

## Guiding Forces and Janet A. Mattei

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**Abstract** We are all shaped by the guiding forces in our lives—some we seek out, some seek us out, many are beyond our control. These forces may be human or not, constructive or destructive, personal, cultural, social, political, historical, or environmental. If we are fortunate we have had at least one human mentor who has nurtured us and helped us to grow towards our potential. Throughout her life, Janet Akyüz Mattei was the recipient of the effects of guiding forces—good and bad—and was herself a guiding force. From childhood on, she was blessed by having mentors and she responded constructively to them. Here Janet Mattei is discussed both as she was shaped by guiding forces and mentors and how, as a mentor and guiding force herself, she shaped others.

### 1. Earliest influences

Janet Hanula Akyüz was born January 2, 1943, in Bodrum, Turkey, the eldest of five. Her parents, Baruh and Bulisa Akyüz, were merchants who owned several shops. University educated, Janet's father was a local leader to whom people brought problems, antiquities they had discovered for him to refer to the proper authority, and so on. Sephardic Jews who had lived in Turkey for generations, the Akyüz family was and is one of strong traditions, history, and pride. The environment in which Janet was born and grew up shaped her from the beginning. On Turkey's west coast, Bodrum was an ancient city, a crossroads of civilizations for centuries, and Izmir, a coastal resort city to which the family later moved, was the ancient Smyrna. Janet grew up being aware of history and the multicultural nature of the world; Turkey was Muslim, Jewish, and Christian. Turkey is a secular state but post-WWII there was still religious prejudice, and women were not in any way considered the equals of men.

Janet's earliest education was in a one-room elementary school, where the teacher recognized her as very intelligent. Education was highly valued in the family, and since the secondary schools in Bodrum were limited, the family moved to Izmir to provide Janet with better opportunities (Figure 1). She attended Roberts American School, a high school with college courses. Janet mentored her siblings, sisters Kadem and Beki and brothers Yusef and Hayim, checking their homework and tutoring them when needed. Miss Naomi Foster, Janet's math and science teacher at Roberts, saw her potential, and mentored

Janet in the sciences. Many of the teachers at Roberts were women—highly unusual in the Turkish culture—and so were excellent role models. Mrs. Blake, the American principal of Roberts, also strongly supported Janet, as did Janet’s mother (Figure 6).

Janet encountered prejudice early: she won a national contest to represent Turkey in a student exchange but was told she could not do so because she was Jewish.

In 1961 Janet came to the U.S. to attend Brandeis University in Waltham, Massachusetts, having won a prestigious 4-year Wien International Scholarship (open by competition to international students) (Figure 3). Prior to the term starting, Janet spent three months in Vermont with AFS host family Janet and Bob MacLennan and their young children. Janet MacLennan (later Janet MacLennan Zisk after marrying planetary astronomer Stan Zisk), an archaeologist, historian, and archivist, was Janet’s first mentor in the U.S. They became and remained very close friends, and Janet Mac was Janet’s administrative assistant 1984–1986 at AAVSO and a mentor on organizational management (Figure 3).

Janet graduated from Brandeis in the class of 1965 with a B.S. in Physics (Figure 4). During her college years the MacLennans were her American family and her Uncle Rafael Akçüz and family in the U.S. were a source of support and family connection when her immediate family was so far away (Figures 2 and 5).

Janet had planned on attending medical school. After graduation from Brandeis she worked for one year as a hospital hematology lab supervisor, but she didn’t really like it. She returned to Turkey, and in 1967 started graduate school in physics at Ege University (near Izmir). At the same time she taught math and physics at the Roberts School, where she was a very popular teacher.

Miss Foster knew the Turkish astronomer Paris Pişmiş, and in 1969 she introduced Janet to Paris as the most brilliant student she had known, telling her she thought Janet would make a good scientist—Janet was known as the “Einstein of Turkey” at this time. Paris mentored Janet, delighting in fostering her rare talent and encouraging another Turkish woman in the sciences.

Paris knew the astronomer Dorrit Hoffleit—Dorrit had been her mentor—and in a fateful move, suggested to Janet she should study under her at the Maria Mitchell Observatory (MMO) on Nantucket and introduced Janet to Dorrit. Dorrit had mentored Paris, Paris mentored Janet and introduced her to Dorrit, who also mentored Janet—they were a trio embodying the power of mentoring (Figure 7).

Janet applied to the MMO summer research program. Dorrit had already selected students for the summer, but Paris’ recommendation led her to add Janet. That summer Janet photographed and analyzed RR Lyr stars while learning much about many things from Dorrit. That initial meeting led to a lifetime mentor-mentee relationship and friendship (Figure 8).

In October 1969 AAVSO held its annual meeting on Nantucket at MMO. Janet stayed to help Dorrit host the meeting and finish research. As the meeting

began, Dorrit went to the mainland to a meeting at Woods Hole. Bad weather prevented her return until the concluding banquet, so she delegated hosting the AAVSO meeting to Janet, who did so very capably with the assistance of Nancy Gregg, another MMO student. At that meeting Janet joined the AAVSO, gave a paper on her research, and met AAVSOer Michael Mattei.

Her experience on Nantucket and with Dorrit and Paris decided Janet on a career in astronomy. She returned to Turkey and earned a M.S. in Physics at Ege University (near Izmir) in 1970. She then continued graduate studies in Astronomy at University of Virginia in Charlottesville. There she experienced considerable prejudice, both personal and academic—she was a woman, she was foreign, and she was Jewish—and was told not to try for a Ph.D. as she was “not Ph.D. material.” She earned her M.S. in Astronomy (her thesis was on T Tauri stars) from UVa in 1972. During her sometimes very difficult days at UVa, AAVSO member and faculty astronomer Martha Stahr Carpenter (Figure 14) was a mentor to Janet (and all the astronomy female students).

Dorrit encouraged Janet to apply for the position of AAVSO Director Margaret Mayall’s assistant. Her recommendation led to Margaret’s hiring Janet in 1972. Mike and Janet married later that same year (Figure 9).

Margaret was planning to retire and wanted Janet to succeed her. The search committee had been active since 1971, but no real action had been taken. Janet applied for the position in January 1973 and was ultimately chosen, becoming AAVSO Director on November 1, 1973, at the age of 29. Margaret was appointed Consultant to the Director for at least one year (Figure 10).

Although Janet had been Margaret’s right arm for a year, the position of Director entailed a very steep learning curve with all the science, administration, and politics to master. Things were complicated by significant issues within AAVSO Headquarters that needed resolving (for example, lack of communication with members, availability of data to researchers), the absence of budget for more staff or materials, and the delicate diplomatic issue of not offending her mentor Margaret Mayall, who was in the office all day every day.

As Janet picked up the Director’s baton (Figures 11, 12), she began working to resolve these issues as she worked on learning management skills, more about types of variables in-depth, and so on. She was also her own mentor; she constantly studied organizational and financial management and grantwriting—skills she needed in her position.

Janet attended professional meetings as AAVSO Director, where she was often snubbed because she did not have a Ph.D. She re-enrolled in Ege University long-distance and earned her Ph.D. in Astronomy (her thesis was on cataclysmic variables) in 1982. Afterwards she became a full member of the IAU and participated vigorously in the appropriate variable star and education commissions and committees.

Her life-long experiences with prejudice because of her sex and religion

made her determined that others would not be treated as she had been. Also, she felt very strongly that girls and young women needed to be mentored/encouraged in pursuing math and science and wanted the AAVSO to play a role, as some handwritten notes by Janet indicate: “Offer opportunity to women in science to provide unique opportunities for scientific research in the analysis of data on CVs. Policy of AAVSO: Women are minority in astronomy. to encourage women in science majors to enter the field[.] recent examples Meech, Pope, Hammel. by offering them part time research assistant” (AAVSO archives).

Thus, from a very early age Janet had experienced strong guiding forces—positive and negative—and had been both a mentor and mentee. This pattern continued for the rest of her life.

## 2. AAVSO mentors

Numerous AAVSOers over the decades offered guidance to Janet, including:

*John Bortle*—cataclysmic variables, publishing observations (*AAVSO Circular* editor) (Figure 13);

*Louis Cohen*—finances and investments (AAVSO Treasurer) (Figure 15);

*Clinton B. Ford*—finances, AAVSO history, charts (Figure 12);

*Grant Foster*—both mentor and mentee, AAVSO staff member, programmer and mathematician, data analyst, statistician; Grant mentored Janet in aspects of advanced data analysis and statistics; Janet mentored Grant, encouraging his great abilities in mathematics and logic (Figure 16);

*Owen Gingerich*—Harvard University and Smithsonian Astrophysical Observatory; history of astronomy (Figure 17);

*Katherine Hazen*—Mt. Holyoke College ’26 chemistry major (Martha’s mother), fundraising, member relations and communications (Katherine was a Headquarters volunteer and a mentor to all of us there) (Figure 18);

*Martha Hazen*—Harvard College Observatory plate collection curator; variable stars, member relations, astronomical community relations, organizational politics (Figure 19);

*Arne Henden*—U.S. Naval Observatory, Flagstaff; photometry, instrumentation (Figure 20);

*Margarita Karovska*—Smithsonian Astrophysical Observatory, Chandra X-Ray Center; long period variables, interferometry, astronomical community relations (Figure 21, right);

*Howard Landis*—photoelectric photometry (Figure 22, left);

*Wayne Lowder*—comparison star sequences, binocular observing (Figure 23);

*Mario Motta*—education, community outreach (Figure 21);

*John Percy*—University of Toronto; pulsating variables, particularly red variables, photoelectric photometry, science education (*Hands-On Astrophysics* co-creator, *Journal of the AAVSO* Editor) (Figure 24);

*Charles Scovil*—publications, charts, sequences, photometry (Figure 25);

*Arthur Stokes*—photoelectric photometry (Figure 22, right);

*Paula Szkody*—University of Washington; cataclysmic variables, astronomical community relations (Figure 26);

*Theodore Wales*—financial management, investments (AAVSO Treasurer); Ted believed in Janet's vision for the AAVSO and supported her sometimes substantial financial expenditures on behalf of the AAVSO (Figure 27);

*Barbara Welther*—Smithsonian Astrophysical Observatory; computerized data processing; she advised Margaret Mayall as well as JAM (Figure 28);

*Charles Whitney*—Harvard University, Smithsonian Astrophysical Observatory; stellar variations, stellar atmospheres, (*Journal of the AAVSO*, Editor) (Figure 29);

*David B. Williams*—organizational management, fundraising, binocular observing (Figure 30);

*Thomas R. Williams*—organizational management, financial management, AAVSO historian (Figure 31);

*Lee Anne Willson*—Iowa State University; pulsating variables, especially long period variables, stellar models, pulsation theory, astronomical community relations (Figure 32, left).

### 3. Government grant mentors

Janet sought out mentors in the government grants community for advice in developing grants for AAVSO programs. Among her colleagues who were particularly helpful were *Nahide Craig* (NASA Science Education Gateway (SEGway) on education); *Gerald J. Fishman* (NASA Marshall Space Flight Center, Principal Investigator on the Compton Gamma-Ray Observatory Burst And Transient Source Experiment) on high-energy astrophysics and gamma-ray bursts (GRBs); *Chryssa Koveliotou* (Universities Space Research Association and National Space Science and Technology Center, a partnership with NASA Marshall Space Flight Center) on high-energy astrophysics and GRBs; *Gerhard L. Salinger* (National Science Foundation, NSF Program Director for Advanced Technological Education Discovery Research K-12) on education; and *Edward J. Weiler* (NASA, Chief Scientist for the Hubble Space Telescope 1979-1998) on HST and other satellite mission applications.

### 4. Janet as mentor in teaching

Janet was passionate about education, and, a born teacher, was active in many science educational initiatives through the AAVSO and other organizations. Among the AAVSO initiatives were *Hands-On Astrophysics* (today updated and expanded as *Variable Star Astronomy*), a curriculum to teach the scientific research process through variable star astronomy and

observing developed with John Percy and Donna Young (Figure 33), and *Partnership in Astronomy*, developed with Mario Motta (Figure 21) and others. A major educational program Janet (and Mike Mattei) taught in was *Towards Other Planetary Systems* (TOPS), developed by Karen Meech as an annual summer astronomy education (and much more) program for Hawaii and Pacific Rim high school teachers. Over the ten years of TOPS, variable star observing and AAVSO's *Hands-On Astrophysics* curriculum were an integral part of the program (Figure 34).

Among those outside the AAVSO was the Eighth United Nations/European Space Agency Workshop on Basic Space Science in the Developing Countries, held in 1999 in Jordan, and subsequent UN/ESA meetings, in which she successfully had *Hands-On Astrophysics* incorporated into the curricula for the participating national observatories.

Janet also was involved in alumnae mentoring and outreach in the Wien International Scholarship program at Brandeis University, the program that she had benefitted from so as an undergraduate (Figure 35). In addition, she was an active member of the Women in Science network that facilitated connections and experiences for women in the sciences in the New England area.

## **5. Janet as mentor at AAVSO Headquarters**

Everyone who worked at AAVSO Headquarters, whether as a summer, semester, or volunteer assistant or as a permanent employee, learned from Janet far more than the details of their jobs. A particular skill or interest (astronomical or other) was always encouraged and supported by her. (Her own enthusiasm for photographing flowers was fostered by everyone at headquarters (Figure 36)). The way she interacted with everyone, responded to pressure, constant interruptions, even hostility, was a model for living life with kindness and compassion, and with fierce determination to succeed, be proactive, and find solutions. The author, who worked with Janet as her assistant and senior assistant for twenty-four years, knows this from long and cherished personal experience. Janet also taught that being a mentor or a mentee wasn't all hard work and serious discussion—it could be a lot of fun, too! (Figure 37)

Permanent assistants' work varied tremendously, depending on what needed doing. Everyone was hired with specific responsibilities and/or projects to be done, but took on other tasks as needed—no one ever said “that's not my job.” Summer assistants' areas of work and research typically included identification and variability research (literature and HCO plates) of stars for preliminary charts, problematic stars, field stars, period analysis and/or mean curve creation using AAVSO data, data validation and light curve plotting for AAVSO publications, creating specialized program charts—a great variety of types of research and work. All assistants gave a presentation on their research at the AAVSO Annual meeting and published an article in *JAASO*—part of Janet's teaching the skills needed in the scientific research process.

Janet had over forty permanent or summer assistants (many Margaret Mayall summer assistants) during her tenure as Director. Figure 38 is a composite photo of her last staff in 2003; it stands for all of us from Headquarters since 1973. Many of Janet's assistants have gone on to professional careers as scientists and have acknowledged the importance of their time working with Janet. Some of these individuals are mentioned briefly below.

*Heidi Hammel* was hired as a Summer Assistant in 1980. Today, Heidi is a planetary astronomer, specializing in the outer planets. She is Executive Vice President of AURA (Association of Universities for Research in Astronomy) and is a recipient of the American Astronomical Society's (AAS) Klumpke-Roberts Award for outstanding contributions to the public understanding and appreciation of astronomy, Harold C. Urey Prize for outstanding achievement in planetary science by a young astronomer, and Carl Sagan Medal for her exemplary work in outreach and public education (Figure 39).

*Karen Meech* was a Mayall Assistant in summer 1979 and a Special Research Assistant during graduate school at MIT. Today Karen is Director of the Astrobiology Institute, University of Hawaii (NASA), emphasizing education and outreach, and a planetary astronomer and co-investigator on NASA cometary missions. Her awards include the AAVSO William Tyler Olcott Award for contributions in mentoring/promoting variable stars, the AAS Annie Jump Cannon Award for distinguished contributions to astronomy within five years of receipt of a Ph.D., and the Harold C. Urey Prize (Figure 40).

*Shelly Pope* was a Mayall Assistant in summer 1982. Today she is a professional astronomer at Lunar and Planetary Labs and Scripps Institution of Oceanography specializing in atmosphere studies, solar radiation and greenhouse gases, global warming, solar wind, and space weather (Figure 41).

*Meg Lysaght Thacher* was a Research Assistant 1988–1990 working on the Hipparcos mission. Today, with an M.S. in Astrophysics, she is a Laboratory Instructor in the Five College Astronomy and Physics Departments, Smith College, and a Lecturer in the English Department at Smith teaching the engineering course “Writing about Science” (Figure 42).

*Mary Dombrowski*, daughter of AAVSO longtime AAVSOer Phil Dombrowski, did a high school science fair project on IP Peg, observing, then analyzing—at increasingly sophisticated levels over several years—the light curve to explain evidence of an eclipsing companion, and won numerous local, state, and national awards. Today she is an M.D. in Neurology, finishing a Neurology Fellowship at Yale, and is married with a young son (Figure 43).

*Ann Piening McMahon* was an undergraduate Assistant 1978–1979, doing data- and science-related work. Ann became a laser communications satellite specialist for McDonnell Douglas, then a science educator for two-to-five year olds (author of *Catalyst and Friends*), and today is director of MySci, a hands-on science program for elementary students at Washington University, St. Louis (Figure 44).

*Tanja Foulds* was AAVSO Project and Meeting Coordinator 1991–1995. Today she is Director of Event Planning for a major hotel in Hawaii (Figure 45).

*Jill Gustafson* was an undergraduate Assistant 1978–1980 doing data entry and clerical tasks, and a Summer Assistant in 1980 helping with the final checking and cleaning of the *AAVSO Variable Star Atlas*. Today Jill is an M.D. in pediatrics.

*Jim Allen* was a high school student Summer Intern in 1979 who analyzed two stars and published a paper with Janet in *JRASC*. His AAVSO internship led to a summer job at Goddard Institute for Space Studies; in a letter he thanked Janet for encouraging his “budding interest in astronomy and astrophysics.”

*Peter Garnavich* was a Clinton Ford Summer Research Assistant in 1982. Today he is a professor of astrophysics and cosmology physics at Notre Dame University, and specializes in supernovae, interacting binaries, and cosmology, and as a co-discoverer of dark energy, is a member of the team that won the 2011 Nobel Prize in Physics (Figure 46).

*Benjamin D. Oppenheimer* met Janet at a middle school star party, after which he wrote telling how much he loved astronomy and asking if he could volunteer at AAVSO Headquarters (he would gladly make coffee, anything). Janet welcomed him as a volunteer at age thirteen (the first thing he learned was how to make coffee) and took him under her wing for the next eight years and more, from middle school into graduate school. She assigned him the recurrent nova RS Oph to study and analyze, teaching him how to do research in increasing depth over the years, prepare and give presentations at the AAVSO and AAS levels, and turn those presentations into publications, and helping him develop his analytical and inquiry skills. After attending Harvard University and graduate school in astrophysics, Ben worked in cosmological modeling and simulations at the University of Arizona; he is currently at Leiden University (Figure 47).

## 6. Conclusion

As a child, Janet was guided by many forces. As an adult, and with her courage, determination, tenacity, persuasiveness, kindness, charity, and optimism, Janet was a guiding force herself even as forces continued to act on her. She shaped the AAVSO through her vision and continual efforts. She shaped the international amateur astronomy community through outreach to national groups and fostering collaborations with groups and individuals from other groups. She shaped the professional astronomy community—the variable star section of it, at least, and perhaps others such as education—through her unceasing efforts to teach that amateur astronomers can and do contribute valuably to research and science. Through her volunteer work for the Wien International Scholarship of Brandeis University, who knows what other areas



of human endeavor she may have affected—after all, the Wien students become leaders around the world in their fields, from science of all kinds to jurisprudence to international relations to the arts. She helped to shape young lives as a mentor and encourager to many young people in many countries. Truly, guiding forces were part of Janet Hanula Akyüz Mattei.

## 7. Acknowledgements

My sincere thanks go to Mike Mattei, Thomas R. Williams, and Mike Saladyga for helpful discussions; to Mike Saladyga for the formatting and layout of the photos, and to Rebecca Akyüz for sharing the childhood and graduation photos of Janet Mattei with the AAVSO.

It is always risky to list individuals involved in many ways over a long time because omissions are sure to be made. My apologies go to any I may have omitted—please send omissions and/or corrections to [eowaagen@aavso.org](mailto:eowaagen@aavso.org).



Figure 1. A teenaged Janet (second from right) with extended family, being embraced by her paternal grandmother.



Figure 2. Janet and her Aunt Liana, July 1962.



Figure 3. Janet and Janet MacLennan.



Figure 4. New graduate Janet with her Uncle Rafael Akyüz.



Figure 5. Janet holds her niece, Rebecca.



Figure 6. Janet and her beloved mother Bulisa (Bella) Akyüz.



Figure 7. A study in mentoring: Janet, Dorrit Hoffleit, Paris Pişmiş.



Figure 8. Presenting Dorrit with the William Tyler Olcott Award at the 2002 AAVSO Annual Meeting.



Figure 9. Janet and Michael Mattei at their engagement party in 1972.



Figure 10. Publicity photo: AAVSO Director and mentor Margaret Mayall handing over the Directorship to Janet Mattei.



Figure 11. Janet at work in 1977—the Director is in!



Figure 12. Clinton Ford, Mike, and Janet at an AAVSO Banquet in the late 1970s.



Figures 13–32, AAVSO Mentors. From top left: John Bortle; Martha Carpenter; Louis Cohen; Grant Foster; Owen Gingerich; Katherine Hazen; Martha Hazen; Arne Henden; Mario Motta and Margarita Karovska; Howard Landis and Arthur Stokes; Wayne Lowder; John Percy; Charles Scovil; Paula Szkody; Theodore Wales; Barbara Welther; Charles Whitney; David B. Williams; Thomas R. Williams; Lee Anne Willson with Janet.



Figures 33–35: JAM and pupil at a *Hands-On Astrophysics* workshop; teaching at TOPS; Rachel Zimmerman, Brandeis Univ. '95, JAM '65, Robin Shostack '97.



Figures 36, 37. Photographing wildflowers; mentor and mentee share a treat.



Figure 38. JAM's last staff (2003): from left—Sara Beck, Katherine Davis, Carl Fehrer (volunteer), Kerriann Malatesta, Gamze Menali, Gloria Cruz-Ortiz, Aaron Price, Arthur Ritchie (volunteer), Michael Saladyga, Travis Searle, Sarah Sechelski, Barbara Silva, Matthew Templeton, Rebecca Turner, Elizabeth Waagen.



Figures 39–47. AAVSO Mentees: from upper left—Heidi B. Hammel; Karen J. Meech; Shelly K. Pope; Meg Lysaght Thacher; Mary Dombrowski; Ann Piening McMahon; Tanja J. Foulds; Peter M. Garnavich; Benjamin D. Oppenheimer.