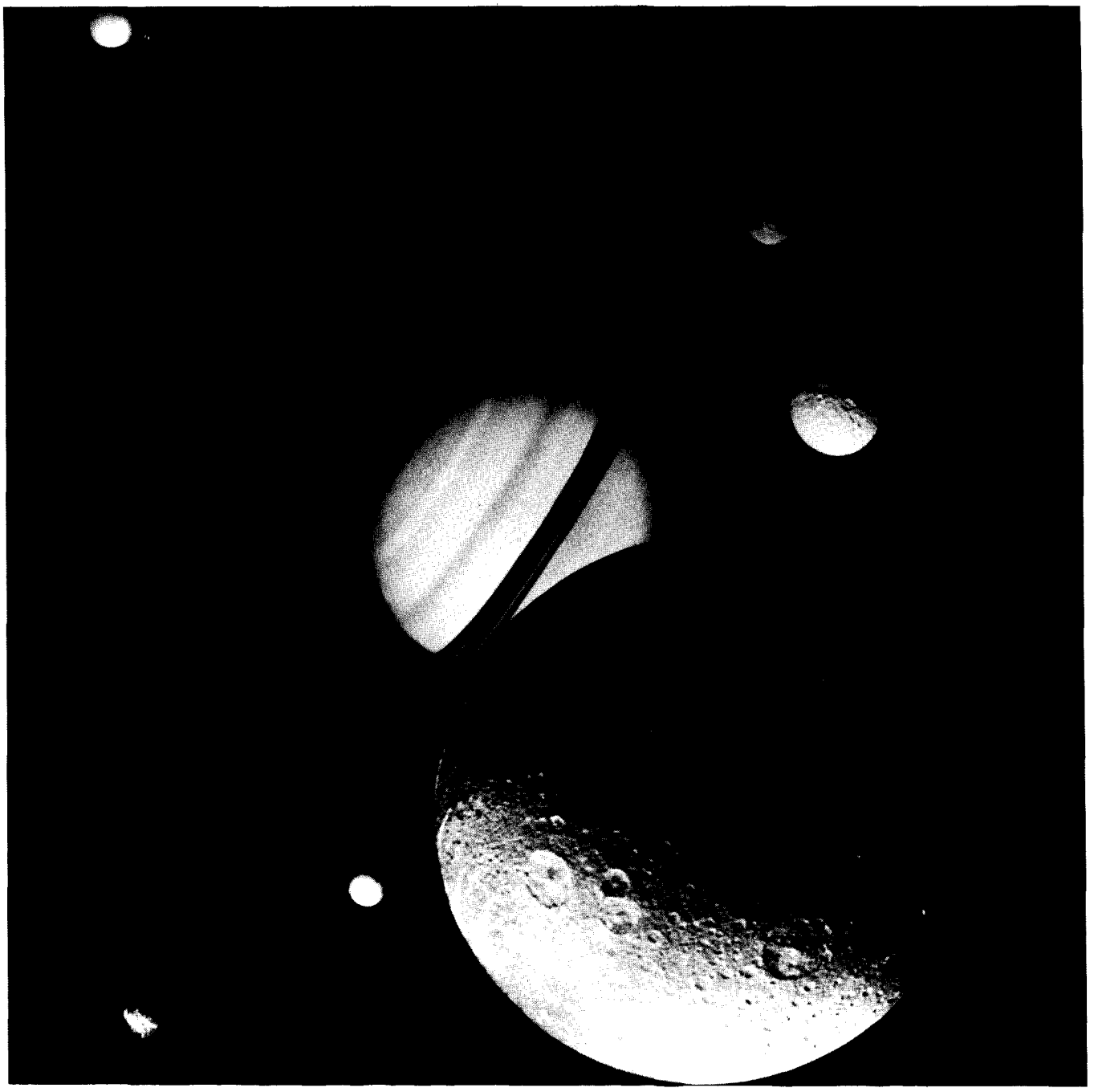
NASA
National Aeronautics and Space Administration

GODDARD NEWS

Goddard Space Flight Center Greenbelt, Md. Vol. 27. no. 29 November 24, 1980

A view of Saturn from Voyager



This montage of images of the Saturnian system was prepared from an assemblage of images taken by the Voyager I spacecraft during its Saturn encounter in November 1980. This artist's view shows Dione in the forefront, Saturn rising behind, Tethys and Mimas fading in the distance to the right, Enceladus and Rhea off Saturn's rings to the left, and Titan in its distant orbit at the top. The Voyager Project is managed for NASA by the Jet Propulsion Laboratory, Pasadena, California.

Goddard Energy Conservation Is Here To Stay

Jim Mills, Associate Director for Institutional Management, indicates that energy conservation at Goddard is here to stay. He said that serious energy conservation measures were first started by the Plant Operations and Maintenance Division (Code 290) in 1971 because energy price increases had begun to create serious budgetary problems. By 1973 total Center energy consumption had been reduced by almost five (5) percent when the oil embargo struck and changed our concern over money to concern over whether there would even be enough energy to keep the center operating.

Energy availability also quickly became a national concern and it was clear that extreme conservation measures were needed as a partial short-term solution to the problem. Recognizing this, NASA established an agency-wide goal of reducing energy consumption by 50% by 1985, using 1973 as the base year against which all reduction would be measured. Since 1973, energy consumption has been reduced another 32 percent by adding mylar to windows so the sun's heat would be partially blocked to reduce the cooling load, by reducing lighting levels, by adjusting building temperatures to around 78°F in the summer and 65°F in the winter, by cycling building air handling systems on and off when conditions permit, by making modifications to heating, cooling, and ventilating systems to make them more energy efficient, and with the cooperation and help of all building occupants.

Figure 1 outlines some of our accomplishments to date and reflects additional planned efforts. Mr. Mills said that we should all be proud of what has been done so far but was quick to point out that we have, to a large extent, been able to realize these impressive energy reductions principally because we have been modifying building heating and cooling systems that were designed and installed during a period when energy was cheap and systems were not designed for efficiency. He indicated much of what has been done was accomplished with very little cost involved and that the next phase of reaching our energy goal will be much more difficult. It will require funds to make significant system changes. Greatly intensified management and operational efforts will also be necessary to reduce and/or improve the way in which we schedule and use electrical equipment at the Center (laboratory, office, and computer equipment consumed approximately 30 percent of all energy used at Goddard in 1980).

While an overall reduction in energy consumption is our primary goal, we also continue

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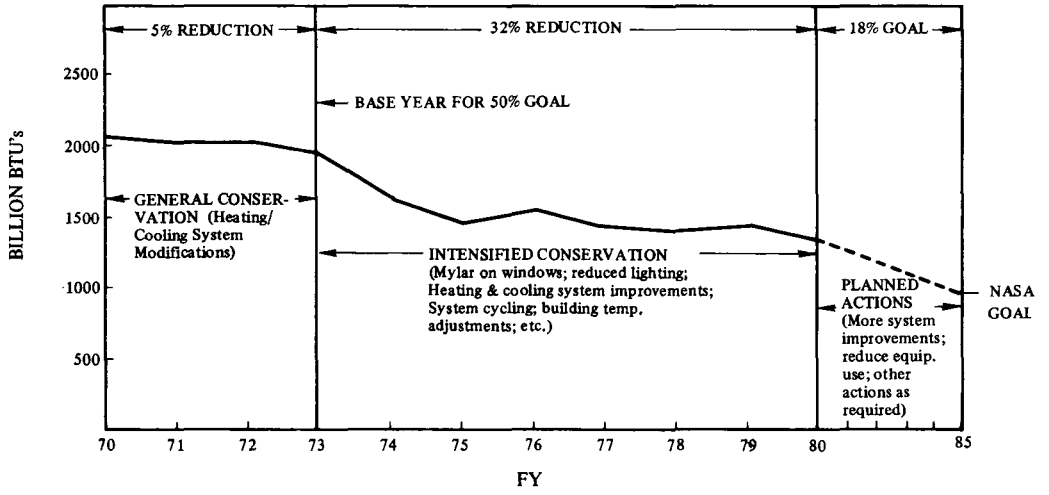


FIG. 1. GSFC ENERGY CONSERVATION PLANS AND ACCOMPLISHMENTS.

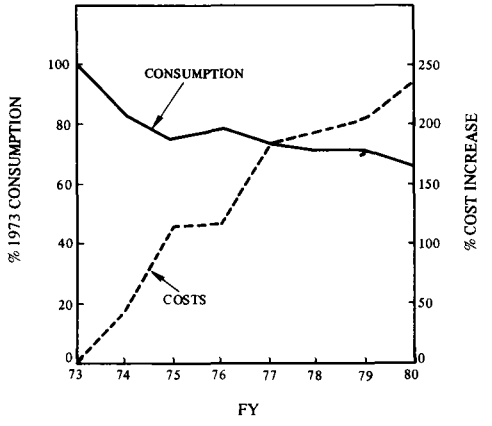


FIG. 2 CONSUMPTION/vs/COST

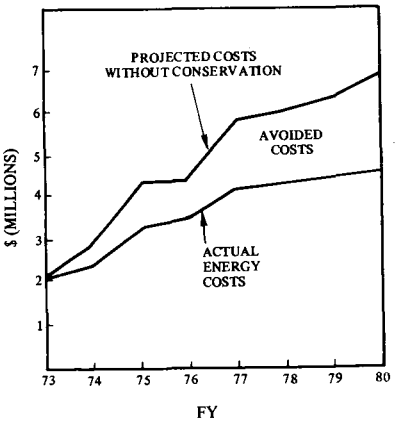


FIG. 3 COST AVOIDANCE THROUGH CONSERVATION

People

Pictured above are Michael Cohen, Personnel Division; Waddell Longus, Chief, Personnel Division; Jim Robinson, Chief, Facilities Engineering Division; Kent Potter, Facilities Engineering Division; Benita Sidwell, Acting Director, Management Operatrions Directorate; Chris Bryan, former Chief Security Office; and Pat Mattea, Security Office.

Accident Reduction Awards Given

The Management Operations Directorate Ad Hoc Committee for Accident Reduction presented the awards for the third quarter on November 3, 1980. The ceremony was held in the office of Ms. Benita Sidwell, acting Deputy Director of Management Operations Directorate.

Kent F. Potter of the Facilities Engineering Division received a certificate and a check for $25 for his effort to eliminate a tripping hazard in building 17. A bicycle stored in the stairwell was frequently secured with the handlebar intruding into the stairway.

A certificate and reserved parking space was presented to Michael P. Cohen of the Personnel Division for his efforts in obtaining help from the Plant Operations and Maintenance Division, Pest Control Section, following reports of mice in building 1.

The third award was presented to Chris Bryan of the Security Office for his role in informing Goddard employees of the potential hazards of leaving aerosol containers in their automobiles.

Energy

Continued from page 2

to benefit in a cost sense. Figure 2 shows how energy consumption has been reduced since 1973 and how energy costs have increased during this same period. Figure 3 reflects what our costs would now be were we still using the energy we did in 1973. Since 1973 a total of $9,724,628 in energy costs have been avoided as a result of conservation efforts, $2,263,680 in 1980 alone. Mr. Mills indicated that national priorities concerning energy conservation coupled with rising costs provide a great deal of incentive. In order to be sure that the proper amount of attention is focused on energy conservation, he said an Energy Management Office is being established which will coordinate and stimulate such activity at Goddard. This office will work with all Directorates in developing conservation goals, formulating emergency procedures in the event they should be needed, in establishing a long range energy plan for the Center, and in identifying and implementing specific conservation measures. Mills is confident that the next part of our conservation goal (18 percent more reduction by 1985) can be reached through the combined efforts of all Goddard employees.

New Employees

Vasicek, Jean M., Student Trainee (Code 861.3), 09-02-80

White, David L., Student Trainee (Code 511.1), 09-02-80

Price, Shirley L., Student Trainee (Code 213), 09-02-80

Moneski, Dean P., Student Trainee (Code 213), 09-02-80

Rose, Shelby L., Clerk-Typist Trainee (Code 230), 09-02-80

Pittman, Havangela, Clerk-Steno Trainee (Code 810), 09-02-80

Morgan, Barbara J., Clerk-Steno Trainee (Code 801), 09-02-80

London, Felecia L., Clerk-Typist Trainee (Code 232.1), 09-02-80

Jenkins, Felcia L., Clerk-Typist Trainee (Code 280.5), 09-02-80

Bright, Cathy L., Clerk-Steno Trainee (Code 267), 09-02-80

Patten, April, Clerk-Typist Trainee (Code 660), 09-02-80

Talley, Cathryn L., Clerk-Typist Trainee (Code 570), 09-02-80

Nowak, Robyn C., Clerk-Typist Trainee (Code 511), 09-02-80

Belt, Mary D., Clerk-Typist Trainee (Code 930), 09-02-80

Corwin, Barbara L. Clerk-Typist Trainee (Code 923), 09-02-80

Brown, Cindy Y., Clerk-Typist Trainee (Code 900), 09-02-80

Vest, Denise, Clerk-Steno Trainee (Code 910), 09-02-80

Cooke, Barbara Ann, Clerk-Steno Trainee (Code 120), 09-02-80

Sciors, Donna M., Clerk-Typist Trainee (Code 710), 09-02-80

Geaslen, Sharon L., Clerk-Typist Trainee (Code 720), 09-02-80

Elben, Sheri Lynn, Clerk-Typist Trainee (Code 720), 09-02-80

Greenwood, Deborah M., Clerk-Typist Trainee (Code 220), 09-02-80

Henry, Debra L., Clerk-Typist Trainee (Code 210), 09-02-80

Jones, Willa O., Clerk-Typist Trainee (Code 8009), 09-02-80

Katrinic, Cathleen J., Clerk-Typist Trainee (Code 246), 09-02-80

Locklear, Wanda L., Clerk-Typist Trainee (Code 270), 09-02-80

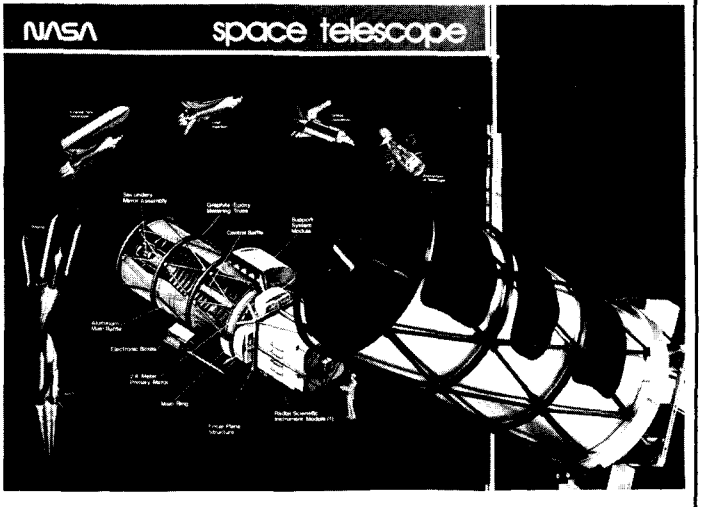
Henson, Tonya Marie, Clerk-Typist Trainee (Code 202), 09-02-80

Gardner, Vicky D., Clerk-Typist Trainee (Code 240), 09-02-80

Jones, Robert L, Electronics Engineer (Code 727.2), 09-02-80

Roberts, Lynn S., Supv. Program (Code 220.1), 09-02-80

Cortes, Rosa, Secretary (Code 405), 09-02-80



The Space Telescope will be a general-purpose astronomical observatory in space with a design lifetime of more than 15 years. It consists of three major modules: the Optical Telescope Assembly; the Scientific Instruments; and the Support Systems Module, which will house the Optical Telescope Assembly and the Scientific Instruments. The Telescope will be on display in bldg. 21 through mid-December.

Ultraviolet Astronomy Yields Possible Neutrino Mass Evidence

A Goddard scientist has found possible new evidence suggesting that the subatomic particles known as neutrinos have mass, and that our galaxy may be surrounded by vast numbers which were produced during the first few moments of the birth of the universe.

Until recently, neutrinos were thought to have no mass, like photons.

Dr. Floyd W. Stecker, of the Laboratory for High Energy Astrophysics at the Goddard Space Flight Center, Greenbelt, Md., says there may be new astronomical evidence based on a recent suggestion by CERN (Centre Européen De Recherche Nucleaire) physicist A. de Rujula and Nobel Laureate Sheldon Glashow of Harvard University that if neutrinos have mass, evidence for their decay might be found in ultraviolet astronomical observations.

Dr. Stecker, writing in the Oct. 27 issue of Physical Review Letters, concludes that tentative evidence of a spectral line, which may be from decaying neutrinos, exists near the ultraviolet wavelength of 0.00017 mm in various rocket observations.

Ultraviolet astronomical observations can only be made above the Earth's atmosphere, with rockets and satellites. Dr. Stecker used rocket observations by Dr. Richard Henry of Johns Hopkins University and his collaborators as well as observations of a French group working with data from the French D2-B spacecraft. Future ultraviolet astronomy studies, providing more refined observations, are needed in order to further test the neutrino-decay hypothesis, according to Stecker.

The hypothesis, if it is correct, holds important implications for theories dealing with the nature of all matter and the ultimate fate of the universe.

The strength of emission lines from ultraviolet spectroscopy gives important evidence on the rate of decay, which in turn is inversely proportional to lifetime. Stecker believes that if his interpretation of the ultraviolet data is correct, these neutrinos live so long that only one neutrino in 10 million would have decayed since the universe began (under the Big Bang theory of cosmic evolution).

According to the Big Bang theory, all of the matter of our present universe was originally packed together in a primeval fireball—an extremely hot, dense ball that exploded about 15 billion years ago. The gigantic explosion threw hydrogen, helium, electrons and radiation out into space. The matter that was spewed into space expanded and cooled, and several million years later, it condensed into galaxies. The universe has continued to expand, and the galaxies have continued moving away from each other ever since.

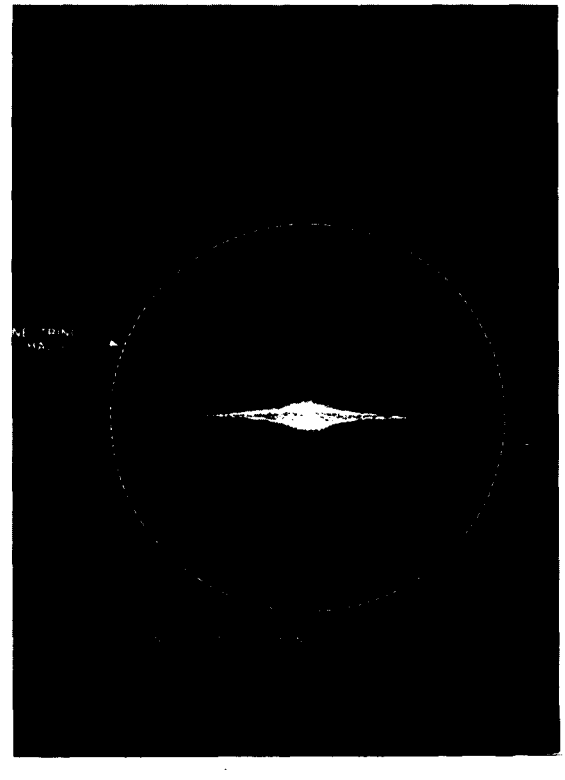
One part of the Big Bang theory states that there are roughly a billion neutrinos for every proton in the universe. (Protons are the nuclei of hydrogen atoms, which account for 90 percent of the atoms in the universe.) Our galaxy may be surrounded by a spherical sea or "halo" of neutrinos which were created in the first moments of the Big Bang, some of which are decaying all the time.

If Stecker's conjecture is correct, the "heavy" neutrinos which produce this spectral line at the observed wavelength would weigh so little that it would take a billion of them to equal the weight of one nitrogen atom. However, there are so many of them that they would make up the bulk of the mass of the universe and account for the mysterious "missing mass" in large clusters of galaxies.

Stecker's mass estimates agree with recent reports by a group at the Institute for Theoretical and Experimental Physics in Moscow.

Other recent evidence for neutrinos having mass has been reported by a group at the University of California at Irvine under Dr. Frederick Reines.

The determination of the fundamental properties of neutrinos, such as their mass and lifetime, provides important clues to understanding the nature of all matter. In addition, the exact determination of the masses of all types of neutrinos (of which three are presently known) will enable astrophysicists, using the general theory of relativity, to deduce whether the universe will keep on expanding forever or will eventually collapse, producing a new Big Bang.



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The GODDARD NEWS is published every two weeks by the Office of Public Affairs, Goddard Space Flight Center, Greenbelt, Md. 20771. Deadline for submitted material is two weeks from the date of publication. For additional information on major articles contained herein, contact the editor on (301) 344-5566

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