NASA
National Aeronautics and Space Administration
Goddard Space Flight Center

# Goddard News

Greenbelt, Maryland and Wallops Island, Virginia

Vol. 30 No. 12 December 1984

## We Got The Spirit

*Goddard Exceeds Goal In CFC Drive*

Goddard employees did, indeed, "Catch the Spirit of Giving," in the 1985 Combined Federal Campaign (CFC). They exceeded the Center's $215,000 goal by the November 16 deadline; as of November 21, the Center's CFC chest totaled $236,074, with many employees still making contributions.

The Center's 1985 CFC Chairman Howard K. Ottenstein said that because pledge cards are still arriving, Goddard could break its all-time CFC record for giving.

Ottenstein, code 402, also said an additional $2,000 to $3,000 had been donated on Central Maryland cards, which is not included in the National Capital Area total. Under the new CFC regulations, which allow contributors to give to the eligible organization of their choice, most Central Maryland pledges were written in on the National Capital contribution card.

Although supplies arrived late, delaying the start of the campaign, it shifted to high gear almost from the outset, with each directorate surpassing its respective goal. One-hundred "key" workers contributed significantly to the CFC drive, Ottenstein said.

Goddard's 1985 CFC Committee included the following lead coordinators: B.J. King, code 100, Naomi Hirose, 150, Linda Wetzel, 200, Marietta Sturgell, 300, J. Hines, 400, Roberta Valonis, 500, Gayle Richardson, 600 and Clay Magee, 700.

Final results of the 1985 National Capital Area CFC will be published in the next issue of the Goddard News.

### *ON THE COVER*

**Clockwise from top left, the spacecraft depicted are the following: Hubble Space Telescope; International Cometary Explorer (ICE); Solar Maximum Observatory; Space Station; Tracking and Data Relay Satellite (TDRS); Earth Radiation Budget Satellite (ERBS) and Landsat.**

# First Man-Made Comet To Appear

## *Satellite Will Create Gigantic Barium Cloud*

By Carter Dove

As part of the world's first active deep space probe, the first man-made comet ever is scheduled to appear briefly in the dawn Christmas skies of the western United States and parts of the Pacific, including Hawaii.

The comet will form when a satellite — one of three in an international effort to learn more about the Earth's magnetosphere — produces a 160 km (100 mile) diameter cloud of barium vapor 113,000 kilometers (70,000 miles) above the Pacific Ocean off the coast of Lima, Peru.

The holiday comet can be seen by the unaided eye at 4° west of Spica in the Constellation Virgo (southeast skies) at 4:18 a.m. (PST) Christmas day for about 10 minutes (20 minutes with 7×50 binoculars) from west of a line connecting Mexico City; Houston, Texas; St. Louis, Missouri; Milwaukee, Wisconsin; and Canada's Belcher Islands to the eastern Pacific, including Hawaii.

Appearing from Earth to be about one-sixth the diameter of the Moon, the comet—tail and all—will be pale yellow-green during the first minute and purple-grey thereafter.

Project scientists chose Christmas Day to deliver the deep space "package" because it's the only day of the year that all of the following favorable conditions exist:

- New moon
- Comet visible from western U.S. and eastern Pacific
- Sun below −18°
- German/British satellites near apogee and aligned with flow of solar wind

"The 'Christmas Comet' ", according to Goddard project manager Gil Ousley, "will be the most visually spectacular part" of a unique international scientific project known as AMPTE — Active Magnetospheric Particle Tracer Explorers. "The main objectives of the mission are to determine how the solar wind interacts with the Earth's magnetosphere", Ousley added.

Scientists, of course, also hope that the comet experiment will shed additional light on how the solar wind interacts with an artificially-injected plasma (barium).

The magnetosphere is an envelope of magnetic field and charged particles surrounding the Earth, extending approximately 64,000 km (40,000 mi) toward the

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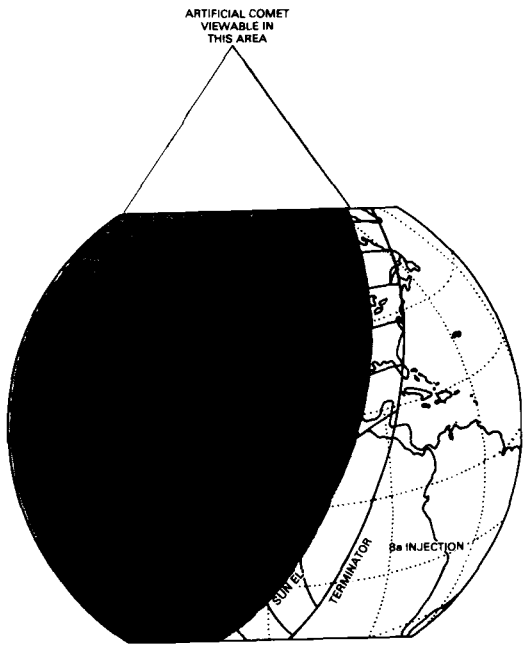



**Man-Made Comet-The artificial comet to be generated by the Active Magnetospheric Particle Tracer Explorers (AMPTE) project on December 25 will be viewable, depending on atmosphere and space weather conditions, by those west of a line connecting Mexico City; Houston, Texas; St. Louis, Missouri; Milwaukee, Wisconsin; and Canada's Belcher Islands to the eastern Pacific, including Hawaii.**

## Man-Made Comet

*Continued from page 2*

Sun and at least 6 million km (4 million mi) away from the Earth on the night side; the solar wind is a stream of hot ionized gas expanding outward from the Sun in all directions at a speed of about 1.6 million km (1 million mi) an hour.

### Three Satellites

The "vehicles" for the experiment are 3 satellites — one each from the United States, the United Kingdom and the Federal Republic of Germany — placed in orbit by the same Delta rocket from Cape Canaveral, Florida on August 16, 1984.

While near its apogee altitude of 113,000 km (70,160 mi), the German satellite will release four 10 kilogram (22 pound) canisters of barium yielding 2.5 kg (5.5 lbs) of barium vapor. The release will be analyzed by its British companion (traveling 3 minutes behind) in one orbit and the American satellite in another near its apogee of 49,684 km (30,880 mi). The British and American satellites will trace the movement of the cold, dense barium comet as well as analyze the composition of the naturally-occurring charged particles inside the Earth's magnetosphere.

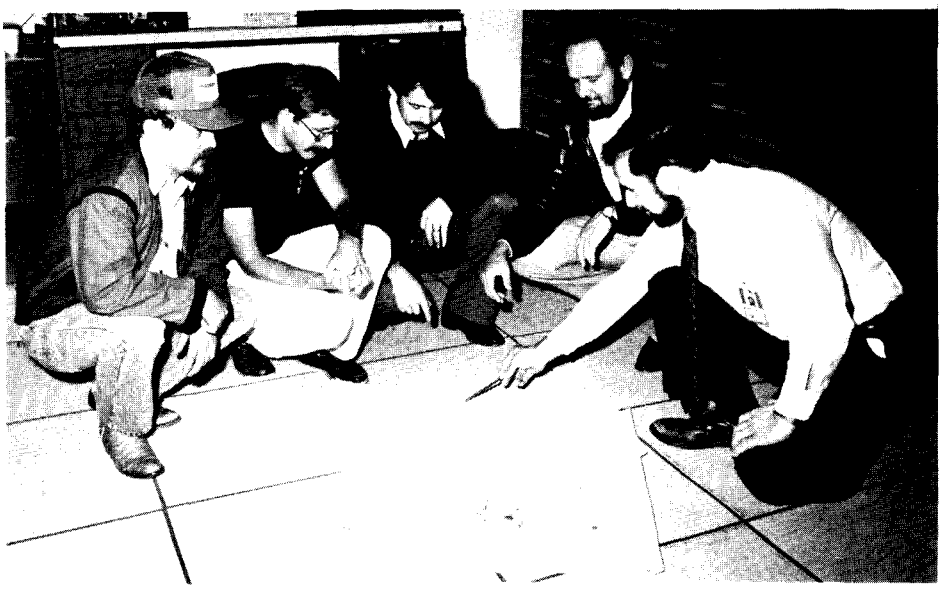
In earlier AMPTE project experiments (Sept 11 and 20) the German satellite released a tracer dye of lithium into the solar wind outside the Earth's magnetosphere. Preliminary results from those experiments indicate that less than 1% of the solar wind gains access to the magnetosphere under the conditions in which the release took place.

### Lithium Releases

If viewing or space weather conditions are not acceptable for the comet experiment on Dec. 25th, it will be postponed until Dec. 27th. Also planned — but not visible from Earth — are 2 more lithium releases in the magnetotail in the spring of 1985.

Although many passive deep space experiments (measuring the natural environment) have been conducted in the past, the AMPTE project for the first time has actively introduced tracer elements such as lithium and barium into space for analysis.

Goddard project scientist Dr. Mario Acuna sees active space experiments such as AMPTE "providing an improved understanding of Sun-Earth interactions, including possible correlations between solar activity and the weather." Looking to the future, Acuna says "the AMPTE spacecraft measurements will also provide useful information about the possible effects of energetic ions on spacecraft electronics and subsystems."



Joe Walters Photo

**SOUTH POLE BOUND - Mike Comberiate (r), who heads the South Pole Satellite Data Link Project team, indicates the area where the team will install the first satellite communications system. Below the map of Antarctic is a photograph of the South Pole region.**

**From left to right SPSDLP team members: Mike Lewis; Joel Gallun; Comberiate's brother, Anthony; Dave Provost, and Comberiate.**

# Goddard Team Antarctic Bound

## *To Establish First Satellite Communications Link*

**By David W. Thomas**

A six-member team of experts from NASA's Goddard Space Flight Center is in the Antarctic to establish the first satellite data link from the South Pole.

If successful, the team's efforts will open year-round collection of scientific data from the Pole, in the past considered a highly improbable feat, even with large expenditures. The Goddard expedition is expected to cost approximately $250,000.

The project is being supported by NASA, the National Science Foundation (NSF), the Applied Research Laboratory of the University of Texas (Austin), the National Oceanic and Atmospheric Administration (NOAA), plus a number of other government, private and educational institutions and some individuals.

### Other Systems Considered

To establish a system other than by satellite would cost an estimated $35 million, according to Michael A. Comberiate, the Goddard engineer who conceived the idea and heads the team. Hardline connections from the Pole have been ruled out, he said, because the ice moves and adversely affects communications. A microwave system of 36 stations across the polar plateau, the crevasse-riddled glaciers, the trans-Antarctic Mountains and the frozen Ross Sea would prove extremely difficult, he continued, because of the severe winter weather which brings temperatures of 120 degrees below zero Fahrenheit (−84 Centigrade) and winds as high as 200 miles an hour (230 knots).

"The project could revolutionize communications in the region," explained Comberiate. "Currently, scientific data collected from the Pole during the winter months must be stored and shipped out by aircraft during the Austral Summer (November 1 - February 1)."

Comberiate, who came up with the idea in 1983 when he went to the Antarctic as a volunteer systems engineer, will use existing polar-orbiting satellites to relay data from the Pole to McMurdo Sound, and then re-transmit the data to a geosynchronous satellite 22,300 miles (35,887 kilometers), which, in turn, would transmit

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**South Pole Bound**
***Continued from page 3***

the information to the Continental U.S.

The McMurdo Station, located on the edge of Antarctica (−77 South Latitude), is barely in view of Intelsat V, one of the satellites in the International Maritime Satellite (INMARSAT) system hovering over the Equator in geostationary orbit. Signals from a transmitter at the Pole (−90 South Latitude) are too far below the "horizon" to be acquired by a geostationary satellite.

### Ham Radio Used

Ham radio communications are used from the Pole, Comberiate explained, but they bounce off the Earth's ionosphere and are not suitable for transmitting scientific data.

"That area has one of the noisiest ionospheric regions in the world," he said, "thus high quality data collection would not be possible using those transmissions."

The link with the Landsat 4 and 5 satellites, with Dynamics Explorer 1 (DE-1) and with Nimbus 7 will allow reliable transmission of routine, high-volume data from scientific investigations being conducted at the Pole-currently by approximately 20 different institutions.

Another independent link to the Applications Technology Satellite (ATS-3) will be attempted to establish two-way voice communications between the Pole and Goddard, located in Greenbelt, MD.

The National Science Foundation (NSF) is providing transportation and travel for the Goddard team, more than five tons of gear and approximately $250,000 in new equipment. The U.S. GeologicalSurvey (USGS) is providing winter-over operators and site planning, and the Applied Research Laboratory at the University of Texas (Austin) is providing ground support equipment and software. The National Oceanic and Atmospheric Administration (NOAA) is providing the use of Landsats 4 and 5, both of which are Earth resources satellites.

Personnel at Goddard are providing the technical expertise, manpower for the design, integration, testing and installing of the system in the field. The Center also has contributed some excess, but special purpose equipment, thermal blankets for the antennas and other key support, according to Comberiate.

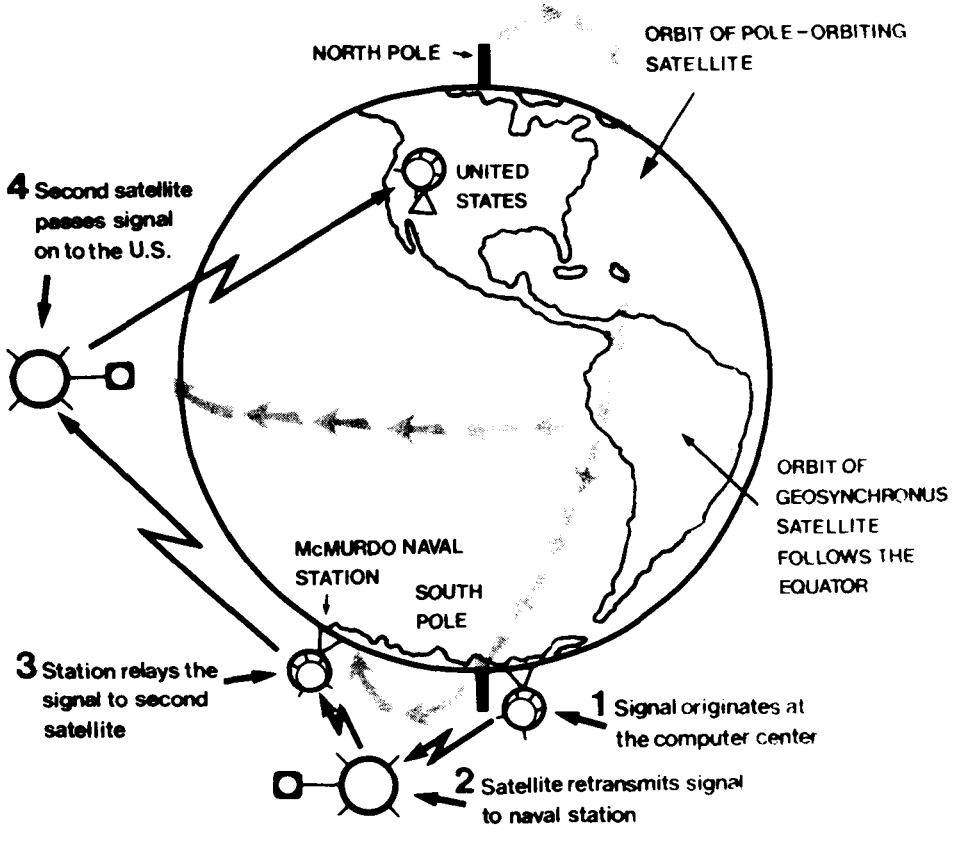
"Support from everyone has been tremendous," explained Comberiate. "We just started on this last spring, and projects normally do not move this fast in government. In almost all cases, though, the people involved bent over backwards to reduce lead times to a fraction of what normally would be expected."

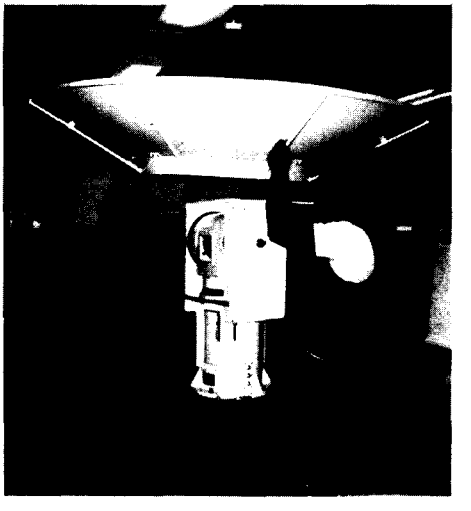
"In some cases," he explained, "they are donating equipment just to be a part of the first attempt to establish a communications link across the Antarctic."

In addition to Comberiate, other Goddard employees participating in the six-week-long expedition are Comberiate's brother, Anthony, a communications expert; Dave Provost, a data systems specialist; Mike Lewis, radio technician, Bendix Field Engineering Corp. (BFEC); Dwight Veney, radio equipment repairman, BFEC, and Joel Gallun, software specialist, OAO Corp.

***"Support from everyone has been tremendous. We just started on this last spring, and projects normally do not move this fast in government."***

***—Mike Comberiate***



**RADOME - Mike Comberiate (r) and Mike Lewis of the South Pole Satellite Data Link Project prepare to package a radome for transportation to the South Pole.**

**TDRSS AWARDS - Goddard retiree Tecwyn Roberts (r) was one of 34 individuals who received honor awards at Goddard recently for their contributions to TDRSS. Roberts received the highest award that Goddard can bestow on its employees. From left to right: Robert O. Aller, associate administrator, NASA Headquarters Office of Space Tracking and Data Systems; James M. Beggs, NASA administrator; Center Director Noel W. Hinners and Roberts.**

# *TDRSS Awards Ceremony Held*

## *Thirty-Four People, Ten Groups Acknowledged*

In an awards ceremony at Goddard November 26, NASA formally honored individuals and groups that helped save the Tracking and Data Relay Satellite (TDRS) and that have kept it flying since.

A team of Goddard and industry engineers used six one-pound thrusters on the errant satellite to push it 14,000 km (8,600 mi) higher in space after it failed to reach proper orbit. Their successful effort required 39 adjustment burns totaling 44 hours to correct the 18-hour elliptical orbit to the 36,000 km (22,300 mi) high geosynchronous orbit desired for TDRS-1.

TDRS-1 had been deployed from the Shuttle (April 4, 1983) nearly three months earlier, but began tumbling when the satellite's Inertial Upper Stage (an Air Force-manager booster rocket) malfunctioned. The failure was identified as a collapsed second-stage nozzle Techroll Seal, a flexible ring which allows the nozzle to move and provide directional control.

The TDRS save was heralded as one of the ten top engineering feats of 1983 in the National Society of Professional Engineers 18th Annual Outstanding Engineering Achievements Competition.

NASA Administrator James M. Beggs, Center Director Noel W. Hinners and Center Deputy Director John Quann presented NASA/Goddard awards to 34 individuals and 10 groups from Goddard and to a host of other individuals and groups from other NASA field centers and from private industry.

### NASA Awards

Twenty-three Center employees and five groups received NASA Headquarters honor awards: Ronald K. Browning, former project manager for NASA's TDRSS at Goddard received the Distinguished Service Medal, the highest award NASA presents to its employees; H. Robert Lynn, Richard Sade and Robert E. Spearing received the Outstanding Leadership Medal; and John J. Schwartz got an Exceptional Engineering Achievement Medal.

The 13 who received Exceptional Service Medals were Jerome Barsky, Raymond Davis, Charles Hunter, Daniel Knighton, James Moore, Gary Morse, John Morton, Richard Tagler, Jerome Teles, Virgil True, Thomas Underwood, Charles Vanek and Thomas Williams.

The following Goddard groups received awards: Network Control Center Development and Operations Teams, the Network Support Committee for TDRS-1, the TDRS-1 Recovery Team, the TDRSS Project and the TDRSS Recovery Public Affairs Team.

Five employees received Certificates of Appreciation from the Space Agency: Charles Brown, Paul Heffernan, William Isley, John Jacintho and Jerome Taube were honored for their support of the TDRS save.

### Center Awards

Twelve individuals and five groups received Center Honor Awards.

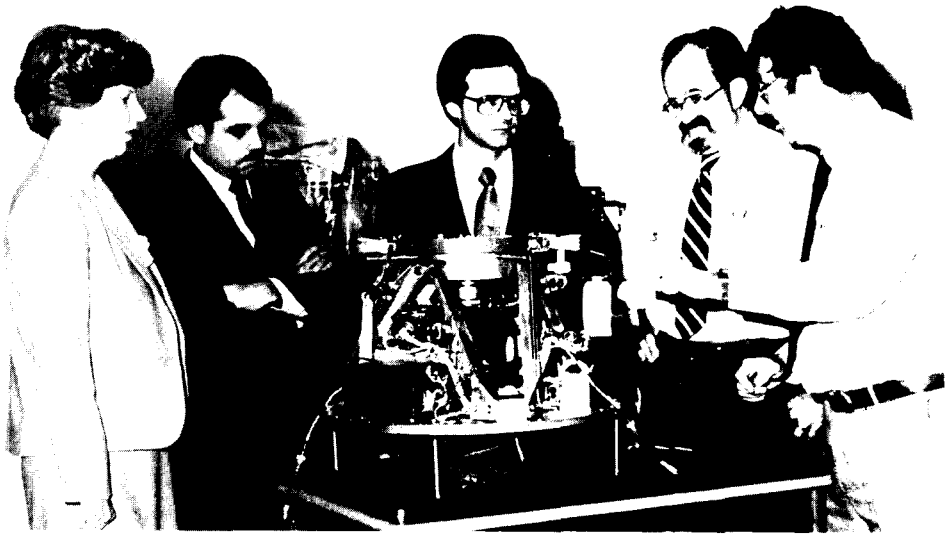
Tecwyn Roberts was presented Goddard's Award of Merit, the highest level of recognition the Center can bestow on its employees.

The groups receiving Center awards were: the Bendix Field Engineering Corporation Space and Ground Tracking Support Personnel, the Quality Assurance and Control Offices, the TDRSS Compatibility Test, Simulations and Network Fallback NCC Teams, the TDRSS Requirements, Planning and Analysis Team and the TDRSS Westinghouse Technical Support Team.

The following persons received Goddard's Exceptional Achievement Award: Wesley Bodin Jr., Robert Burns, Jerre Hartman, Michael Johnson, John Lovelace, Jeffrey McKenzie, Betty Millar, H. Wade Stonesifer, Raymond Tatum, John Voelkel and Albert Whalen.

When the total TDRSS becomes operational, the three-satellite network will be able to view 85 to 100 percent of the Earth orbits of most user-spacecraft below them, which will offer a major improvement over the 15 to 20 percent of a satellite's Earth orbit that currently can be viewed through Goddard's worldwide network of ground stations.

TDRS-B is scheduled to be launched no earlier than February 1985, according to Goddard officials. TDRS-1 already has proved its worth by expanding significantly the Earth-communications window with a variety of NASA spacecraft, including the Shuttle. TDRS-1 performed exceptionally during the ten-day STS-9/Spacelab I mission, in which the Shuttle Columbia and its payload were able to remain in contact with Earth more than 99 percent of the time the Orbiter was within range of the satellite.



**GAS EXPERIMENT - Goddard's Get Away Special (GAS) Program Manager Jim Barrowman (right) explains a GAS experiment to officials from Kentucky who plan to reserve a GAS canister for a future Shuttle flight. From left to right: Donna Miller, GAS program manager, NASA HQ; Kris Kimel, representative from the Kentucky Lt. Governor's Office; Lee Todd, president, Data Beam Corp., and chairman, Science and Technology Committee of the Kentucky Tomorrow Commission; Clarke Prouty, Goddard GAS technical liaison manager and Barrowman.**

# *Kentucky Group Puts $500 Down*
## Reserves Canister For Future Experiment

By David W. Thomas

Goddard and NASA Headquarters (HQ) officials last month met with representatives from Kentucky Tomorrow, a newly-formed commission on the state's future, and indicated they would accept a $500 down payment from the commission on a Getaway Special (GAS) canister to be flown on an upcoming Shuttle flight.

The event is part of an overall plan to nurture the state's drive for increased education in science and technology.

Commission members, a representative from the Kentucky Lt. Governor's Office and the president of a Kentucky firm, visited Goddard November 1 to learn more about NASA's GAS program, which is managed by Goddard.

NASA offers the GAS program to anyone who wishes the opportunity to fly a small experiment aboard the Shuttle. The experiment must be of a scientific research and development nature.

The commission plans to donate the GAS canister to the winners of a future contest in Kentucky's school system, according to Kris Kimel of Kentucky Lt. Governor Steven Beshear's Office.

"Plans to implement the contest are just beginning," Kimel said, "which is why we're here . . . to find out the best way to start such a contest."

Kimel added that Story Musgrave, a mission specialist on STS-6 and also a commission member who claims Kentucky as his home state, suggested the GAS contest idea to foster the move to upgrade education in science and education within the state.

Kimel was accompanied by Lee Todd, president, Data Beam Corp., and chairman, Science and Technology Committee of the Kentucky Tomorrow Commission.

While here, the commission members heard presentations on the GAS program from private sponsors, from the Prince George's County School System and from Goddard's Jim Barrowman and Clarke Prouty, GAS program manager and technical liaison manager respectively. Donna Miller, GAS program manager, NASA HQ, also attended the meeting and provided additional information on the GAS manifest.

The meeting was arranged by Elva Bailey and Richard Crone of the Center's Education Office, which has helped establish several previous GAS programs locally and nationally.

# Dr. Kupperian Dies

**James E. Kupperian**

Dr. James E. Kupperian, 59, considered by his colleagues the founder of NASA's space astronomy program, died of a heart attack recently at a local health center. Dr. Kupperian served in numerous positions of increasing responsibility since joining Goddard at its inception in 1959. His latest post was Associate Director for User Systems in the Flight Projects Directorate.

Many in the scientific community - business and government - knew him, but few knew of the contributions he made to space science and space technology, according to Maury Dubin, code 616, who often worked closely with Dr. Kupperian during the latter's tenure at Goddard.

"Dr. Kupperian, perhaps more than anyone else, was responsible for America's advanced position in space astronomy," said Dubin, a Goddard physicist. "He probably pushed this country ahead of the rest of the world by nearly a decade with his contributions."

After receiving his Ph.D. in physics from the University of North Carolina, Dr. Kupperian moved to the Washington area about 1954 and joined Herbert Friedman's staff at the Naval Research Laboratory (NRL), which, at the time, was the only group involved in space astronomy research in the U.S.

Dr. Kupperian and other luminaries in the field developed photometers capable of detecting near ultraviolet radiation, an unprecedented achievement at the time. These photometers eventually were flown on Aerobee rockets to explore stellar and solar radiation, the study of which previously had been blocked by the Earth's atmosphere. The Aerobee rocket launches provided new information on the ultraviolet sky and paved the way for future advancements.

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## Dr. Kupperian

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Based on a single Aerobee rocket flight that mapped the ultraviolet sky, Kupperian and his associates, the core group at NRL that would eventually become a component of Goddard, drafted a plan for space astronomy using pointed space telescopes.

Dr. Kupperian became even more active in space research once Goddard was formally established.

In 1959, he became an advisor on the late Homer Newell's (former NASA associate administrator) staff at NASA Headquarters, where he was instrumental in planning the space research program. He formed and led the Goddard group that evolved into the astronomy division. He wrote the plan for the Orbiting Astronomical Observatories, and he tried to improve sounding rocket technology by designing and developing stellar pointers capable of one arc per second.

Dr. Kupperian's contributions span from being one of the pioneers in space research to being the brainchild behind the OAO project and more, according to Dubin. He was both project scientist and deputy project manager for the OAO project, which included the largest spacecraft payload for space astronomy. The OAO project was one of the most significant scientific research programs of the 60s.

It also was the first demonstration that large aperture telescopes could be placed in space and pointed precisely at celestial objects, and it was the forerunner to the Hubble Space Telescope, the next giant step in space astronomy, scheduled for a Shuttle launch in 1986.

Dr. Kupperian is most noted for his work on the OAO project, but his contributions to the development of fine-pointing sounding rockets and to overall space research are equally as important.

Dr. Kupperian lived in Bowie, Maryland and was born in Milwaukee. Survivors include two children, James E. III and Virginia Jean, and his mother, Amanda Kupperian all of Bowie.

**NIMBUS AWARDS - Five of the 280 Goddard employees who were honored for their participation in the Nimbus-7 project display the plaques they received at Goddard during ceremonies November 20. From left to right: Albert J. Fleig, Nimbus project scientist; Charles MacKenzie, former Nimbus project manager; Dr. Edward J. Hurley, Nimbus data processing manager; Ralph Shapiro, former deputy project manager and Michael Forman, Nimbus operations manager. Nimbus-7 was launched in October 1978 and has been in service more than six years. It is considered the single most important source of space observations of the Earth's atmosphere and oceans, according to Dr. Hurley.**

# *NOAA-F Launched After Record Delays*

After a record-setting 13 delays – eight times because of strong winds and five times because of mechanical problems – the weather satellite was launched successfully from Vandenberg Air Force Base, Calif., on December 12.

# STS 51-C Delayed

*New Launch Date January 23*

NASA last month announced the delay of the 51-C Space Shuttle mission originally scheduled for launch from the Kennedy Space Center, Fla., on Dec. 8, 1984.

A decision was made because as many as 2,800 thermal protection tiles on the underside of the orbiter Challenger have to be replaced due to unexpected degradation of the bonding material.

NASA has set the earliest new launch date for January 23.

When Challenger returned from space on its last mission, a black tile from the left wing area, just behind and below the crew door area, was missing. About 100 tiles were removed from Challenger, and the adhesive substance known as "screed," used to smooth irregularities in the surface of the orbiter, was found to have softened. This white, Room Temperature Vulcanizing (RTV) material is used in much the same way that body putty is used on a car. It hardens and can be sanded smooth after it dries.

The "screed" is used on areas of the body of the orbiter, such as the underside of the fuselage, body flap, elevons and the sides.

The screed is applied directly over the aluminum skin of the orbiter. All other areas are covered with a primer called red RTV-560 which is used as an adhesive for bonding the strain isolation pads (SIP) to the body and the tile to the SIP.

The 51-C mission is the first completely dedicated Department of Defense mission. One previous mission, STS-4, carried a DOD payload as part of its cargo, but was flown primarily as the final development mission for the orbiter Columbia.

**Mail your story to the Goddard News, or call the Editor at 344-8102**

# *Hubble Space Telescope Optics Arrive In California For Mating*
## HST to Be Largest Scientific Payload

The optics for NASA's Hubble Space Telescope — so powerful that it may enable scientists to see to the edge of the known universe — arrived on the west coast Nov. 1. In California, they will be integrated with the other telescope components and prepared for launch aboard the Space Shuttle in 1986.

The Optical Telescope Assembly for the Hubble Space Telescope was transported from its manufacturer, the Perkin-Elmer Corp., Danbury, Conn., to the Lockheed Missiles and Space Co., Sunnyvale, Calif. Much of the trip was by Super Guppy, a NASA aircraft specially modified to carry oversized cargo.

The 3 meter (10-foot) diameter, 9 meter (30-foot) long assembly, which consists of the primary and secondary telescope mirrors, associated electronics, and supporting structure for the telescope's instruments, left Perkin-Elmer by truck October 29 and was flown from Stewart Airport, Newburgh, N.Y., October 31.

At Lockheed, the assembly will be integrated with sensitive scientific instruments shipped earlier and with other Lockheed supplied spacecraft components, then checked out, and prepared for shipment to the Kennedy Space Center, Fla., for launch.

"The move went flawlessly," said Jim Odom, Space Telescope Project manager at NASA's Marshall Space Flight Center, Huntsville, Ala. "Things went so smoothly, in fact, that we completed the move ahead of schedule."

The overall telescope, 43 feet long and weighing more than 25,000 pounds, will become the largest scientific payload ever placed in Earth orbit.

From its vantage point 590 kilometers (368 statute miles) in altitude and above the Earth's distorting atmosphere, the telescope will enable scientists to see an estimated 14 billion light years and to observe celestial objects 50 times fainter than now possible from ground observatories. Some scientists have termed the telescope the greatest advance in astronomy since the invention of the simple telescope almost four centuries ago.

The Marshall Space Flight Center has overall management responsibility for the Hubble Space Telescope project. Science instrument development has been led by NASA's Goddard Space Flight Center in Greenbelt, Md.

Once in orbit around the Earth, the telescope's astronomical research work will be guided by Goddard and the Space Telescope Science Institute in Baltimore, Md.

## Goddard Retiree Alumni Association One Year Old

A belated happy birthday to Goddard's Retiree and Alumni Association (GRAA), which recently completed its first year and anticipates many more years of service to GRAA members and to the Center.

Regular monthly luncheons, except for the next meeting, which will be held Wednesday, January 2 instead of New Year's day, will continue to be held on the first Tuesday of each month.

The monthly GRAA Newsletter will not be published in December but will continue in 1985. Peggy Becker, editor of the GRAA Newsletter, wishes all a Happy Holiday!

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**Goddard News**

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**Editor: David W. Thomas**

## NASA Administrator Beggs
*Issues Principles For Excellence*

**We Demonstrate Belief in Our People By:**

Taking on inspiring National goals, translating them to challenging objectives at each level, and acknowledging the collective responsibility of managers and team members.

Demonstrating confidence and respect for all members of the NASA Team, rather than depending upon regulating behavior through excessive rules and regulations.

Entrusting responsibility and authority to the lowest practicable operating level in order to encourage initiative and pride and to minimize bureaucracy and paperwork.

Encouraging honest, open and frequent two-way communication on all matters affecting team members and the work.

**We Manage For Success By:**

Hiring a high quality and integrated work force, providing them opportunity for creative and productive work, and maintaining a positive climate for personal development and career growth.

Stressing world class quality and pride in performance at every working level and recognizing each outstanding contribution.

Communicating clearly defined goals and focusing on successful performance through systematic program planning and execution.

Encouraging as much contractor competition as appropriate, and executing programs through non-adversarial team efforts.

Providing to all offices and facilities the modern equipment needed for quality and productive work.

**We Operate With An Open Management Style By:**

Recognizing that inherent in R&D are high-risk and high-payoff efforts, and maintaining high technical credibility and improving performance through free and open reviews of technical failures.

Encouraging those who are responsible for carrying out the work to make suggestions for improvements and participate in the planning.

Providing ample opportunity for our people to communicate with the best minds in science and technology in other organizations.

Maintaining integrity in all our dealings with the NASA Team and all outside individuals and organizations.