

## Unheard Voices, Part 2: Women in Astronomy

A Resource Guide by Andrew Fraknoi [Aug. 2021]

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There is growing documentation of the challenges women have faced, and are facing, in having an equal role in astronomy. At the same time, women are attaining important positions throughout the astronomical community, including the presidency of the International Astronomical Union and the American Astronomical Society. This means that excellent role models are now available to show girls that they can be an integral part of the human exploration of the universe. Many instructors of astronomy would like to present such role models during their class discussions, but don't have the material to do so at hand or in their textbooks.

Therefore, the Higher Education Working Group within NASA's Science Mission Directorate sponsored this guide to English-language materials on women in astronomy. It has now been updated to include more younger women and people of color among the women featured. It is not meant to be a comprehensive introduction to this complex topic, but merely a sampling of useful resource for educators and their students on the history, the biographical information, and the current issues. Suggestions for additional materials that are both accessible to and readable by beginners are most welcome.



Vera Rubin   Annie Cannon & Henrietta Leavitt   Claudia Alexander   Cecilia Payne

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## 5. A Sampling of Material about Other Women Astronomers

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### 1. Resources on the History of Women in Astronomy

- Armstrong, Mabel *Women Astronomers: Reaching for the Stars*. 2008, Stone Pine Press. Covers the lives and careers of 21 women astronomers, past and present; written for teenagers and up.
- Bernardi, G. "Who Was the First Professional Woman Astronomer? Christine Kirch" in *Sky & Telescope*, Jan. 2019, p. 68.
- Bell Burnell, Jocelyn: "A Celebration of Women in Astronomy" (a talk in 2012 in Edinburgh; we only hear the audio, there is no video, but it is a fascinating public talk with profiles of specific women, including Caroline Herschel and Vera Rubin, and discussions of trends): [https://www.youtube.com/watch?v=\\_50PyimUE5s](https://www.youtube.com/watch?v=_50PyimUE5s)
- Bovill, Mia: A 2017 talk on "The Harvard Computers and the Classification of the Stars": <https://www.youtube.com/watch?v=dhF2bOrKWks> (the talk starts at 16 min 30 sec into the video)
- Dvorak, John "The Women Who Created Modern Astronomy" in *Sky & Telescope*, Aug. 2013, p. 28. Focuses on the work of Annie Cannon, Antonia Maury, and Wilhelmina Fleming in classifying and understanding stars.
- Freitag, Ruth "Bibliography on Women in Astronomy": <http://www.loc.gov/rr/scitech/womenastro/womenastro-intro.html> A far more comprehensive and scholarly bibliography, organized by last name, of written articles on women in astronomy. Ruth Freitag's work was the early inspiration for the resource guide you are reading.
- Ghez, Andrea & Cohen, Judith *You Can Be a Woman Astronomer*. 2006, Cascade Press. A picture book for children from grades 3 - 5.
- James, C. "Edward and Mina" in *Astronomy*, July 2002, p. 46. Despite the title, this treats several women who worked at the Harvard Observatory.
- Lankford, J. & Slavings, R. "Gender and Science: Women in American Astronomy 1859-1940" in *Physics Today*, Mar. 1990, vol. 43, p. 58.
- Mack, P. "Straying from Their Orbits: Women in Astronomy in America" in G. Kass-Simon & P. Farnes, eds. *Women of Science*. 1990, Indiana U. Press.
- Rice, Emily: a talk on contributions of women to astronomy (with many historical and contemporary examples and an analysis of modern trends): <https://www.youtube.com/watch?v=5vMR7su4fi8>
- Rubin, Vera "Women's Work: Women in Modern Astronomy" in *Science* 86, Jul/Aug. 1986, p. 58.
- Smith, Beverly: A presentation on the history of women in astronomy and current statistics about their participation: <https://www.youtube.com/watch?v=yAa-gCSUwEE>
- Sobel, Dava *The Glass Universe*. 2016, Viking. Rich, deeply researched, marvelous book on the women who worked at Harvard at the start of the 20<sup>th</sup> century and changed the way we understood the stars.

Spradley, J. "Women and the Stars" in *The Physics Teacher*, Sep. 1990, p. 372.  
Warner, Deborah "Women Astronomers" in *Natural History*, May 1979, p. 12.  
4000 Years of Women in Science: <http://4kyws.ua.edu/> Maintained by two women astronomers, this site includes brief information on women from many fields of science, not just astronomy. For 20<sup>th</sup> century women scientists, see: <http://4kyws.ua.edu/20th.century/20th.shtml>  
The Woman Astronomer: <http://www.womanastronomer.com/> Debra Davis, a Colorado amateur astronomer, keeps this site and newsletter devoted to both amateurs and professionals.  
Women at NASA: <http://women.nasa.gov/> Profiles of women who work for the US Space Agency, including a number of astronomers and astrobiologists. The profiles include personal statements that can be quite moving and inspiring.

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## 2. Resources on Issues Women Face

Bell Burnell, Jocelyn "So Few Pulsars, So Few Females" in *Science*, 23 April 2004, vol. 304, no. 5670, p. 489.  
Bell Burnell, Jocelyn, TED talk on "Reflections on Women in Science: Diversity and Discomfort" (a 15-minute talk with some of her personal history and statistics about women in astronomy): <http://www.youtube.com/watch?v=jp7amRdr30Y>  
Davenport, J., et al. "Studying Gender in [AAS] Conference Talks": <https://arxiv.org/abs/1403.3091>  
Finkbeiner, Ann "Good Morning, Gentlemen and Meg: Astronomy, A Woman's Choice" (an article compiling personal history and suggestions from interviews of 15 noted women astronomers): <https://cswa.aas.org/status/2001/JANUARY2001/Finkbeiner.html>  
Geller, Margaret "The Black Ribbon" in *Science*, 28 August 1998, vol. 281 no. 5381 p. 1278. On-line at: <https://science.sciencemag.org/content/281/5381/1278.full>  
Kinney, Anne, et al, eds. *Meeting the Challenges of an Increasingly Diverse Workforce: Women in Astronomy and Space Science*. 2009, NASA. The entire book is available free on the web as a PDF file: <https://cswa.aas.org/MEETING/WomeninAstroProceedings.pdf>  
Seager, Sara "So Many Exoplanets, So Few Women Scientists," a blog post at: [https://www.huffpost.com/entry/women-in-science\\_b\\_2471980](https://www.huffpost.com/entry/women-in-science_b_2471980)  
Urry, C. Megan, et al, eds. *Women in Astronomy: Proceedings of a 1992 Workshop*. 1993, Space Telescope Science Institute. (Now on web at: <http://www.stsci.edu/institute/conference/wia/> )  
Urry, Meg: colloquium on "Women in Science: Why So Few?" (an hour-long, illustrated talk on statistics and issues, not just about astronomy, but with many eye-opening ideas): <http://vimeo.com/35730552>  
American Astronomical Society Committee on the Status of Women: <https://cswa.aas.org/>  
A rich site with back issues of the valuable "Status" newsletter, a database of living women astronomers, legal resources, conference proceedings, and discussion of

issues related to the role of professional women in the field. For good resources from other fields they recommend, see: <https://cswa.aas.org/resources.html>

STATUS is the magazine of the Committee on the Status of Women of the American Astronomical Society (it is a treasure trove of materials, issues, personal stories): <https://cswa.aas.org/STATUS.html>

10 Tips for Undergraduate Women Science Students (from Astronomer Sara Seager): <http://www.usnews.com/education/blogs/professors-guide/2010/08/11/10-tips-for-women-students-in-science-fields>

*The Baltimore Charter* (spelling out what can be done to help improve the status and working conditions of women in astronomy): <https://cswa.aas.org/bc.html>

*Why So Few? Women in Science, Technology, Engineering, and Mathematics* (2010 research report from the Association of University Women discusses key research findings on factors that block women's participation and progress in science): <http://www.aauw.org/resource/why-so-few-women-in-science-technology-engineering-and-mathematics/>

Women at Work: A Meeting on the Status of Women in Astronomy: <http://www.stsci.edu/institute/conference/wia/>  
Proceedings of a pioneering 1992 meeting with useful local and national perspectives.

Women in Planetary Science: <http://womeninplanetaryscience.wordpress.com/profiles/>  
(Profiles of more than 50 women active in studying the solar system, and a discussion of issues they face)

Women in Astronomy Blog (from the American Astronomical Society): <http://womeninastronomy.blogspot.com/>

*Women in Astronomy 2009* (a 3-minute video, made in conjunction with the 2009 meeting about women in astronomy. Concise framing of issues through interviews with leaders such as Vera Rubin, Meg Urry, and Dara Norman): <http://www.youtube.com/watch?v=1QyMB0qagZs>

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### 3. Material on Some Women Astronomers of the Past

#### **Alexander, Claudia** (1959 - 2015)

Interview on the Women in Planetary Science web site: <http://womeninplanetaryscience.wordpress.com/2011/02/03/claudia-alexander-be-prepared-to-be-flexible-in-your-career/>

JPL video where she explains some of her work (3 min): <https://www.jpl.nasa.gov/video/details.php?id=184>

Memorials and Brief Interview at NASA Solar System Exploration: <https://solarsystem.nasa.gov/people/1140/claudia-alexander-1959-2015/>

Obituary in the *NY Times*: <https://www.nytimes.com/2015/07/20/us/claudia-alexander-nasa-manager-who-led-jupiter-mission-dies-at-56.html>

Memorial at the American Geophysical Union EOS Site: <https://eos.org/articles/claudia-joan-alexander-1959-2015>

Alexander, Claudia: *Windows to Adventure: Which Mountain is Greatest of All?* (a 2-part children's book series on mountains on Earth and other worlds; 2015, Red Phoenix Books)

**Burbidge, Margaret** (1919 - 2020)

Armstrong, Mabel *Women Astronomers: Reaching for the Stars*. 2008, Stone Pine Press.  
This book for teens has a chapter on Burbidge.

Bartusiak, Marcia "Margaret Burbidge" in *Smithsonian*, Nov. 2005, p. 34 (brief biography, on the web at:

<http://www.marciabartusiak.com/uploads/8/5/8/9/8589314/burbidge.pdf>

Burbidge, Margaret "Watcher of the Skies" (an autobiographical article from *Annual Reviews* 1994; 37-page PDF):

<http://www.annualreviews.org/doi/pdf/10.1146/annurev.aa.32.090194.000245>

Byers, Nina & Williams, Gary, eds. *Out of the Shadows: Contributions of 20<sup>th</sup> Century Women to Physics*. 2006, Cambridge U. Press. Includes chapter on Burbidge.

Croswell, Ken *The Alchemy of the Heavens: Searching for Meaning in the Milky Way*. 1995, Doubleday. See Chapter 9.

Reed, J. "A Great Woman Astronomer Leaves England Again" in *Smithsonian*, Jan. 1974, p. 34.

Rubin, Vera "Margaret Burbidge: AAAS President-Elect" in *Science*, vol. 211, p. 915 (Feb. 27, 1981). On the web at: <http://science.sciencemag.org/content/211/4485/915> (but you will need privileges from your library to access the piece beyond page 1.)

Skuse, B. "Happy [100<sup>th</sup>] Birthday, Margaret Burbidge" in *Sky & Telescope*, July 2019, p. 60.

"The Stargazer" in *Time* magazine, Mar. 20, 1972, p. 38.

Bruce Medal Profile: <http://www.phys-astro.sonoma.edu/BruceMedalists/BurbidgeM/>

Interview with David DeVorkin at the Center for the History of Physics from 1978:

<https://www.aip.org/history-programs/niels-bohr-library/oral-histories/25487>

Her 2001 Hitchcock Lecture on "Modern Alchemy: Stars, Chemistry, and Cosmology":

<http://podcast.uctv.tv/vod/23342.mp4>

Happy 100th Birthday Video Card from colleagues at the U. of California, San Diego; reminiscences and the story of her career:

<https://www.youtube.com/watch?v=afie3P5hwNg>

Brief Obituary in *Nature* by Virginia Trimble: <https://www.nature.com/articles/d41586-020-01224-9>

Her memorial celebration through the AAS (July 2020) with a 2-hour video remembering her life and work: <https://baas.aas.org/pub/2020i0205/release/1>

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**Cannon, Annie** (1863-1941)

Armstrong, Mabel *Women Astronomers: Reaching for the Stars*. 2008, Stone Pine Press.  
This book for teens has a chapter on Cannon.

Bok, Priscilla "Annie Jump Cannon 1863-1941" in *Publications of the Astronomical Society of the Pacific*, June 1941, vol. 53, p. 168. (Available on the Web at: <http://adsabs.harvard.edu/abs/1941PASP...53..168B> )

Greenstein, George "The Ladies of Observatory Hill" in *American Scholar*, Feb. 1993, p. 437. (Reprinted in his book *Portraits of Discovery*, 1998, John Wiley.)

Hearnshaw, John *The Analysis of Starlight*. 1986, Cambridge U. Press. See Chapter 5.

Kidwell, P. "Three Women of American Astronomy" in *American Scientist*, May/June 1990, p. 244.

Merrill, P. "Annie Jump Cannon" in *Monthly Notices of the Royal Astronomical Society*, vol. 102, no. 2, p. 74 (1942).

Sobel, Dava *The Glass Universe*. 2016, Viking. Includes a considerable amount of material on Cannon and her mentoring of other women.

Annie Cannon pages at Wellesley College: <http://academics.wellesley.edu/Astronomy/Annie/> Part of a student project, but with good local historical information.

Article on MacTutor: <http://www-history.mcs.st-andrews.ac.uk/Biographies/Cannon.html>

Aceves, Ana: Annie Jump Cannon, Star Classifier (a short post on the Sky & Telescope website, 2016: <http://www.skyandtelescope.com/astronomy-resources/annie-jump-cannon-star-classifier/>

Project Continua Page: <http://www.projectcontinua.org/annie-jump-cannon/>

Obituary by H. A. Bruck in *The Observatory*, Vol. 64, p. 113-115 (1941): <http://adsabs.harvard.edu/abs/1941Obs....64..113B> (click on "full printable article PDF")

Information on video about Cannon's life and work: <http://cfa-www.harvard.edu/~alexg/ajc.html>

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### **Clerke, Agnes** (1842-1907)

Bruck, Mary "Agnes Mary Clerke: Chronicler of Astronomy" in *Quarterly Journal of the Royal Astronomical Society*, Mar. 1994, p. 59. Lengthy profile, on the web at: <http://adsabs.harvard.edu/full/1994QJRAS..35..59B>

Bruck, Mary *Agnes Mary Clerke & the Rise of Astrophysics*. 2002, Cambridge U. Press.

Bruck, Mary "Agnes Mary Clerke: Ever Popular Historian of Astronomy" in *Antiquarian Astronomer*, 2004, iss. #1, p. 3. On the web at: <http://adsabs.harvard.edu/full/2004AntAs...1....3B>

Cliver, Edward "Agnes Mary Clerke: Real Time Historian of Astronomy" in *Astronomy & Geophysics (the magazine of the Royal Astronomical Society)*, June 2007, vol. 48, p. 3.25. (On the web at: <https://academic.oup.com/astrogeo/article/48/3/3.25/200790/Agnes-Mary-Clerke-Real-time-historian-of-astronomy> )

Debakcsy, Dale: Agnes Mary Clerke: At the Nerve Center of 19<sup>th</sup> Century Astrophysics" at: <http://womenyoushouldknow.net/agnes-mary-clerke-nerve-center-19th-century-astrophysics/>

Russell, Sarah "Agnes Mary Clerke: Stars, Systems, Problems" in *Astronomy & Geophysics*, 1 June 2016, Vol. 57, Issue 3, Pages 3.16ff. On the web at: <https://academic.oup.com/astrogeo/article/57/3/3.16/1741860>

See, T.J.J. "Some Recollections of Agnes Mary Clerke" in *Popular Astronomy*, 1907, Vol. 15, No. 6, p. 323.

Weitzenhoffer, Kenneth "The Prolific Pen of Agnes Clerke" in *Sky & Telescope*, Sep. 1985, p. 211.

Biography at the History of Mathematics website: <http://www-history.mcs.st-andrews.ac.uk/Biographies/Clerke.html>

1907 Obituary from the *Astrophysical Journal* by Margaret Huggins: <http://adsabs.harvard.edu/abs/1907ApJ...25..226H> (click on full article)

Brief 1907 obituary in the *Times* of London: [http://en.wikisource.org/wiki/The\\_Times/1907/Obituary/Agnes\\_Mary\\_Clerke](http://en.wikisource.org/wiki/The_Times/1907/Obituary/Agnes_Mary_Clerke)

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### **Fleming, Williamina** (1857-1911)

Armstrong, Mabel *Women Astronomers: Reaching for the Stars*. 2008, Stone Pine Press. This book for teens has a chapter on Fleming.

Hirshfeld, Alan "Williamina Fleming: The Brief Life of a Spectrographic Pioneer" in *Harvard Magazine*, Jan/Feb. 2017. On the web at: <https://harvardmagazine.com/2017/01/williamina-fleming>

Nelson, Sue "From Scotch Maid to Innovative Astronomer" in *Astronomy & Geophysics*, 1 June 2016, vol. 57, issue 3, p. 3.12. On-line at: <https://academic.oup.com/astrogeo/article/57/3/3.12/1741845>

Sobel, Dava *The Glass Universe*. 2016, Viking. Includes a considerable amount of material on Fleming's life and work.

Spradley, J. "The Industrious Mrs. Fleming" in *Astronomy*, July 1990, p. 48.

Spradley, J. "Two Centennials of Star Catalogs Compiled by Women" in *Astronomy Quarterly*, vol. 7, no. 3, p. 177 (1990).

Brief biography at Woman Astronomer site: <http://www.womanastronomer.com/wfleming.htm>

Short biographical article at the New England Historical Society: <http://www.newenglandhistoricalsociety.com/williamina-fleming-boston-maid-discovered-stars/>

Fleming, Wilhelmina: Obituary (1911) by Annie Cannon from the *Astrophysical Journal*: <http://adsabs.harvard.edu/abs/1911ApJ...34..314C> (click on the PDF box at the end to see the article itself)

Her page at Project Continua: <http://www.projectcontinua.org/williamina-paton-fleming/>

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## Herschel, Caroline (1750-1848)

Armstrong, Mabel *Women Astronomers: Reaching for the Stars*. 2008, Stone Pine Press.

This book for teens has a chapter on Herschel.

Belkora, Leila *Minding the Heavens: The Story of Our Discovery of the Milky Way*. 2003, IOP Publishing. Chapter 4 is about the Herschels.

Brock, Claire *The Comet Sweeper: Caroline Herschel's Astronomical Ambition*. 2008, Totem Books. A popular-level biography. A radio program interviewing the author can be found at: [http://www.bbc.co.uk/radio4/womanshour/03/2007\\_11\\_thu.shtml](http://www.bbc.co.uk/radio4/womanshour/03/2007_11_thu.shtml)

Gould, Paula "Two Good Women, or Too Good to Be True?" (a 2002 essay from *Science*, considering how Caroline Herschel and Mary Somerville are treated by history, in contrast with men of their time): <https://science.sciencemag.org/content/296/5574/1805.full>

Higgins, F. *Sweeper of the Skies: Caroline Herschel*. 1967, Follett. For young people.

Hoskin, Michael "Caroline Herschel's Life of Mortification and Disappointments, in *Journal for the History of Astronomy*, Nov. 2014, Vol. 45, No. 4, p.442-466.

Hoskin, Michael "In Caroline Herschel's Footsteps" in *Sky & Telescope*, Aug. 2007, p. 59.

Hoskin, Michael "Astronomy's Matriarch" in *Sky & Telescope*, May 2005, p. 42-46.

Hoskin, Michael *The Herschel Partnership, as Viewed by Caroline*. 2003, Science History Publications. By a noted historian of astronomy.

Hughes, D. "Caroline Herschel: Comet Huntress" in *Journal of the British Astronomical Association*, Apr. 1999, vol. 109, p. 78. On the web at: <http://adsabs.harvard.edu/full/1999JBAA..109...78H>

Lemonick, Michael *The Georgian Star: How William and Caroline Herschel Revolutionized Our Understanding of the Cosmos*. 2008, W. W. Norton. A popular-level history of their partnership, by a science reporter.

Lubbock, C. *The Herschel Chronicle*. 1933, Cambridge U. Press. Family chronicle of William and Caroline, by his grand-daughter. On the web at: <https://books.google.com/books?id=Hcc5AAAAIAAJ>

McCully, Emily *Caroline's Comet*. 2017, Holiday House. Illustrated children's book.

Ogilvie, Marilyn: *Searching the Stars: The Story of Carolyn Herschel*. 2011, History Press. On the web at: <https://books.google.com/books?id=2LgTDQAAQBAJ>

Winterburn, Emily *The Quiet Revolution of Caroline Herschel: The Lost Heroine in Astronomy*. 2018, History Press.

Biography at MacTutor Site:

[http://www-groups.dcs.st-and.ac.uk/~history/Biographies/Herschel\\_Caroline.html](http://www-groups.dcs.st-and.ac.uk/~history/Biographies/Herschel_Caroline.html)

The full text of the 1879 (2<sup>nd</sup>) edition of the *Memoirs and Correspondence of Caroline Herschel* has been digitized and is freely available from Google Books at:

<http://books.google.com/books?id=9kIBAAAAQAAJ>

Nicholas, Siobhán: *Stella* (a play about Caroline Herschel):

<http://www.guardian.co.uk/science/blog/2012/may/14/play-astronomer-caroline-herschel>

Obituary in *Monthly Notices of the RAS*:

<http://adsbit.harvard.edu/full/seri/MNRAS/0008//0000066.000.html>

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### **Huggins, Margaret** (1848-1916)

Becker, Barbara "Dispelling the Myth of the Able Assistant: Margaret and William Huggins at Work in the Tulse Hill Observatory" in Helena Pycior, et al. eds., *Creative Couples in the Sciences*. 1996, Rutgers University Press. (On the web at:

<http://faculty.humanities.uci.edu/bjbecker/ExploringtheCosmos/week7b.html>; this is also part of a whole book on the Huggins' at:

<http://faculty.humanities.uci.edu/bjbecker/huggins/>)

Becker, Barbara "Margaret Huggins and Tulse Hill Observatory" in *Astronomy & Geophysics*, Vol. 57, Issue 2, 1 Apr. 2016, p. 2.13. On-line at:

<https://academic.oup.com/astrogeo/article/57/2/2.13/2468644>

Belkora, Leila *Minding the Heavens: The Story of Our Discovery of the Milky Way*. 2003, IOP Publishing. Chapter 6 is about the Hugginses.

Bruck, Mary *Agnes Mary Clerke & the Rise of Astrophysics*. 2002, Cambridge U. Press. See Chapter 5 and several other sections about Margaret Huggins' work and relationship with Clerke.

Bruck, M. T. "Companions in Astronomy: Margaret Huggins and Agnes Clerke" in *Irish Astronomical Journal*, Sep 1991, vol. 20(2), p. 70. On-line at: <http://cdsads.u-strasbg.fr/pdf/1991IrAJ...20...70B>

McKenna-Lawlor, Susan *Whatever Shines Should be Observed*. 2003, Springer. The story of five 19<sup>th</sup> century women who made contributions to astronomy and science, including Huggins.

Joe Tenn's article on the Hugginses from the Griffith Observer: <http://www.phys-astro.sonoma.edu/BruceMedalists/Huggins/HugginsesDrapers.pdf>

Dale Debakcsi's 2018 article "The Secrets Stars Keep: Lady Margaret Huggins Pioneer of Spectral Photography" is at: <https://womenshouldknow.net/margaret-huggins-spectral-photography/>

Obituary in the *Monthly Notices of the Royal Astronomical Society*:

<http://articles.adsabs.harvard.edu//full/1916MNRAS..76R.278./0000278.000.html>

Obituary by Sarah Whiting in the *Astrophysical Journal*, 1915:

<http://adsabs.harvard.edu/abs/1915ApJ....42....1W>

Barbara Becker's 2015 public lecture on the history of 19<sup>th</sup> century spectroscopy has information on M. Huggins' role (about 50 min into the video):

<https://www.youtube.com/watch?v=fzw-hRzCfAs>

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### **Leavitt, Henrietta** (1868-1921)

Armstrong, Mabel *Women Astronomers: Reaching for the Stars*. 2008, Stone Pine Press. This book for teens has a chapter on Leavitt.

Burleigh, Robert *Look Up!: Henrietta Leavitt, Pioneering Woman Astronomer*. 2013, Simon & Schuster. A book for children ages 4 – 8.

Ferguson, Kitty *Measuring the Universe*. 1999, Walker. Chronicle of how distances were found in the universe, with good discussions of contributions by individual astronomers.

Johnson, George *Miss Leavitt's Stars: The Untold Story of the Woman Who Discovered How to Measure the Universe*. 2005, Atlas/Norton.

Mitchell, H. "Henrietta Leavitt and the Cepheid Variables" in *The Physics Teacher*, Mar. 1976, vol. 14, p. 162.

Moore, Patrick *Astronomers' Stars*. 1987, Norton. Chapter 10 concerns Leavitt's work on Cepheids.

Singh, Simon *Big Bang*. 2004, Harper. Chapter 3 has a nice section on her life and work.

Sobel, Dava *The Glass Universe*. 2016, Viking. Includes a considerable amount of material on Leavitt's life and work.

Brief Biography at Woman Astronomer Site:  
<http://www.womanastronomer.com/hleavitt.htm>

Biography on the Famous Scientists Website: <https://www.famousScientists.org/henrietta-swan-leavitt/>

Haynes, Corey "Meet Henrietta Leavitt" post:  
<http://www.astronomy.com/news/2019/02/meet-henrietta-leavitt-the-woman-who-gave-us-a-universal-ruler>

Gunderson, Lauren: *Silent Sky* (a play about Leavitt):  
<https://sites.google.com/site/henriettasrhapsody/> and  
<http://silentskyplay.tumblr.com/> For more about the dramatist:  
<http://laurengunderson.com/>

Video of talk by George Johnson on his "Search for Miss Leavitt":  
<http://perimeterinstitute.ca/videos/search-miss-leavitt>

Film (17-min) by Pangratios Panacosta on Leavitt:  
<https://www.youtube.com/watch?v=70cFwfNW7gQ>

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### **Maury, Antonia** (1866-1952)

Armstrong, Mabel *Women Astronomers: Reaching for the Stars*. 2008, Stone Pine Press. This book for teens has a chapter on Maury.

Hearnshaw, John *The Analysis of Starlight*. 1986, Cambridge U. Press. See Chapter 5.

Hoffleit, Dorrit "Antonia Maury" in *Sky & Telescope*, Mar. 1952, p. 106.

Sobel, Dava *The Glass Universe*. 2016, Viking. Includes some material on Maury's life and work.

Vassar Encyclopedia Entry: <http://vcencyclopedia.vassar.edu/alumni/antonia-maury.html>

Short biography on the Woman Astronomer site:  
<http://www.womanastronomer.com/amaury.htm>

Short biography at Project Continua: <http://www.projectcontinua.org/antonia-maury/>

Short biography at Time magazine site: <http://time.com/4262838/antonia-maury-astronomer/>

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### **Mitchell, Maria** (1818-1889)

Anderson, Dale *Maria Mitchell: Astronomer*. 2003, Chelsea House. For young adults.

Armstrong, Mabel *Women Astronomers: Reaching for the Stars*. 2008, Stone Pine Press.

This book for teens has a chapter on Mitchell.

Belserene, Emelia "Maria Mitchell: 19th Century Astronomer" in *Astronomy Quarterly*, vol. 5, no. 19, p. 133 (1986).

Berglund, Renee *Maria Mitchell and the Sexing of Science*. 2008, Beacon Press. Story of her life and of the importance of her work and fame for women's issues.

Booker, Margaret *Among the Stars: The Life of Maria Mitchell*. 2007, Mill Hill Press. A long biography for adult readers.

Gormley, Beatrice *Maria Mitchell: The Soul of an Astronomer*. 1995, Eerdmans Publishing. A book for youngsters.

Holmes, Richard "Maria Mitchell at 200: A Pioneering Astronomer Who Fought for Women in Science" in *Nature*, 18 June 2018 (vol. **558**, pp. 370-371):

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Her web page at Smithsonian: <http://cfa-www.harvard.edu/~mjg/>  
Her MacArthur Foundation "Genius Award" Page: <https://www.macfound.org/fellows/394/>  
Text of her 1995 Phi Beta Kappa Address at Harvard "Sense of Wonder":  
<http://gos.sbc.edu/g/geller.html> (Listed by NPR as one of the best commencement speeches ever: <https://apps.npr.org/commencement/speech/margaret-j-geller-harvard-university-1995/> )  
Her 2010 Chautauqua Lecture on astronomical photography "Click! The Universe":  
<https://www.youtube.com/watch?v=kTKGQzWa6yM>  
2013 interview when she won the APS Lillienfeld Prize (6 min):  
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<https://www.scientificamerican.com/article/how-andrea-ghez-won-the-nobel-for-an-experiment-nobody-thought-would-work/>

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Her web page at UCLA: <http://www.astro.ucla.edu/~ghez/>

Her Nobel Prize Lecture in 2020: [https://www.youtube.com/watch?v=wGw6\\_CdvGKM](https://www.youtube.com/watch?v=wGw6_CdvGKM)

Interview at the U. of Chicago website about her high school days and winning the Nobel Prize: <https://news.uchicago.edu/story/astronomer-andrea-ghez-responsibility-comes-nobel-prize>

"The Monster Black Hole at the Center of the Milky Way," her 2017 talk in the Silicon Valley Astronomy Lectures: <https://www.youtube.com/watch?v=dv1igzE-aX4&t=359s>

2017 UCLA Student Video where she is asked 37 questions in 6 minutes:  
<https://www.youtube.com/watch?v=o-Tnc3CUseM>

Her 2009 Lecture at TED: <https://www.youtube.com/watch?v=c8re1U9rCo4> OR  
[http://www.ted.com/talks/andrea\\_ghez\\_the\\_hunt\\_for\\_a\\_supermassive\\_black\\_hole.html](http://www.ted.com/talks/andrea_ghez_the_hunt_for_a_supermassive_black_hole.html)

Sky & Telescope website pieces about her work:  
<http://www.skyandtelescope.com/astronomy-news/star-zips-around-black-hole/> AND

<http://www.skyandtelescope.com/astronomy-news/milky-ways-central-monster-measured/>

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<http://blackholes.stardate.org/research/ghez-interview.php.html>

Her MacArthur Foundation "Genius Prize" page:

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Interview with her for the PBS TV Show NOVA in 2006:

<http://www.pbs.org/wgbh/nova/blackhole/explorer.html>

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Bortz, Fred: *Beyond Jupiter: The Story of Planetary Astronomer Heidi Hammel* (2005, Franklin Watts/Scholastic & Joseph Henry Press). A colorful profile of Hammel as a person and scientists, written for teenagers (but enjoyable reading for everyone.)

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<https://womeninplanetaryscience.wordpress.com/2010/09/30/heidi-hammel-ask-for-help-when-you-need-it/>

2008 interview in *The New York Times*:

<http://www.nytimes.com/2008/09/02/science/02conv.html>

Her Planetary Society page with posts and radio show appearance:

<http://www.planetary.org/about/board-of-directors/heidi-hammel.html>

Her answers to frequently asked questions at the site for the kids' book about her:

<http://www.fredbortz.com/HammelBio/AstroFAQ.htm>

2016 podcast with the editor of *Astronomy* magazine:

<http://www.astronomy.com/magazine/superstars-of-astronomy-podcast/2016/04/heidi-hammel>

An hour interview of Minnesota Public Radio about the successor telescope to the Hubble and her work:

<http://minnesota.publicradio.org/display/web/2008/03/05/midmorning2/>

Some brief reminiscences by her brother:

[http://everything2.com/index.pl?node\\_id=1373765](http://everything2.com/index.pl?node_id=1373765)

Interview in Newsweek, Nov. 26, 2007: <http://www.newsweek.com/id/70975>

Her page at the James Webb Space Telescope website: <https://jwst.nasa.gov/meet-hammel.html>

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### **Luu, Jane** (1963 - )

Bartusiak, Marcia "The Remarkable Odyssey of Jane Luu" in *Astronomy*, Feb. 1996, p. 46.  
Davies, John *Beyond Pluto: Exploring the Outer Limits of the Solar System*. Chapter 4 features Luu's life and work.

Flamsteed, Sam "Where Comets Come from - Hubble Space Telescope Provides Evidence for Kuiper Belt" in *Discover*, Nov. 1995. On-line: <http://discovermagazine.com/1995/nov/wherecometscomef583> (Includes some material about her life and early work.)  
Interview from 2003 (with a lot of biographical information) at Imagiverse Site: [http://www.imagiverse.org/interviews/janeluu/jane\\_luu\\_21\\_03\\_03.htm](http://www.imagiverse.org/interviews/janeluu/jane_luu_21_03_03.htm)  
Brief autobiography at the Shaw Prize site: <http://shawprize.org/en/shaw.php?tmp=3&twoid=92&threeid=208&fourid=348&fiveid=170>  
Career profile at the *Science* magazine site: <http://www.sciencemag.org/careers/2012/10/no-starry-eyed-astronomer>  
Transcript of her Kavli Prize talk: [http://www.kavliprize.org/sites/default/files/Jane\\_Luu\\_manuscript.pdf](http://www.kavliprize.org/sites/default/files/Jane_Luu_manuscript.pdf)  
Brief 2012 video of her and David Jewitt's Shaw Prize lecture: <https://www.youtube.com/watch?v=ypKWDKWRzyY>  
2012 Talk to the Rosalind Franklin Society on the Kuiper Belt (with some personal memories): <https://www.youtube.com/watch?v=I5pnR002y6k>

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### **Lopes, Rosaly** (1957 - )

Her page at *JPL Science*: <https://science.jpl.nasa.gov/people/Lopes/>  
Biography and interview in *Volcano World*: <http://volcanoworld.wordpress.com/2011/12/19/rosaly-lopes/>  
Discusses her work on "Through the Eyes of Scientists" (3 min, 2011): <http://www.youtube.com/watch?v=ntCPur1SQ4Y>  
Shalby, Colleen "Rosaly Lopes and the Enigmatic Workings of Volcanoes" at the AAAS website: <https://www.aaas.org/rosaly-lopes-and-enigmatic-workings-volcanoes>  
"To Understand Volcanoes on Other Worlds, Stand on our Own" in *Quanta* Magazine: <https://www.quantamagazine.org/to-understand-volcanoes-on-other-worlds-stand-on-our-own-20180828/>  
Lopes, R. & Carroll, M. *Alien Volcanoes*. 2008, Johns Hopkins U. Press.

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### **Max, Claire** (1946 - )

Her page at the University of California Observatories: <http://www.ucolick.org/~max/>  
Article on her receiving the 2004 E.O. Lawrence Award: [http://currents.ucsc.edu/04-05/09-27/max\\_award.asp](http://currents.ucsc.edu/04-05/09-27/max_award.asp)  
3-minute video with Freeman Dyson describing her role in the rise of adaptive optics: <https://www.youtube.com/watch?v=4ntfOaqKHFU>  
Finkbeiner, Ann "Astronomy: Laser Focus" in *Nature*, 21 Jan 2015. (Claire Max has transformed the capabilities of telescopes.) On the web at: <https://www.nature.com/news/astronomy-laser-focus-1.16741>

2015 News Release on being appointed Director of the U. of California Observatories:  
<https://news.ucsc.edu/2015/08/uco-director.html>

A Basic Tutorial on Adaptive Optics (2012):  
[https://www.youtube.com/watch?v=4VWFcy6\\_Ij8](https://www.youtube.com/watch?v=4VWFcy6_Ij8)

Max, Claire: "A Sharper Image" talk in the Silicon Valley Astronomy Lectures:  
<https://www.youtube.com/watch?v=stAGLke6XDU&t=84s>

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### **Norman, Dara** (1970 - )

Her moving talk at the June 2020 American Astronomical Society meeting on "The Inclusion Revolution": <https://www.youtube.com/watch?v=rQDzeDuCLLs>  
*Meet the Keynote Speaker* feature from Astrobites (related to the above talk):

<https://astrobites.org/2020/05/25/meet-the-keynote-speakers-dara-norman/>

Parks, Clinton "Dara Norman: Astronomer and Astronomy Enabler" on the *Sky & Telescope* website: <https://skyandtelescope.org/astronomy-resources/famous-astronomers/dara-norman-astronomer-and-astronomy-enabler/>

Her Wikipedia Page: [https://en.wikipedia.org/wiki/Dara\\_Norman](https://en.wikipedia.org/wiki/Dara_Norman)

Norman, Dara "Can Big Data Lead to an Inclusion Revolution" in *Astronomy Beat*, July 2018: [https://astrosociety.org/file\\_download/inline/12faca89-b5f4-4e59-aa62-ce7ad5add47c](https://astrosociety.org/file_download/inline/12faca89-b5f4-4e59-aa62-ce7ad5add47c)

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Overbye, Dennis "An Odyssey from the Bronx to Saturn's Rings" (a Sep. 21, 2009 *New York Times* profile):

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<https://www.scientificamerican.com/article/cassini-at-saturn-a-retrospective/>

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Her biography at her website: <http://carolynporco.com/about/biography/>

Her biography on the Edge website: [http://www.edge.org/3rd\\_culture/bios/porco.html](http://www.edge.org/3rd_culture/bios/porco.html)

1999 Profile in the *New York Times*:

<http://www.nytimes.com/library/national/science/081799sci-nasa-cassini-2.html>

2005 Profile by Bjorn Carey:

<http://www.cnn.com/2005/TECH/space/02/15/saturn.astronomer/index.html>

Her talk on Cassini at the Silicon Valley Astronomy Lectures (2015):

<https://www.youtube.com/watch?v=Vx135n8VFX>

Her entry at the Encyclopedia of World Biography:

<https://www.notablebiographies.com/newsmakers2/2005-La-Pr/Porco-Carolyn.html>

Her talk to the TED Conference (Mar. 2007):

[http://www.ted.com/index.php/talks/carolyn\\_porco\\_flies\\_us\\_to\\_saturn.html](http://www.ted.com/index.php/talks/carolyn_porco_flies_us_to_saturn.html)

2014 Appearance on StarTalk with Neil Tyson:

<https://www.startalkradio.net/show/madame-saturn-a-conversation-with-carolyn-porco-part-1/>

2017 Article about Her and Space Images at Time.com:

<http://time.com/4894102/voyager-anniversary-photos/>

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### **Sargent, Anneila** (1942 - )

Gallagher, Paul "Anneila Sargent: The Woman from Fife who Advises the White House" in *The Independent*, Apr. 13, 2013:

<http://www.independent.co.uk/news/people/profiles/anneila-sargent-the-woman-from-fife-who-advises-the-white-house-8572137.html>

Goldsmith, Donald *The Astronomers*. 1991, St. Martin's Press. See Chapter 12 of this book, which focuses on the work of a few astronomers at the frontiers of science.

Sommerville, Iain "From Burtisland to the Outer Limits: The Journey of Anneila Cassells [Sargent]" (mostly about her early life): <http://www.burntisland.net/sargent.htm>

Her page at Caltech: [http://www.astro.caltech.edu/people/faculty/Anneila\\_Sargent.html](http://www.astro.caltech.edu/people/faculty/Anneila_Sargent.html)

Her 2015 talk in Edinburgh on "Make it Happen: Women into Science" (with a bit about her own career): <https://www.youtube.com/watch?v=TnA-L1FVYz8>

2017 Profile in the *Courier* (a UK Newspaper):

<https://www.thecourier.co.uk/fp/news/local/fife/176569/fife-born-professor-anneila-sargent-superstar-american-astronomy/>

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Jones, Chris "The Woman Who Might Find Us Another Earth" in *New York Times Magazine*, Dec. 7, 2016. On the web at:

<https://www.nytimes.com/2016/12/07/magazine/the-world-sees-me-as-the-one-who-will-find-another-earth.html>

Powell, Corey "Sara Seager's Tenacious Drive to Discover Another Earth" in

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Seager, Sara "So Many Exoplanets, So Few Women Astronomers" (an article in the Huffington Post Jan. 2013 about the hardship that constant travel imposes on women scientists with small children): [http://www.huffingtonpost.com/sara-seager/women-in-science\\_b\\_2471980.html](http://www.huffingtonpost.com/sara-seager/women-in-science_b_2471980.html)

Seager, Sara *Is There Life Out There: The Search for Habitable Exoplanets* (her 48-page, 2009, self-published popular-level intro, as a free PDF):

<https://www.saraseager.com/wp-content/uploads/2016/08/book-is-there-life-out-there.pdf>

Her website: <https://www.saraseager.com/>

Short Profile at AAAS website: <http://membercentral.aaas.org/blogs/member-spotlight/sara-seagers-search-earth-planets>

Brief 2017 Interview on *Women in Astronomy* site:

<http://womeninastronomy.blogspot.com/2017/01/meet-your-cswa-sara-seager.html>

2017 Talk at Google "Mapping Nearby Stars for Habitable Exoplanets":

<https://www.youtube.com/watch?v=jyfCukKVjC0>

Interview at Space.com 2013 on the Drake Equation: <https://www.space.com/22648-drake-equation-alien-life-seager.html?cid=51463011558824>

Interview at the *Physics Today* site Feb. 2019:

<https://physicstoday.scitation.org/doi/10.1063/PT.6.4.20190227a/full/>

2015 TED Talk on the Search for Life on Other Earths:

<https://www.youtube.com/watch?v=qAYqK9lAxic>

2013 TED Talk on the Search for Real Alien Life:

<https://www.youtube.com/watch?v=NnM4SaGc8R0>

2015 Interview at MIT's Infinite History Project (with reminiscences about her own life):

<https://www.youtube.com/watch?v=3O9nvqn1iLs>

2016 Nature Video "Back to the Thesis" (asks her to review what events led to her thesis): <https://www.youtube.com/watch?v=fk9VdAXeZiY>

10 Tips for Undergraduate Women Science Students (from Astronomer Sara Seager):

<http://www.usnews.com/education/blogs/professors-guide/2010/08/11/10-tips-for-women-students-in-science-fields>

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## **Shields, Aomawa** (1975- )

Interview at *Astronomy in Color*:

<http://astronomyincolor.blogspot.com/2016/09/faculty-highlight-aomawa-shields.html>

Her Wikipedia page: [https://en.wikipedia.org/wiki/Aomawa\\_Shields](https://en.wikipedia.org/wiki/Aomawa_Shields)

Her rich personal website: <https://variablestargirl.com/>

Her faculty website at UC Irvine: <https://faculty.sites.uci.edu/shields/>

Interview at University of California News:

<https://www.universityofcalifornia.edu/news/astrobiology-s-rising-star>

2015 TED Talk on Finding Other Planets:

[https://www.ted.com/talks/aomawa\\_shields\\_how\\_we\\_ll\\_find\\_life\\_on\\_other\\_planets](https://www.ted.com/talks/aomawa_shields_how_we_ll_find_life_on_other_planets)

She has started an organization called *Rising Stargirls* to encourage girls of all color and backgrounds to learn science through astronomy: <http://www.risingstargirls.org/>

Brief NOVA segment on her career path:

<https://www.facebook.com/watch/?v=253867345266434&t=13>

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## **Shoemaker, Carolyn (1929 - )**

Armstrong, Mabel *Women Astronomers: Reaching for the Stars*. 2008, Stone Pine Press.

This book for teens has a chapter on Shoemaker.

Levy, David "Star Trails: Carolyn Shoemaker" in *Sky & Telescope*, June 1991, p. 658.

Levy, David *Shoemaker by Levy: The Man who Made an Impact*. 2000, Princeton U. Press.

Biography of Eugene Shoemaker, but with much information about Carolyn's work.

Preston, Richard *First Light*. 1987, Atlantic Monthly Press. Section 2 is a profile of the Shoemakers.

Reeves, R. "Interview with Gene and Carolyn Shoemaker: Meteor Crater to Palomar" in *Astronomy*, June 1993, p. 13.

Shoemaker, Carolyn "Ups and Downs in Planetary Astronomy" in *Annual Reviews of Earth and Planetary Science*, vol. 27, p. 1 (1999). Reminiscences about her career.

Biography at USGS Page: <https://astrogeology.usgs.gov/people/carolyn-shoemaker>

1994 Article from *New Scientist*, with history and reactions to the discover of Comet

Shoemaker-Levy 9: [http://www.bibliotecapleyades.net/esp\\_shoemaker\\_a.htm](http://www.bibliotecapleyades.net/esp_shoemaker_a.htm)

Brief Biography at the Harcourt School Site:

[http://www.harcourtschool.com/activity/biographies\\_science/shoemaker/](http://www.harcourtschool.com/activity/biographies_science/shoemaker/)

Her 1998 Essay from *Science Magazine* on Space Exploration (with some thoughts about her own life and work): <http://www.sciencemag.org/cgi/content/full/282/5394/1637>

2-min video with advice for young women going into astronomy:

<https://www.youtube.com/watch?v=AADENDV2Z8>

Page about her and her story about her husband, at Story Corps:

<https://storycorps.org/stories/carolyn-shoemaker-and-phred-salazar-160708/>

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## **Stofan, Ellen (1961 - )**

Stofan, E. "Venus: The Way We Might Have Been" in Stern, S.A., ed. *Our Worlds: The Magnetism and Thrill of Planetary Exploration*. 1999, Cambridge U. Press; pp. 31-45. Combines a discussion of the exploration of Venus with autobiographical information on her development as a scientist.

Her page when she was Chief Scientist at NASA:

[https://www.nasa.gov/offices/ocs/stofan\\_bio.html](https://www.nasa.gov/offices/ocs/stofan_bio.html)

Jan. 2017 *Christian Science Monitor* story about her resignation as Chief Scientist:

<https://www.csmonitor.com/Science/Spacebound/2017/0104/Why-is-chief-NASA-scientist-Ellen-Stofan-stepping-down> (Also a story in *Wired*:

<https://www.wired.com/2017/01/dont-turn-earth-venus-warns-nasa-ex-chief-scientist-ellen-stofan/> )

Apr. 2017 story about her at *Motherboard*:

[https://motherboard.vice.com/en\\_us/article/538xwa/ellen-stofan-former-nasa-chief-scientist](https://motherboard.vice.com/en_us/article/538xwa/ellen-stofan-former-nasa-chief-scientist)

Her 2013 Interview at *SpaceNews*: <http://spacenews.com/37599profile-ellen-stofan-nasa-chief-scientist/>

Her talk on Mars Exploration at the Royal Institution:

<https://www.youtube.com/watch?v=20ufMGhA2e0>

Announcement of her becoming Director of the Air and Space Museum, 2018:

<https://www.space.com/40257-ellen-stofan-national-air-space-museum.html>

"Lecture on Exploring Titan by Boat" (at the Denver Museum of Natural History 2012, 1 hr, 18 min): <http://vimeo.com/44046816>

JPL Podcast with Slides on YouTube (about lakes on Titan):

<http://www.youtube.com/watch?v=0PP5hSbwHXQ> (Transcript at:

<http://www.nasa.gov/multimedia/podcasting/jpl-cassini-20070103.html> )

News announcement being named NASA Chief Scientist, July 2013:

<http://www.nasa.gov/press/2013/july/nasa-welcomes-new-chief-scientist/#.UfbSwo3CZ8E>

Video where she explains a proposed mission to study the lakes of Titan; a bit technical (2011, 9 min): <http://www.youtube.com/watch?v=xkYIdhvdYWU>

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### **Tarter, Jill** (1944 - )

Armstrong, Mabel *Women Astronomers: Reaching for the Stars*. 2008, Stone Pine Press.

This book for teens has a chapter on Tarter.

Drake, Frank & Sobel, Dava *Is Anyone Out There?* 1992, Delacorte/Bantam. Page 152 ff.

Has a number of discussions of Tarter's life and work, especially in Chapters 7 & 10.

Ferron, Karri "Brief Interview with Jill Tarter" in *Astronomy*, Dec. 2009, p. 10.

Hayes, Jacqui "Silent Witness (profile of Jill Tarter)" in *Cosmos* magazine, Apr. 2010. On web at:

<https://web.archive.org/web/20100801135435/http://www.cosmosmagazine.com/features/print/3593/silent-witness>

Jackson, Ellen *Looking for Life in the Universe: The Search for Extraterrestrial Intelligence*.

2005, Houghton Mifflin. A profile of Tarter and her work for young people in grades 4-8.

Lubick, N. "An Ear to the Stars" in *Scientific American*, Nov. 2002, p. 42. A brief profile of Tarter and her SETI work.

Scoles, Sarah *Making Contact: Jill Tarter and the Search for Extraterrestrial Intelligence*.

2017, Pegasus. A popular-level book with the story of her life and work.

Swift, David "Interview with Jill Tarter" in *SETI Pioneers*. 1990, U. of Arizona Press.

Brief 2004 Profile on CNN Site:

<http://www.cnn.com/2004/WORLD/americas/04/15/tarter/index.html>

2017 Interview on the KQED *Forum* program about her work:

<https://ww2.kqed.org/forum/2017/07/18/pioneering-astronomer-jill-tarter-on-making-contact-with-alien-life/>

"Will the 21<sup>st</sup> Century be the Time we Discover Life Beyond Earth?" Her 2017 talk in the Silicon Valley Astronomy Lectures:

<https://www.youtube.com/watch?v=wYcM0BOYHyw>

Interview at the U. of Washington in 2015 (37 min):

<https://www.washington.edu/alumni/at-length-with-jill-cornell-tarter/>

Her TED Prize lecture (2009): <https://www.youtube.com/watch?v=EszGivRdgTE>

Nov. 2007 Interview for the KQED TV show *Quest*:

<https://www.youtube.com/watch?v=QwEm3WHvNHI>

The Search for Cosmic Company (her 2011 TEDX Talk at USC):

<https://www.youtube.com/watch?v=6DmpJoEmyZs>

2012 Talk on "The World We Dream":

<https://www.youtube.com/watch?v=4EABW8WVT0>

2012 Interview at *Space.com*: <https://www.space.com/15803-jill-tarter-seti-search-retirement-qanda.html>

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### **Trimble, Virginia (1943 - )**

Feder, Toni "Q&A: Virginia Trimble on Fifty Plus Years in Astronomy" for *Physics Today*, 2018:

<https://physicstoday.scitation.org/action/showDoPubSecure?doi=10.1063/PT.6.4.20180313a&format=full>

Scoles, Sara "The Woman Who Knows Everything about the Universe" in *Wired* magazine, 2018: <https://www.wired.com/story/the-woman-who-knows-everything-about-the-universe/>

Trimble, Virginia *Visit to a Small Universe*. 1992, American Institute of Physics Press. A collection of her articles, including several that bear on her own life and work.

Trimble, V. "Affirmative Action and Women in Science" in *The Scientist*, Sep. 1996:

<https://www.the-scientist.com/?articles.view/articleNo/18033/title/Affirmative-Action-And-Women-In-Science--Post-Hoc--Ergo-Propter-Hoc-/>

Trimble, V. "Anybody But Hubble" (After-dinner talk on who discovered the expansion of the universe): <https://arxiv.org/ftp/arxiv/papers/1307/1307.2289.pdf>

Her page at U. of California, Irvine:

[https://www.faculty.uci.edu/profile.cfm?faculty\\_id=3060](https://www.faculty.uci.edu/profile.cfm?faculty_id=3060)

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<http://www.abc.net.au/rn/scienceshow/stories/2000/148938.htm>

Her "Top 10" lists for the astronomy of the past and future:

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Announcement of her AAS Education Prize:

<http://www.noao.edu/outreach/press/pr06/pr0605.html>

Her speech for the 100<sup>th</sup> anniversary of the American Astronomical Society (pdf file):

<https://aas.org/archives/BAAS/v32n2/wolff.pdf>

Oral History Interview at the American Institute of Physics: <https://www.aip.org/history-programs/niels-bohr-library/oral-histories/23363-1>

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## 5. A Sampling of Material about Other Women Astronomers

*NOTE:* This section is organized by the last name of the astronomers being described, not by author.

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Brown, Beth: Profile: <https://www.youtube.com/watch?v=KfJMVDjf6dk>

Bunce, Emma: Her page at the U. of Leicester:

<https://www2.le.ac.uk/departments/physics/people/emmabunce> (and a BBC

Interview: <https://www.bbc.co.uk/sounds/play/m000jvxq>

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Debra Fisher



Jocelyn Bell Burnell



Jane Luu



Jill Tarter