Obituaries

Prepared by the Historical Astronomy Division

WULFF-DIETER HEINTZ, 1930-2006

Wulff Dieter Heintz, Professor Emeritus of Astronomy at Swarthmore College, passed away at his home on 10 June 2006, following a two-year battle with lung cancer. He had turned seventy-six just one week earlier. Wulff was a leading authority on visual double stars and also a chess master. A prominent educator, researcher, and scholar, Wulff was noted for being both succinct and meticulous in everything he did.

Wulff Heintz was born on 3 June 1930 in Würzburg (Bavaria), Germany. Naturally left-handed, his elementary school teachers forced him to learn to write ‘‘correctly’’ using his right hand, and so he became ambidextrous. During the 1930s, Wulff’s family saw the rise of Adolf Hitler and lived under the repressive Nazi regime. As a teenager during World War II, Wulff listened to his family radio for any news from the outside world. He used to say that he loved the blackouts during the bombing runs because it made it much easier to see the stars. On the night of 16 March 1945, Wulff’s home town of Würzburg was heavily bombed, resulting in the destruction of eighty-five percent of the city and the deaths of several thousand civilians. One incendiary bomb landed on the roof of his family home, but Wulff climbed up to the roof and extinguished it before the flames could spread. The next morning, he discovered (with some delight) that his high school had burned to the ground. As Germany continued to suffer massive losses, teenage boys as young as fifteen were inducted into the military and sent off to replenish the troops. To avoid an uncertain fate, Wulff hid out in a farmhouse in the countryside outside of Munich. When the allied troops invaded Germany in 1945, Wulff volunteered to be a translator between the American and British soldiers and the local villagers. In return for his valuable service, the soldiers taught Wulff how to smoke cigarettes, a habit that he continued until his final days even after having been diagnosed with lung cancer.

Shortly after the war ended, Wulff enrolled at Würzburg University, eventually completing his studies in 1950 with two majors, mathematics and chemistry. In 1950 he enrolled for graduate studies at Munich University. Conditions were horrid and austere, and the students were undernourished. Most of the university buildings had been destroyed during the war, but the buildings and domes of the Munich-Bogenhausen Observatory, which housed the meridian circles and the telescopes, suffered only minor damage. Lectures in astronomy were given in one of the small, surviving buildings on a tiny blackboard, forcing the lecturer to hold the chalk in his right hand and a sponge simultaneously in his left hand. Deplorable circumstances notwithstanding, Wulff, along with fellow classmates and future colleagues Edward Geyer, Theodor Schmidt-Kaler, and Joachim Herrmann, received a thorough instruction in astronomy from, among others, Hans Bucerius (celestial mechanics and theoretical astronomy), Wilhelm Rabe (binary stars), Erich Schoenberg (photometry, general astronomy), and Felix Schmeidler (astrophysics and galactic astronomy). Wulff also gained practical training in meridian circles and position micrometers, and learned to make binary star observations with the old Fraunhofer refractor (1835) of the Munich Observatory. It was here that his passion for binary stars was born.

In 1953, Munich University awarded Wulff the degree of *Doktor rerum naturalis* in astronomy, which he completed under the direction of Felix Schmeidler. Wulff was almost immediately recruited by the Munich University Observatory to serve as the Scientific Assistant at the Southern Station in Mount Stromlo, Australia. He worked at Mount Stromlo from 1954 to 1955, then returned to Munich to serve as Research Officer from 1956-69, during which time he visited both the United Kingdom and the United States. Wulff was involved in observations of the planet Mars, and in particular the dust storms that were occurring on that planet around the time of the 1956 opposition. His sketches of the Red Planet were quite detailed, and showed then unknown surface features which spacecraft visiting the planet years later revealed to be large volcanoes.

In 1960, Wulff published an early but substantial paper, ‘‘Die Doppelsterne im FK4,’’ which was very important in the construction of the FK4 and was still used in 1988 for the FK5. Subsequently, in 1961, he was invited to attend the IAU Symposium on Visual Double Stars at the University of California, Berkeley. The experience was inspirational and solidified Wulff’s devotion to double star research. By the end of the decade, in 1969, he published the results of an extensive statistical study of binary stars in a classic paper which became a much referenced contribution to the field.

On 14 June 1957, Wulff married Dietlind (Linde) Laschek, and the couple spent their honeymoon at the Royal Greenwich Observatory at Herstmonceux Castle in England. The marriage produced two children, a daughter Ruth, born in 1965, and a son Robert, in 1967. Wulff earned a *Privatdozent* (advanced postdoctoral degree) at Technological University Munich in 1967. Shortly thereafter, he accepted an invitation from Professor Peter Van de Kamp to come to the United States as a visiting astronomer at Swarthmore College, located outside Philadelphia. Wulff joined the Department of Astronomy permanently as an Associate Professor in 1969, and moved his family from Germany to the United States the following year. Wulff became Chairman of the Department in 1972 and served in that capacity until 1982. Wulff was promoted to the rank of Professor in 1973, and was a full-time faculty member at Swarthmore until his retirement in 1998. Wulff continued to teach introductory astronomy courses as an adjunct professor at nearby Widener University until 2005.

Over his long and distinguished career, Wulff Heintz pursued numerous research interests, including fundamental astrometry, stellar statistics, planetary studies, radial velocities, and, in his last years, monitoring slow variable stars using a CCD detector. Together with the committed staff of the Sproul Observatory, Wulff determined about 800 precise trigonometric parallaxes of mostly faint, high- proper motion stars. The lion's share of his attention over the period 1954-97 was devoted to double and multiple stars, orbit theory, and relative astrometry. An assiduous observer, Wulff logged many hours at the 24-inch Sproul refractor, striving to equal or better the record for total number of observations by a single observer set by William Herschel at the beginning of the nineteenth century. Over several decades, Wulff made a total of 54,000 micrometer measurements of double stars and discovered over 900 new pairs. Some of his resolutions of new binaries have only been confirmed with speckle interferometry or by the *Hipparcos* satellite. In fact, in the latter case, several of the ''new'' binaries resolved by *Hipparcos* had actually been previously resolved by Wulff years earlier.

As a dynamicist, Wulff had unquestioned skill in the calculation and analysis of binary star orbits. He fully employed both micrometry and photography, and also incorporated published spectroscopic data to calculate orbits for some 500 binary systems. He tackled some of the most complex systems which can be unraveled – astrometric systems where the secondary or tertiary is hidden and can only be disentangled by careful analysis of available observations. His prolific calculation of binary star orbits earned him the title of the ''Swarthmore Orbit Machine'' among some of his colleagues. Historically, only W.H. van den Bos made more observations of pairs than Wulff. Before the advent of interferometry the highest quality observations of the closest pairs were made by Wulff and his collaborator Charles Worley at the USNO. Wulff and Charles both concentrated on the closest pairs. These were not only the most difficult to split but also astrophysically the most important, because from these faster moving systems one could calculate orbits and in some cases determine masses. Wulff and Charles collaborated in the *Fourth Catalogue of Orbits of Visual Binary Stars*, (US Naval Observatory, 1983), the last paper version of this catalogue and a standard reference for many years. Even the more recent versions of the catalogue list more orbits by Wulff than by any other calculator.

Wulff was the author of some 150 research papers, plus several articles in the popular literature and encyclopedias. He was the author, co-author, or editor of nine books. His early monograph *Doppelsterne* (Goldmann, 1971) was recrafted and translated into English to become *Double Stars* (D. Reidel, 1978). This was the standard binary star text for many years and continues to serve as the definitive text on the subject. Those familiar with Wulff's style of writing will know why it was referred to as the ''Terse Tome,'' but it contained all relevant information. Wulff collaborated with one of us (Augensen) to translate the German *Handbuch f*ür Sternfreunde into the English *Compendium of Practical Astronomy* (Springer-Verlag, 1994).

In addition to his professional pursuits, Wulff was an acknowledged chess master, and he authored *Das praktische Schachbuch* (Practical Chess Book), which had thirteen printings in the period 1968-1981. He was also an adept pianist, and was especially fond of playing Chopin, Liszt, and Rachmaninov.

Wulff's role as an educator was no less significant. Wulff enjoyed teaching courses at all college levels. As a lecturer

Wulff-Dieter Heintz, 1930-2006

for the Harlow Shapley Lecture Program of the AAS, Wulff visited a number of smaller colleges and universities across the U.S., delighting audiences with his wit, charm, and knowledge. One of Wulff's favorite activities was running the public viewing sessions at Sproul Observatory, in which he used the large 24-inch refractor to observe the moon, planets, double stars, nebulae, and star clusters. He ran special telescope sessions for Cub Scouts, Brownies, church groups, and amateur astronomical societies.

A truly international scholar, Wulff was a member of the Astronomische Gesellschaft, the American Astronomical Society, and a Fellow of the Royal Astronomical Society. Between 1979 and 1985, he served as president of IAU Commission 5 (Documentation and Astronomical Data) and on the executive committee of the International Council on Scientific and Technical.

Wulff is survived by Dietlind, his wife of forty-nine years, his daughter Ruth and son Robert, and his two sisters Monika Heintz and Ursula Heintz-Eberlein, who both live in Germany. After having lived a career which was so rich and productive, Wulff will be much missed by the astronomical community, and especially those working in the areas of astrometry and binary stars.

Harry J. Augensen
Widener University
Edward H. Geyer
Universität Bonn

MICHAEL JOHN KLEIN, 1940-2005

Michael John Klein died on 14 May 2005 at home in South Pasadena, California. The cause of death was tongue cancer that metastasized to the lungs. He was a non-smoker. Mike was a passionate radio astronomer, a trusted astronomical observer, an educator and a family man.

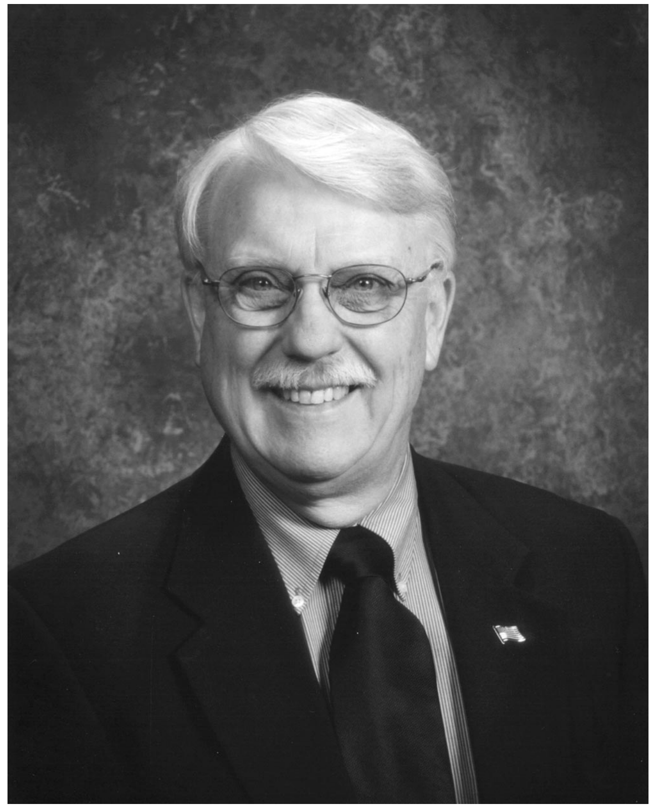
Mike was born on 19 January 1940 in Ames, Iowa, the son of Florence Marie (Graf) and Fred Michael Klein. His mother was a homemaker, and his father was a banker. Mike had two older sisters, Lois Jean (Klein) Flauher and Marilyn June (Klein) Griffin. In 1962, Mike married his high school sweetheart Barbara Dahlberg, who survives him along with their three children, Kristin Marie (Klein) Shields, Michael John Klein Jr., Timothy Joel Klein, and six grandchildren.

Mike developed a love for astronomy early in his life, and credited an early morning, newspaper-delivery route that he had at age twelve, which took him outside well before sunrise. He told family members that as he walked along his route, he stared into the sky and wondered what everything was. He studied sky charts, located stars, and began to understand how the planets shifted their positions relative to the stars each day.

Another big influence in Mike's life was his brother in-law, Jim Griffin. Jim helped Mike understand that his passion for science did not have to remain a hobby, but could and should become a career. Jim's encouragement led Mike to attend Iowa State University in Ames, where he earned a BS in electrical engineering in 1962. Mike then started graduate school in electrical engineering at Michigan State, but after one semester transferred to the University of Michigan, Ann Arbor, where he earned an MS (1966) and PhD (1968) in astronomy. His doctoral dissertation, under the direction of Professor Fred Haddock, was based on extensive observations of the planets and examined the physical and thermal properties of planetary atmospheres and surfaces.

Mike was awarded a Resident Research Associate position at JPL by the National Research Council in 1968. He joined JPL as a full time research scientist in 1969 where he remained until his death. He observed the radio emissions from Mercury, Jupiter, Uranus and other planets for over thirty-five years. Mike produced the most extensive set of observations of the synchrotron emission from Jupiter ever recorded. When JPL and the NASA Ames Research Center initiated a radio search for signs of extra-terrestrial intelligence (SETI) in the 1980s, Mike managed the JPL effort to scan the entire sky for signs of narrow band radio signals. He was open-minded about the possible existence of extra-terrestrial intelligent life.

Mike devoted much of his energy to education in the last fifteen years of his life. He felt that science created a pathway for learning and remarked that ''students need science and science needs students.'' Using SETI as a vehicle for education, Mike co-authored a book, *Cosmic Quest: Searching for Life Among the Stars* (with Margaret Poynter) in order to promote public awareness of astronomy and exobiology. In the early 1990s, Mike became a leader and driving force in a collaborative educational effort involving JPL, NASA, the Lewis Center for Educational Research in Apple Valley, California, and the Apple Valley Unified School District. A 34- meter (110-foot) radio antenna at NASA's Deep Space Network's Goldstone Complex was converted into an interactive, research, and teaching instrument available to classrooms throughout the United States and military bases overseas via the Internet. Known as the Goldstone Apple Valley Radio Telescope (GAVRT), the project has been in operation for approximately ten years in fourteen countries and three territories. More than 15,000 students from kindergarten through twelfth grade have participated to date and the number is expected to grow to more 50,000 students in the next four years. As a tribute to Mike's leadership, the GAVRT instrument has been named the ''Michael J. Klein Radio Telescope.''



Michael John Klein, 1940-2005

Mike was a member of the American Astronomical Society, the International Astronomical Union, the International Scientific Radio Union, and the American Institute for Aeronautics and Astronautics, for whom he was a Distinguished Lecturer in 1992 and 1993. He appeared on many television programs including CBS Nightwatch with Charlie Rose, ABC, NBC, and CNN News.

Mike achieved balance and perspective in his personal and professional life. He loved being a professional radio astronomer and shared his passion with family, friends, and students. He would take his children with him when he went on overnight observing trips to the desert. Mike was also active in his church where he taught Sunday school and held other positions. His family recalls how he always made time for them, be it for weeklong treks in the Sierra Nevada Mountains, sporting events, church outings, vacations, or nightly family dinners. He was completely present in multiple worlds. Mike's children still marvel at the ability he had to take any controversial topic and explore how opposing sides might merge their views, where others would have debated the correctness of one side or the other.

Mike was an inspiration to scientists and non-scientists alike. He set a high standard in his scientific work, and he shared his passion for life and the wonders of the universe.

Samuel Gulkis
Jet Propulsion Laboratory and
California Institute of Technology

BARRY JAMES LABONTE, 1950-2005

Barry James Labonte, 1950-2005

Dr. Barry J. LaBonte, age 55, a senior solar physicist in the Space Department of the Johns Hopkins University Applied Physics Laboratory, died on 24 October 2005 in Philadelphia of complications following surgery. He was an internationally recognized expert on solar magnetic fields, the solar cycle, and on the sophisticated instruments needed for studying them.

Barry LaBonte was born in Providence, Rhode Island on 28 April 1950. His parents were Arlene and William LaBonte, and Barry was the oldest of their three children. He excelled early in mathematics and was admitted to the California Institute of Technology, where he earned a BS in economics and a PhD in astronomy. From 1978 to 1981, he did his postdoctoral work at the Mount Wilson Observatory where he and Dr. Robert Howard discovered and analyzed the solar torsional oscillations, which are global flow patterns somewhat analogous to the jet streams of terrestrial weather. They described their findings in a series of thirteen papers in three years. LaBonte and Howard also showed that magnetic fields on the sun are much more dynamic than were previously thought. Contrary to the impression that a few, long-lived sunspots give, the total replacement of the surface magnetic flux occurs within only ten days.

In 1981 Barry became an astronomer at the Institute for Astronomy of the University of Hawaii, where he taught undergraduate and advanced graduate courses and became head of the Mees Solar Observatory. In addition to further work on solar magnetism, he initiated a research program in solar acoustic oscillations, which led to the discovery that sunspots absorb acoustic waves of the global oscillations of the sun. Doug Braun, Tom Duvall, and Barry LaBonte calculated that sunspot magnetic fields, contrary to earlier expectations, absorb enough p-mode energy to alter the spectrum of the global oscillations. It was later shown that sensitive analysis of the oscillations on the face of the sun could detect the presence of sunspots on the invisible side, before they rotate into view. The method, called helioseismic acoustic imaging, has led to much improved two-week predictions of solar activity on the earth-facing side of the sun. While at the University of Hawaii, he guided the work of graduate students and postdocs, and many of his students are among today's outstanding solar researchers.

Barry served the AAS Solar Physics Division variously as a member of the Steering Committee, Nominating Committee, and the Hale Prize Committee. He served the nation on the NSF-NASA- DOE Astronomy and Astrophysics Advisory Committee and the NASA Solar and Heliospheric Physics Management and Operations Working Group.

He worked hard to improve the visibility of heliospheric physics at NASA, where it encountered a very barren stretch in the late 1980s and early 1990s. With the initiation of the ''Living With a Star'' program in 2000, Barry moved to the East Coast where at the Johns Hopkins University Applied Physics Laboratory (APL) in Laurel, Maryland, he could work more effectively on solar space missions.

Barry felt at home with all aspects of solar physics, and he found excitement in the fact that solar and heliospheric science had an impact on earth and man-made systems. At APL, he worked principally on the interpretation of solar magnetic activity. He also helped to develop the technology of the Solar Bolometric Imager, a unique telescope for precise measurements of the sources of the variations in the sun's radiative output. The torsional oscillations that LaBonte and Howard discovered may be one source of subtle and unexplained variations. Barry also was interested in the flow of magnetic helicity into the corona. He developed a program to automatically compute from near real-time data the amount of helicity entering the corona each day. He used the program to compile helicity data on hundreds of sunspot groups and concluded that there is a threshold accumulation of helicity needed for the occurrence of a large flare. His work always involved fundamental science that could possibly lead to accurate forecasts of solar activity and its effect on geospace. When he died, he was studying the three-dimensional structure of the magnetic fields and electric currents in the solar corona in order to understand the disequilibrium that produces solar eruptions.

I first met Barry when he was a summer intern working with George Simon at the Sacramento Peak Observatory in Sunspot, New Mexico in the early 1970s. Besides working on the solar granulation, Barry learned how to use the Doppler-Zeeman analyzer, the first of the many solar magnetographs that he used to such advantage in his productive career. We had common scientific interests, which led me to follow his career closely, although I was on the East Coast and he was in Hawaii. We had both done our thesis under Hal Zirin and our postdoc with Bob Howard and had haunted many of the same scientific meetings, so I felt I knew him well. At APL he brought a depth of understanding and quick intelligence to our little solar group that lighted up every day.

Barry was more than an imaginative, witty, and productive scientist whose contributions greatly advanced solar physics. He was also a devoted father, rarely taking off from work except to be with his children. Inspired by his daughter Hillary's decision to train for an operatic career, he became an opera buff. He was an avid reader of history, especially military history, and was a member of the Hawaii Bunny Club and the Howard County Hare Raisers. He is survived by his wife, Beatrice Hawkins, and by their three children, Allan, Hillary, and Anna.

D. M. Rust
John Hopkins University Applied Physics Laboratory

ALEXANDER (ANDY) FRANZ LUBENOW, 1956-2005

Alexander (Andy) Franz Lubenow, Program Coordinator at the Space Telescope Science Institute, was diagnosed with cancer of the gallbladder, pancreas, and liver in May 2005 and died on 29 September 2005. He was forty-nine.

Andy was born to Bodo and Helen Lubenow in St. Paul, Minnesota on 4 January 1956. In 1964 at the age of eight, he moved with his family to Buenos Aires, Argentina, and attended the American Community School there until returning with his family in 1973 to St. Paul. Argentina had a big impact on Andy's future as an astronomer. He later recalled how he had observed and was puzzled by the ″upside-down″ appearance of the Moon in the southern hemisphere. In Argentina, he built his first telescope using a mirror he had ground himself. He never parted ways with that instrument.

Andy did not follow a standard educational track. He spent two years at St. Olaf College in Northfield, Minnesota, before transferring to the University of Minnesota, where he earned his bachelor's degree and began work towards a master's degree in astrophysics. Later he transferred to the University of Illinois at Urbana-Champaign, where he remained until Dr. Peter Stockman hired him to work on the Hubble Space Telescope project. While in school, he worked as a teacher's assistant, taught night school, and gave demonstrations of stargazing. He was an excellent teacher and had a flair for writing. He later wrote articles for a sailing magazine and a pilot's magazine.

Andy was a very practical, meticulous, and steady worker, attributes that he combined with an understated and dry sense of humor. He was always able to find a way through a problem, no matter how sticky. If a job required him to roll up his sleeves and get it done through hard work, he would persevere. Nevertheless, he was always on the lookout for an easier way. He had no patience for being forced to deal with stupid things for stupid reasons.

At work at the Space Telescope Science Institute (STScI), Andy was responsible for scheduling and coordinating scientific observations with the Hubble Space Telescope. He gave particular support to observations of solar system objects (or ″moving targets″ as they are known at STScI), even before the launch of the Hubble. His in-depth knowledge of the needs of solar system observing and his understanding of all the tools developed by the project (many designed with his input) made life easier for those that worked alongside him on the planning and implementation of observing programs on the HST. Astronomers who worked outside the walls of STScI might easily have overlooked Andy's involvement in making their scientific programs a success. Andy quietly helped ''his observers″ without any desire for personal glory. Although a few of the observing teams no doubt appreciated Andy's role in the execution of their HST program, most likely took him for granted. At the time of his death, Andy had worked on 465 HST programs, which have so far resulted in 1041 published papers.

Alexander (Andy) Franz Lubenow, 1956-2005

At play, Andy approached hobbies in his meticulous way. He purchased a house for its unfinished basement so that he could creatively lay out an HO-gauge model train set. The railroading hobby was by no means an obsession, but an activity with a beginning, middle, and end. When Andy finished his layout, he moved on to other things. Around the time that the HST was launched, Andy took up sailing. Like the model-train hobby, this was not an idle whim but a carefully planned and studied activity involving locomotion. While Andy enjoyed all aspects of sailing, he took greatest pleasure in using his sailboat, named Spica, as an instrument to explore the Chesapeake Bay. Like most dedicated sailors, he also enjoyed using his boat in concert with the wind and water to get around naturally. He was a fine navigator.

Andy's love of navigation was a common thread between his work and play. To track and observe moving targets with the HST is a complicated navigational problem and the type of challenge upon which Andy thrived.

After he had mastered sailing, he embarked on a new hobby: flying. He studied for and

quickly earned a private pilot's license, purchasing his own Piper Cherokee in the process. One goal—a cross-country trip—was accomplished in June 2003, when he flew solo from Baltimore to Los Angeles and back. ''You ought to try it,'' he told me. ''As Lindbergh put it, flying is the perfect mix of science, engineering, and art. Only the pilots know why the birds sing....although I'm sure the geese I heard flying over[head] in formation the other night were swearing, and given the weather, I didn't blame them a bit!''

When discussing his illness just days before his death, Andy was very calm about the whole thing and joked that ''none of us is getting out of this life alive.'' It was during this conversation that he first heard the news that an asteroid was to be named in his honor. I read him the citation and asked for his comments:

Lubenow 65885 Alexander Franz Lubenow

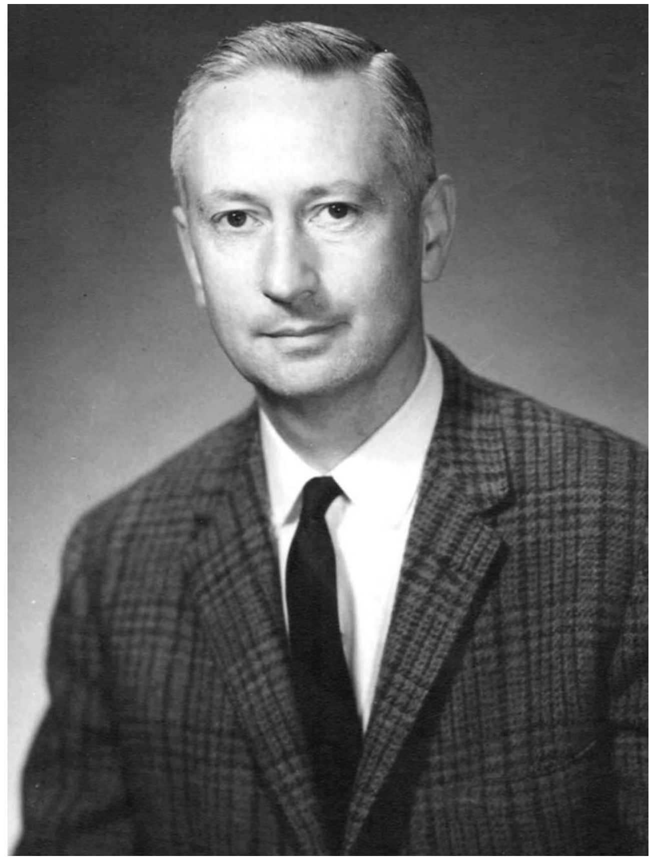
Discovered 1997 Dec. 27 by M. W. Buie at the Anderson Mesa Station of the Lowell Observatory. Alexander (Andy) F. Lubenow (1956-), Program Coordinator at the Space Telescope Science Institute. Andy has provided exceptional support to the Hubble Space Telescope as an innovator and expert observation planner, especially for solar system targets, over the lifetime of HST.

He had nothing to add. He responded that the citation pretty much said it all, and to say more would be to say less.

Andy was a pleasure to know and work with. He was a friend, confidant, and sometimes even a guiding inspiration. When our paths diverged, I took some consolation in knowing that I would see him each year at the DPS meeting showing off the latest that the HST had done for solar system research. His visits have now come to an end but his legacy will live on. And somewhere, out in the dark of space, is a chunk of rock bearing his name.

Marc Buie
Lowell Observatory

CORNELL H. MAYER, 1921-2005



Cornell H. Mayer, 1920-2005

Cornell (Connie) H. Mayer, a pioneer of radio astronomy, died on 19 November 2005 of congestive heart failure at his home in Mt. Vernon, Virginia. He was eighty-three.

Cornell Mayer was born in Ossian, Iowa on 10 December 1921. After graduating from the University of Iowa in 1943, he joined the Navy during World War II and was stationed at the Naval Research Laboratory (NRL) in Washington, DC. There he assisted Fred T. Haddock in the development of the first radar antenna inside a submarine periscope. This device has been credited with shortening the war in the Pacific because of the number of Japanese ships that were sunk with its aid. With Haddock, Connie also discovered centimeter-wave radio bursts from the sun coincident with solar flares. They made the first detection of thermal radio emission from the Orion nebula and other galactic HII regions. They also detected extragalactic objects and thus initiated the important field of centimeter-wave astronomy. Their observations were made with a 50-foot parabolic reflector on a gun mount located on the roof of one of the NRL buildings. This telescope had the world's highest radio resolving power for many years.

With Haddock's departure to the University of Michigan in 1956 to create a new radio observatory there, Connie became head of a group in the Radio Astronomy Branch at NRL, where he remained until his retirement in 1980. Much of his work involved the measurement of planetary temperatures by analysis of radio emissions. By making technical innovations in instrumentation--such as replacing disc choppers with a ferrite switch to compare the sky and reference load, or using argon gas tubes for calibration--Connie greatly improved the performance of his equipment. This resulted in the discovery of an astonishing, 600^o C surface temperature of Venus, which contradicted the widespread notion that Venus was similar to the Earth and potentially habitable. In spite of the extraordinarily careful and systematic way that the observations were carried out and analyzed, many remained skeptical about the result and its interpretation in terms of a massive greenhouse effect, until the Mariner-II spacecraft fly-by in 1962, which put all such doubts to rest. Connie and his group continued to make radio observations of other planets and discovered a non- thermal centimeter wavelength emission from Jupiter. This led directly to work done at Caltech that demonstrated the existence of Van Allen-like belts around the planet.

Being a superb engineer, Connie firmly believed that technology led to scientific discovery. Like others, he was preoccupied with the improvement of the sensitivity of radio astronomy receivers, and applied physics to new designs. In 1959, Connie collaborated with Charles Townes and his students at Columbia in the first application of the maser to astronomy. When Townes received the 1964 Nobel Prize for the invention of the maser, he asserted that Connie's desire to improve receiver sensitivity was influential in his work and shared a portion of his prize money with him.

Connie's greatest contribution was in the study of non-thermal radio sources at very short wavelengths. Non-thermal sources were recognized by the fact that their flux density decreases with increasing frequency. If the emission mechanism were synchrotron radiation (as theorized in 1950), then the radiation should be linearly polarized up to a theoretical maximum of 70 percent. In 1949, John Bolton had identified a discrete radio source with the Crab Nebula optical counterpart. The optical radiation was known to contain a diffuse component with a featureless spectrum. The Russian astrophysicist Joseph Shklovsky boldly hypothesized that both the optical and radio emissions were due to the synchrotron mechanism. This implied that the optical radiation would be polarized, and Soviet scientists found it so in 1954. Soon after, the radio source Virgo A was matched with the peculiar galaxy M87, whose spectrally featureless optical jet was found to be polarized in 1956. Thus the crucial evidence in support of the synchrotron mechanism for both galactic and extragalactic radio sources was the detection of polarization in their optical radiation. The very next year, Connie and his collaborators showed that at a 3 cm wavelength, the Crab Nebula was substantially polarized (8%) at a position angle close to that of the optical direction. The hundreds of pixels obtainable in the optical, as opposed to only one in the NRL 3 cm observation, enabled the variation of position angle with sky position to be measured. Five years later, the NRL group, succeeded in measuring the first polarization in two extragalactic radio sources, Cygnus A and Centaurus A, at 3 cm. Later measurements at slightly longer wavelengths showed that polarization must be common in synchrotron sources, but that the amount decreased rapidly with increasing wavelength.

It was already evident from the NRL measurements that Faraday rotation was important, and it was also clear that increased resolution would be required to remove the effects of averaging over distributions with varying position angles. This led Connie to build receivers at even shorter wavelengths and to use them on larger telescopes than NRL's. The most spectacular results were obtained in 1966 with a 1.55 cm receiver on the NRAO 140-ft reflector at Green Bank, which provided a beam width of only 1':7. They found that the Crab Nebula had a distribution of polarization similar to that observed optically, reaching up to 16%. Internal Faraday rotation was clearly required to explain the rapid depolarization with increasing wavelength. For Cygnus A, they had just enough resolution to show that the two components of the double radio source were nearly orthogonally polarized.

Their most beautiful result was on the galactic supernova remnant Cassiopea A, where they found a remarkable circular circumferential symmetry in the polarization vectors, explaining why previous work with poorer resolution indicated no polarization. Most importantly they recognized that the implied radial field ''suggests that the magnetic field has been carried out with the expansion of the supernova envelope, and...[they] observe[d] polarized radiation associated with a component which has been stretched out in the radial direction during the expansion of the shell.'' This landmark paper led the way for later polarimetric studies of both galactic and extragalactic radio sources. Observations two decades later with the VLA (the world's most powerful, synthesis radio telescope with a quarter million pixels to each one of Connie's), substantiated most or all of his early conclusions, and was a tribute to his pioneering effort.

The NRL group was later involved in discoveries about the variability of interstellar water and SiO masers, the structure of molecular clouds and star forming regions, the development of techniques for precision time transfer, remote sensing of the ocean and atmosphere, and much else, but in the aforementioned radio astronomy work, Connie Mayer had no peer. A colleague remarked, ''Connie was among the last of the scientist-engineers who built their own equipment, performed their own experiments, and also interpreted the results into paradigm shifting science.''

Connie was a rare and noble example of natural modesty, becoming uncomfortable if anyone praised him. After his death, his wife found many awards that he had received but never framed nor told her about. He joked that he did not want a formal funeral ''with a lot of people getting up and mouthing off about me.'' He received full military honor services at Arlington National Cemetery, but was cremated as per his wishes. He is survived by Carey Whitehead Mayer, his wife of fifty-six years, and their daughter, Carolyn Elizabeth Mayer. Their son, John, died in 1978.

V. Radhakrishnan
Raman Research Institute
Bangalore, India

JOHN LOUIS PERDRIX, 1926-2005

John Perdrix, astronomical historian and co-founder of the *Journal of Astronomical History and Heritage*, died on 27 June 2005.

John Louis Perdrix was born in Adelaide, Australia, on 30 June 1926. After studying chemistry at Melbourne Technical College and working in industry, he joined the Commonwealth Scientific and Industrial Research Organization's Division of Minerals and Geochemistry. In 1974 the Division relocated to the Western Australian capital, Perth, and John spent the rest of his working life there involved in geochemical research.

From his teenage years John had a passion for astronomy, which he fine-tuned through the Astronomical Society of Victoria and the Victorian Branch of the British Astronomical Association. He was very active in both groups, serving as President of the former and Secretary/Treasurer of the latter. He was also an FRAS, and a member of the AAS, the

John Louis Perdrix, 1926-2005

BAA parent body, and the IAU (Commission 41)— no mean feat for an Australian amateur astronomer. Throughout his life, he was a strong advocate of close amateur-professional relations.

John's main research interest was history of astronomy, and over the years he wrote a succession of research papers, mainly about aspects of Australian astronomy. His well- researched and neatly-illustrated papers on the Melbourne Observatory and the Great Melbourne Telescope are classics, and when the Observatory's future was in the balance they played a key role in the State Government's decision to convert this unique facility into a museum precinct. To support his research activities, John built up an amazing library that developed its own distinctive personality and quickly took over his house and garage before invading commercial storage facilities!

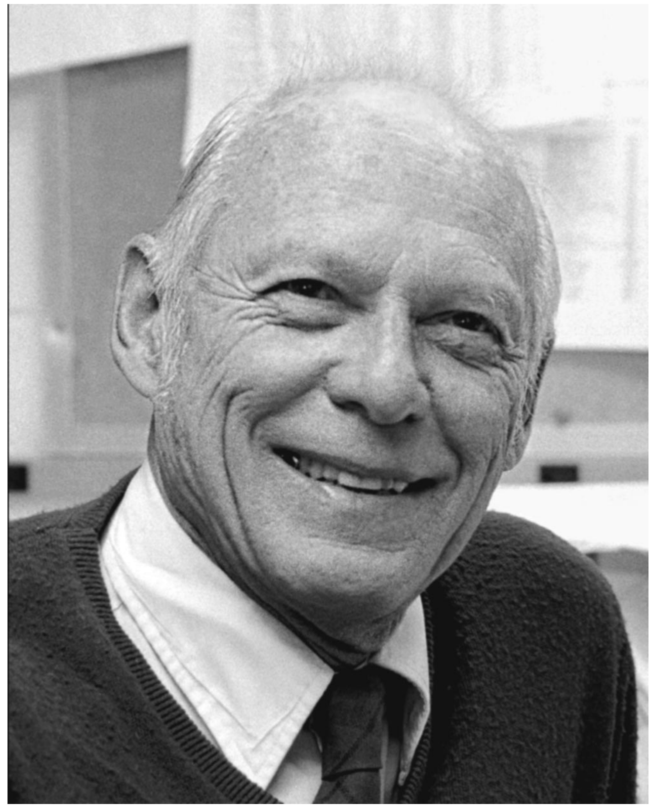
Apart from writing papers, John had an even greater passion for editing and publishing. From 1985 to 1997 he produced the *Australian Journal of Astronomy*, and in 1998 this was replaced by the *Journal of Astronomical History and Heritage* (JAH^2). Both journals appeared under the banner of his own publishing house, Astral Press, until 2005 when JAH^2 was transferred to the Center of Astronomy at James Cook University.

When cancer was first diagnosed, this did not deter John, and he continued to pursue his astronomical and editorial interests. Early in 2005 the cancer was in remission and John decided to make one final overseas trip, a long-anticipated visit to St. Petersburg. It was while he was returning to Australia that the illness aggressively reappeared, and he was taken off the airplane at Dubai and died peacefully in Rashid Hospital three days later. He was just three days short of his seventy-ninth birthday.

Always the consummate gentleman, John Perdrix had a keen sense of humor and was wonderful company. He will be greatly missed by all who knew him. Our condolences go to his six children, Louise, John, Timothy, Fleur, Lisa and Angella.

Wayne Orchiston
James Cook University

A. KEITH PIERCE, 1918 – 2005



A. Keith Pierce, 1918-2005

A. Keith Pierce was a solar astronomer who will be remembered for bringing the physics lab to the telescope and for his design of the world's largest solar telescope, the 1.5-meter McMath Telescope on Kitt Peak in Arizona. Born in Lincoln, Nebraska, he died of cancer in Tucson on 11 March 2005. He was eighty-six.

His father, Tracy Pierce, had gone to graduate school in Berkeley, California, with a major in mathematics and a minor in astronomy. Fellow students of his class included Seth Nicholson and Donald Shane, people who were later to influence young Keith's life.

Tracy Pierce received an appointment as an instructor, later Professor, of mathematics at the University of Nebraska in Lincoln. In his spare time dad Tracy became something of a telescope nut, following ''the bible'' –Albert Ingall's A.T.M (Amateur Telescope Making). His enthusiasm rubbed off on his son.

Seth Nicholson, who became a famous Mt. Wilson Observatory astronomer, and Donald Shane from Berkeley, both stayed at the Pierce home while on their Sigma Xi lecture tours. After two years at Lincoln, followed by two more at Berkeley, Keith had earned his bachelor's degree in astronomy.

During World War II, Dr. Shane became personnel director at the E.O. Lawrence Radiation Lab and arranged for Keith to work there at the cyclotron. A crash program to produce U235 from U238 was under way. At a crucial point in 1942 the cyclotron turned out the sought-after material. Much celebration ensued among the Rad Lab leaders. During this gala, Keith was on the night-shift and pretty much on his own. It was then that he turned a valve to the right, when left was called for, and the entire system went down. Shortly thereafter he was sent to Oak Ridge for the duration of the war. He cannot have been thought of badly, however, because he was invited to the Trinity test in New Mexico. (He didn't go because of the pending birth of his first son, John.)

The year 1945 found Keith back in Berkeley working on his Ph.D. under Shane. After finishing this degree, Keith was brought by Leo Goldberg to the University of Michigan, Ann Arbor, and then to Lake Angelus, where his association with Robert McMath began. His prowess with instrumentation led to a mapping of the infrared solar spectrum with unprecedented accuracy.

McMath, a Detroit engineer, had this dream of building a large solar telescope at a suitable elevated and dry location. Through friends in Washington (viz. the Director of the Bureau of the Budget), he found funds to construct this telescope under the guidance of Keith Pierce. Kitt Peak National Observatory was an ancillary result.

The above is a distillation of an interview with Keith regarding his career on the occasion in 1992 of the rededication of the McMath-Pierce Solar Facility. I would add that Keith carried out seminal work on the solar spectrum. These include ''The Chromospheric Spectrum Outside Eclipse, λλ 3040-9266,'' with Jim Breckenridge, ''The Kitt Peak Table of Photographic Solar Spectrum Wavelengths,'' and with Charles Slaughter, ''Solar Limb Darkening, I and II.'' For sixteen years, Keith directed the Solar Program of KPNO with a gentle hand. At home with his first wife, Mildred, and later with his second, Trudy, he extended warm hospitality to visitors from around the world. He leaves three children: John (deceased), Barbara Isabel Orville, and Willard Ross.

William Livingston
NOAO/National Solar Observatory

RONALD CECIL STONE, 1946-2005

Ronald C. Stone, an astronomer at the US Naval Observatory Flagstaff Station, passed away on 10 September 2005 in Downer's Grove, IL, following a valiant struggle with cancer. He was fifty- nine years old.

Ron was born on 9 June 1946 in Seattle, Washington, to Helen (Vocelka) and Cecil Stone. His father was a World War II veteran who attended college on the GI Bill and became a mechanical engineer. He and his wife raised three sons: Dwight, Ronald, and Gavin. They lived in a number of locations across the U.S. before settling at last in Downer's Grove when Ron was in the fourth grade.

Ron's interest in astronomy began when he was given a toy planetarium projector while still in grade school, and later a small telescope. In high school, he also built his own telescope, grinding the 6- inch mirror by hand.

He completed grade school and high school in Downer's Grove and did his undergraduate studies at the University of Illinois at Urbana-Champaign, majoring in astronomy and physics and graduating *cum laude* in 1968. The following year, he was drafted into the U.S. Army and served for two years, including a stint in Vietnam. Although his primary assignment was auditing, he was also involved in the defense of the Long Binh base in Vietnam. He was honorably discharged from the service in 1971 and enrolled that fall at the University of Chicago.

While a graduate student working with Bill van Altena, Ron developed his life long interest in the field of astrometry. Van Altena recalls him as ''a quiet and cheerful student who wanted to learn, and [who] worked hard to understand the intricacies of astrometry... deriving the most precise proper motions from the 40-inch [Yerkes] refractor plates.'' Working at Yerkes Observatory in Williams Bay, Wisconsin, he completed a thesis entitled, ''Mean Secular Parallax at Low Galactic Latitude.'' While living in Wisconsin, Ron also became engaged to Ellen Mickel, and the two were married at his parents' home in Downer's Grove.

After earning his Ph.D. in 1978 from Chicago, Ron held a number of research and postdoctoral positions. These included a few months at the Venezuelan National Observatory in Merida, where he helped to set up an astrometric program. This work was unfortunately cut short because of difficulties obtaining the requisite work visa. He also had a two year postdoc at Northwestern University, where he did spectroscopy of massive stars and studied various open clusters. Ron and Ellen's first child, Heather, was born on 9 June 1981 in Evanston, IL.

Ronald Cecil Stone, 1946-2005

Ron and Ellen moved to Washington, DC, in 1981, where Ron joined the staff of the U.S. Naval Observatory Transit Circle Division. Their son, Geoffrey, was born on 10 May 1983. The marriage ended in divorce in 2001.

During the three years that he spent at the USNO headquarters, Ron received training in observing and data reduction with the 6-inch transit circle. When in 1984 the observatory opened the Black Birch Station in New Zealand for surveying the southern sky with the 7-inch transit circle, Ron joined the first group of astronomers to transfer. There he became involved in developing software for the 7-inch, particularly with the image dissector and the acquisition and reduction of planetary observations. Together with Ellis Holdenreid, he worked on some aspects of the real time control software for the 7-inch. He also continued to work on his earlier interest in runaway OB stars.

When Ron's tour at the Black Birch Station was coming to an end, he requested a transfer to the USNO Flagstaff Station in northern Arizona. There was a transit circle at the Flagstaff Station being fitted with a CCD camera, and Ron's experience with transit circles in Washington and Black Birch made him well-qualified to help with the modernization of this instrument.

Ron worked with David and Alice Monet to automate the

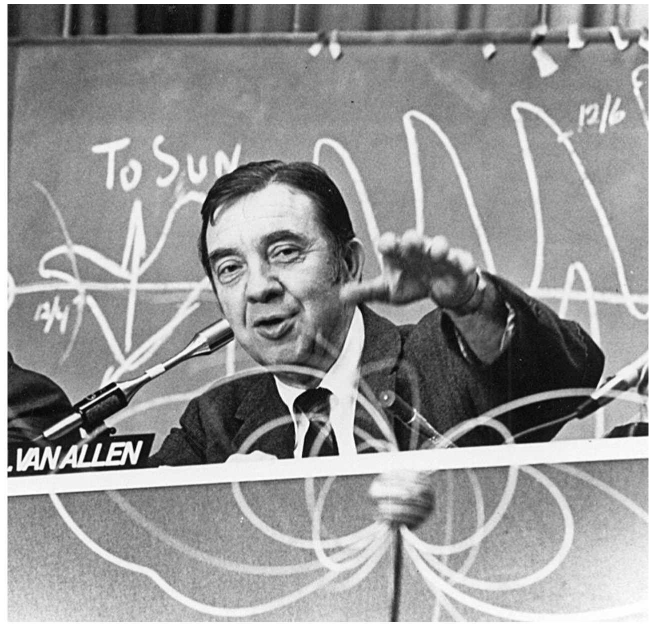
8-inch and develop astrometric software for reducing and analyzing its observations. This telescope came to be known as the FASTT, for Flagstaff Astrometric Scanning Transit Telescope. It was used from 1992 onward to obtain highly accurate astrometric positions of various Solar System bodies that were targets of several NASA space missions. In addition, Ron observed astrometric calibration regions for the Sloan Digital Sky Survey. He collaborated in projects to predict and observe stellar and planetary occultations, determine the masses of certain asteroids, and improve the orbits of numerous planetary satellites.

In his letter recalling Ron Stone's career, Bill van Altena wrote, ''I also knew and respected Ron as a scientist who worked to do the very best that he could with the FASTT system and produced an outstanding set of data that will be remembered as setting the standards for the best that could be done with drift scanning astrometry.''

Ron used FASTT observations of radio stars and the brightest quasars to confirm the tie between the optical and radio reference frames. He developed extensive software for automated reduction of FASTT observations. During his last year of life, he took on the additional responsibility of bringing another new telescope, the 1.3-meter, into operation, and was making good progress in this effort until his illness forced him to relinquish the task.

Besides his professional interests, Ron was a avid outdoorsman. During his years in Williams Bay, he rode a motorcycle and enjoyed SCUBA diving. He is one of the few people to have gone diving in Lake Geneva. He liked nothing better than hiking and exploring wilderness areas. As his brother, Dwight, recalled, ''If he saw a mountain, he had to climb it!''

Alice Monet
USNO Flagstaff Station



James Alfred Van Allen, 1914-2006

JAMES ALFRED VAN ALLEN, 1914-2006

James Alfred Van Allen, world-renowned space scientist, died 9 August 2006 at the age of ninety-one. He succumbed to heart failure after a ten-week period of declining health.

Van Allen served for his entire sixty-seven-year professional career as an amazingly productive researcher, space science spokesman, inspired teacher, and valued colleague. The realization by him and his associates that charged particles are trapped by the Earth's magnetic field began a whole new field of research, magnetospheric physics. Following that initial discovery, he and his associates quickly extended their observations, first to the inner planets, and then to the rest of the planets and beyond. During his tenure at Iowa, he and his group flew instruments on more than sixty successful Earth satellites and planetary spacecraft, including the first missions to the planets Venus, Mars, Jupiter, Saturn, Uranus, and Neptune.

Van Allen's lifetime publication list numbers more than 275, of which many are widely-cited, seminal papers. He was the sole author of more than 125 of those papers. Beyond the research laboratory, Van Allen worked energetically throughout his career in establishing space research as a new branch of human inquiry. He was among the most sought-after as a committee member and adviser, working at the highest levels of government, including the White House and Congress, and at all levels of the national and international research establishments. Many presentations in the non-scientific arena helped to bring the exciting discoveries and challenges of space research to the attention of the general public.

James Van Allen (Van to his many friends and colleagues) was born on 7 September 1914 on a small farm near Mount Pleasant, Iowa, the second of four sons of Alfred Morris Van Allen and Alma Olney Van Allen. After high school in Mount Pleasant, he entered Iowa Wesleyan College, majoring in physics and graduating *summa cum laude*. While there, he was introduced to geophysics research under the tutelage of physics professor Thomas C. Poulter, who served as chief scientist on the 1933-1935 Second Byrd Antarctic Expedition. He entered the State University of Iowa for his graduate work in physics, receiving his master's degree in solid state physics in 1936 and his Ph.D. degree in nuclear physics in 1939.

Van Allen's first post-graduate work was as a Carnegie Research Fellow at the Department of Terrestrial Magnetism (DTM) of the Carnegie Institution, located in Washington, DC. There, he was involved in the department's work on nuclear physics, geomagnetism, cosmic rays, auroral physics, and ionospheric physics. By late 1939, the war in Europe was escalating, and Van Allen shifted to development of the embryonic proximity fuse, continuing that work in the Applied Physics Laboratory (APL) that was established for that purpose in 1942. Van Allen and two colleagues took the first of the then highly secret radio proximity fuses to the South Pacific Fleet for initial field trials and introduction into combat.

Following the war, Van Allen organized the High Altitude Research Group at APL and directed it until his departure in1950. Among other things, he participated in the planning and use of captured German V-2 rockets. As that program was closing, he led the development of the Aerobee sounding rocket to meet the need for continuing high altitude research. The Aerobee achieved a remarkable record of achievement, with a total of 1,037 fired as of January 1985.

As the 1950s opened, Van Allen and his family moved to Iowa City, where he became Professor and Head of the State University of Iowa Physics Department. He and his new graduate students started a research program by using the university's football practice field to launch cosmic ray instruments with small surplus balloons. That quickly expanded to the use of rockets to carry larger balloons to greater heights. Those ''rockoons,'' a Van Allen invention, were launched from a series of six highly successful field expeditions from 1952 through 1957.

As the prospect for launching Earth satellites began to materialize, Van Allen became an enthusiastic participant in planning and executing the U.S. program. After gaining a spot on the short list of initial experiments for the Vanguard satellite program, development of the cosmic ray instrument that he had proposed became a high laboratory priority. That instrument was launched in abbreviated form by an Army Jupiter C vehicle as Explorer I on 31 January 1958, and the full version was launched less than two months later as Explorer III. The two satellites resulted in what Van Allen considered the crowning event of his long and distinguished career – the discovery, with his university associates, of the bands of intense radiation that surround the Earth, now known as the ''Van Allen Radiation Belts.''

Van Allen continued to take a leading role in extending space research beyond Earth's orbit. His group sent instruments to the Moon, Venus, Mars, Jupiter, Saturn, and throughout interplanetary space. During his outstandingly productive career, Van Allen served as principal investigator on more than twenty-five space science missions.

James Van Allen was the consummate teacher and mentor. Years ago, when asked how he would most like to be remembered, he replied simply, ''As a teacher.'' He supervised the preparation of forty-eight master's and thirty-four doctor's theses by sixty different individuals. He gave those graduate students extraordinary freedom and responsibility in the conduct of their projects. He always treated his students, both undergraduate and graduate, with respect, listening to them, learning from them, and guiding them with wisdom and kindness.

The folksy, pipe-smoking scientist worked from 1951 until 1964 in a modest office on the second floor of the old Physics and Mathematics building. He maintained his own private laboratory, where he continued to spend many hours with hands-on work at the bench. When the new Physics and Astronomy building was completed in 1964 (rechristened in 1982, appropriately, as Van Allen Hall), he set up his private working room apart from his departmental office in a large, soon-cluttered, corner office on the seventh floor.

That room became the center of his activity in 1985, when he retired as Department Head and active teacher. There, through his retirement years and until shortly before his death, he continued his roles as researcher, advisor, and mentor, serving at times as Professor Emeritus, Carver Professor of Physics, and Regent Distinguished Professor.

Van Allen maintained membership in over a dozen professional organizations and received over a dozen Honorary ScD degrees. His additional awards and other distinct forms of recognition are far too numerous to list here, but include AAS's Gerard P. Kuiper Prize, the Crafoord Prize of the Royal Swedish Academy of Science, the National Medal of Science presented by U.S. President Reagan, the National Science Foundation's Vannevar Bush Award, NASA's Lifetime Achievement Award, the 2006 Smithsonian National Air and Space Museum Lifetime Achievement Trophy, the Gold Medal of the Royal Astronomy Society, AGU's John A. Fleming Award and William Bowie Medal, and the Abelson Prize by the American Association for the Advancement of Science.

In addition to those many public acknowledgements of his prodigious contributions, James A. Van Allen will be fondly remembered by his many students, who now populate the entire realm of modern space research.

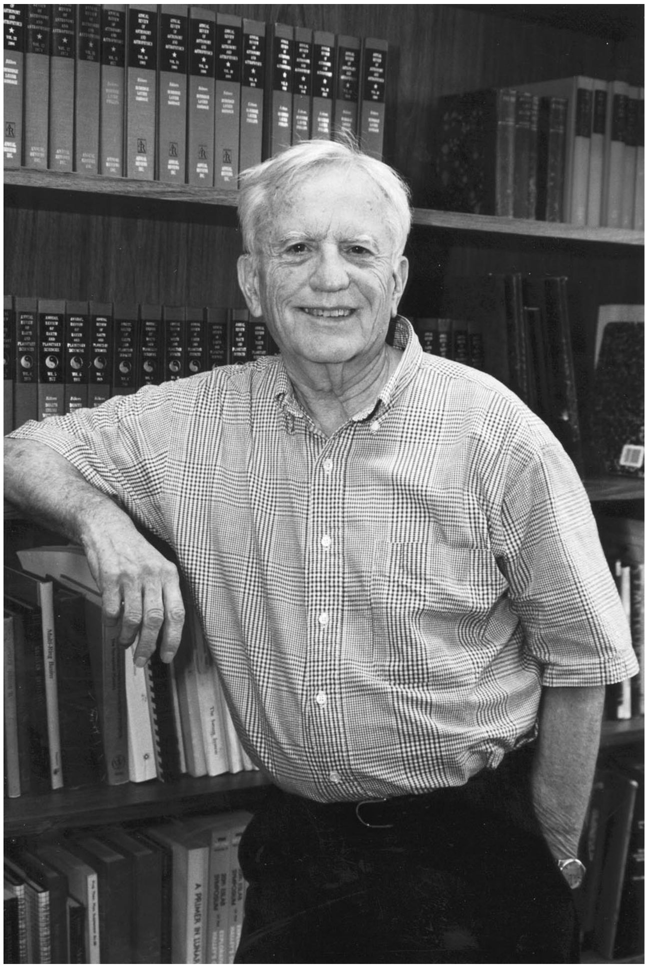
He is survived by his wife, Abigail Fithian Halsey II Van Allen, and his five children, Cynthia Van Allen Schaffner, Dr. Margot Van Allen Cairns, Sarah Van Allen Trimble, Thomas Halsey Van Allen, and Peter C. Van Allen.

George H. Ludwig
Winchester, Virginia
Retired, National Aeronautics and Space Administration
Carl E. McIlwain
La Jolla, California
Research Professor of Physics, University of California, San Diego

GEORGE WEST WETHERILL, 1925-2006

George W. Wetherill, 1997 National Medal of Science recipient, died from heart failure on 19 July 2006, at his Washington, DC home. Wetherill can be rightfully called the father of modern theories of the formation of the Earth. Prior to the first Protostars and Planets meeting in Tucson in 1978, planet formation theories tended to be eccentric concoctions created by distinguished senior scientists who had earned the right to dream a little bit about how our Solar System had formed. Wetherill was in the vanguard of the effort to place planet formation theory on a solid basis.

Born in Philadelphia on 12 August 1925, Wetherill served in the U.S. Navy during World War II, teaching radar at the Naval Research Laboratory in the District. He graduated from the University of Chicago in 1953 after receiving a succession of degrees: Ph.B., S.B., S.M., and Ph.D. Wetherill joined the staff of the Carnegie Institution's Department of Terrestrial Magnetism (DTM), located in northwest Washington, DC, in 1953. He and his colleagues at DTM and Carnegie's Geophysical Laboratory proceeded to revolutionize the field of geochemical dating of rocks by applying the physics he had learned at Chicago. Wetherill conceived of the concordia diagram, which uses the decay of radioactive uranium into lead to provide accurate dates for when the rocks crystallized. Wetherill's concordia diagram was a concept that found immediate and lasting acceptance, and stands as a singular achievement in the earth sciences. It opened up the field of geological dating for events that happened billions of years ago on the Earth and on other rocky bodies.



George West Wetherill, 1925-2006

Wetherill's great early success in geochemistry led to his being appointed as a professor of geophysics and geology at UCLA in 1960. At UCLA, Wetherill began his second major undertaking, working on the orbital evolution of asteroids and of other small bodies in the Solar System. He was the first to show that debris kicked out from meteorite impacts on Mars could be expected to end up on Earth, as has been spectacularly verified by the dozens of Martian meteorites found to date on Earth. We now know that the cheapest way to get a sample of Mars is to send an expedition to the South Pole, where the Martian meteorites are sitting on the ice sheets, waiting to be picked up.

In 1975, Wetherill returned to DTM as its Director. At DTM Wetherill launched into his third major research area, planet formation modeling, using the skills he had developed at UCLA to study asteroids and meteorites. He quickly became the world's leading authority on the process by which the rocky inner planets formed through impacts between progressively larger and larger bodies. Wetherill was the first to point out that the Earth's formation involved impacts by bodies as large as Mars on the growing Earth. One such giant impact is the now-accepted explanation for how the Earth's Moon was formed -- an off-center giant impact produced a spray of hot rock that ended up in orbit around the Earth and then formed the Moon.

Wetherill stepped down as the Director of DTM in 1991, but continued to vigorously pursue his models of planet formation. In 1995, the first solid evidence of planetary systems orbiting other stars like our Sun was presented. In the decade since, astronomers have discovered nearly 200 planets in orbit around nearby stars, and recently may have found the first rocky planets. George Wetherill was way ahead of these discoveries. His 1996 models of terrestrial planet formation, combined with the latest discoveries, imply a rich future for those who seek to find Earth-like planets in our neighborhood of the galaxy.

Wetherill's scientific success has been widely recognized, perhaps more widely than that of any other first rank scientist. In 1997 he received the highest scientific award in the nation—the National Medal of Science. Wetherill was elected to the American Academy of Arts and Sciences in 1971 and to the National Academy of Sciences in 1974. He received the 1981 F. C. Leonard Medal of the Meteoritical Society, the 1984 G. K. Gilbert Award of the Geological Society of America, the 1986 G. P. Kuiper Prize of the Division of Planetary Sciences of the American Astronomical Society, and the 1991 Harry H. Hess Medal of the American Geophysical Union. In 2003 Wetherill was awarded the Henry Norris Russell Lectureship, the highest honor bestowed by the American Astronomical Society.

Survivors include his wife, Mary Bailey, of Washington, DC, and his daughters, Rachel Wetherill, of Round Hill, Virginia, and Sarah Wetherill Okumura, of Morgan Hill, California. He was preceded in death by his son, George W. Wetherill III, in 1974, and by his first wife, Phyllis Steiss Wetherill, in 1995.

Alan P. Boss
Department Department of Terrestrial Magnetism
Carnegie Institution of Washington