

## **Reminiscences on the Career of Martha Stahr Carpenter: Between a Rock and (Several) Hard Places**

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**Abstract** An overview is presented of the life and work of Martha Stahr Carpenter, three-term president of the AAVSO and member since 1946, based on her reminiscences and archival research.

### **1. Introduction**

Martha Stahr Carpenter was the AAVSO president who served during a critical time in the organization's history: its eviction from Harvard. Very little has been previously published about her life and career, and this work is the most complete biographical study of her to date.

### **2. Early life**

Martha Elizabeth Stahr (pronounced STAIR), or "Patty" to her friends and family, was born in Bethlehem, Pennsylvania, on March 29, 1920, the middle child and younger daughter of Reverend Doctor Henry Irvin Stahr and his wife Alice Stockwell (Moat 2011). Henry was devoted to public service, and was not only a minister for many years, but was also one of the founders and first president of the United Way of Frederick County, Maryland. He was also deeply involved with the Boy Scouts of America (Anon. 1930). As a young girl Carpenter was interested in astronomy, and joined a club in junior high school, but was disappointed when the teacher who sponsored it "didn't know anything pertinent. He mostly made imaginative speculations on such topics as little people who might be living on the moon" (Carpenter 2011b).

When she was fourteen years old her father became President of Hood College in Frederick, Maryland. There she met astronomy professor and AAVSO member Leah B. Allen, who encouraged her interest in astronomy by showing her objects through the Clark telescope. Carpenter spent her first year of college at Hood and took Allen's astronomy course, and "it suddenly dawned on me that I could actually become an astronomer" (Carpenter 2011a). She transferred to Wellesley (the college her mother had attended), where there was a full astronomy major. She joined the AAVSO, and began attending meetings. As she told the author, "I yearned to have a telescope of my own so I myself

could make observations for the AAVSO” (Carpenter 2011a). With the help of another student (who had taken a mirror-making course at the Franklin Institute in Philadelphia) she began grinding her own mirror in the basement of Wellesley’s observatory. She recounts that she could not find an oil drum for her grinding base, despite an exhausting campus and town-wide search; one of the food service workers in her dormitory inquired why she looked so tired, and offered her an old vegetable oil drum to use instead—a base that afterwards smelled rather distinctive (Carpenter 2011c). She attended meetings of the Amateur Telescope Makers of Boston, and with their help mounted her mirror into a telescope and portable mount, and attended the Stellafane amateur telescope-making convention. She later used the instrument to observe variable stars at her family’s oceanfront summer home in Scituate, Massachusetts, and her family still owns the telescope (Carpenter 2011a, 2011b).

Carpenter remembers that the summers of 1944–1945 offered particularly great skies. There were heavy black curtains over the windows during war-time, and the skies were very, very dark. She recounted that one time the Coast Guard came to their house and “wondered about what this contraption was that I had set up” (Carpenter 2011b). They apparently wanted to make sure her telescope wasn’t some kind of enemy device. Under the observer code SME Carpenter contributed 396 variable star observations to the AAVSO between 1940 and 1950, including 83 of SS Cygni, 22 of Mira, 19 of R CrB, and 16 of RS Cygni.

Carpenter graduated from Wellesley in 1941 and began graduate work at the University of California, Berkeley. She worked on a number of projects there, for example finding twenty-nine new variables in the Scutum cloud from a single photographic plate (Federer 1942). She and fellow student Leon E. Salanave also tried to calculate an orbit for Comet Vaisala 2, but according to Julie Vinter Hansen (1942) “met with difficulty.” But she also did work in statistics, and obtained a Master’s Degree in 1943 with the thesis “A Method of Calculating Curves of Growth.” Afterwards, she spent 1944–1945 at Lick Observatory, where, using the spectrograph on the 36-inch refracting telescope, and supported by a University of California Fellowship and the Alice Freeman Palmer Fellowship of Wellesley College, she measured the radial velocities of fifty F- and G-type stars of eleventh magnitude situated within two degrees of the north galactic pole (in other words, far from the galactic plane). This study became the foundation for her Ph.D. thesis (Anon. 1944; Moore 1946). Carpenter recalls that students would ordinarily never have been allowed to use this instrument, but since it was the war years, “most of the astronomers had left. There was a discussion as to whether a woman could handle the big telescope, [but] I just went up there. The man was there doing all he could to handle it, and it wasn’t before long that I was doing it with him, so they were very glad that the telescope was kept in use, because it was more than one person could handle” (Carpenter 2011b). This tension surrounding women in astronomical observatories can also be seen in the careers of Margaret Burbidge, Helen

Sawyer Hogg, and Vera Rubin, among others, and severely limited the roles for women in astronomy (Burbidge 1994; Larsen 2009; Mack 1990; Rubin 1997).

After completing her Ph.D. in 1945, she taught at Wellesley for two years. During this time she made twelve observations of Comet 1946a Timmers with the 12-inch refractor there and published the results in *The Astronomical Journal* (Stahr 1946). Her class in Practical Astronomy made variable star observations and submitted them to the AAVSO, and she herself became a life member of the organization in 1946 (Carpenter 2011b). The 1947 Spring meeting of the AAVSO was held at Hood College, with Carpenter's parents acting as hosts. According to the meeting minutes, the AAVSO members were treated to a tour of Mrs. Stahr's extensive collection of 250 vases (Seeley 1947). The following year Henry Stahr retired to Scituate, Massachusetts, and over the next few years the elder Stahrs attended a number of AAVSO social events.

### 3. Early career at Cornell

In 1947 Carpenter became an assistant professor in astronomy at Cornell University, and in so doing was the first woman faculty member in Cornell's College of Arts and Sciences (Rossiter 1995). That first summer she did some variable star observing with one of the female Cornell students, but devoted most of her time to a joint Astronomy Department/School of Electrical Engineering project to observe radio waves from celestial objects (such as the sun and galactic center), the first research program in radio astronomy at an American university. She noted that when the program initially wrote its grants the engineers had a collaborating astronomer already in mind, but in Carpenter's words "they ended up with me instead" (Carpenter 2011c). According to the 1948 report of Cornell's Fuytes Observatory, Carpenter

represented the Department in the radio-wave astronomy project operated jointly with the School of Electrical Engineering. Problems include the planning of observational programs, preparation of astronomical data for the project, and the general coordination of developments in theory and observation. Qualitative observations are now being obtained with an Army 268 Radar which has been converted to receive solar and cosmic noise at 205 megacycles. (Shaw 1948)

Carpenter presented a summary of the July 1948–June 1949 Cornell solar radio observations at the June 1949 meeting of the American Astronomical Society (AAS). The Cornell data did not break any new ground, instead verifying results previously obtained by A. E. Covington of the National Research Council in Canada (Stahr 1949). In his 1948 report, Shaw had also noted that the "construction of the 'radio-wave telescope' with 17-foot parabola is nearly complete" (Shaw 1948). However, to Carpenter's frustration, it would take

more than another year to get the parabolic dish scope up and running (Cornell 1949). Carpenter was troubled by what she saw as the lack of organization surrounding the building of the new dish radio telescope. As she recalls, “there were lots of delays, lots of administrative difficulties, seven changes in director in a year and a half in the School of Engineering” (Carpenter 2011b).

While waiting for the new facilities to come online, she began a project that she could do on her own, and that she felt was “appreciated,” namely the creation of lengthy bibliographies of publications on radio astronomy. As she explains it, “I tried to find all the world’s pertinent literature. Much of it was unknown to astronomers. A lot of it was in engineering journals and much of it was in foreign publications” (Carpenter 2011a). The result was a number of collections of “abstracts of the published literature pertaining to radio noise of extraterrestrial origin” and “lists of references for temporary use” until published abstracts could be provided (Carpenter 1958). The resulting volumes of *The Bibliography of Radio Astronomy* and *Supplements* appeared in 1948 through 1950 (under her maiden name), *The Bibliography of Extraterrestrial Radio Noise* and *Supplements* covered the field from 1950 to 1958, and *The Bibliography of Natural Radio Emission From Astronomical Sources* surveyed the literature of 1961 through 1963 (Appendix A). Her bibliographies (like the Cornell radio work in general) were funded by a grant from the U.S. Navy, and some of her supplemental bibliographies were issued as part of various reports to the International Scientific Radio Union and IAU Commission 40. She was a member of IAU Commission 40 and represented the Cornell Radio Astronomy Project at the General Assembly of the IAU at Rome. Carpenter wrote the abstracts for the *Bibliographies*, but relied on anonymous assistants to help her locate the pertinent articles. She found married women with children who had backgrounds in physics, engineering, astronomy, or foreign languages, and who had the time and interest to help her. Much of the work was done by correspondence. Some of the women were paid through Carpenter’s grants, while others were strictly volunteers (Carpenter 2011c). Not only were these bibliographies important to radio astronomers of that time, but in recent years historians of radio astronomy have found these bibliographies to be “indispensable” in their studies (Sullivan III 2009, 211). Interestingly, Carpenter understood that some of her work (and reports of the radio astronomy work at Cornell in general) was classified by the U.S. Government, though the exact status of that classification is unclear at this distance (see note in the Appendix at the end of this paper).

Carpenter regularly attended AAVSO meetings and gave talks on “The Sun as a Microwave Variable” at three successive spring AAVSO meetings, in 1947, 1948, and 1949. She also presented on the Cornell solar observations at the AAS meeting in 1949, and lectured on radio astronomy to the General Electric Science forum, the General Electric Research Laboratory, and the Cornell Chapter of Sigma Xi. Her paper “Radio Waves from the Sun” appeared in the

book *Science Marches On*, published by General Electric in 1950 (Shaw 1954, 1956). When asked to describe her radio work at Cornell, Carpenter explained that she would point the radio telescope at the moon to see if there would be a radio reflection from solar flares. One night, she got a really nice “swish” that was clearly not static, and thought she had finally observed this effect. She contacted astronomers in Japan to corroborate but their equipment wasn’t working that night, so nothing ever came of these results. She never saw the effect again (Carpenter 2011c).

For many of her years as a faculty member at Cornell she was one of only two full-time astronomy professors, the other being the Fuertes Observatory Director R. William Shaw. According to the annual observatory reports published in the *Astronomical Journal*, she developed and taught a variety of courses at the undergraduate and graduate level, including courses in the Milky Way, External Galaxies, Astrometry, Radio Astronomy and Geodetic Astronomy, Orbit Theory, Galactic Structure, and Introductory Astronomy (Shaw 1948, 1949, 1951, 1952, 1953, 1954). One of the first graduate students she worked with at Cornell was Vera Cooper Rubin, and acted as advisor for Rubin’s M.A. thesis on large-scale systematic motion of galaxies apart from Hubble flow. Rubin credits one of Carpenter’s courses with initially getting her interested in galactic motions, and also noted that Carpenter was very supportive of her work (Rubin 1997, 154, 198).

At Cornell, Carpenter met and then married fellow faculty member Jesse Thomas Carpenter. The son of a Durham, North Carolina farmer, Jesse was twenty-one years Carpenter’s senior. A Harvard Ph.D., he came to the New York State School of Industrial and Labor Relations at Cornell in 1947 from his position as Labor Economist with the U.S. Bureau of Labor Statistics. He had previously taught Political Science at New York University for many years. An expert in collective bargaining and labor arbitration, he was the author of two books: *The South as a Conscious Minority 1789–1861: A Study in Political Thought and Employers’ Associations and Collective Bargaining in New York City* (Cooke 2010). After a short engagement, they married on August 18, 1951, in Scituate, Massachusetts, with Carpenter’s father performing the ceremony (ILR Cornell 1951, 4).

#### **4. Carpenter and the AAVSO**

During this time she took on increasing leadership roles within the AAVSO, starting with her election to the Council in 1946. She served as second Vice President, first Vice President, and finally President in 1951. During her tenure as president she had to deal with several thorny issues, such as the future of the publication of “Variable Star Notes” (given the demise of the journal *Popular Astronomy*), and serious difficulties within the AAVSO Solar Division (Figure 1). But Carpenter’s second term as president also coincided with the

most stressful period in AAVSO history, the ouster of the organization from Harvard. This pivotal time in the organization's history is carefully detailed in *Advancing Variable Star Astronomy* (Williams and Saladyga 2011); therefore this essay will only focus on Carpenter's role in this turbulent time.

In a November 1952 letter, Clint Ford congratulated Carpenter for her excellent stand at the October council meeting (Saladyga 2011). At that meeting Donald Menzel had spearheaded the creation of a re-evaluation committee to consider the future of the AAVSO, one of the first steps toward the eviction of the AAVSO from Harvard. Although she does not remember her actual words at this meeting, Carpenter recalls that all throughout this difficult time she was steadfast in her belief that the AAVSO should remain in Cambridge. As she explained, "it was a great part of the life of people who lived there" (Carpenter 2011b). Nevertheless, she was given the difficult task of creating this re-evaluation committee, and when she received a letter from Donald Menzel requesting that the AAVSO report be submitted by the unexpectedly early date of January 20, 1953, she had to take responsibility for handing in the report on behalf of the organization without sufficient time for the entire Council to thoroughly review, digest, and approve it (Williams and Saladyga 2011; Carpenter 2011b).

During this time, Carpenter also recalls being

suddenly presented with a plan for the AAVSO to be moved far away, to an institution that was already planning to acquire it, and had worked out the details of hosting the organization. All that was needed to make it a "done deal" was my signature as president of the AAVSO. Apparently those who had made the decisions thought that I would immediately sign the relevant papers on behalf of the AAVSO. My response, however, was that I was not at all sure the AAVSO members would agree to such an agreement, and that first the Council members should discuss it and present their recommendations to the membership. Apparently the powers that be (or were) at Harvard were entirely surprised that I, and therefore the AAVSO, did not immediately accept their proposal. (Carpenter 2011a)

When pressed, Carpenter could not recall who actually gave her the papers, and where the AAVSO was to be moved, except that it was a small college in the Midwest she had never heard of (and cannot remember the name of to this day). In her words, "Menzel had already given the AAVSO to this organization—he must have been embarrassed when he couldn't deliver it" (Carpenter 2011b). Carpenter recounts that some claimed that she "saved the AAVSO," but she says that she "merely refused to make a decision that I felt the organization could, and should make. Harvard had every right to discontinue its AAVSO sponsorship, but I felt that it should not have tried to decide unilaterally our future course." (Carpenter 2011a)

Carpenter also had to deal with what she calls “the intense politics within the organization with regards to Harvard. Some people were so imbued with remembering how prominent Harvard and Menzel were and to do anything against their suggestions would be unheard of” (Carpenter 2011b). Others (including Margaret Mayall) were less restrained. For example, in a February 19, 1953, letter Mayall asked Carpenter if she thought Menzel should be asked to resign from his position as First Vice President of the AAVSO; in Margaret’s words, “it was a very low thing to accept an office in an organization he was planning to ruin” (Mayall 1953). Carpenter replied on March 3, 1953, that “The matter of asking Dr. Menzel to resign is a delicate one but one which I suppose we shall have to face if he doesn’t do so of his own accord. Personally I have been expecting that he *would* resign” (Carpenter 1953).

With Carpenter’s second term as president nearing its end, the organization was thus in a serious quandary as to what to do about the next round of officers. Past president David Rosebrugh was not so quick to count out Menzel, noting in a February 22, 1953, letter to Clinton Ford that Menzel

is merely acting upon instructions, so it might well show our confidence in him to elect him our president next fall. On the other hand others may think differently. If so we might consider electing Carpenter to a 3rd term, dropping the present First VP from the line-up, which would be somewhat smoother than failing to elect the present first VP to the presidency. However I would favor giving serious thought to continuing the succession at present. (Rosebrugh 1953a)

However, after discussing the matter with other members at a picnic in honor of Harlow Shapley, Rosebrugh declared in a May 10, 1953, letter sent to Carpenter, Ford, and others that “Third term opposed for any one” and it would be best to find a “financial man” to become president. In his words, “No honor, big headache” (Rosebrugh 1953b).

Despite some hopes of finding another candidate, in the end history was made, and Carpenter continued for another term. In the AAVSO’s *Variable Comments*, Jocelyn Gill noted that Carpenter’s re-election was due to her “inspired leadership and devotion to the interests and work of the Association through this difficult period” (Williams and Saladyga 2011, 185). During her last term, Carpenter and the Council spent considerable time crafting fundraising letters by committee, an arduous task. She was also a part of the organization’s Endowment committee until 1964.

## **5. Opportunities and new challenges**

Despite the considerable problems, Carpenter’s tenure as president also brought with it professional and personal joys. First, she was promoted to associate professor at Cornell in 1953 (Shaw 1953). Then in 1954 the

Carpenters finally realized their dream of visiting Australia. Jesse received a Fulbright research award for a sabbatical to study Australia's compulsory arbitration system, and Carpenter received a research grant from the Australian Commonwealth Scientific and Industrial Organization to do radio astronomy for a year. According to the AAVSO Council Minutes of May 1954, Carpenter wanted to resign the AAVSO presidency (as she would miss the October meeting) but was persuaded to remain in that role during the few months of overlap with her Australia trip, and during her time away she made a point to visit as many of the Australian AAVSO members as she could (Ford 1954).

In Australia Carpenter worked on mapping the spiral arms of the Milky Way by using the Potts Hills' radio telescopes to observe 21-cm radio waves from hydrogen, "a fascinating subject if there ever was one," she proclaimed in an October 8, 1954, letter to Margaret Mayall (Carpenter 1954). She and radio astronomers F. J. Kerr and J. V. Hindman extended the map of the Milky Way made by researchers at the University of Leyden, resulting in a number of conference presentations and publications featuring this now famous map of the galaxy, the first to combine radio data from the northern and southern hemispheres (Kerr *et al.* 1956; Kerr *et al.* 1957; Carpenter 1957). "It was so exciting to be actually able to see where the arms of the galaxy were actually made out," Carpenter later recounted (2011b). She coordinated the observations, while her collaborators focused on the analysis. Such observations not only allow for mapping of the spiral structure of the galaxy, but also provide vital information for determining the location of the plane of the galaxy. The hydrogen was found to be "remarkably flat in the inner parts of the galaxy," leading Carpenter and her colleagues to define the average plane in this region as the "principal plane of the galaxy" (Kerr *et al.* 1957, 679). Their research also found that the arms tilted up at the outer regions; in other words, they weren't just confined to the galactic plane, but they curve up at the outer edge, a phenomenon now seen in many spiral galaxies with extended HI disks (Garcia-Ruiz *et al.* 2002). At the Annual 1955 AAVSO meeting in Springfield, Massachusetts, Carpenter gave a talk on her experiences in Australia, including her meetings with AAVSO members.

With their return from Australia, change came to the Carpenters. Margaret Rossiter erroneously wrote in her seminal work *Women Scientists in America* that because Carpenter married another Cornell faculty member, she was appointed a research associate rather than promoted to associate professor. This is patently wrong, as Carpenter had already been promoted before her time in Australia. In addition, as Carpenter explained to the author (2011c), her 1955 shift to Research Associate was her own personal choice. When she and Jesse returned from Australia their goal was to start a family, which they thought would not be easy (given that she was 35 and he was 56). She therefore gave up teaching and wanted to devote her professional time to research and writing her bibliographies, which she felt would be a better fit with raising a family. Fortunately, their first daughter, Martha Alice, was conceived within their first



year back at Cornell. A second daughter, Sarah Margaret, followed three years later. However, because of her relatively advanced age, Carpenter's doctors were, in her words, "trying to take extra care of me" so when she developed a cold while pregnant with Alice she had to remain in bed and missed the May 1956 AAVSO meeting at Cornell that she herself had organized (Carpenter 2011c).

When Jesse retired in 1966, the Carpenters began to make plans to move, in Carpenter's words, "below the Mason-Dixon line" so that their children could get to know Jesse's large extended family in North Carolina (Carpenter 2011b). While Jesse worked on his third and last book, *Competition and Collective Bargaining in the Needle Trades, 1910–1917*, Carpenter began investigating opportunities for astronomical research closer to North Carolina. She says that the most responsive institution was the University of Virginia (UVA) in Charlottesville, "so that's where we ended up" and where she lives to this day (Carpenter 2011b). Before Carpenter left Cornell in 1969 she had stopped her radio astronomy bibliography project, in her words "because by then it was something astronomers knew about. In the beginning they didn't really know about what was observed beyond the earth—it was something that had to sink in a little in astronomical knowledge" (Carpenter 2011b). She began as a part-time lecturer at UVA in 1969, and became an associate professor in 1973 (Fredrick 1969; Jaques Cattell Press 1992).

While UVA had a radio astronomy program (in concert with the National Radio Astronomy Observatory), between 1972 and 1981 Carpenter's research centered on using optical observations and her statistical skills to increase our understanding of the distance scale within our galaxy. This work centered on the Hyades star cluster, and was conducted with graduate and undergraduate students. Using parallax, proper motion, radial velocity, and other data, they investigated the true membership of the cluster and determined its convergent point and distance, one of the building blocks for determining the cosmic distance scale and calibrating the HR diagram. The convergent point and distance Carpenter and her student colleagues announced at an AAS meeting in 1975 was well-cited in the literature for two decades (Corbin *et al.* 1975; Perryman *et al.* 1998). Over the years she continued to refine these calculations based on increased sets of data produced by other UVA colleagues. She also studied the high proper motion, low metallicity, visual binary 85 Pegasi (Carpenter *et al.* 1975; Fredrick *et al.* 1975; Fredrick 1977; O'Connell 1981).

In 1970–1973, Carpenter served again on the AAVSO council, and encouraged one particular UVA graduate student's increasing involvement with the AAVSO: Janet Mattei (Carpenter 2011b). Most importantly, when Mattei submitted her name for the AAVSO director's position (to succeed Margaret Mayall), Carpenter requested that Mattei's credentials be "discussed at length" (Williams and Saladyga 2011, 239). Carpenter also hosted the 1973 Spring meeting of the organization at UVA. Around this time, many astronomy departments across the U.S. began the sometimes painful shift from

an emphasis on astrometry to astrophysics. UVA was one of these institutions. Former colleague Bob Rood very candidly summarized this transition in an email to the author: “[Carpenter] was very much a classic old-line astronomer in my view. I was very astrophysically oriented. Early in my career I became what today would be called director of graduate studies. This led to some professional conflicts with a number of older faculty” (Rood 2011). Carpenter retired from UVA in 1985, and Jesse died the next year, after thirty-five years of marriage. She had intended to keep her hand in research, but found that UVA was slow to get her the new computer she needed to run her calculations. Eventually she let it go, and has not been active in astronomy in many years (Carpenter 2011b). However, she continues to be active in her community, and is a benefactor to community organizations and the Astronomical Society of the Pacific. At ninety-one she still drives a car and runs many of her own errands, but only in town (Moat 2011).

## 6. Conclusion

Despite the difficulties she encountered in her terms as president, in her words (2011a) she “so fondly enjoyed” her time of service to the AAVSO and was delighted to hear that the AAVSO still remembers her as an important member of the organization. She and her daughter Alice attended the dedication of the AAVSO Headquarters on October 6, 2011 (Figure 2), and they were greatly impressed with the growth of the organization over the past few decades. Carpenter describes her role in the field as “an observational astronomer” (2011c) and it was clear in her correspondence with this author that she did not relish the astronomical politics that she had become involved in at several stages in her career. In reflecting on her mother’s career, Alice Moat, herself a computer scientist, shared that she was once asked if she became interested in science because of her father. She had replied, “no, because of my *mother*” (Moat 2011). In conclusion, the struggles and successes in the life and career of Martha Stahr Carpenter shed additional light on the history of women in American astronomy in general, and the history of the AAVSO in particular.

## 7. A note on the sources

This paper was largely based on three types of sources:

- 1) Published annual reports of observatories where she worked and studied, and her published professional papers;
- 2) Letters and reports housed in The Thomas R. and Anna Fay Williams AAVSO Archive; and
- 3) Personal communications with Martha Stahr Carpenter (Carpenter 2011a, letter dated September 7, 2011; Carpenter 2011b, telephone call

dated September 16, 2011; and Carpenter 2011c, personal conversation dated October 6, 2011) and her daughter Alice Moat (Moat 2011, personal conversation dated October 6, 2011).

## 8. Acknowledgements

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- Williams, T. R., and Saladyga, M. 2011, *Advancing Variable Star Astronomy: The Centennial History of the American Association of Variable Star Observers*, Cambridge Univ. Press, Cambridge.



Figure 1. AAVSO Spring Meeting at Clarkson College, Potsdam, New York, May 1952. Martha Carpenter is in front row, second from right. To her right are AAVSO Recorder Margaret Mayall (with cane), and Helen Sawyer Hogg.



Figure 2. Martha Stahr Carpenter at the AAVSO's 100th Anniversary Meeting, October 2011, Cambridge, Massachusetts.

## Appendix A: Carpenter's Bibliographies

*Note: Examples of the bibliographies for which a security classification was considered and the ultimate classification status is unclear can be found at the Defense Technical Information Center, Fort Belvoir, Virginia (<http://handle.dtic.mil/100.2/AD0008460> and <http://www.dtic.mil/dtic/tr/fulltext/u2/007563.pdf>). This repository also houses copies of Carpenter's Bibliographies and the Cornell Radio Astronomy status reports. The Bibliographies are here listed in order of publication.*

- Stahr, Martha Elizabeth. 1948, *Bibliography of Radio Astronomy*, Cornell Univ. School of Electrical Engineering, Radio Astronomy Report No. 2, OCLC 11535128.
- Stahr, Martha Elizabeth. 1949, *Bibliography of Radio Astronomy, First Supplement*, Cornell Univ. School of Electrical Engineering, Radio Astronomy Report No. 4. OCLC 11535106.
- Stahr, Martha Elizabeth. 1950, *Bibliography of Radio Astronomy, Second Supplement*, Cornell Univ. School of Electrical Engineering, Radio Astronomy Report No. 10. OCLC 11535144.
- Carpenter, Martha Stahr. 1950, *Bibliography of Extraterrestrial Radio Noise*, Cornell Univ. School of Electrical Engineering, Radio Astronomy Technical Report No. 11. OCLC 15684047.
- Carpenter, Martha Stahr. 1952, *Bibliography of Extraterrestrial Radio Noise Supplement for 1950*, Cornell Univ. School of Electrical Engineering, Center for Radiophysics and Space Research, Astronomy Report No. 12–13. OCLC 14943851.
- Carpenter, Martha Stahr. 1953, *Bibliography of Extraterrestrial Radio Noise Supplement for 1951*, Cornell Univ. School of Electrical Engineering, Center for Radiophysics and Space Research, Research Report EE 173. OCLC 14943851.
- Carpenter, Martha Stahr. 1958, *Bibliography of Extraterrestrial Radio Noise Supplement for 1952*, Cornell Univ. School of Electrical Engineering, Center for Radiophysics and Space Research, Research Report EE 371. OCLC 14943851.
- Carpenter, Martha Stahr. 1960, *Bibliography of Extraterrestrial Radio Noise Supplement for 1953*, Cornell Univ. School of Electrical Engineering, Center for Radiophysics and Space Research, Research Report EE 444. OCLC 14943851.
- Carpenter, Martha Elizabeth Stahr. 1957, *Bibliography of Extraterrestrial Radio Noise List of Publications Issued During the Period 1952–1956 Inclusive*, Cornell Univ. School of Electrical Engineering, Research Report EE 332. OCLC 2763953.
- Carpenter, Martha Stahr. 1957–1958, *Bibliography of Extraterrestrial Radio Noise List through 6th Quarterly Lists of Recent Publications*, Cornell Univ. School of Electrical Engineering Research Reports EE 353, EE 396, EE 414, EE 417. OCLC 18842513.
- Carpenter, Martha Stahr. 1957–1963, *Bibliography of Natural Radio Emission From Astronomical Sources. Lists of Recent Publications*, Cornell Univ. School of Electrical Engineering Research Reports EE 332, E 353, EE 396, EE 414, EE 417. OCLC 676271245
- Carpenter, Martha Stahr. 1959, *Bibliography of Natural Radio Emissions From Astronomical Sources*, Center for Radiophysics and Space Research, Cornell University. OCLC 5277147.
- Carpenter, Martha Stahr. 1961–1965, *Bibliography of Natural Radio Emissions From Astronomical Sources*, Cornell University Center for Radio-physics and Space Research (Book format OCLC 219600844; individual journal format OCLC 647105399).