, was a guest.

Morgan State Program Resumes

Eight faculty members from colleges and universities with substantial minority enrollments in Maryland, Delaware, Pennsylvania and the District of Columbia are taking part in the sixth GSFC/Morgan State Summer Faculty Research Program. Each participant is devoting full-time effort to research under the direction of Goddard technical monitors on practical problems in mathematics, computer science, physics, chemistry, management systems, and mechanical, electrical and electronic engineering. The 10-week program which began on June 2 is being coordinated by Dr. Nathaniel K. Proctor, Professor of Biology at Morgan State.

Faculty members participating in the program are: Bernice Eboh, Morgan State; Dr. Proctor; Dr. Edward Sommerfeldt, Coppin State; and Dr. Dah-Nien Fan, Howard University. Back row: Dr. Richard Hope, Morgan State; Bernice Henderson, Morgan State; and Dr. D. Craig Munshower, Cheyney State. Now shown are Dr. Alan Truelove, Federal City College, and Dr. Cheng-Jin Fan, Morgan State.

Goddard technical monitors are: John Rogers, Thermodynamics Branch; James F. McGarvey, Flight Performance Branch; Betsey O'Brien, Management System Office; James Zerega, Procurement Management Division; Dr. George Jacobs, Earth Resources; John E. Green, Network Support; Eugene Young, Network Operations Control; and James R. Mundy, EEO.

The summer research program is designed to foster cooperation between participating institutions and Goddard, to increase the resource base available to Goddard for application to its research mission, and to benefit the academic process at participating institutions.

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GODDARD NEWS is published monthly by the Office of Public Affairs at the Goddard Space Flight Center, Mail Code 202, National Aeronautics and Space Administration, Greenbelt, Maryland 20771.

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