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Susan M. Simkin (1940–2021)

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Susan M. Simkin died on Friday, the 5th of February, 2021 in Socorro, New Mexico.

Simkin was the first woman to be a tenured full professor in the Department of Physics and Astronomy at Michigan State University. She is noted for her work on the dynamics and kinematics of cold and ionized gas in active galaxies hosting supermassive black holes and for her innovative contributions to techniques in astronomical data analysis. In her later career, she served as a scientific editor for *The Astrophysical Journal* and as Program Director for Extragalactic Astronomy at the National Science Foundation. Her fierce dedication to science and passionate promotion of women in science will be remembered well.

Credit: unknown.

Contributions to the Field of Astronomy

Simkin was well-known for her careful observational work in optical and radio studies of active galaxies, including a special class of optically-luminous AGN called Seyfert galaxies. This work on Seyfert galaxies explored the relationships between the optical emission-line properties of these galaxies, their large-scale structure, and their nuclear properties. Her interest in the kinematics and dynamics of gas in radio galaxies led to papers that were noted for their scrupulous attention to detail. In 1972, in a *Nature* paper, she presented evidence for a difference between the velocities of the ionized gas and the stars [1]. This work was very difficult, especially in the days before low-noise CCDs. Her first observations were made with glass plates, and she moved on to become an expert in photoelectric devices such as James Gunn's SIT vidicon (a silicon vidicon photon detector), built for the Palomar Hale 200-inch telescope and CCD work.

She pioneered the use of Fourier techniques for measuring velocity dispersions of stars in galaxies [2], and her innovative work on image processing, including the sharing of

data reduction packages between institutions (Australia, Wisconsin, STScI, MSU, for example) was appreciated by many astronomers (pre-IRAF!). Her studies of structures in spiral galaxies showed that the optical disks of spiral galaxies had characteristic truncation radii. One of her most interesting discoveries was of the evidence of spectral lines associated with the lobes of radio galaxies. This discovery gave an important clue about the motions of the radio sources and the delivery of energy from the central engine to the lobes themselves. She also worked towards identifying the alignment of any rotational motion of the galaxy with the direction of the axis of the radio source [3][4][5]. These works contributed ultimately to the broader astronomical community's insights as to the surprisingly intimate connection between the fueling of the central radio source and its host galaxy. The paper by Simkin, Su and Schwarz (1980; [5]) on 'Nearby Seyfert galaxies' is perhaps her most influential research paper, and it continues to be cited regularly today. It was written during her time in Australia and co-authored with Su Hong-jun, a Chinese astronomer who was visiting Mt. Stromlo at the same time and who became a long-standing research collaborator of Sue's.

Sue was one of the first observers with the *Hubble Space Telescope*, leading a successful Cycle 1 proposal to image the central regions of nearby active galaxies at unprecedented angular resolution. This work later formed the basis for a detailed optical and radio study of the inner regions of the powerful radio galaxy Pictor A [6]. Sue also worked on the analysis of under-sampled HST WFPC imaging, and wrote a short technical paper on this topic [7].

During Sue's time as an ApJ science editor, 'AGN feedback' became known as an important mechanism not just for the development of radio lobes but also for the relationship between the radio source and the evolution of the galaxy, the supermassive black hole, and the source of the raw material and fuel for both of these, the gas surrounding the galaxy. Sue was one of the pioneers of AGN observations, and was considered one of the best AGN observers of her generation.

Susan Simkin may be most remembered for her passionate work in support of women in astronomy. She originally conceived and produced the STATUS newsletter from MSU in 1986, and was its first editor. In 1971, Margaret Burbidge famously declined the AAS Cannon Prize because it was only available to women. In response to this challenge, an AAS task force, established by the AAS Council in 1972, studied the demographics of the AAS and reported in 1974 that the percentage of women in the AAS was 8%, the lowest it had been in the then 75-year history of the AAS [8]. It took another five years for the AAS to establish the Committee on the Status of Women in

Astronomy in 1979. The CSWA adopted Simkin's STATUS newsletter for its own in 1987. Sue Simkin's personal account of this history is captured in her report on the "Committee on the Status of Women in Astronomy" from *The American Astronomical Society's First Century*[\[9\]](#).

Life and Career

Susan Marguerite (Smith) Simkin was born on July 26, 1940 in Detroit, Michigan, United States, the daughter of Norman and Alice Smith. She married Roger Simkin in 1961, then graduated from Earlham College in Richmond, Indiana in 1962 with an Honors BA in Physics and Mathematics, ranked second in her class. At the University of Wisconsin, she was supported as a Wisconsin Alumni Research Fellow (1962–1963) and as a NASA Trainee (1963–1966), earning her PhD in astronomy in January 1967 for her work on photoelectric and photographic observations of galaxies. She acknowledged Wisconsin professor Arthur D. Code (1923–2009; AAS President 1982–1984), for suggesting her research topic, but she did not identify him or anyone else as a formal thesis advisor.

She worked as a research associate at Columbia University from 1966 to 1972, with a stint as a lecturer in 1970 and as a teaching professor for three classes per year in 1972 and 1973. At Columbia, she worked on spectroscopy of galaxies and on theoretical models for galaxies. During this time she was raising two young children Daniel (b. 1968) and Benjamin (b. 1970), and she supported Roger while he completed his medical training.

She became a member of the American Astronomical Society in 1963 during her first year or two of grad school. She was a life-long member of the American Association for the Advancement of Science, and she was made a member of the International Astronomical Union in 1973. She clearly valued the professional scientific societies, volunteering and contributing to them her entire life. She joined the MSU Astronomy Department as a research associate working with Dr. Herbert Rood in January 1974. She attracted attention for her success at winning access to observing time at large telescopes at the Kitt Peak National Observatories and for her careful work in absorption-line spectroscopy of galaxies, and in particular for discovering a non-circular velocity field in galaxy NGC 2903. The MSU Department of Astronomy and Astrophysics offered her an assistant professor position to start in September 1975. Her official start was delayed while she began and completed a prestigious one-year NATO fellowship at the Kapteyn Institute, Groningen, Netherlands from September 1, 1975 to August 31, 1976. She was awarded tenure and promotion to associate

professor in 1979. Her appointment moved to the Physics and Astronomy Department in July 1981 with the dissolution of the then-Astronomy and Astrophysics Department and its merger with the MSU Physics Department. Since there had been no tenured women faculty in that Physics Department until Simkin arrived in 1981, and since she was the first and perhaps only woman to be a tenured professor of Astronomy and Astrophysics at Michigan State University, she became the first tenured woman faculty member of the MSU Physics and Astronomy Department.

Susan Simkin was well-connected in the international astronomical community and was able to spend sabbaticals and faculty leaves in many locations. Her MSU tenure was awarded while she was on a 16-month leave as Senior Research Fellow at Mt. Stromlo Observatory, Canberra, Australia, from September 1, 1977 to December 31, 1979. She loved to tell a story about how a kangaroo kicked her and dislocated her knee, ruining her running plans for the rest of her life. She spent a year as an NSF Visiting Professor at University of Wisconsin Madison from September 1, 1982 to August 31, 1983. In 1983, she was promoted to full professor. She spent sabbatical leaves as a visiting professor at the Department of Astronomy at Caltech and at the Carnegie Observatories and its Department for Terrestrial Magnetism in 1986, and another leave at the Space Telescope Science Institute in Baltimore during the first repair mission (Feb 1993–1994), with a few months after that at the VLA in Socorro. She played a vital role in Michigan State University's efforts to join a telescope project, which eventually led to MSU's participation in the SOAR telescope, a 4-meter telescope on Cerro Pachon, Chile, which saw first light in 2006. She later took a 2-year leave for an NSF position as an NSF Visiting Scientist, a program officer in the Division of Astronomical Sciences, Extragalactic Astronomy and Cosmology 1999–2001, and began her term as emeritus professor in 2002. She was a science editor for *The Astrophysical Journal* from 2001–2008. Sue was well-known for her plain-spoken honesty and blunt manner of speaking, but she was very well-respected as knowing her science, from both a technical and a theoretical perspective. She was dismissive of bullshit in all its forms, but she was also a kind, wise, and ferocious mentor for those of us who followed in her footsteps.

She constructed a log home with her husband Roger near Socorro, to which they moved after her retirement from Michigan State University. Their time in Socorro was saddened by Roger's long illness and his death while hiking near town, circumstances which led to the effective end of her astronomical efforts. Her sister, Martha K. Smith, herself a mathematics professor in Texas, shared: "Susan and I shared a room as children. One of my earliest memories is that when she was about 5, she heard about a

kit of glow-in-the-dark stars plus a crescent moon, with adhesive on the back to put them on a ceiling. She told our parents that she wanted a kit for the ceiling of our room. My parents agreed, and I still remember watching our Dad on the stepladder applying the moon and stars to the ceiling, with detailed directions from Sue. So her interest in astronomy began at a tender young age!”

Physics and Astronomy department paper archives with MSU Board of Trustee documents and other employment records, were the source of timeline information. Information about the MSU astronomy programs and professor demographics were collected from the annual reports from Michigan State University, in the BAAS (e.g. [10])

Citations

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