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McDonnell Center for Space Sciences
To Be Established with $4 Million Gift

Space Sciences Have Distinguished History

The space sciences at Washington University date back to shortly after World War II when a cosmic-ray physics group was established through the personal influence of Arthur Holly Compton. The late Mr. Compton was chancellor and physics professor at the University. In 1966, with the support of James S. McDonnell, the space sciences program expanded markedly. The Laboratory for Space Physics was established and provision was made for the McDonnell Professor of Space Sciences and for three fellowships, named in memory of the late astronauts, Roger B. Chaffee, Virgil I. Grissom and Edward H. White.

WU's space sciences program in the broadest sense addresses the following general questions:

How and when were the chemical elements formed?
How and when did the solar system originate?
How did the planets form and what are they really like?
What is the nature of the moon and what is its history?
What is the structure of the sun and the nature of the sporadic violent outbursts that occur on its surface?
Where do cosmic-rays come from and what can they tell us about the universe outside the solar system?
What has happened to the solar system in its travels several tens of times around the galaxy since its beginning?

The University’s current fields of interest in the space sciences are in four basic areas: (1) the origin of chemical elements (2) the study of energetic solar and galactic nuclei in space (3) the formation and evolution of the planets and (4) the exploration of the universe using new techniques of far-infra-red

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sion Team that is scheduled to soft-land an instrumented laboratory on the planet Mars in 1976.

Space sciences, according to Professor Walker, embrace a variety of disciplines normally found in different departments on campus. The new center transcends these traditional divisions and will unite scientists with very different backgrounds. It is expected that the stimulating interaction of these diverse scientific intellects will lead to new directions in the study of the universe and man's role in it, Professor Walker said.

Noting that the first American in space and the first American in Earth orbit made their flights in spacecraft designed and built in St. Louis, WU officials voiced their convictions that the new McDonnell Center for the Space Sciences will enable St. Louis to maintain and expand its leadership in the exploration of space.

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by the McDonnell Center for the Space Sciences. The universe is a vast and wondrous place. Its exploration will continue for as long as the human race exists. Thanks to this generous gift, Washington University will play a crucial role in that quest in the years to come.

The center will build on an already strong base of research by WU's scientists in the fields of lunar and planetary studies, and measurements of particles and fields in outer space. The University's space sciences group was one of those selected to study the first samples from the moon and remains one of the foremost scientific teams now engaged in lunar-sample analysis. Other members of the faculty have built and flown some of the largest balloon-borne detectors ever used for the study of cosmic-rays. This work led to the selection of a WU scientist as a principal investigator on an important cosmic-ray experiment scheduled to be flown in 1979 on the High Energy Astronomy Observatory which will be one of the largest scientific satellites ever launched. Another WU scientist, using a unique, balloon-borne telescope, recently has discovered bright sources of far-infra-red radiation in the galaxy. University scientists are also part of the Viking Mission Team that is scheduled to soft-land an instrumented laboratory on the planet Mars in 1976.

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astronomy. Astrophysicists now believe that many of the chemical elements must have been formed in a period of seconds in spectacular explosions of stars. In addition to producing the common 92 elements that are found on earth, these explosions must also have produced other radioactive elements that have been produced by man in the laboratory. One particularly important such element is plutonium. Although produced in the original explosions, elements like plutonium have long since died away and are now extinct. However, solid objects formed when such elements were present continue to show evidence of their prior existence. WU is one of the world leaders in the study of these extinct isotope effects in meteorites and lunar rocks. It has helped to define the conditions that produced the heritage of elements which make up the solar system. Extinct isotope effects also allow fine-scale measurement of the early chronology of the solar system and the mechanism of formation of the planets.

The University's laboratory was the first to find evidence for the prior existence of extinct isotopes in the lunar samples, and it is currently working to fill in the enigmatic gap in the history of the moon from 4 to 4.6 billion years ago. This gap in history, indicating a period of great cataclysms in the early solar system, is one of the most exciting and puzzling discoveries of the Apollo program.

The splendid Mariner photography of Mars has shown that this planet, like the moon, has a surface that is greatly cratered. It is equally evident that erosion on Mars is very different from that on the moon. The space sciences program at WU has a new faculty member who is part of the Mariner and Viking photography teams. His primary research interest is to understand the evolution of the Martian surface.

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the chemical elements, including very heavy elements such as uranium—as the cosmic radiation should if it were produced in the same explosions which are thought to be responsible for the formation of the elements. The University has pioneered in the study of such heavy elements in the cosmic radiation, and its high-altitude balloon flights which used both plastic and photographic emulsion detectors have contributed about half the world’s early information on this question. In addition, a series of highly successful balloon flights using electronic detectors is giving a much more detailed understanding of heavy cosmic-rays. The success of the above experiments led directly to the selection of another WU space scientist as the principal investigator for a cosmic-ray experiment for a High Energy Astronomy Observatory satellite to be launched in 1979. This experiment is expected to refine and to double information about heavy cosmic-rays.

The sun itself suffers violent explosions from time to time, and WU space scientists have discovered an unexpectedly large quantity of very low-energy particles in these solar flares. This information has led to new speculation about the nature of the solar flare process. The data were gleaned from an experiment flown to the moon and returned on the Apollo 16 mission.

At still lower energies the sun produces an intense flux of nuclear particles called the solar wind. The first measurements of the abundance of heavy elements in the modern-day solar wind are being made on materials flown in an experiment on the Apollo 17 mission. This experiment was entirely constructed at WU.

As is so often the case in science, the ideas and techniques generated in WU’s space sciences work have had an impact in other fields. Perhaps the most interesting of these are the new approaches University space scientists have developed for the study of art and archeology. These applications have already been useful in dating various objects of ceramic art. The techniques were developed as a combination of the research on extinct isotopes coupled with an attempt to indirectly measure the heat flow from the moon.

Currently, research in space sciences is primarily being carried out in the

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WU Faculty of Arts and Sciences. The faculty members and their areas of interest are:

Department of Physics: Professor John W. Clark is engaged in theoretical studies of neutron stars as an extension of his basic interest in many-body problems in nuclear physics; Professor Michael W. Friedlander is primarily engaged in far-infra-red astronomy using a balloon-borne telescope. He has also studied cosmic-rays using balloon-borne nuclear emulsions and plastic track detectors; Professors Charles M. Hohenberg and Robert M. Walker study lunar and meteoric samples using techniques of etched tracks, thermoluminescence, and rare gas mass spectroscopy to investigate the early history of the solar system and the history of cosmic-rays, solar flares, and the solar wind; Professors Martin H. Israel and Joseph Klarmann are studying the composition of heavy cosmic-rays using large-area electronic detectors on balloons and satellites; Professor Martin Lee is a specialist in theoretical plasma astrophysics, particularly cosmic-ray propagation and wave processes in interplanetary space.

Department of Earth Sciences: Professor Raymond E. Arvidson is involved in photographic studies of Mars, using both Mariner and Viking; Professors Ghislaine Crozaz-Walker and G. Jeffrey Taylor work closely with Professor Walker in lunar and meteoric studies; Professor Frank A. Podosek is collaborating with Professor Hohenberg in rare-gas mass spectroscopy of lunar samples and meteorites.

Space research is not the province of any one discipline—geologists, geochemists, and biologists are expected to be as much a part of the program as astronomers and astrophysicists. The new center is conceived as an interdisciplinary research entity, which, at the same time, is an integral part of WU and its teaching role.

Space Sciences studies focus in Compton Lab, but program is interdisciplinary.
TUESDAY, DECEMBER 3
8:30 p.m. School of Architecture Lecture, “The Work of the Office of Hirshen, Gammill, Trumbo and Cook, AIA, Berkeley, Calif.” Sanford Hirshen, assoc. prof. of architecture, U. of California, Berkeley. Steinberg Hall.

WEDNESDAY, DECEMBER 4
11:15 a.m. Assembly Series Lecture by Col. Theodore McNeal, president, St. Louis Board of Police Commissioners. “St. Louis Police — Community Relations.” Graham Chapel.

FRIDAY, NOVEMBER 29
7:30 & 9:30 p.m. WU Filmboard Series, “Camelot.” Wohl Center Line D. Admission $1.

TUESDAY, DECEMBER 3

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“Faculty Show 74” featuring WU artists and designers. Steinberg Hall. Sponsored by the School of Fine Arts. Weekdays 9 a.m.-5 p.m.; Saturday 10 a.m.-4 p.m.; Sunday 1-5 p.m. Through Dec. 2.

Memorabilia of the St. Louis Car Company, including scale models and photographs of vehicles built here from 1887-1973. Level five, Olin Library. Weekdays 8:30 a.m.-5 p.m.

The WU Record is published weekly during the academic year by the Office of Information, director, Roger Signor; editor, Kathy Pearson; contributing editors, Dorothy Brockhoff, King McLey; calendar editor, Anne Hallett. Photographs by Herb Weitman, Rick Levine and Gail Cissna. Address all communications to the editor, Box 1142.

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TUESDAY, DECEMBER 3
8 p.m. Music For Two Pianos, Josephine Brandt and Doris Reynolds. Music of Bach, Debussy, Brahms and Milhaud. Graham Chapel.

RECOCNITIONS

TWO MEMBERS OF THE WU COMMUNITY, Stanley Elkin, professor of English, and Mona Van Duyn, co-founder and co-editor with her husband, Jarvis Thurston, professor of English, of Perspective magazine, have been asked to serve as judges of the 1975 National Book Awards. Elkin will be a judge in the fiction category. Ms Van Duyn will be one of the judges in the poetry category.

APPOINTMENTS

LINDA ELLSWORTH of Edwardsville, Ill. has been appointed associate director of the newly established Center for the Study of Public Affairs at WU. She will work with Professor Robert H. Salisbury, director. The center was established to bring together the resources of academic political science programs and professionals in the public sector. One of her major responsibilities will be to develop a master’s degree program for those who are or hope to be in public service. She will also help to plan meetings and symposia on major public issues. Ms Ellsworth, who received both her bachelor’s and master’s degrees at Southern Illinois University, Edwardsville, was assistant for program development to the vice president and provost at SIUE prior to her appointment at WU.

ANNOUNCEMENTS

WU WOMAN’S CLUB will hold a luncheon at 12:30 p.m. Friday, Dec. 6 at the Brentwood Congregational Church, 2400 S. Brentwood Blvd. Punch will be served at noon. The luncheon will have an English garden theme, highlighted by an illustrated lecture by John Elsey, curator of hardy plants at the Missouri Botanical Garden. Reservations may be made by sending $3 per person to Mrs. G. R. Whitaker, Jr., 212 S. Elm, St. Louis, Mo., 63119, no later than Dec. 3. An additional $1 per child should be included for those needing a baby sitter, who will be provided at the church. For further information, call Mrs. Whitaker at 962-8756.

WU URBAN STUDIES students will serve as interns for the St. Louis Board of Aldermen under an agreement announced Nov. 15 by Richard A. Gephardt (D.—14th Ward.) Those assigned to this task will serve the legislative research committee which Gephardt chairs and also other aldermen. Under a resolution introduced last year by Alderman Gephardt, a group of WU law students have also served as legislative assistants for the Board of Aldermen.

Missouri State Committee for the Humanities is accepting applications for funding projects on the state bicentennial theme, “Education and Representative Government: 1776-1976—the Future.” Deadline for short form proposals is Dec. 2. For further information call the Research Office, 863-0100, ext. 4141, or Robert Walrond, ext. 3164.

WU FACULTY in the fields of science, mathematics and engineering are eligible to apply for one of 80 National Science Foundation Faculty Fellowships in Science Applied to Societal Problems. Applicants must have five or more years of full-time teaching experience and be U.S. citizens or nationals. Application deadline is January 7. For further information call Mrs. Nancy Wagner, 863-0100, ext. 4141.

Twelve United States cities have more than 500 Washington University alumni. They are: St. Louis, 24,811; New York, 2316; Chicago, 2095; San Francisco, 1291; Los Angeles, 1256; Washington, D.C., 1228; Kansas City, Mo., 833; Boston, 730; Denver, 622; Philadelphia, 564; Houston-Galveston, 535 and Dallas-Fort Worth, 525.