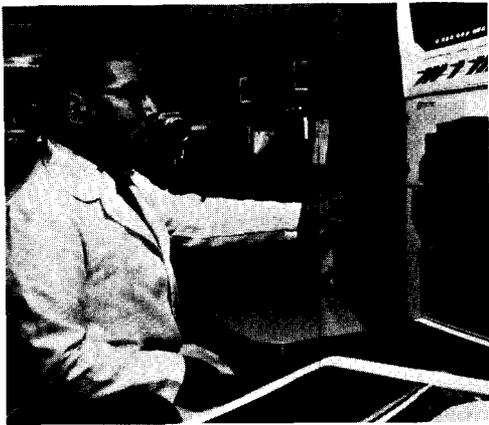
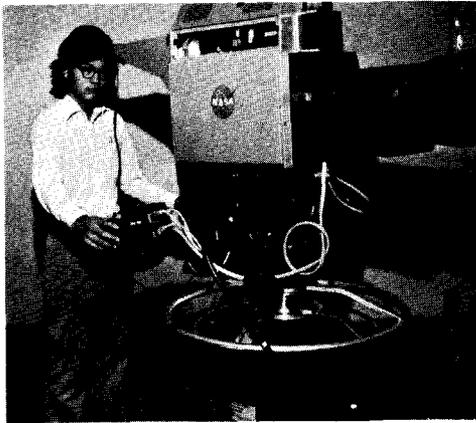


Summer Workers At Goddard



DR. MICHAEL ROCK, of Bowie State College, is conducting an analysis of spacecraft contaminants as his research project in the GSFC/Morgan State College Summer Research Program. See story on page 9.



SCOTT NAKADA is one of 25 junior scientists working here this summer as part of the American University Summer Science Research Participation Program for Senior High School Students. See story on Page 5.



SUMMER AID Paula Jones is one of over 70 young people helping out in work assignments throughout the Center. The story is on pages 6 and 7.

ALSO IN THIS issue are stories on the Summer Institute in Public Administration and the Summer Institute in Computer Applications on page 8.

GODDARD NEWS

August 1973

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Explorer 48 Mission Declared a Success

Goddard's most recent Small Astronomy Satellite (SAS-B) has achieved its primary scientific objective, and the mission has been declared a success. The SAS was designed to observe the little understood gamma radiation in our galaxy and beyond.

Officially named Explorer 48, the satellite carries a Goddard-built gamma ray telescope (a digitized spark chamber). This experiment is the most sensitive experiment of its type ever placed in orbit to study gamma ray sources in the universe.

The 186-kilogram (410-pound) satellite completed more than six months of successful operation last month before an electrical malfunction occurred and data transmission stopped. An investigation of the problem indicates it is associated with the experiment's low voltage power supply. Efforts to reactivate the system by ground command will be continued for the next few weeks.

However, in declaring the Explorer 48 mission a success, Dr. John E. Naugle, NASA Associate Administrator for Space Science, reported:

"It is clear that even if no further experiment data becomes available, the data already acquired is considered extremely significant since the most promising sky regions have already been surveyed."

Some of the preliminary results from Explorer 48 observations reported by Dr. Carl Fichtel, Project Scientist at Goddard, include:

- Detection of gamma radiation apparently coming from outside of our galaxy which may be of cosmological origin. One theory suggests that the mechanism controlling such radiation comes from the interaction of cosmic rays with interstellar matter. In an expanding universe model, the density of matter was much greater in the past than at present. Thus, the radiation produced by cosmic ray interactions reached the satellite from great distances and was distorted during its journey because of the continuing expansion of the universe. An alternate explanation evolves from the "big bang" theory of the universe in which equal amounts of matter and antimatter are created. Matter and anti-

matter will separate into regions the size of galactic clusters of pure matter and pure antimatter. At the boundaries of such vast regions, annihilation of matter and antimatter occurs, creating neutral pions which in turn decay into gamma rays, according to this theory.

- High energy gamma radiation has been detected from the Crab Nebula. Until these observations, only pulsed energetic radiation had been detected in the Crab.
- The center of our galaxy has been confirmed to be rich in gamma rays and a detailed map of this radiation is presently being prepared. From a study of the energy distribution of the gamma rays it is now known that two separate mechanisms are responsible for this radiation.

These preliminary results were reported by Dr. Fichtel and his co-investigators at the annual meeting of the American Physical Society in April, at the Goddard Space Flight Center's International Symposium and Workshop on Gamma-Ray Astrophysics in May, and at the 140th meeting of the American Astronomical Society last month.

"The strong interest of the scientific community in these initial results," according to Dr. Naugle, is "indicative of the great scientific significance of the Explorer 48 investigation."

The satellite was launched last November 16 by a NASA Scout rocket from the Italian-operated San Marco Equatorial Range in the Indian Ocean off the coast of Kenya. It is the second of three spacecraft in the SAS series managed by Goddard. The first SAS satellite, Explorer 42, called UHURU - Swahili for freedom - was launched from San Marco in 1970, and carried out the most successful studies of celestial X-ray sources ever accomplished by satellite. The third SAS, carrying advanced X-ray experiments, is scheduled for launch in 1975.

Prime contractor for SAS spacecraft is the Applied Physics Laboratory of Johns Hopkins University, Silver Spring, Maryland.

For further information on Explorer 48 results, see the May 1973 issue of the *Goddard News*.



GODDARD/INDUSTRY TEAM MEMBERS, chosen on the basis of their superior performance of their Manned Flight Program tasks, were honored in Florida last June by the Manned Flight Awareness Council. In addition to sunning and shopping, the 13 honorees toured the MILA STDN station, attended a VIP reception, and viewed the launch of Skylab 2 from the VIP viewing area. The team members and their guests pictured above are: Ralph Banning, Mrs. Elynor Dalton, David Fink, Dan Dalton, Lester Heller, Lynn Santamour, Warren Benson, Mrs. Benson, Mrs. Darlene Middleton, Elaine Fry, John Middleton, John Harvey, Mrs. Doris Harvey, Mrs. Betty Mitchell, Mrs. Harriett McCurdy, Mrs. Evelyn Wiley, James Mitchell, Bill McCurdy, Helen Fuller, and Mrs. Elsie Mason. Not pictured is Chuck Mason, the photographer and a host for the group.

Ross Covington in Germany

Ross Covington, Head of the Operations Assurance Section, recently went to Germany to participate in a partnership mission coordinated by the World Evangelism Foundation and the Union of German Baptists. The New Life Crusade, as the mission was called, was organized as a way for American Evangelists to compare their methods and techniques with those used in Germany.

Arriving in Dusseldorf on June 6, the revivalists were greeted by the U.S. Ambassador to Germany who gave them a brief history of the country. In addition, several German officials including President Willie Brandt sent welcoming letters.

After the general orientation was completed, the evangelists were divided into approximately 30 teams and were assigned to various cities for two weeks of work in revival meetings held in tents, churches, or town halls. Mr. Covington, the Director of Evangelism and Congregational Song Leader at Seabrook Baptist Church, found himself in Aalen, a city about 45 miles east of Stuttgart. There he stayed in the home of a German family and thoroughly enjoyed the warm and friendly hospitality extended by his hosts.

Before returning to the U.S., Mr. Covington met with Aalen's mayor, Burgermeister Hermann, and presented the city with photographs of Europe taken by the Nimbus 3 satellite.



ROSS COVINGTON presents Nimbus photographs of Europe to the Mayor of Aalen, Germany, during his recent mission to that country. From left are: Mr. Covington; Dr. Gerald Martin, team leader in Aalen; Burgermeister Hermann; and Pastor Birdie Vogel, the interpreter during the presentation.

Stan Weiland Receives AAS Award



STANLEY WEILAND, ERTS/Nimbus Project Manager, received the American Astronautical Society's Lloyd V. Berkner Space Utilization Award during the society's Annual Meeting Honors Night Banquet held earlier this summer. The award cited him for "outstanding contributions to the commercial utilization of space technology." Mr. Weiland, who became Project Manager shortly after the successful launch of the first Earth Resources Technology Satellite in July of 1972, was formerly Nimbus Spacecraft and Observatory Manager. He came here in 1963 from the U.S. Army Signal Corps Research and Development Laboratory in Fort Monmouth, New Jersey.

Hollingsworth Twice Honored



RUSSELL T. HOLLINGSWORTH of the Test and Evaluation Division has been doubly honored by the Institute of Environmental Sciences at its recent Annual National Meeting in Anaheim, California. Mr. Hollingsworth was elected to the status of Fellow in the Institute for his contributions to organization, growth and technical programs of the National Office and local chapters. He was also elected to the position of Technical Vice President for the next two years. Mr. Hollingsworth has been associated with both the Test and Evaluation Division and the IES since 1960.

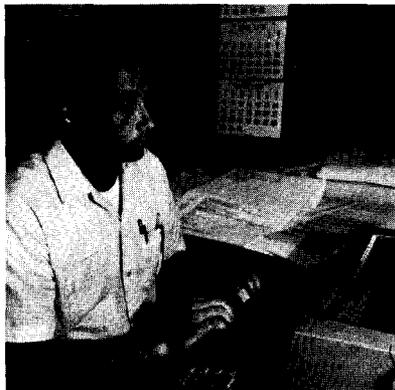
Typing Helps Machining Efficiency

Why would a typing teacher from a local high school come to Goddard and teach touch typing to eight technicians in the Aerospace Experimental Machining Branch? The answer is "simple" — men in that branch use numerical controlled machining to cut out certain metal spacecraft parts in a more efficient manner than manually operated machining would allow. The automatic cutters do their work according to instructions found on punched tapes — tapes whose production usually involves technicians communicating with a computer via a typewriter-like input terminal. A desired cutting path is described in general mathematical formulas, and then the computer translates the formulas into specific numerical directions which are punched onto instruction tapes.

This is where the typing class enters the picture. Until recently, technicians were forced to waste valuable computer time as they used a hunt and peck system to communicate with the computer. But because of the four-week typing class, eight men now enjoy increased speed at a keyboard and save time and money in the process.

It all began when J. Frederick Taub, Head of the Aerospace Experimental Machining Branch, contacted Mrs. Gladys Chasnoff of Organization and Employee Development and explained the typing problem to her. Mrs. Chasnoff got in touch with the Prince Georges County Adult Education Office and arranged to have Jack Bookout of Du Val High School hold three classes per week for the eight technicians beginning on May 22. By June 20 when the course ended, 24 hours of instruction and practice had taken place and, according to Mr. Taub, it has paid off immensely. The men now make fewer programming errors and have cut the time spent at a keyboard to one-fifth the former amount.

JOHN LALLANDE uses his newly-learned typing skills as he operates a remote input terminal in Building 5. J. Frederick Taub, head of the Aerospace Experimental Machining Branch, estimates that a programming job which used to require 35-40 minutes would now take his trained technicians only 7 or 8 minutes to complete.



THE OLIVETTI BOYS. The technicians who took the four-week typing class are pictured above in their classroom. They are (from front to back, left to right) Woodrow Poland, Robert Hessler, Charles Davis, Charles Fleetwood, Lee Horning, Wilson Powers, and John Lallande. Not pictured is Anthony Walch, Jr. Standing are the initiators of the course, Mr. J. Frederick Taub, head of the Aerospace Experimental Machining Branch, and Mrs. Gladys Chasnoff of the Employee Organization and Development Branch.



AFTER TRANSLATING the necessary machine movements into numerical form and coding them onto a tape, Lee Horning uses that tape to direct numerical controlled machining and automatically cut out a component for an experimental quadrupole spectrometer.

Clubs Give Rec Center a Face Lift

During the week of July 15 to July 21, the Recreation Center was filled with members of the Flying and Sailing Clubs as they painted the five year old redwood complex. GEWA recently loaned \$3,200 to the two clubs for capital improvements and, to assist in the repayment, made arrangements through their presidents to undertake the painting venture.

Every night from 5:00 until dusk, ten to twenty of the members responded to the call to "get the job done" issued by Flying Club president Paul Rall and Sailing Club president Gene Willingham.

The following Flying Club members contributed 84 man-hours to their two-day effort and will be awarded a certificate granting two hours free use of the club's flight simulator: John Brahm, Harry Chernikoff, Bill Cooper, Stan Corwin, Don Fitzpatrick, Ken Gardner, Dick Goldberg, George Griffin, Frank Kraus, Bob Lencho, Jim Metzger, Bill Nichols, John Paulkovich, Tony Pierro, Paul Rall, Bert Stephenson, and Al Wolfson.

Among the members of the Sailing Club, there were 17 volunteers who helped with the painting and, therefore, earned time in the use of the Club's sail boat. The workers were: John Ainsworth, Paul Ainsworth, Lloyd Carpenter, Frank Dooley, Pete Donn, Mort Foxe,

Herb Gillis, Ray Jameson, Peggy Kolenkiewicz, Ron Kolenkiewicz, Dave Mangers, Ward Meyer, Roger Nulan, Harvey Safren, Bob Silverberg, Peter Tricoff, and Howard Wright.

According to Ed Fitch, GEWA Facility Chairman, and Jack Libby, Gewa Club Chairman, many such activities will be planned in the future to encourage club involvement in facility construction and maintenance.

Also included in the week's activity at the Rec Center was the construction of a picnic area. Under the auspices of Dave Lewoc, all of the work was donated by members of Goddard's Orbit Club as a way to show their thanks for the use of the Rec Center for their meetings. After Bill Green completed the initial clearing, President Walter Gates and members of the club had a three-evening work session using chain saws, axes, shovels and rakes to complete the final clearing. New horseshoe pits were also installed.

As Mr. Libby has said, "The Rec Center is taking on a new appearance. It is inspirational to see the response of the GEWA sponsored clubs in supporting projects beneficial to the welfare of all Goddard employees."

Karate Club Members Earn Black Belts



OVER TWO YEARS of training culminated in a First Degree Black Belt for Ronald O'Leary. Pictured above, he successfully executes a flying side kick.



JOHN ARNESON'S good technique results in three broken cinder blocks and a First Degree Black Belt.



FREE-SPARRING with an opponent, Ronald Gunton (right) effectively utilized fighting techniques acquired in the course of two-and-a-half years of training. Capping his efforts on June 23, he was presented with his First Degree Black Belt.

On Saturday, June 23, Goddard Karate Club members John Arneson, Ronald Gunton, Ronald O'Leary, John Stewart, and Martha Whitworth went to Annapolis, Maryland, and successfully completed tests for First Degree Black Belt. Also present was the club's first president and highest ranking member, Robert Morrissey, who earned his Second Degree Black Belt in July, 1972. To earn their Black Belts, the participants had to complete a series of nine patterns, free-spar for two 2-minute sessions, execute a breaking technique using two or three cinder blocks, execute one board-breaking technique, and perform a "specialty" technique - one which is extraordinary or in which the individual excels.

Black Belt status is usually attained after an average of three years of training with at least six hours of practice per week. But it should be noted that progression through the ranks is determined on the basis of personal qualifications.

Prior to receiving a Black Belt, one must pass through ten lower belts. Among others, they include the beginner's white belt, a gold belt, green belt, blue belt and red belt.

The Goddard Karate Club meets every Monday and Wednesday evening between 5:00 and 6:30 in the Building 8 Auditorium. New classes begin approximately every three or four months. For more information, contact Bill Bray (ext. 2455) or Bernie Dixon (ext. 5667).



FIVE CINDER BLOCKS give way to Robert Morrissey's excellent technique. Mr. Morrissey began training in September of 1968 and seven months later he became president of Goddard's newly formed Karate Club. In July 1972 he was presented with his Second Degree Black Belt.



JOHN STEWART, still deep in concentration, ends the seventh pattern with a powerful punch. Mr. Stewart began training in August of 1969 and was awarded First Degree Black Belt in the recent ceremonies.



THE FIRST FEMALE to receive a Black Belt within the Karate Club, Martha Whitworth began her training in April, 1970. Here she shows her happiness after being awarded her First Degree Black Belt.

Young Scientists in AU Program

Twenty-five junior scientists who are intrigued by science, engineering and math spent an enjoyable and educational summer here this year as members of the Summer Science Research Participation Program for Senior High School Students. The program, which was sponsored by the American University and supported by the National Science Foundation, provided gifted students with an opportunity to supplement their initial interests in space-related sciences with practical lab assignments at the Center.

In order to be included in the program, the students had to write two essays and obtain recommendations from their high schools. After AU selected the 118 applicants who would be assigned to a variety of local research labs, Jim Curtis of Goddard's Organization and Employee Development Branch helped the program administrators place 25 qualified students at the Center.

Work for all the summer researchers began on June 15 with a general orientation provided by AU. Then, on June 18, Goddard's students reported to the Center for an introduction and assignment to their specific projects.

Mrs. Margaret Maury of AU served as Associate Program Director and worked closely with the students as they progressed with their research. Approximately every ten days, she toured Goddard's offices where the students were working on projects that might involve a variety of technical subjects including the cataloging of Nimbus imagery, the examination of wetting characteristics on surfaces, the development of test rigs for magnetic tape-head testing, or the study of the interconnection between the magnetic fields of the earth and the sun.

Although the participants were not paid for their work, they did receive a small expense allowance designed to defray the costs of food and transportation. In addition, the National Space Club provided a special scholarship for Goddard's two returning students, Eric Thing and Clinton Winchester. Other program contributors included the Washington Academy of Sciences, the Washington Junior Academy of Sciences, the Chemical Society of Washington, the Department of Agriculture, and Goddard.



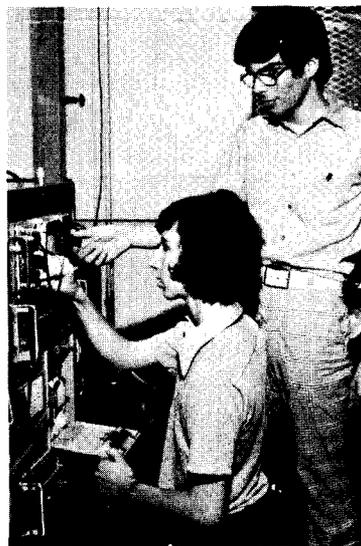
SILVER MIRRORS inside cameras placed aboard satellites are prone to tarnishing, and Scott Shenker's assignment this summer was to find the thickness of a dielectric film that will prevent the tarnish yet not reduce the mirror's reflective ability any more than necessary. Such a task meant that Scott used a sulfide chamber to expose film-coated mirrors to tarnish inducers, noted the results, and finally measured the thickness of the particular coating being tested. Pictured above, he is using an Angstrometer to do that measuring.



ABOARD APOLLO 15, 16 and 17 were gamma-ray spectroscopy experiments flown to determine the energy of gamma-rays originating in outer space. Secondary interference prevented the direct use of the data that was gathered, so this summer, Lanny Poland helped with the elimination of that interference from the data. Lanny has found that "meeting the people here at Goddard is as much of an experience as working - they've all been so friendly and willing to help me."



MAPPING INTERSTELLAR MOLECULES is the subject of Ellen Nagle's work this summer. To do so, she selects a region from the Palomar telescope's optical pictures of space and uses Goddard's darkroom to reprint an enlargement of the desired area. Then she takes radio maps of molecules and correlates them to the optical pictures. Ellen has already finished mapping two regions for inclusion in an atlas of interstellar molecules and plans to return to the Center after the official end of the AU/NSF program in order to complete her project.



A COMET'S TAIL always points away from the sun. Why? According to some scientists, the bits of matter which make it up are so small that they are more strongly affected by solar pressure than by the sun's gravity. Michael Zedd (standing) and Bruce Thorner are helping to substantiate the scientists' theory by studying tektites which are suspended in a magnetic field inside a vacuum chamber and then subjected to simulated solar pressure.



NEIL MELKER uses an electron spectrometer to analyze the decay of a zirconium crystal when it is hit by low energy x-rays. While Neil is quick to express his fascination with his specific assignment under the AU/NSF program, he feels that the experience is even more significant because it introduces the participants to "the people and atmosphere of research." According to Neil, "We get to see how an experiment is run and realize you have to know more than theoretical physics, chemistry and mechanics. You see the skills and background, properties and capabilities that research involves."

AU High School Students

Robert Albin
Peter Bedini
Bruce Buswell
Frank Delalla
Charles Gandy
Louise Gray
James Griffin
Michael Hayge

Paul Hillstrom
David Jankowski
Kenneth Keene
William Krieger
Neil Melker
Ellen Nagle
Scott Nakada
Robert Peiken

Carl Pinches
Lanny Poland
Paul Reyes
Scott Shenker
Steven Snyder
Eric Thing
Bruce Thorner
Clinton Winchester
Michael Zedd

1973 Summer Aids

- Curtis Allen
- Frances Allen
- Herbert Allen
- Brenda Austin
- Marcella Barnes
- Gay Lynn Beatty
- Rodney Blackwell
- George Bowens
- Marcus Brown
- Michele Brown
- Tony Butler
- Olivia Chase
- Jacqueline Council
- Yvette Craig
- Esther Daley
- Maria Daley
- Sandra Davis
- Robbie Davis
- Elijah Farmer
- Charles Fletcher
- Jacqueline Ford
- SuEllen Gardner
- Regina Garland
- Daryl Glover
- Larry Gore
- Marjorie Guensche
- Jennifer Harris
- Robert Henry
- Deborah Holiday
- Zita Hughes
- Andre Jackson
- Debra Jackson
- Diane Jackson
- Ronald Jackson
- Dianne Johnson
- Karen Johnson
- Elleen Jones



Summer Aids I

With the hopes of giving st... and have a profitable summer... Summer Aids on July 2. Su... Gross and Paul Jones served... Coordinators under the direct... nel Services Branch. Also wo... Coordinator Elaine Martin and...

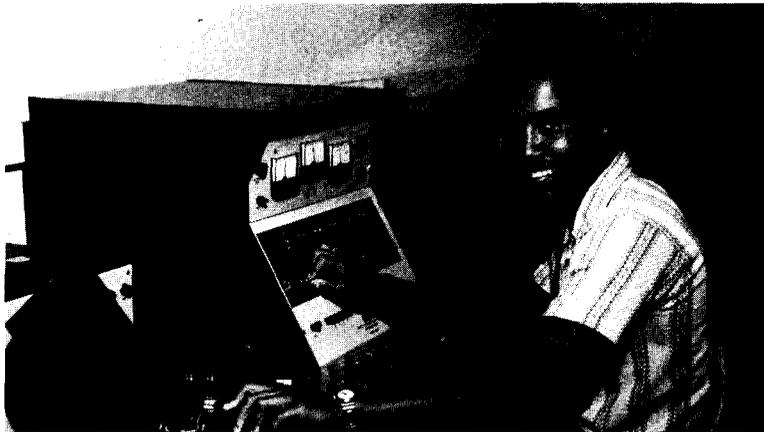
The Aids, who ranged betv... primarily from the Washingto... main fields. Those who took... could be found doing such th... tioning system, attending cou... and taking care of various ma... jobs were assigned to proje... tography machinery, the codi... writing of APL computer pro... cal field, Aids handled typi... distribution.

As well as gaining on-the-... Goddard had the opportunity... program designed to expand a...

Perhaps one Aid's commen... the entire program. Accordi... I sure do hope to be back next...



- Paula Jones
- Charles Kirkland
- Lawrence Law
- William Lew
- Theadus Macklin
- Victor Mellen
- Linda Owens
- Spencer Parker
- Cecilia Pratt
- Debra Proctor
- Angela Quander
- Michelle Quattlebaum
- Gail Rotan
- Sherrie Roberts
- Eugene Robinson
- Jacqueline Robinson
- Lisa Ann Ross
- Michael Sarracino
- Melvin Saunders
- Reginald Scales
- Shelley Scott
- Gregory Sims
- Cathleen Suiter
- Jerry Ann Sullivan
- Gregory Taylor
- Michele Taylor
- Randall Timbers
- Lillette Turner
- William Turner
- Clifford Watts
- Linda Watts
- Elaine Williams
- Michael Williams
- N. Ray Wilson
- Judith Winston

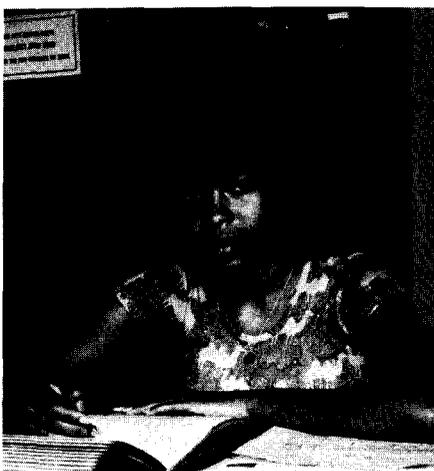


Help in Many Fields

...ts a chance to gain job experience
 ...ddard was happy to welcome 76
 ...er Civil Service employees Cindy
 ...ne Youth Opportunity Campaign
 ...of Carl Mohrwinkel of the Person-
 ...g on the program were Assistant
 ...cial Assistant Homer Newton.

...16 and 21 years of age and come
 ...tropolitan Area, worked in three
 ...of Goddard's maintenance work
 ...as checking the Center's air condi-
 ...in refrigeration and fire fighting,
 ...e rooms. Aids in scientific/techni-
 ...requiring the operation of chroma-
 ...f data onto punched tapes, or the
 ...s among other things. In the cleri-
 ...ng, telephone answering and mail

...xperience, Summer Aids new to
 ...ttend VICORE, a special reading
 ...mprove the students' reading.
 ...ut her summer work best sums up
 ...Brenda Austin, "I love my job and
 ...!"



It's the Sixth Year for SIPA

To introduce 13 college students to both the theory and practice of public administration, Goddard has sponsored its sixth annual Summer Institute in Public Administration. Program Coordinator Carl Mohrwinkel, of the Personnel Services Branch, and Academic Advisor Dr. Bill McGregor, of the University of Maryland, have incorporated individual research assignments, seminars, field trips, and project management simulations into the ten-week program.

So that the participants could gain a better appreciation of the work involved in public administration, research topics were assigned to each student in the Institute. The assignments covered such problems as measuring the productivity in the Procurement Division, assessing the print media's receptiveness to ERTS imagery, and finding more suitable methods for spare parts disposal.

In addition, Dr. McGregor held daily classes, and talks were given by Goddard's Director Dr. John F. Clark; Dr. Michael J. Vaccaro, Associate Deputy Director for Management; and Samuel Keller, Director of Administration and Management. Other Goddard speakers included Robert Amoroso, Richard Baker, Dr. Charles Buffalano, Herbert Fivehouse, Edward Mason, Gilbert Ousley, Dr. George Pieper, Mrs. Marjorie Townsend, and Dr. Anne Underhill.

For a view of some of the administrative techniques used elsewhere in NASA and in the rest of the Federal government as well, the program members took field trips to NASA Headquarters, to the Kennedy Space Center, to the National Oceanic and Atmospheric Administration, and to the Office of Management and Budget. In addition, the SIPA participants visited other Federal agencies, went to Capitol Hill to speak with Senator Howard Cannon and Senator Mark Hatfield, and even managed to attend the Watergate hearings one day.

An interesting twist provided by the Institute was a three-day simulation in satellite management. The project, called GREMEX, involved the use of a computer that threw out problems and then predicted the outcomes of the solutions provided by the "project managers."

Goddard employees serving as advisors to SIPA students were Charles Boyle, Dr. Charles Buffalano, Joseph Cappello, Michael Cushman, Ben Goldman, James Graalman, Thomas Hamilton, Harry Hegarty, Edward Mason, Robert McCaffrey, Richard Sade, David Schaefer, and Martin Stein.



SIPA MEMBERS are (from left, front row): Erwin Chou, Karen Jacon, Geoffrey Simmons. Second row: Dr. Bill McGregor, Roberta Ujakovich, Bart Brown, Emily Rosenthal. Third row: Mark Campisano, Sarah Lichtenstein, Bruce Williams, Ben Tacker, Debbie Mercer. Fourth row: Carl Mohrwinkel, Dan Crippen, Alan Fishbein.

SICA: A Summer of Computer Basics

In conjunction with Bowie State College, Goddard again hosted the ten-week Summer Institute in Computer Applications. The Institute, which began on June 11, combined a course in computer applications with practical work experience for 16 qualifying students.

A two-part program, the first three weeks of the Institute were devoted to formal instruction in computer utilization, basic control language, and FORTRAN IV programming. Five advanced students elected to study an additional computer language and take only a brief refresher course in FORTRAN.

After completing their classroom training, the participants were divided into two-man teams for the second stage of the program — work on actual problems encountered at Goddard. Goddard advisors for that final seven-week period were: Russell Agreeen, Jerome Chambers, Oliver Clark, Dennis Giblin, Willis Holmes, Eddie Jones, Otto Kent, Fred King, Ronald Larsen, Jesse Maury, Robert Nelson,

Demetrios Poros, Lloyd Purves, Barbara Putney, Edward Watkins, Jr. and Fred Whitlock.

In all, eleven predominantly black schools were represented in this year's Institute. They included: Bowie State College, Cheyney State College, Coppin State College, D.C. Teacher's College, Delaware State College, Federal City College, Howard University, Lincoln University, Morgan State College, the University of Maryland-Eastern Shore, and Washington Technical Institute. The participating students, all of whom were at least college sophomores with a 3.0 grade average, earned four college credits for their work and received a \$1,000 fellowship for their summer's efforts.

The Summer Institute in Computer Applications is directed by Dr. Peggy Bannister Scurry of Bowie State College with the help of her administrative assistant Brenda James. Hans Bremer, head of Goddard's Computer Management Section, serves as chairman of the Ad Hoc Committee for the Institute.



SICA PARTICIPANTS are (from left, seated): Vincent Kelley, Carolyn Palmer, Lavetta Alston, Conchita Lawson, Marion Jones, Gary Smith. In the second row are: Dr. Peggy Bannister Scurry, Leatrice Miller, Robert Uhl, Barbara Hollis, James Gorham, Richard Thorpe, William Cornish, Reuben Edmonson, Bruce Morrison, Teresa Boone, Brenda Stinson, Brenda James.

Faculty Members in Morgan State Program

Twelve faculty members from colleges and universities in Maryland, Delaware, Pennsylvania and the District of Columbia were engaged in intensive research here this summer as a part of a special program sponsored jointly by Goddard and Morgan State College. The ten-week program, which ended its third season on August 10, provided an opportunity for faculty members to work on practical problems under the direction of technical monitors from the Goddard staff.

The GSFC/Morgan State Summer Research Program is designed to: make available the research and educational opportunities at Goddard to educational institutions in the local area, strengthen the scientific and technological competence of colleges and universities, and stimulate cooperative participation in NASA research by the faculties of predominantly black colleges and universities. The program is directed and coordinated by Dr. Nathaniel K. Proctor, Professor of Biology at Morgan State College.

Research projects by the program participants include: the mathematical determination of spacecraft orbits, analysis of spacecraft contaminants, cost accruals of NASA projects, cost evaluation for spacecraft, high voltage problems in the vacuum of space, cost benefits for an operational earth resources satellite, construction and evaluation of a training program for procurement, and the preparation of a teaching package using ERTS imagery.

This last project, the preparation of the ERTS imagery teaching package, has provided a particular challenge to investigators Margaret A. Tindal of Coppin State College and Charles F. Robinson of Morgan State College who are working under the supervision of Elva Bailey, Goddard's Educational Programs Officer.

Mr. Bailey says, "The NASA charter spells out an obligation of this agency to actively disseminate information about its research programs and their results. Over the years one of the most demanding and enthusiastic consumers of this new information has been the educational community especially at the elementary and secondary school level. The information has to be packaged properly for this special audience if optimum educational value is to be achieved. Educators who have had the opportunity to learn about ERTS imagery have been quick to see the great potential value this material has for educational purposes.

"Miss Tindal, a geographer, and Mr. Robinson, a physical scientist, have teamed up in their research project to produce a teaching package which will utilize ERTS imagery to teach concepts in land use, mapping, geology and hydrology for use by teachers at about the ninth grade level. We think that the product of their summer research project will provide significant educationally enriching experiences for teachers to use with students in social science classes as well as earth science classes."

Faculty members who took part in the program were Dr. Michael Rock, of Bowie State College; Sylvan Pinsky, Dr. Edward Sommerfeldt and Margaret A. Tindal, all of Coppin State College; Dr. Jagjit Bakshi, of Federal City College; Mrs. Renate Bever, of D.C. Teachers College; Dr. Tung Tsang, of Howard University; Stanley Tsai and Thomas Gorman, both of Lincoln University; and Dr. Robert Collagen, James J. Schiller, and Charles F. Robinson, of Morgan State College.

Goddard technical monitors for the program were: Dr. Carmelo Valez, Systems Development and Analysis Branch; John Westrom, Space Power Technology Branch, Edwin Korklin, Project Support Branch; Francis Hagen, and David Clemens, Resources Analysis Office; Frederick Gross, Materials Engineering Branch; Elva Bailey, Educational Programs Office; David Schafer, Data Techniques Branch; and Dr. Isidor Adler and Dr. L. I. Yin, Theoretical Studies Branch.



A TEACHING PACKAGE using imagery from the Earth Resources Technology Satellite (ERTS) will be the result of work here this summer by Margaret Tindal, of Coppin State College, and Charles Robinson (right), of Morgan State College. Here they discuss their project with technical monitor Elva Bailey, Goddard Educational Programs Officer.



TECHNICAL MONITOR Peter A. Bracken (left), Head of the Data Management and Programming Office, discusses a computer research analysis project with summer investigator Dr. Edward Sommerfeldt of Coppin State College.



MRS. RENATE BEVER, of D.C. Teachers College, and technical monitor John Westrom, of the Space Power Technology Branch, inspect equipment she is using in a study of high voltage problems in space.



DR. TUNG TSANG of Howard University is working on a summer research project entitled "Radiation Damages in Minerals and Causes for Inhibition of Al_2O_3 Growth in the Presence of Plasma."



PARTICIPANTS in the GSFC/Morgan State College Summer Research Program are (clockwise, from left) James Schiller, Sylvan Pinsky, Thomas Gorman, Mrs. Renate Bever, Dr. Edward Sommerfeldt, Charles Robinson, Margaret Tindal, Dr. Robert Collagen, Stanley Tsai, and Dr. Michael Rock. Not shown are Program Coordinator Dr. Nathaniel K. Proctor, Dr. Tung Tsang and Dr. Tagjit Bakshi.

Over 100 Retire in First Half of '73

More than 100 Goddard employees retired during the period of January 1 and June 31, 1973. Among them were three "old timers," Daniel G. Mazur, John T. Mengel and Robert E. Bourdeau, who came to NASA in 1958-59 from the Naval Research Laboratory where they were key members of the Vanguard team.

Mr. Mazur, for years Director of Technology, retired as Associate Deputy Director for Engineering. Mr. Mengel, formerly Director of Mission and Data Operations, retired as Goddard's Senior Tracking and Data Scientist. Mr. Bourdeau, formerly Director of Projects, retired as Director of Space Applications and Technology.

Other key retirees, in order of code, are: Louis Best, Head of the Space Science and Satellite Applications Section of the Budget Branch; George Messina, Head of the Fabrication Management Section; Wanda Eckell, OSO Project Secretary; Melba L. Mouton, Assistant Chief the Geodynamics Program Division; Dr. Robert Rochelle, Associate Chief of the Communications and Navigation Division; William P. Varson, Associate Chief of the Network Engineering Division; Niles R. Heller, Chief of the Network Facilities and Services Division; Virgil Byrd, Head of the Recording Systems Office; and John E. Liner, Head of the Communications Technical Office.

The following is a list of people who retired from each directorate. We regret that space does not permit us to mention more about each retiree.

Office of the Director

Daniel Mazur
John Mengel

Administration and Management Directorate

Edmund Ahern	Lorraine Gilbert	James Randolph
Ira Beckner	Clarence Harron	Paul Reuter
Lois Best	William Hardgrove	Howard Ruddell
William Blair	D. Wiley Jenkins	Jeanne Ruddell
Ellen Boyce	Tillie Kroto	Emma Ruppert
Paul Cocchiaro	Clifford Link	Walter Stewart
Leo Edmonds	Charles Little	Charles Trotter
Arthur Essex	William McDermott	Eleanor Wert
Irving Finkleman	Felice McNeece	Charles Whitfield
Ruth Flanagan	William Melchi	Edward Williams
Arthur Flayhart	George Messina	Howard Wipf
	Eugene Novak	

Systems Reliability Directorate

William Fortier	George Somerville
William Hardgrove	Kurt Sundstrom
John Kimen	Vernon Thames
Donald McAfee	James Wood
William O'Hara	Wilbur Young
Harold Shapiro	

Projects Directorate

John Callaghan
Wanda Eckell
George Gemunder

Mission and Data Operations Directorate

Cyrus Creveling	L. Lamar Layton
Myron Dakin	Robert Mitchell
Chester Fortune	Melba Mouton
William Healy	Fred Nemir
Hans Hertz	Jesse Rogers
Hubert Hinton	Herbert Stotler
Charles Jurgensmeyer	

Space and Earth Sciences Directorate

Kenneth Bourne	Edward Monasterski
Eileen Ellicott	Theodore Psaropoulos
Felix Geiger	Thomas Skillman
Helen Graham	William Tierney
Henry James	Alberta White
Louis Kirouac	

Space Applications and Technology Directorate

Robert Bourdeau	J. H. Perry
Emil Busch	Stanton Prentiss
Alach Cole	Edward Redman
James Connellee	Charles Reeves
Thomas Cook	William Risley
Vivienne Goebel	Robert Rochelle
Maurice Handegard	Robert Sheehy
Clarence Kinley	Charles Smith
John Maskasky	William Tucker
Charles Miller	Edward Twine
Graham Moore	Edward Weller
Harry Nichols	

Networks Directorate

Grant Bomgardner	Francis Hartz
Lyle Bonney	Niles Heller
David Byer	Robert Kenney
Virgil Byrd	John Liner
Richard Coan	Charles Lundstedt
Thomas Combs	Ernest McCarley
Donald Dunsmore	John Onda
Fred Ellis, Jr.	William Palmer
Charles Goodman	Victor Simas
James Gregg	James Suite
James Hammond	William Varson

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Nancy Mengel, Editor
Patricia Ratkewicz, Secretary, Phone Extension 4141
Harriet Rosenthal, Special Assistant