



girl scouts
of southern arizona



Women of the Moon, Women in Science Word Search Introduction Larry Lebofsky and the NIRCam E/PO team

For thousands of years, women have been honored by having their names in the heavens. Five of the 88 constellations are named for women: Andromeda, Cassiopeia, Coma Berenices (Berenice's hair), Hydra (female water snake), and Virgo. Virtually all of the first 500 asteroids—into the twentieth century—were named for women (or names that were made feminine-sounding by adding "ia" or "a" endings). More recently, the naming convention for Venus (the goddess of love) restricts the names of features on that planet to goddesses and famous women.

For the Moon, nearly 70 craters have been named for women. Of these, 28 are named for women who have made contributions to science. We have created two activities, a word search game and a find-the-crater game. For the word search game (adapted from a word search activity developed by Debra Davis—<http://www.womanastronomer.com/moonwomen1.htm>), we have given you the last names of 28 women of science. You are to find their names in the grid provided. In all cases, the names start close to their actual location on the Moon. There are a few exceptions: the name Sappho was proposed for a crater, but it was not approved by the committee that makes the final decision. Also, the crater Joliot (actually Irène Joliot-Curie) was named for her husband, both of whom were Nobel Prize recipients. Irène was the daughter of twice Nobel Prize recipient Madame Curie (who has her own crater)!

The second activity is a graphing activity. We have given you the full names and a short biography of each of the women scientists. We have also given you the coordinates of the craters and their diameters. You are to use these coordinates to locate the craters on the two maps (nearside and farside) of the Moon.

Have fun and good luck!

WOMEN OF THE MOON, WOMEN IN SCIENCE: WORD SEARCH PUZZLE

		180	170	160	150	140	130	120	110	100	90	80	70	60	50	40	30	20	10	0	10	20	30	40	50	60	70	80	90	100	110	120	130	140	140	160	170	180	
NORTH	90	N	B	Q	G	K	J	E	K	Y	W	V	C	A	I	F	K	P	G	F	T	F	S	D	A	S	I	Y	U	M	J	I	E	Z	F	U	Y	Q	90
	80	I	X	Z	B	R	E	S	E	T	Y	I	S	M	B	V	R	O	W	C	C	I	C	Y	U	F	R	K	Z	H	I	F	O	X	K	A	M	V	80
	70	O	G	K	Q	W	H	X	X	C	K	S	J	E	Z	W	E	Z	V	V	F	J	P	G	Z	V	G	P	H	W	S	N	N	T	N	G	L	W	70
	60	T	E	S	N	S	A	Z	N	O	E	T	H	E	R	A	U	K	Q	S	M	O	W	T	J	Q	X	L	M	P	T	R	O	N	O	S	R	G	60
	50	F	H	D	O	E	J	Y	R	D	W	X	P	Y	X	N	I	T	R	G	S	H	E	E	P	S	H	A	N	K	S	I	P	O	C	V	R	X	50
	40	R	K	J	U	F	V	T	Z	Q	F	N	Q	H	A	K	Y	T	I	E	E	M	I	T	C	H	E	L	L	C	L	D	C	P	V	E	H	U	40
	30	C	V	F	F	F	H	K	K	L	E	H	C	S	R	E	H	V	A	A	L	Q	M	A	U	R	Y	T	Q	O	Y	H	A	L	N	C	P	B	30
	20	W	Z	U	K	I	T	O	W	O	J	T	G	X	L	J	B	I	Y	P	K	C	H	M	T	M	V	G	J	S	B	R	R	I	U	F	F	L	20
	10	Y	G	W	I	L	T	V	L	I	T	E	U	Z	G	P	N	M	S	U	Y	K	N	O	N	N	A	C	L	F	D	J	I	E	R	T	A	E	10
	0	M	C	I	N	U	I	A	P	A	M	A	C	A	Y	E	C	U	R	B	Q	H	M	Q	B	S	J	Y	K	L	G	E	C	R	P	H	N	K	0
10	A	V	B	S	A	V	L	D	L	M	R	D	U	P	E	A	A	P	I	L	C	V	L	D	O	E	D	C	E	M	W	O	E	E	D	W	O	10	
20	S	B	N	E	C	A	E	O	F	A	B	V	K	O	E	X	O	J	B	Y	A	Z	P	N	M	N	A	U	M	W	Y	S	S	G	Z	D	A	20	
30	L	X	O	R	M	E	V	C	U	U	D	T	W	R	G	L	K	N	L	W	T	G	K	C	E	K	X	R	I	B	Q	A	H	Y	R	T	M	30	
SOUTH	40	D	L	R	K	M	L	S	Q	G	N	Q	N	R	O	T	C	O	R	P	J	H	E	G	W	R	I	B	I	N	S	K	P	K	I	N	J	I	40
	50	U	P	M	C	A	I	K	B	S	D	Z	O	R	D	L	J	E	R	P	R	A	U	Y	H	V	N	L	E	G	K	E	P	O	L	J	Q	V	50
	60	Q	Y	O	P	I	U	A	N	M	E	U	B	U	Q	C	F	L	Z	O	H	R	L	V	X	I	S	U	M	K	H	M	H	V	Z	P	U	T	60
	70	J	R	O	V	T	F	Y	M	N	R	H	F	C	T	D	W	B	D	N	D	I	B	F	E	L	V	E	X	Q	G	F	O	A	R	S	I	Z	70
	80	I	A	Z	C	X	R	A	V	P	L	O	L	H	E	H	S	U	H	X	R	N	X	S	E	L	X	Z	H	O	W	C	C	B	N	Y	D	O	80
90	P	T	L	Y	D	G	H	B	J	G	P	I	M	S	Q	M	X	T	Z	N	A	A	O	B	E	T	V	J	J	Z	T	U	I	A	I	O	P	90	
		180	170	160	150	140	130	120	110	100	90	80	70	60	50	40	30	20	10	0	10	20	30	40	50	60	70	80	90	100	110	120	130	140	140	160	170	180	
WEST																				EAST																			

- | | | | |
|--------------|------------------|---------------|----------------|
| 1. Blagg | 8. Curie* | 15. Leavitt | 22. Noether |
| 2. Bok | 9. Fleming | 16. Lepaute | 23. Proctor |
| 3. Bruce | 10. Herschel | 17. Maunder | 24. Resnik |
| 5. Cannon | 11. Hypatia | 18. Maury | 25. Sappho*** |
| 6. Catherina | 12. Jenkins | 19. McAuliffe | 26. Sheepshank |
| 7. Clerke | 13. Joliot** | 20. Meitner | 27. Somerville |
| 8. Cori | 14. Kovalevskaya | 21. Mitchell | 28. Tereshkova |

*Official crater name maiden name, Sklodowska; **Full last name is Joliot-Curie, but crater named after her husband; ***Name not officially accepted

WORD SEARCH ANSWERS

		180	170	160	150	140	130	120	110	100	90	80	70	60	50	40	30	20	10	0	10	20	30	40	50	60	70	80	90	100	110	120	130	140	140	160	170	180					
N	O	R	T	H	90	N	B	Q	G	K	J	E	K	Y	W	V	C	A	I	F	K	P	G	F	T	F	S	D	A	S	I	Y	U	M	J	I	E	Z	F	U	Y	Q	90
					80	I	X	Z	B	R	E	S	E	T	Y	I	S	M	B	V	R	O	W	C	C	I	C	Y	U	F	R	K	Z	H	I	F	O	X	K	A	M	V	80
					70	O	G	K	Q	W	H	X	X	C	K	S	J	E	Z	W	E	Z	V	V	F	J	P	G	Z	V	G	P	H	W	S	N	N	T	N	G	L	W	70
					60	T	E	S	N	S	A	Z	N	O	E	T	H	E	R	A	U	K	Q	S	M	O	W	T	J	Q	X	L	M	P	T	R	O	N	O	S	R	G	60
					50	F	H	D	O	E	J	Y	R	D	W	X	P	Y	X	N	I	T	R	G	S	H	E	E	P	S	H	A	N	K	S	I	P	O	C	V	R	X	50
					40	R	K	J	U	F	V	T	Z	Q	F	N	Q	H	A	K	Y	T	I	E	E	M	I	T	C	H	E	L	L	C	L	D	C	P	V	E	H	U	40
					30	C	V	F	F	F	H	K	K	L	E	H	C	S	R	E	H	V	A	A	L	Q	M	A	U	R	Y	T	Q	O	Y	H	A	L	N	C	P	B	30
					20	W	Z	U	K	I	T	O	W	O	J	T	G	X	L	J	B	I	Y	P	K	C	H	M	T	M	V	G	J	S	B	R	R	T	U	F	F	L	20
					10	Y	G	W	I	L	T	V	L	I	T	E	U	Z	G	P	N	M	S	U	Y	K	N	O	N	N	A	C	L	F	D	J	I	E	R	T	A	E	10
					0	M	C	I	N	U	I	A	P	A	M	A	C	A	Y	E	C	U	R	B	Q	H	M	Q	B	S	J	Y	K	L	G	E	C	R	P	H	N	K	0
10	A	V	B	S	A	V	L	D	L	M	R	D	U	P	E	A	A	P	I	L	C	V	L	D	O	E	D	C	E	M	W	O	E	E	D	W	O	10					
20	S	B	N	E	C	A	E	O	F	A	B	V	K	O	E	X	O	J	B	Y	A	Z	P	N	M	N	A	U	M	W	Y	S	S	G	Z	D	A	20					
30	L	X	O	R	M	E	V	C	U	U	D	T	W	R	G	L	K	N	L	W	T	G	K	C	E	K	X	R	I	B	Q	A	H	Y	R	T	M	30					
40	D	L	R	K	M	L	S	Q	G	N	Q	N	R	O	T	C	O	R	P	J	H	E	G	W	R	I	B	I	N	S	K	P	K	I	N	J	I	40					
50	U	P	M	C	A	I	K	B	S	D	Z	O	R	D	L	J	E	R	P	R	A	U	Y	H	V	N	L	E	G	K	E	P	O	L	J	Q	V	50					
60	Q	Y	O	P	I	U	A	N	M	E	U	B	U	Q	C	F	L	Z	O	H	R	L	V	X	I	S	U	M	K	H	M	H	V	Z	P	U	T	60					
70	J	R	O	V	T	F	Y	M	N	R	H	F	C	T	D	W	B	D	N	D	I	B	F	E	L	V	E	X	Q	G	F	O	A	R	S	I	Z	70					
80	I	A	Z	C	X	R	A	V	P	L	O	L	H	E	H	S	U	H	X	R	N	X	S	E	L	X	Z	H	O	W	C	C	B	N	Y	D	O	80					
90	P	T	L	Y	D	G	H	B	J	G	P	I	M	S	Q	M	X	T	Z	N	A	A	O	B	E	T	V	J	J	Z	T	U	I	A	I	O	P	90					
		180	170	160	150	140	130	120	110	100	90	80	70	60	50	40	30	20	10	0	10	20	30	40	50	60	70	80	90	100	110	120	130	140	140	160	170	180					
										WEST																				EAST													

WOMEN OF THE MOON, WOMEN IN SCIENCE: BIOGRAPHIES AND CRATER LOCATIONS

- 1. Blagg:** Mary Adela Blagg (1858–1944). English amateur astronomer. She played a major role in standardizing the names of lunar features. **1.2N, 1.5E**; Diameter = 5.0 km
- 2. Bok:** Priscilla Fairfield Bok (1896–1975). American astronomer married to Dutch astronomer Bart Bok. Together they mapped the spiral arms of the Milky Way Galaxy and studied star clusters. **20.3S, 171.6W**; Diameter = 43.0 km
- 3. Bruce:** Catherine Wolfe Bruce (1816–1900). Patroness of astronomy, donated funds to buy telescopes at three major institutes including Harvard College Observatory. **1.2N, 0.4E**; Diameter = 6.1 km
- 4. Cannon:** Annie Jump Cannon (1863–1941). American astronomer who worked with Edward C. Pickering to create the Harvard Classification Scheme to organize and classify stars based on their temperature. **19.9N, 81.4E**; Diameter = 57.6 km
- 5. Catharina:** Saint Catherine of Alexandria (unknown–about 307). A scholar and martyr, patron saint of young maidens and female students. **18.0S, 23.6E**; Diameter = 98.8 km
- 6. Clerke:** Agnes Mary Clerke (1842–1907). Irish astronomer and writer about topics in astronomy. **21.7N, 29.8E**; Diameter = 6.7 km
- 7. Cori:** Gerty Theresa Cori (1896–1957). American biochemist. The third woman to receive a Nobel Prize in medicine for discovery how glycogen (a derivative of the sugar glucose) is broken down and resynthesized as a way for the body to store energy. **50.5S, 152.9W**; Diameter = 67.2 km
- 8. Curie:** Maria Sklodowska-Curie (1867–1934). Polish-born, French scientist, the first person to receive two Nobel prizes. She did pioneering work in radioactivity and discovered the elements polonium and radium. Her crater is named Sklodowska. The crater Curie is named for her scientist husband Pierre. **18.0S, 96.2E**; Diameter = 125.5 km
- 9. Fleming:** Williamina Paton Stevens Fleming (1857–1911). Scottish-born American astronomer. Worked as a maid for Edward Pickering who, frustrated with his male assistants at Harvard College Observatory, declared his maid could do a better job and hired her to do clerical work. She devised a way to classify stars by assigning letters to the amount of hydrogen observed in their spectra. She classified more than 10,000 stars, discovered 59 gaseous nebulae, 310 variable stars, 10 novae and in 1888 discovered the famous Horsehead nebula. **14.9N, 109.3E**; Diameter = 126.4 km
- 10. C. Herschel:** Caroline Lucretia Herschel (1750–1848). German-born English astronomer. Worked with brother Sir William Herschel. Discovered several comets including the periodic comet 35P/Herschel-Rigoliet. She was the first female scientist to be recognized in Great Britain. **34.5N, 31.3W**; Diameter = 13.7 km
- 11. Hypatia:** Hypatia of Alexandria, Egypt (about 360–415). Greek scholar considered first notable woman in mathematics, she also taught philosophy and astronomy. **4.3S, 22.6E**; Diameter = 38.8 km
- 12. Jenkins:** Louise Freeland Jenkins (1888–1970). American astronomer. Received a masters degree in astronomy from Mount Holyoke College. Researched trigonometric parallax of stars and studied variable stars. **0.4N, 78.0E**; Diameter = 37.8 km
- 13. Joliet:** Irène Joliet-Curie (1897–1956). She and her husband Fredric Joliet-Curie received 1935 Nobel Prize for their work synthesizing new radioactive elements. Daughter of Maria Sklodowska-Curie. **25.8N, 93.4E**; Diameter = 172.8 km
- 14. Kovalevskaya:** Sofia Vasilyevna Kovalevskaya (1850–1891). First major Russian female mathematician, first woman appointed to full professorship in Europe (Sweden). **30.9N, 129.4W**; Diameter = 113.7 km

- 15. Leavitt:** Henrietta Swan Leavitt (1868–1921). American astronomer, worked at Harvard College Observatory as one of Edward Pickering’s women assistants counting images on photographic plates. She discovered the relationship between the brightness and period of a class of variable stars that became the basis for the work of Edwin Hubble that showed that the Universe was expanding and led to Hubble’s law. **44.9S, 139.9W**; Diameter = 69.3 km
- 16. Lepaute:** Nicole-Riene De La Briere Lepaute (1723–1788). French astronomer married to Jean-André Lepaute the royal clockmaker. Calculate the exact timing of a 1764 solar eclipse, correctly predicted the return of Halley’s Comet, and helped calculate the attractions of Jupiter and Saturn on Halley’s Comet. **33.3S, 33.7W**; Diameter = 16.4 km
- 17. Maunder:** Annie Scott Dill Maunder (1868–1947). British astronomer and mathematician. Worked with future husband E. Walter Maunder at Greenwich Royal Observatory as a “lady computer.” She photographed the Sun and tracked sunspot movement. Their work demonstrated the correlation between sunspots and Earth climate (less solar activity = colder climate) during the “Little Ice Age,” now called the Maunder minimum. **14.5S, 93.9W**; Diameter = 53.8 km
- 18. Maury:** Antonia Caetana de Paiva Pereira Maury (1866–1952). American astronomer. She published an important early catalog of solar spectra from her work at Harvard College Observatory. After a disagreement with Edward Pickering about her classification scheme she left (but later returned). Edward Hertzsprung used her work to identify giant and dwarf stars. **37.1N, 39.7E**; Diameter = 16.6 km
- 19. McAuliffe:** Christa Corrigan McAuliffe (1948–1986). NASA’s first teacher in space. She died in the Challenger disaster. She was born in Boston and educated at Framingham State College. **33.2S, 149.8W**; Diameter = 19.1 km
- 20. Meitner:** Lise Meitner (1878–1968). Austrian-born Swedish physicist, studied radioactivity and nuclear physics. Discovered nuclear fission (for which colleague Otto Hahn received the Nobel Prize). She escaped Nazi Germany and was instrumental in getting the United States to work on the atomic bomb, though she refused to work on the bomb. **10.9S, 113.1E**; Diameter = 87.3 km
- 21. Mitchell:** Maria Mitchell (1818–1889). American astronomer born on Nantucket. At 12 she helped her father calculate the exact time of an annular eclipse. She was the second woman to discover a comet. As a professor of astronomy, she was the first faculty member appointed at Vassar College. Maria Mitchell Observatory on Nantucket is named for her and her home is a museum. **49.8N, 20.2E**; Diameter = 32.1 km
- 22. Noether:** Emmy Amalie Noether (1882–1935). German Jewish mathematician. She did groundbreaking work in abstract algebra and theoretical physics. **66.4N, 114.2W**; Diameter = 64.8 km
- 23. Proctor:** Mary Proctor (1862–1957). Irish-born American. Like her father in Britain, she wrote popular newspaper articles and books on astronomy. **46.4S, 5.0W**; Diameter = 47.6 km
- 24. Resnik:** Judith Arlene Resnik (1949–1986). An American engineer and astronaut who died in the Challenger disaster. **34.2S, 150.8W**; Diameter = 22.2 km
- 25. Sappho:** Greek poetess about 600 BC. Invented the verse form known as Sapphics, a four-line stanza in which the first three lines contain eleven syllables and the last five syllables. **25S, 133.2E**; **not approved**
- 26. Sheepshanks:** Anne Sheepshanks (1789–1876). Sister of English astronomer Richard Sheepshanks. Upon his death, she contributed funds to purchase a photographic telescope at Cambridge Observatory. **59.2N, 17.0E**; Diameter = 23.7 km
- 27. Somerville:** Mary Somerville (1780–1872). Scottish science writer. She and Caroline Herschel became the first women members of the Royal Astronomical Society. **8.3S, 65.0E**; Diameter = 17.1 km
- 28. Tereshkiva:** Valentina V. Tereshlova (1937–). Retired Soviet cosmonaut. She was the first woman to fly in space aboard Vostok 6 on June 16, 1963. **28.2N, 143.8E**; Diameter = 31.3 km

