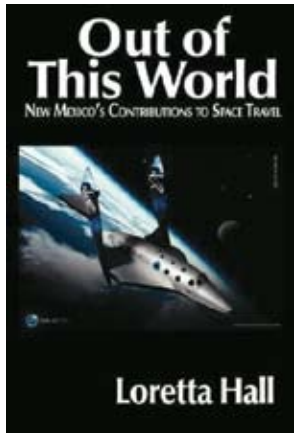
New Mexico's Role in Space

by Glenn Mesaros



Out of This World: New Mexico's Contributions to Space Travel
by Loretta Hall
Los Ranchos, N.M.: Rio Grande Books, 2011
Paperback, 175 pp., $19.95
www.LPDPress.com

When the Massachusetts State Fire Marshal banned Robert Goddard from launching any more rockets in that state in 1929, little did he know that he would set into motion a multi-billion-dollar space and defense industry in New Mexico. One of Goddard's rockets had set fire to some grass near the city of Worcester, Mass., on July 17 that year, after it rose a mere 90 feet before landing 170 feet from the "launch" site, an old windmill.

After securing funding from Daniel Guggenheim, via Charles Lindbergh, Jr., Goddard moved one train-carload of equipment to a desolate southeastern section of New Mexico, near Roswell. In the next 10 years, Goddard perfected his rocketry to the point where his last rocket, in 1937, reached 9,000 feet altitude in 7 seconds. By 1935, his rockets had broken the sound barrier.

The Alamogordo Space History Museum overlooking White Sands Missile Range.

This book tells the story of New Mexico's role in space, from the beginning to the present. It has some excellent pictures of these early rockets, which featured liquid fuels, gyroscopes, and advanced engineering, all designed in Goddard's own machine shop.

As World War II interrupted Goddard's research and development of rocketry, another scientist, Robert Oppenheimer, organized the Manhattan Project in Los Alamos to construct the atom bomb. The test bomb was detonated in July 1945, in this same desolate New Mexico desert, called the "White Sands Missile Range."

After the end of the war in Europe, in August 1945, 300 train-carloads of German V-2 rocket components arrived at the White Sands Proving Grounds in

The remains of a V2 rocket on display at the Museum (left) and an F1 rocket engine.

southern New Mexico, followed soon by several hundred German rocket scientists, led by Werner Von Braun.

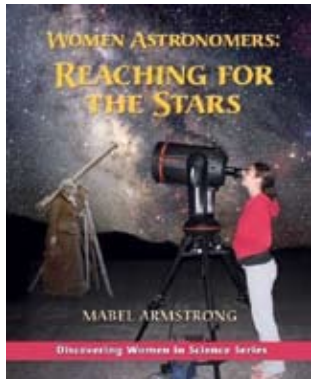
The newly assembled U.S. rocket program launched 67 V-2 rockets there between 1946 and 1951, some reaching 132 miles altitude. One of the charred V-2 rocket remains is now featured as an exhibit in front of the Alamogordo Space History museum.

Scientists used these launches for the first-ever space age experiments of the upper atmosphere, and its effects on everything from fruit flies to corn seed.

When Werner Von Braun moved his team to Huntsville, Alabama in 1951, NASA utilized the New Mexico area and R&D facilities for certain aspects of the Mercury program. The U.S. government built two huge science labs at Los Alamos and Sandia, which continue today.

Women at the Forefront of Astronomy

by Steve Carr



Women Astronomers: Reaching for the Stars
by Mabel Armstrong
Marcola, Ore.: Stone Pine Press, Inc., 2008
Paperback, 288 pp., $16.95

Mabel Armstrong has written a refreshing and inspiring tale of triumph for teenage readers about pioneering female astronomers who made great contributions in science, and who dared to challenge many assumptions of the day.

This is not a feel-good book, however, and in fact is a bit alarming, since over and over again these most promising women found that their biggest adversaries were often the prestigious universities and ivory tower research institutions which used blatant, heavy-handed tactics to discriminate against women and protect their "Big Bang"-style sacred cows.

Portrait of Hypatia of Alexandria (370-415), who designed the astrolabe for navigation.

The joy of discovery—that uniquely human quality—was usually the only reliable ally for these female heroes, whose lives were not about personal ambition, fame, or fortune.

For thousands of years, women have been at the forefront of astronomy. In the famous library at Alexandria, Egypt, Hypatia (370-415), a dedicated follower of Socrates and Plato, designed the astrolabe for navigation, along with a table of positions of stars that was used for more than 1,200 years by sailors around the world.

Caroline Herschel (1750-1848) and her brother, William, had two great passions, music and astronomy, and they built the world's largest telescope, considered to be the eighth wonder of the world at the time. They discovered Uranus, comets, and numerous nebulae, but it was Caroline's rigorous method that became the foundation of modern observational astronomy.

American Women Astronomers

Maria Mitchell (1818-1889) was the first to discover a comet in America, but had to defy the authorities at Vassar College, where she was head of the astronomy department, to carry out her work. She objected to the rules from the Vassar principal, which were obsessively concerned with creating proper ladies instead of enthusiastic learners. Mitchell violated many rules including the campus curfews, by calling her class at 3 A.M. to see a lunar eclipse.

Henrietta Swan Leavitt (1868-1921), an expert on variable stars, was reduced to working as a human computer (doing the tedious and time-consuming astronomical calculations) at Harvard's observatory, yet she discovered a method of measuring the size of our galaxy and the universe, which was considered to have been the greatest scientific advancement in 10 years.

Many thought that she had the best mind in the department, but she was personally barred by the department head, Edward Pickering from more advanced astronomy classes at Harvard. Some say that research of variable stars was set back several decades by this decision.

Another "computer," Antonia Caetana Maury (1866-1952), left Harvard because she used spectrograms to learn about entire life cycles of stars and their composition, while the department head, the same Pickering, only wanted to classify stars by brightness. If Harvard could not compete

Maria Mitchell (1818-1889) was the first in America to discover a comet.

"We need imagination in science. It is not all mathematics, nor logic, but is somewhat beauty and poetry."

—Maria Mitchell, astronomer