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Howard D. Greyber (1923–2016)

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Howard D. Greyber died on Tuesday the 22nd of November, 2016.

Howard David Greyber, best known to astronomers for 50 years for firm advocacy of a Strong Magnetic Field (SMF) model for quasars and active galaxies, died on November 22, 2016 in San Jose, California. He later extended the SMF model to interpret gamma ray bursts, to form young stars and the large scale structure of the universe, and to mimic Dark Energy. Howard was born in New York City, on April 2, 1923, the only child of Arthur and Beatrice (Horowitz) Goldgraber. Skipping through school, he was a member of the math and chess teams¹ at Stuyvesant High School, a public but selective school, from which he graduated in 1939, not long after his 16th birthday. Howard passed an exam that had been instituted in 1934, and Stuyvesant was so popular that they ran split sessions.

Credit: Emilio Segrè Visual Archives of the American Institute of Physics.

Young Goldgraber's first choice of college would have been Columbia, but Cooper Union in those days offered full tuition scholarships to every student admitted. As one of the top three entering freshmen, Howard also was offered a Schweinberg Scholarship that provided a \$300 living stipend. He earned a Cooper Union degree in Engineering in 1943.

Newly minted engineers were a very salable commodity during World War II, and Goldgraber first became one of nearly 100 members of a Special Engineering Detachment at Kallex Corporation, a new (1942) wholly owned subsidiary of W. M. Kellogg Company (power plants etc., not breakfast cereals), formed to design a

gaseous diffusion facility. Howard, initially at headquarters (Jersey City, New Jersey, and the Woolworth building in lower Manhattan), went on to Oak Ridge, Tennessee, where the facility was built and operated as K-25 (K for Kellogg; 25 for Uranium-235), the most expensive piece of WWII construction. Kellogg was sold in 1950; W. M. Kellogg merged with Brown and Root (the company that failed to dig the Mohole), but before that Howard left the project, volunteered for and earned an officer's commission in the U.S. Navy. Some training then led to his work as a radar officer on the USS *Crescent City*, operating in the Pacific and transporting American and Chinese troops.

Following the war, Howard remained attached to government service, in the US Naval Reserve and apparently was involved in some combination of investigation as to how far the Soviets had progressed toward an atom bomb and Operation Crossroads, the 1946 Navy bomb test on Bikini. Goldgraber was discharged as a full lieutenant in 1949 and served as a reserve officer until 1955. He started graduate school at the University of Pennsylvania in 1946, financed by the G.I. Bill. He wanted to study nuclear physics (as did a very large fraction of post-WWII physics graduate students!), but his intended advisor Theodore Allen Welton (who had been an MIT classmate of Richard Feynman's and part of the theory group at Los Alamos under Hans Bethe) left Penn for Oak Ridge, where he served out the rest of his career, being best known for the fluctuation-dissipation theorem. Then Howard was to work with Gian-Carlo Wick, who was to come from University of California, Berkeley, but Penn refused to hire him, because he had declined to sign a "loyalty oath" at UCB. This left Howard, after a wasted year, to the mentorship of 1947 University of Pennsylvania hire, spectroscopist Charles Wilbur Ufford, which led to his 1953 thesis "On Magnetic Interaction in the Theory of Atomic Spectra." It can be found via ADS under author's name Howard D. Goldgraber, but with no apparent on-line source and is not cited in Condon and Shortley's 1964 *Theory of Atomic Spectra*. Ufford, however, appears in seven places, presumably because he worked with both Condon and Shortley (separately) in the 1930s.

It is likely that Howard's next few years were again spent on something with nuclear/defense/classified aspects². He reappears in the scientific literature as Howard D. Greyber at General Electric Missile and Ordnance Systems Division in Philadelphia as a co-author with Ralph Alpher (of Alpher, Bethe, Gamow) on a 1960 paper describing how gases react to shock waves. Next came properties of a gas heated by thermonuclear reactions, carried out with US Atomic Energy Commission support at the Radiation Laboratory of the University of California (at Livermore, Edward Teller's shop), though the author had already moved on to the Geophysics Corporation of America (later GSA) in Boston. He probably changed his surname quite soon after

receiving his Ph.D. Family members agree it was because “Goldgraber” had caused him to suffer a great deal of teasing in youth, from which he wished to spare his eventual children.

Another 1960 paper on energy produced by colliding galaxies (an early model for radio galaxies like Cygnus A) again carries a GE address, but this time the Schenectady branch. The energy source was supposed to be $d + p$, in hydrogen considerably enriched in deuterium, and there would have been a signature in the gamma ray spectrum of the radio galaxies if gamma ray spectroscopy from space had been possible in those days.

In any case, Greyber was clearly by then beginning to think of himself as an astrophysicist. He attended the 1961 General Assembly of the International Astronomical Union in Berkeley and spoke briefly in a session of Commission 33 (then Milky Way, not Galaxies = Comm. 28). In 1962 he went to Northeastern University (Boston) and devised a model of the Milky Way with a strong dipole magnetic field, axis aligned with the rotation axis that was later applied to all spiral galaxies. The model predicted that the field along spiral arms would point one way north of the galactic plane and the opposite direction south of the galactic plane, which is perhaps true.

Quasars were discovered in 1963 and were part of the driver for the convening of the First Texas Symposium on Relativistic Astrophysics (Dallas, December 16–18). Greyber was there (from Northeastern) and provided two pages of his discussion remarks for the proceedings. He again invoked a strong dipole field for spiral galaxies and said that active ones (radio, quasar, and such) are unlikely to be ellipticals. Ongoing observations, however, showed that virtually all are giant ellipticals, and this perhaps marks the point at which Greyber’s work increasingly diverged from the astrophysical mainstream.

Summer 1964 saw him back in Berkeley, attending a Hillel event. Also attending was a brand new UC Berkeley graduate, Andrea Cohen. They clearly clicked very quickly, for he suggested they marry before he left at the end of the summer. She demurred, but they did marry in September 1965 and spent much of the next year in London and Paris. One of his papers lists Imperial College London as his affiliation, and another thanks the Observatoire de Paris for hospitality.

Greyber’s subsequent astrophysical publications appear mostly in AAS and APS meeting abstracts and contributed conference papers. They have gone almost entirely uncited, apart from self-citations. From the late 1960s to 1972, Greyber was at the

Martin (soon Martin-Marietta) Corporation, where he worked on the Viking Project at their facility in Colorado. In 1973 the family moved to Washington, DC, where for a time Howard ran the meetings program for the American Association for the Advancement of Science³. There are no ADS papers with dates from 1973 to 1983, and for most of that time, AAS directories provided his home address and phone number in Potomac. Andrea believes that his work in this period was probably again classified. The 1982 AAS directory has him at the Division of Materials Science at NSF.

The resumed stream of SMF model papers from 1984 onward listed him sometimes at “Greyber Associates,” sometimes at his home address. The SMF model got renamed the Magnetogravitodynamics (MDM) model and predicted organized primordial magnetic fields in and between clusters and superclusters of galaxies.

Portions of some of the papers addressing active galactic nuclei and gamma ray bursts put magnetic fields to work in ways that sound qualitatively a good deal like the current “best buy” models, and one might reasonably wonder why Greyber is never credited as a pioneer along those lines. Three factors probably contributed. First, as he wrote under the title “Credentials and Conformity” a scientist has the best chance of having his ideas recognized if he is associated with a prestigious institution and does not depart too much from the current mainstream. Second, the publications are nearly always short and include very little in the way of calculations leading to predictions of values for field strengths, extent of beaming, luminosities, and so forth. Third, his presence at conferences was sufficiently frequent and sufficiently conspicuous that he had only to raise his hand during a discussion session or question and answer period for participants to mumble “Carthago delenda est” (Carthage must be destroyed), or words to that effect. I cannot claim perfect innocence in this matter, though he gave accepted contributed papers at two conferences where I was on the SOC, and his fairly extended review of SMF issues appeared in *Comments on Astrophysics* (1989) during my term as editor in chief (1987–95 or thereabouts).

Greyber was elected to IAU membership at the 1970 General Assembly in Brighton. One of his early publications was AFOSR Report 2958 “On the Steady-State Dynamics of Spiral Galaxies” in 1962. On another occasion he credited Donald H. Menzel for using a similar mechanism “for the generation of a loop current during the formation of stars.”

Howard Greyber had strong opinions about a number of issues not related to cosmic magnetic fields, and wrote fairly often to the *New York Times*, *Physics Today*, and other publications. He felt that every congressional district should have a high school as

good as Stuyvesant had been when he attended. Few would quarrel with that, though who gets to attend is less easy to decide. He was, for the most part, a rock-ribbed Republican, and entered Republican primary elections, six times, once for the House from Massachusetts, and five times for the Senate, from Maryland, receiving on various occasions anything from about 1 percent of the votes up to 27 percent (in Massachusetts). He advocated the use of 16-inch guns during the Vietnam War and thought that the U.S. should somehow intervene in Tibet to keep it from being completely dominated by Han Communist Chinese⁴. Generally a strong supporter of President Reagan, he disagreed on the issue of formal, organized prayers in schools, sending a resolution from the Washington Board of Rabbis to Maryland Senator Charles McCurdy (“Mac”) Mathis to be entered into the Congressional Record on March 20, 1984.

The Greybers returned to California in 2004, and Howard's last AAS address was in San Jose. He died there on November 22, 2016 at the age of 93 and is survived by his wife, Andrea, their three children (Elizabeth, Robert, and Daniel), and eight grandchildren. His son, Daniel, is a Rabbi in Durham, North Carolina, and also, of course, by inheritance, a Kohen. Andrea (who is about my age and so was a good deal younger than Howard) and Daniel generously contributed many family memories to this obituary. Additional memories from Daniel can be found at:

<http://www.rabbigreyber.com/blog/2016/12/23/on-the-shloshim-of-my-father.html>.

Footnotes

1. Note added by Daniel Greyber: later in life Howard proposed to a chess review publication his idea for a “spherical chess” game. [↵](#)
2. Note added by Daniel Greyber: between Howard’s Ph.D. at Penn and his work at Livermore, he did calculations on Project Matterhorn for Johnny Von Neumann and John Archibald Wheeler. [↵](#)
3. Note added by Daniel Greyber: during this time Greyber co-edited with G. W. Morgenthauer, “Astronomy from a Space Platform,” proceedings of 1971 American Astronautical Society meeting co-sponsored by the AAAS: <https://catalogue.nla.gov.au/Record/393454> [↵](#)
4. Note added by Daniel Greyber: declassified correspondence between Howard and Secretary of State Dulles was found several years ago. [↵](#)