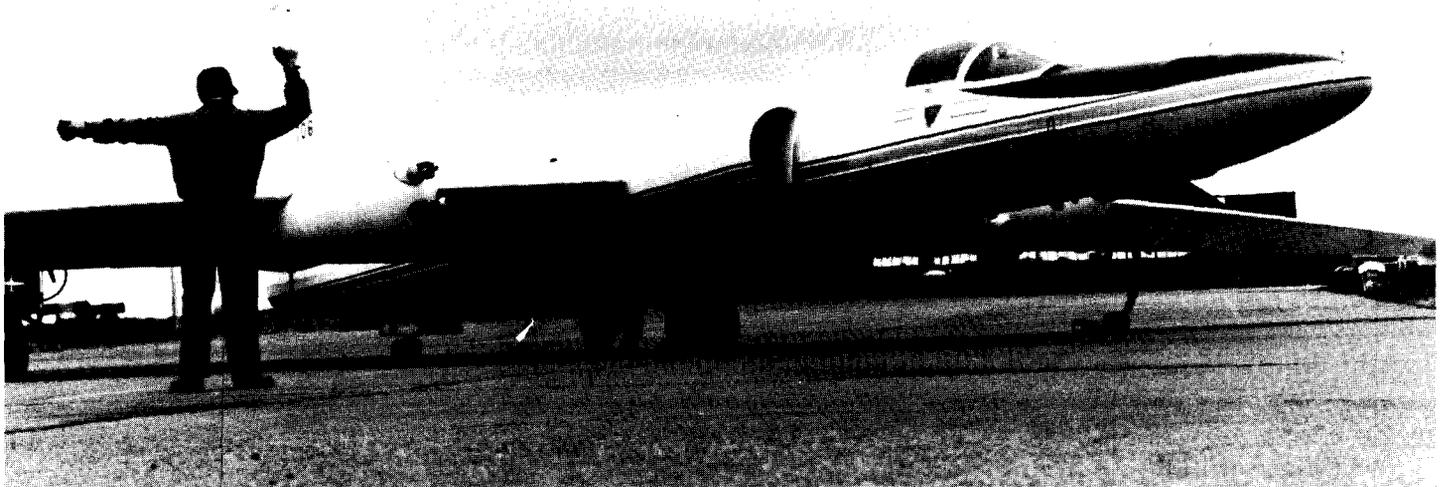


Goddard Supports Arctic Ozone Expedition in Norway



ARCTIC AIRCRAFT—NASA's ER-2 aircraft, shown preparing for takeoff, is a modified U-2 high-altitude aircraft. For the Airborne Arctic Stratospheric Expedition, the aircraft carried 12 science instruments and flew to altitudes as high as 65,000 feet (19 kilometers).

by Michael Braukus

Norway in January. The surroundings don't sound as enticing for temporary duty as Bermuda or the Caribbean but that's where a group of Goddard personnel were assigned as members of an international science team to study ozone depletion in the Arctic.

The Goddard team joined more than 150 U.S. and European scientists, technicians and support personnel at Stavanger, Norway, for the six-week airborne expedition which began January 1, and concluded February 15.

Officially called the Airborne Arctic Stratospheric Expedition and sponsored by NASA and the National Oceanic and Atmospheric Administration, the investigation was aimed at determining if chlorofluorocarbons were damaging the Arctic ozone layer and influencing ozone concentrations over heavily-populated northern mid-latitudes.

The aircraft for the expedition were provided by NASA's Ames Research Center, Moffett Field, CA. The specially-instrumented ER-2 and DC-8 aircraft made about twenty flights into the region of the Arctic vortex. The timing of the flights coincided with the statistically most active period for the formation of extremely low-temperature polar stratospheric clouds there. Such clouds are involved in the complex processes that result in the destruc-

tion of stratospheric ozone in the Antarctic polar vortex.

The aircraft flights were coordinated using near real-time Total Ozone Mapping Spectrometer (TOMS) data from the Goddard-managed NIMBUS-7 satellite. Dr. Arlin Krueger, TOMS principal investigator, explained that the data were used together with meteorological data for mission planning. TOMS is the only source of high-resolution global information about the total ozone content of the atmosphere.

After Goddard received the TOMS data from the spacecraft, they were processed and then transmitted over a dedicated phone line to a computer at Stavanger where the data were plotted. Goddard personnel in Stavanger included: Dr. Richard Stolarski, Dr. Mark Schoeberl, Dr. Jack Kaye, Dr. Leslie Lait, Dr. Paul Newman, and Eric Nash, all of Goddard's Atmospheric Chemistry and Dynamics Branch, Code 616.

The Wallops Flight Facility also provided support for the expedition. Dr. Arnold Torres, Code 672, balloonsonde measurements principal investigator, reported that George Brothers, Code 824, and Rodney Corson, Code 833.1, launched balloon-borne ozone sonde instruments from Lerwick, U.K., off Scotland's northern coast. The data was then transmitted to Stavanger for coordinating aircraft mis-

sions. In a cooperative program, Wallops provided ozone sonde hardware to the Danish Meteorological Institute which launched balloons from Greenland and then provided this additional information about Arctic ozone to Stavanger.

The data from the various experiments underwent preliminary analysis at Stavanger. At the time of this article, a summary statement of the observations and new findings had not been made. After they return home, the various science teams will work towards providing a more complete analysis of their data by late summer 1989.

This is the second airborne expedition Goddard has supported. In 1987, the Center participated in a similar airborne campaign over the Antarctic.

The ER-2 is a modified U-2 high-altitude airplane which conducts high-atmospheric

Continued on page 2

INSIDE

Dr. Jim Garvin:
Geological
Detective

Page 6



Talk from the Top

John W. Townsend Jr.

Q: Recently purple mums were planted outside of Building 8 only to be eaten by the deer one day later. This was evidenced by the "presents" left close to the flowerless stems. This seems like an incredible waste of time, effort and money. Can't our landscapers choose shrubbery that is "deer-proof?"

A: Deer are naturally attracted to plants and continuously "prune" our flowers, azaleas, hollies, and other plants of new growth. Very few of the plants used in landscaping are not an "hors d'oeuvre" for our hoofed friends. To limit ourselves to a select few plants that deer will not graze on would create a monotonous and dull landscape around our buildings. Not all of this "pruning" is damaging. Much of it keeps our trees so they look like trees rather than bushes, and it keeps many grassy areas and road shoulders clear of encroaching shrub brush. The many trails that our joggers and walkers enjoy were originally established and are maintained by our deer herd.

Q: Is there any danger of deer population growing too large for the Center grounds? Does anyone periodically survey the herd to ascertain that the animals won't starve during the winter because there is not enough food to support their numbers?

A: POMD (Physical Operations and Maintenance Division, Code 290) is contacting the U.S. Department of Agriculture regarding these concerns. . . . Nature . . . has established a balancing system so that a doe will typically have one fawn when food is limited and two fawns when food is plentiful. The real problem is when well-meaning individuals decide to feed the deer. Then, for whatever reason, they stop. Of course, Nature is not ready to take over, and the deer can suffer needlessly. The best advice is to let Nature take its course. The one thing we could all do for the protection of the deer and ourselves is to obey the speed limit on Explorer Road, a major deer crossing area.

Center Director John W. Townsend, Jr. wants to hear from you! Send your questions to: TALK FROM THE TOP, Code 130.

GSFC Opens Postal Substation

by Andrew J. Negri

For those employed long enough to remember the postal kiosk near Building 99, December 12, 1988 brought a return of basic postal services to Goddard. On that day, the Goddard Employees Welfare Association (GEWA) opened a postal substation in the GEWA store.

The human touch was added in the person of Margaret (Marge) Carrick, a new GEWA employee who will sell you stamps, weigh, insure, and register your parcels, and provide a variety of other postal services. Marge is the mother of Goddard employee Cheri Carroll, Code 201. Pressed into service two weeks before Christmas, Marge's new position kept her busy. "I was fine once I stopped hyper-ventilating!" she remarked.

The idea for the post office came from Kathie Jarva, Code 271, in an employee suggestion to the GEWA council. The facility is operated under a public service contract, with no cost to either GEWA or the U.S. Postal Service. People who played key roles in the creation of the post office were USPS employee Barbara Ford; Greenbelt Postmaster, Frank Ford; and Roy Martin, Director of Field Operations.

On the Goddard side, Tom Paprocki, Code 231, and Bill Braun, Code 205, provided logistical and security support. The post office is open Monday through Thursday, 11 am to 2 pm. Future services will include money orders, postal products (letters, envelopes, etc) and philatelic items.



PHOTO D. McCALLUM

POST OFFICE RIBBON-CUTTING—William Keathley (right), Associate Director for Programs, Code 100, and Frank Ford, Postmaster, Greenbelt, officially open with a ribbon-cutting ceremony the Post Office Contract Station in the GEWA store as Marge Carrick, GEWA postal clerk, looks on.

Expedition

Continued from page 1

research. It flew in the region of expected maximum ozone depletion up to 65,000 feet and carried 12 scientific payloads.

The DC-8, a modified version of the commercial DC-8, is NASA's newest airborne laboratory. Its interior cabin space has been modified into a flying laboratory for Earth resources and atmospheric remote sensing research. For the Arctic experiment, it carried 10 scientific instru-

ments with scientists and technicians to altitudes of 40,000 feet (12 kilometers).

Stavanger, on the western coast of Norway, was selected for the expedition because of its aircraft and science support facilities and housing. Another factor was its mild weather. Despite being close to the Arctic circle, the runways usually are free of ice and snow, due to the nearby coastal waters and the Gulf Stream current, officials explained.

GSFC/Contractor Council Formed

Goddard recently hosted the first meeting of its GSFC/Contractor Council, an organization formed to encourage communication between civil service and contractor concerns.

As envisioned, the council will be a forum for the discussion of suggestions, recommendations, problems, and other information relevant to the Goddard contractor community, according to Carl Poleskey, Goddard's Industrial Relations Officer.

"The Council also will provide a mechanism to explain to the contractor community the rationale supporting existing or changing policy and procedures," said Poleskey.

Center Director Dr. John W. Townsend, Jr. is chairman of the council. Other members are Sharon C. Foster, Director of Management Operations, and seven contractor representatives, representing all on-site and near-site contractors (classified as large or small companies providing services, hardware, or software, or classified as disadvantaged companies.)

Chosen to include one contractor representative from each GSFC directorate, and to represent companies of a certain type, the following companies comprise the contractor members of the council and the types of companies they represent: Bendix Field Engineering Corporation (BFEC), large services provider; Lockheed Missiles and Space Company, large hardware provider; Computer Sciences Corporation (CSC), large software provider; Klate Holt Company, small services provider; IDEAS, small hardware provider; Interferometrics, small software provider; and Hernandez Engineering, Inc., disadvantaged company.

The GSFC/Contractor Council is an idea born of the GSFC/Industry conference held last spring to improve the working relationship between the civil service and contractor communities. Several subcommittees of civil servants and contractor employees also were established after the spring conference to research and examine such concerns as productivity, space allocation, procurement, security badges, car decals, and the Fitness Facility; several of these subcommittees will continue to examine these issues and present their findings to the council.

For more information about the GSFC/Contractor Council, or to find out who your contractor representative is, contact Carl Poleskey, Code 201 (x67380).

NASA Pipeline

DRYDEN FLIGHT RESEARCH FACILITY, Edwards, CA—Researchers and pilots at Dryden have completed flight tests on the first experimental forward-swept-wing X-29 aircraft and are planning high angle of attack flight tests, now scheduled for spring 1989, for the second X-29. Angle of attack refers to the angle of the nose of an aircraft relative to its flight path. The ability to fly and maneuver at high angles of attack means improved maneuverability for high-performance aircraft.

HEADQUARTERS, Washington, DC—NASA has requested proposals from industry for a ground-based radar that will quantify and characterize debris orbiting between 180 and 360 miles (290 and 580 km) above Earth. Data gathered by such an orbital debris radar are needed for designing the permanently manned Space Station Freedom. Even the smallest pieces of orbital debris pose a potential hazard to the pressurized modules of Freedom, so the Space Station must be built to withstand as much orbital debris damage as possible.

JET PROPULSION LABORATORY, Pasadena, CA—Researchers at the Jet Propulsion Laboratory have developed a new digital, visual-filtering technology that will offer new hope to sufferers from maculopathy, or central spot blindness. Based on digital image processing developed to enhance the first pictures of Mars obtained by the Mariner 4 spacecraft in 1965, the technology alters spatial contrast and other properties of printed material to make it easier to read for people who can no longer see fine detail or read because of degeneration of key retinal cells in the eye.

JOHNSON SPACE CENTER, Houston, TX—Officials at Johnson recently released a request for proposal (RFP) for continued studies and design of an unmanned reusable reentry satellite (RRS) that could significantly expand NASA's capability to investigate the weightless environment. The RRS, called LifeSat when carrying life science payloads, will be placed into Earth orbit by an expendable launch vehicle, reserving the Space Shuttle for activities requiring crew presence.

MARSHALL SPACE FLIGHT CENTER, Huntsville, AL—Officials at Marshall recently have dedicated a new Fluid Dynamics Water Flow Facility which contains a unique full-sized acrylic model of a Space Shuttle main engine hot gas manifold. Engineers already are using the model to research such flow phenomena as eddies, recirculation, flow angles, vortices, static and total pressures, and unstable flow patterns, in hopes of improving engine efficiency.

January Storm Challenges Snow Crews

While most of us were snuggling deeper into our blankets on that snowy Friday morning in January, Plant Operations and Maintenance Division Chief Jack Knox was having a telephone conference with Center Director Dr. John W. Townsend, Jr., to decide if Goddard would open in the snow.

Salt and plow crews were already at Goddard with the center's eight plow trucks, having been called out at midnight the night before to prepare for a snow emergency.

This is the scenario every morning during inclement weather. Goddard's snow policy authorizes the Center Director to excuse employees based on the severity of the weather. Knox, whose crews call him "Snowflake," makes his recommendations to the Center Director, who then

makes a decision on what action the center will take.

Knox then notifies the Office of Public Affairs (PAO), which, in turn, notifies local radio and television stations so public announcements can be made.

But Goddard employees have another resource for information during inclement weather—the Public Affairs Code-A-Phone. Just dial 286-NEWS for up-to-the-minute details on Goddard's snow closings and status.

On that snowy Friday, more than 3,500 employees called the PAO Code-A-Phone for information—and they could go back to sleep with a carefree heart!

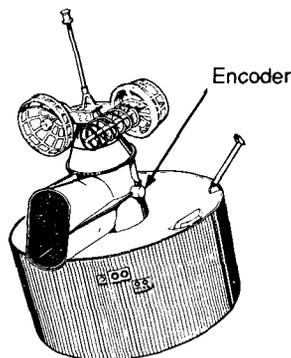


286-NEWS

Goddard Scientists Predicted Failure of GOES-6 Lamps

The failure of the sixth Geostationary Operational Environmental Satellite (GOES-6) last month was no surprise to Goddard scientist Henning Leidecker, Code 313, whose prediction of the satellite's failure was within seven days of the actual event.

The failure was due to a burned out tungsten-filament lamp in the satellite's encoder, a phenomenon which Leidecker and his colleagues, Walter Viehmann, (retired October 1988) Norm Hemhold (now at RCA AstroSpace), and Chuck Powers, all of Code 313, had been studying for some time.



The team, led by Walter Viehmann traced previous failures of satellites in the GOES series to the burned-out lamp phenomenon, beginning with GOES-1, launched in 1976. Although accelerated testing of the lamps indicated a lifetime of 15 years or more, subsequent testing by the Materials Branch indicated a lifetime somewhere between one and two years.

Based on these tests, executed before the launch of GOES-6 in 1983, that spacecraft was fitted with four lamps, to be turned on in sequence as each burned out. When the fourth lamp was turned on, October 6, 1987, Leidecker made the prediction that its lifetime would be 480 days. The lamp burned out after 473 days, rendering the spacecraft's Visible/Infrared Spin-Scan Radiometer (VISSR) Atmospheric Sounder (VAS) inoperable.

Until GOES-I, the first of a new generation of geostationary weather satellites, is launched in mid-1990, GOES-7, now stationed over the east coast, has been moved to mid-country at approximately 98 degrees west longitude. From that location, coast-to-coast coverage is still possible, although coverage extending into the Atlantic and Pacific Oceans is restricted.

Leidecker and Viehmann have formulated a set of predictions for the lifetimes of these lamps as well.

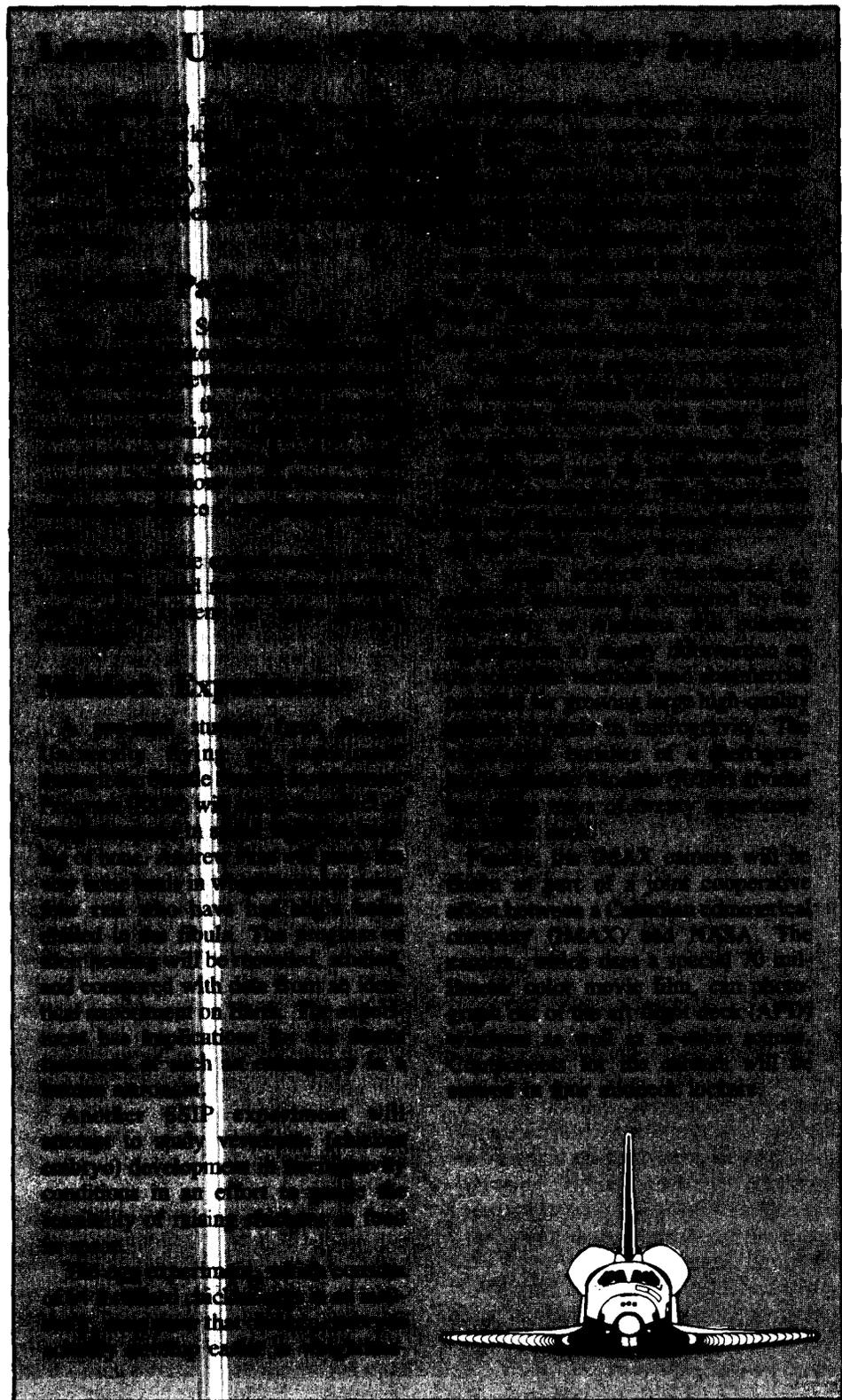
"GOES-7 is unique," said Leidecker, "because it has two encoders, one with two of the same type of tungsten-filament lamps as in the previous GOES satellites,

and the other equipped with light-emitting diodes (LEDs). I can say with 95% confidence that the tungsten-filament lamps in the first encoder have a combined lifetime of at least ten years."

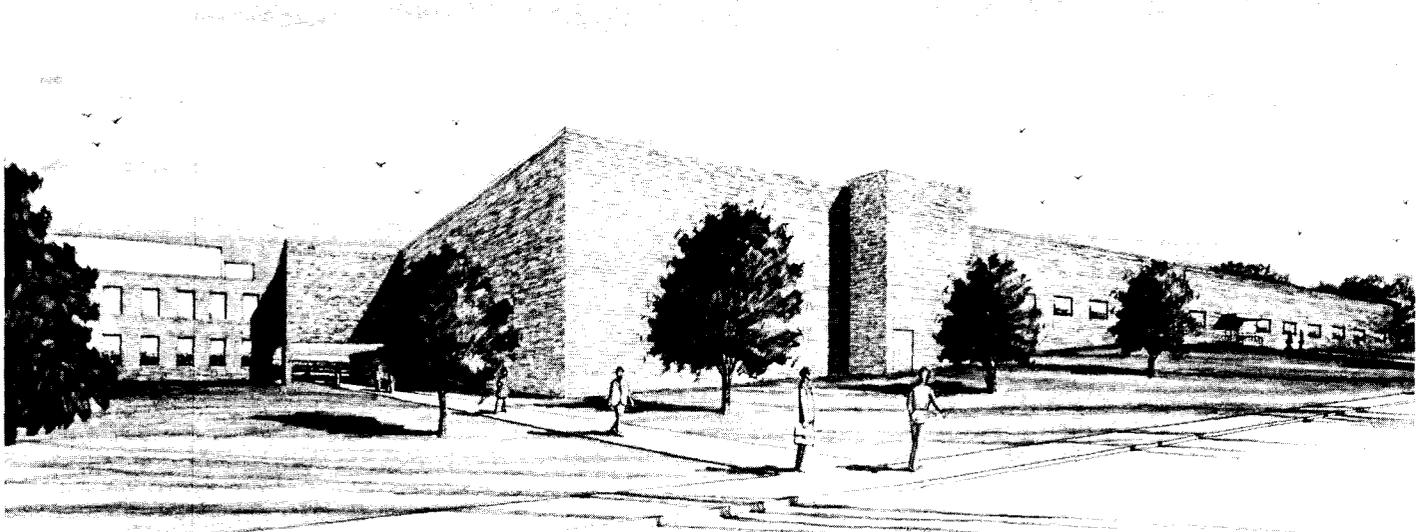
According to Charles Thienel, Chief of the METSAT Projects Office, the failure of GOES-6 will have relatively little impact on the Goddard's day-to-day operations.

"We must simply continue to prepare for the earliest possible launch of GOES-I," said Thienel, "while striving to maintain our commitment to standards of quality and engineering within the confines of scheduling and budget requirements."

GOES-I is set for launch no earlier than July 1990, aboard an Atlas expendable launch vehicle (ELV).



GSFC To Build New, Safer Laboratories for Quality Assurance and Detector Development



SAFETY LABS—This artist's concept of the new Quality Assurance & Detector Development Lab (QUADDL) shows a covered walkway between the existing Building 11 and the proposed laboratories. The new building will house Quality Assurance Labs for the Materials Branch of the Office of Flight Assurance (Code 313) and clean room Detector Development Labs for the Instrument Microelectronics and Detectors Branch of the Engineering Directorate (Code 724).

by Carolynne White

Two Goddard laboratories that handle hazardous chemicals and materials in the development of technology for future space missions may move into a new building specially designed to meet their common stringent safety requirements in the spring of 1991.

An engineering study is underway for a new building, to be attached to the back of Building 11, to house Quality Assurance Labs for the Materials Branch of the Office of Flight Assurance (Code 313), and clean room Detector Development Labs for the Instrument Microelectronics and Detectors Branch of the Engineering Directorate (Code 724).

Because both branches increasingly use hazardous chemicals and materials in their research, it has become essential to remove the hazardous operations to a specifically designed and constructed facility. The answer is a Quality Assurance & Detector Development Lab (QUADDL), a 61,200 square-foot building—which includes a special "support" area designed for storage of hazardous chemicals and gases.

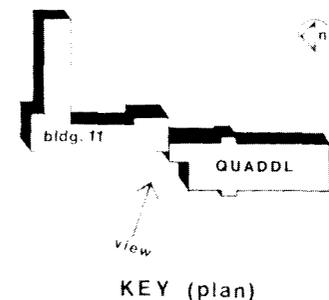
Approximately 75 percent of the space in the \$7.5 million lab will consist of a laboratory and office space for Quality Assurance; the other 25 percent is a large

clean room area for the Detector Development Lab.

The tentative Spring 1990 date for breaking ground on the facility is contingent upon Congressional approval of the 1990 budget. If all goes according to schedule, construction will begin in 1990 and be complete in time for move-in in spring 1991.

The Detector Development Lab (the "DDL" half of the QUADDL) will consist of a class 100 laminar flow clean room within a class 10,000 clean room and be connected to the current Code 724 offices in Building 11 via an airlock and gowning/support area. Equipped with state-of-the-art semiconductor processing equipment, between six and ten Code 724 personnel will use the DDL to design, fabricate, test and flight-qualify high sensitivity detectors for Earth and astronomical observations, gallium arsenide integrated circuits for high speed electronics, silicon very large scale integrated circuits for advanced electronic systems, electron devices for operation at liquid helium temperatures, and in-house development of custom NASA/GSFC devices and components.

Semiconductor fabrication requires various hazardous processing steps, including



the use of poisonous gases, poisonous chemicals and low-level radiation, in addition to a very clean environment. The DDL has been specially designed to accommodate the strict requirements for use and storage of these poisonous chemicals.

The rest of the building will be the Materials Quality Assurance Laboratory (MQAL), devoted to offices and laboratories for approximately 36-40 Code 313 personnel. The Materials Branch performs a broad spectrum of analytical and support services to all Goddard flight projects; some of these technologies, such as Non Destructive Evaluation (NDE), composite testing and evaluation, fracture mechanics of brittle materials (ceramics, composites), and low-earth orbit/long duration effects on materials, are especially essential to Shuttle or Space Station projects such as Shuttle Solar Backscatter Ultraviolet (SSBUV), Shuttle Payload of Opportunity Carrier (SPOC)/Hitchhiker-G, and the Shuttle High Energy Astrophysics Laboratory (SHEAL).

INSIDE

Dr. Jim Garvin: Geological Detective

by Carolyn White

Although he doesn't wear a Sherlock Holmes hat or smoke a big pipe, Dr. Jim Garvin is a modern day detective. A scientist in the Geophysics Branch of Goddard's Laboratory for Terrestrial Physics, his work involves studying the geological clues left behind by major events in the Earth's record—craters left by meteor impacts, lava flows left by erupting volcanoes—to recreate the events and understand the phenomenon that caused them.

As Garvin explains his work in comparative planetology, his infectious enthusiasm draws the listener's imagination to wander with him over bleak landscapes of craters and lava flows like those he studies in exotic locations such as Iceland and the Soviet Union.

The energetic Garvin began his world-hopping long before coming to Goddard; during his childhood, Garvin lived in Beirut, Lebanon and Sydney, Australia—with a Christmas visit to New Zealand! In addition, his professional travels have led him to Iceland and the Soviet Union. But his geological training (Ph.D., Brown University, 1984) colors his observations of these exotic locales. When asked to describe New Zealand, he said, "It's got incredible majestic geology—with alps where you can ski year round, and glaciers, and right across on the northern island it's got incredibly explosive active volcanos."

Not to mention the geological history of the place—one of the biggest volcanic eruptions in history occurred in New Zealand, according to Garvin: "The mountain probably totally blew up," he said. "The entire mountain is gone and left in its place is beautiful Lake Taupo! Ash from that eruption fell in China and is found on the ocean floor all the way around the world. The tremendous explosion probably sent a plume of ash 37 miles (60 kilometers) into the air, as compared to the six-mile-high (10-kilometer) plume out of Mt. St. Helens. Of course, this explosion was small in comparison with those that occur during the process of meteor impact which forms giant impact craters on Earth."

Soviet Collaboration

Garvin's nine trips to the Soviet Union to collaborate with Soviet geophysicists and geologists have yielded rich scientific



PHOTO D. McCALLUM

GARVIN

results—and a healthy appreciation for American music!

"There's not exactly a lot to do over there," he complained. "I used to kid my Russian friends—I'm very fond of progressive music and they couldn't get it over there. I had to take tapes over there so they could hear what I considered to be good stuff (groups like U2, REM, Cockburn)—they just couldn't get it."

His fondness for progressive music includes a personal acquaintance with the members of the rock band U2, one of whose first concerts in the United States was sponsored by Garvin's own Brown University.

"I hung out with them when they first came to Brown—they were just four Irish guys," he said. "I used to get postcards from (U2 drummer) Larry Mullen's sister, who used to run the fan club. I still get concert tickets from the tour manager sometimes."

Geological Analogies

Garvin's research focuses on using examples of geological phenomenon on Earth as analogies to help understand similar phenomenon on the other terrestrial planets—Mars, Venus, and the Moon.

"Most geologists work by analogy" he explained. "When you try to do things in geology on the Earth or on other planets, you don't have control over experimental conditions. It's already happened! So you've got to play Sherlock Holmes and deduce what happened by understanding the critical parameters and then figure out

why and how these things are important."

In addition to his work in planetary geology, Garvin is principal investigator for the General Airborne Laser Altimeter Research Program, a grant from NASA Headquarters.

"The General Airborne Laser Altimeter Research Program was born out of a need for laser-accuracy to study landscape features," he said. "When I came to Goddard, there were people involved in projects to measure the ocean surface pressure using lasers beamed from an aircraft, and I said, 'Why not use lasers to measure craters and volcanos the same way?' So, I collaborated with two fantastic engineers here at Goddard and got a grant to figure out how to fly a laser altimeter in an aircraft and measure very fine-scale topography. Over the last three years I have been involved in several projects to perfect airborne laser altimetry."

Now Garvin is a co-investigator on a NASA study team working to extend these principles of airborne laser altimetry into space; it is preparing a laser altimeter instrument for a flight to Mars on the Mars Observer in the early 1990s.

Football-field Resolution

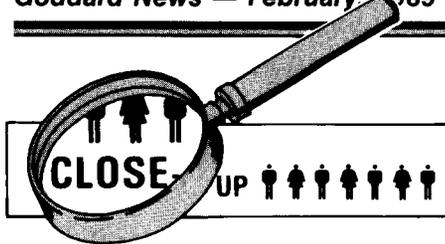
The instrument will sample the topography of Mars at what Garvin calls "football-field resolution," a far closer look than that provided by previous flybys of the planet. For Garvin, this means that he can get the small-scale information he needs to study Mars in the same detail as he studies the landscapes of Iceland.

"I'm interested in short wavelength things, things on the scale of people," he explained. "If you're walking around on the ground, what are you looking at? I like landscapes. I like to walk all over them, and I'm primarily interested in how you quantify, how you measure those things on a small scale."

Walking around outdoors on wild landscapes is probably the only way Garvin, an amateur herpetologist, finds time to pursue snakes and monitor lizards, one of his outside interests. The interest may have surfaced when Garvin and his family lived in Australia, and Garvin had a monitor lizard friend who visited the family's backyard regularly—thanks to Garvin's regular feeding!

Unfortunately, Garvin's travels and

Continued on page 8



STALLINGS



BACKERT

The former head of the Data Capture Systems Section, **WILLIAM H. STALLINGS**, has been named Associate Chief of the Information Processing Division, Code 560. His new duties include long range planning, monitoring research and development, and systems engineering for the division. "I am looking forward to helping to assure that the division meets the technological and operational challenges of the future," said Stallings. "This includes meeting ground system data handling requirements for the Space Station Freedom and its platforms as well as numerous other Goddard missions."

The Division of Financial Management welcomes its new Division Chief, **MICHAEL C. BACKERT**, from the Department of the Interior (DOI). As a supervisory auditor with the DOI, Backert established and managed a decentralized organization of field auditors responsible for conducting financial examinations of coal mining operators. Before his tenure at Interior, Backert worked with the U.S. Treasury and held a variety of financial positions in the private sector. A graduate of the University of Baltimore, Backert is also a Certified Public Accountant.



DOLAN

STEPHEN K. DOLAN, formerly Spacecraft Manager, Upper Atmosphere Research Satellite (UARS) Multi Mission Modular Spacecraft (MMS), was

appointed Deputy Project Manager, Satellite Development Missions. His division provides all the hardware for the MMS program, which includes building spacecraft for the Explorer Platform Program, and the UARS spacecraft.

Joanne Simpson Becomes President of American Meteorological Society



PHOTO D. McCALLUM

Joanne Simpson, Code 610, is the first woman president of the American Meteorological Society. Simpson, who

came to Goddard in 1979, is the Chief Scientist for Meteorology for Goddard's Laboratory for Atmospheres. She was also the first woman to receive her doctorate in Meteorology—1949, from the University of Chicago.

Simpson has received many awards for her pioneering work in modeling and observation of cumulus clouds, severe storms, and tropical hurricanes. These include the American Meteorological Society's Meisinger Award in 1962 and the NASA Exceptional Scientific Achievement Medal in 1982. But the award of which she is most proud is the Carl-Gustav Rossby Research Medal, the American Meteorological Society's highest honor, which she received in 1983.

Show Us Your Stuff!!

Attention Goddard Shutterbugs

The *Goddard News* is looking for quality photographs of on-Center activities for future issues. If you have a visually interesting picture that depicts a day-in-the-life of Goddard Space Flight Center, or looks at Goddard in a different way, send a copy to Goddard News Editor, Code 130, or drop it by the Public Affairs Office, in Building 8, Room N150.



Ideally, photos should be black and white, 4 x 5 or larger, and clearly focused. Please include your name and phone extension on the back of the photo, especially if you want it returned. Photo credit will be given in the *Goddard News*.



Following is a list of Goddard donors who were cited by the American Red Cross with gallon pins at the Bloodmobile on February 1, 1989:

NAME	GALS.	NAME	GALS.
Michael Adams	1	John Pearl	5
Tad Blanchard	2	Bob Phillips	12
Michael Blizzard	5	Richard Stavely	2
Wayne Boncyk	1	Craig Stoken	1
Kent Cockerham	3	Andrew Szymkowiak	4
Arnold Eudell	3	Tex Tutas	3
W. McGunigal	1	Mary Walsh	2
Ronald O'Leary	6	Darrel Williams	1
Stephen Paddack	5		

The next bloodmobile visit will be on April 5, 1989, from 8:30 a.m. to 1:30 p.m. in the Building 8 Auditorium. Thank you, Goddard, for your continued support of the program.

Jim Garvin

Continued from page 6

many activities prevent him from keeping a live snake as a pet. But to keep from missing his reptilian friends too much, Garvin shares his office with an eight-foot-long inflatable snake!

Garvin is also lending his talent—in exchange for some remote sensing flybys—to Goddard's Joint Global Ocean Flux Study (JGOFS), involving NASA, the British, the Norwegians, and others.

The project is to study biomass, but Garvin is mostly interested in the project's potential to fly his laser altimeter over remote areas of Iceland.

"We're going to piggyback on this experiment and fly our laser altimeter over an icecap glacier, which is very exciting!" he smiled. "Icecap glaciers in Iceland are very interesting because they're climatically sensitive. They grow on top of volcanoes and when the climate changes they either recede or advance. If you can construct a baseline for measuring the rate of recession over time, you can start looking at the way climate changes, and eventually that's what we want to do repeatedly from space on a decade-long time scale using the Earth Observing System (Eos)."

Extracurricular Activities

When he's not out flying over primitive landscapes with his laser altimeter, or traveling to remote crater sites, Jim Garvin likes to relax with a nice, quiet game of ice hockey. As a goalie, Garvin's talents

are in demand among hockey leagues.

"I get calls at crazy hours of the night, saying 'Can you play tomorrow?'" he said. "Last month, I played with 18-year-old kids, who absolutely couldn't get anyone else to play on a Sunday morning in a match against a hated rival."

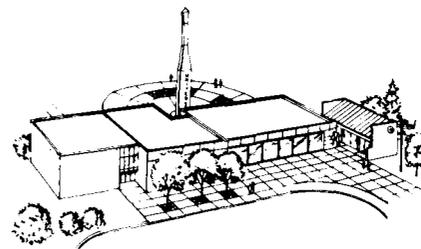
A Dream Come True

When Garvin first came to NASA he was on the original seven-member team to study NASA leadership under Astronaut Sally Ride. As part of the initial ice-breaking exercises, the team was asked to envision themselves and what they'd be doing with NASA in 10 years.

Garvin's reply demonstrated the time scale on which a geologist thinks. "Most of the engineers were thinking about doing work on the Space Station," he said. "In 10 years, I thought, we'll just be getting data back from the Mars Observer, so I envisioned myself in the lab, studying pictures and topographic profiles of the surface of Mars, and asking the questions that I ask about places like Iceland and the western United States about the surface of Mars."

Flying an orbital laser altimeter to Mars is a dream come true for Garvin, and the Goddard-based Mars Observer Laser Altimeter project will make these comparative geologic studies an exciting prospect for geologic detectives all over the world.

Goddard Is Looking For A Few Good People



by Darlene Ahalt

Goddard needs volunteers who are at least 18 years old and U.S. citizens to conduct general tours at the Visitor Center in Greenbelt.

Last spring, Goddard completed a new exhibit gallery with exciting exhibits on how we study space science, Goddard's role in researching the "Big Bang" theory, and a new computer game that challenges you to design, test and launch your own satellite. Adults and youngsters can take a ride in the gyro chair and operate a simulated Manned Maneuvering Unit.

If you think you've got what it takes and are willing to sacrifice at least four hours a day, one day a week, Goddard needs you. We want you to help explain Goddard's mission and exhibits, primarily to school groups. If you are selected, you will be trained and provided literature about NASA, Goddard, the Visitor Center, and the space program. Goddard volunteers will meet and get first-hand information from NASA scientists, engineers and researchers.

The Visitor Center is open to the public 10 a.m. to 4 p.m. Wednesday through Sunday.

If you want something interesting, challenging and worthwhile to do that uses your talents in public speaking, shows your enthusiasm for America's space program, and displays an interest in working with students, write Darlene Ahalt, Goddard Mail Code 130, or call x8101 for information and applications.

NASA
National Aeronautics and
Space Administration
Goddard Space Flight Center

Goddard News

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OOPS !

Let's give credit where credit is due—Last month's issue of the *Goddard News* contained several photographs contributed by the Photographics Lab, for which photo credits were inadvertently omitted from the issue. Credits are as follows:

Page 1	Pete Baltzell
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