First Unitarian Universalist Society of Albany, 405 Washington Ave. Albany, NY 12206

7.14.13 Sermon: "Maria Mitchell: 19th Century Astronomer, Teacher, and Women's Rights Advocate"

Presenter: Sue Stierer

Good morning. My name is Maria Mitchell. I was born on August 1, 1818 on the tiny island of Nantucket off the coast of Massachusetts. My parents, William and Lydia Mitchell already had two children, and after me came seven more. I grew up in a Quaker community where women were respected members, the "divine light" in every person was recognized, and simplicity was the way to honor God. From my mother I learned to be thrifty and hardworking, to sew my own clothing, cook family meals at the kitchen fireplace, and keep the house clean. She had been a librarian and read to us daily; novels, short stories, poetry, the Bible, and *The Nantucket Inquirer* newspaper filled our home.

We lighted our homes with oil-burning lamps in those days, and many men from Nantucket, including my brother Andrew, went to sea hunting whales for their oil. But my father did not. He supported us by working as a store-keeper, a whale-oil refiner, a barrel-maker, and eventually as a banker. He also taught us our school lessons; first at home, and then in the school he established. Many evenings, my brothers and sisters and I followed him up to the roof to "sweep the sky" for stars through his telescope. He became a respected amateur astronomer and "learned societies" asked him to come speak to them. I loved gazing through his telescope, and eventually began helping him catalog the movements of the stars. He used this information to correct the chronometers brought to him by the captains of whaling ships stopping in Nantucket. (A **marine chronometer** is a clock that is precise and accurate enough to be used as a portable time standard; it can therefore be used to determine longitude by means of celestial navigation.) In 1831, when I was about 12, I assisted my father in the painstaking recording of crucial information during the solar eclipse.

By the time I turned 16, I had completed the normal school run by Cyrus Pierce and become his teaching assistant. Then I accepted the position as librarian for Nantucket's new Atheneum library and cultural center. Over the next 20 years, I cared for and read many of its 3200 volumes, **and** I was paid $60 a year! After I completed the work needed to maintain the collection, I could read the novels of Sir Walter Scott and James Fenimore Cooper, Shakespeare's plays and poetry, scientific journals, Benjamin Franklin's scientific writings and all 5 volumes of Celestial Mechanics by Pierre –Simon de Laplace!

In the lecture hall at the Atheneum, public discourses called lyceums, were held. Famous poets and scholars including Ralph Waldo Emerson, Henry David Thoreau, Theodore Parker, Horace Greeley, John Greenleaf Whittier, and Lucy Stone spoke. The Quaker community on Nantucket was an important part of the Abolition movement, and the first anti-slavery convention was held at the Atheneum in 1841; I heard Frederick Douglass deliver his first speech!

My father had become a cashier at the Pacific Bank, and I would often join him in his new observatory at night, using his 4 inch telescope to measure star movements for The United States Coast Guard. For those of you who may not know, the size of a refracting telescope

refers to the effective diameter of its objective lens, which is the lens nearest the object being viewed that “collects” the light. The larger the aperture, the greater the amount of light collected and the greater the resolution.

On October 1, 1847, I saw a new “fuzzy star” at five degrees above Polaris (the North Star) and recorded its coordinates, thinking it might be a comet. The next night it had moved and I was sure. The King of Denmark was holding a contest at that very time to discover the first “telescopic comet,” and our friend, William Bond at the Harvard Observatory immediately submitted my discovery. But Father Francesco de Vico at the Vatican Observatory in Rome had seen the same comet two days later, and, his entry arrived first, so he was awarded the prize. Professor Bond was determined that the prize should go to the real winner. He enlisted Harvard President Edward Everett in my cause. President Everett wrote an article for a German scientific journal explaining the circumstances of my discovery, then contacted an American diplomat in Copenhagen. Eventually, the King of Denmark presented me with the medal. I became a celebrity at 30! Letters of congratulations from around the world poured in; tourists stopped by. Doors of fashionable mansions opened to me. The whole thing seemed to me something of a farce. I still saw myself as a tall, bony, unattractive woman, with large dark eyes, a dark complexion, and a deep voice; when I was asked to sit for a portrait with my father, I persuaded one of my more attractive sisters to sit in for me. Later, when I **did** sit for portrait myself, I was painted looking through my telescope. I liked this portrait because it focused on what I was looking **at** not on my appearance.

Professional opportunities also arose after my discovery. The American Academy of Arts and Sciences voted me their first woman member in 1848. Joseph Henry, the director of the new Smithsonian museum sent me a $100 to continue my studies. The U.S. Nautical Almanac Office offered me a new job: I was to compute the tables predicting the daily position of Venus, for $300/year! It was with great gladness that I accepted this step into astronomy as my profession; I had long since decided that I ***did not*** want to spend my life as my mother had, raising children at home with no opportunity to pursue my other gifts and interests.

In 1856, I accompanied Prudence Swift, the daughter of a wealthy Chicago banker on a trip to Europe. The Almanac had reluctantly agreed to allow me to go, as long as I continued my assignment with them while I traveled. We sailed first by steamboat down the Mississippi River to New Orleans, where I was appalled at my first sighting of men and women being sold like cattle in a slave market. After arriving In London, we visited the Royal Observatory in Greenwich, and the home of my childhood hero, astronomer Sir John Herschel. Then on to Cambridge, Stratford-on-Avon, and Westminster Abbey. The financial crash in the States took Prudence home, but I was able to continue on to Rome with my new friends Nathaniel Hawthorne and his wife. By special arrangement, I was able to visit the Vatican Observatory, but in the daytime only. I did, however, observe Jupiter and Saturn through their telescope! When I visited British mathematician and astronomer Mary Somerviile, and, in Berlin, Alexander von Humboldt, the author of Cosmos.

I returned to Nantucket in the summer of 1858, where I spent the next three years taking care of my ailing mother. The severity and persistence of her illness were very difficult for my father and me since she had always been such a strong person. I did continue to study stars, especially the colors of binary star systems, with the new 5” telescope given to me by the group

called the Women of America. My mother died in 1861, just before the war started. After several years of depression, I moved with my aging father to Lynn, Massachusetts near Boston.

In 1864, Matthew Vassar, a wealthy brewer from Poughkeepsie, NY, built Vassar Female College, designing the grounds to look like the Tuileries Gardens in Paris. **He** believed that each woman had received from her creator the same intellectual constitution as man, and had the same right as man to intellectual culture and development. I accepted the position Mr. Vassar offered me as Professor of Astronomy and Director of the Observatory. Vassar's observatory was built to rival those at Harvard and Yale, with a 12 ¾ " aperture telescope in the dome, which was covered with sheets of tin, and revolved by operating 16 cast iron pulleys.

At Vassar, I dedicated myself to giving a solid education to young American women; I taught them to value themselves and their own minds, showing them a respect for their mental capacity many had never experienced. I was a rigorous teacher of mathematics, and urged my students to be patient and thorough. I taught them that astronomy "is not *all* mathematics, nor all logic, but it is somewhat beauty and poetry," and that "every formula which expresses a law of nature is a hymn of praise to God." I knew I had found an enterprise worthy of my best efforts and energy.

Not everyone at Vassar approved of me. Our principal Miss Hannah Lyman took exception to some of my teaching methods: getting my students out of bed in the middle of the night to witness astronomical events broke Miss Lyman's rule that all young ladies were to be in bed with lights out by 10 o'clock. In 1868, 5 students stayed up all night with me observing a meteor shower! Miss Lyman also thought that "Young ladies are not supposed to have feet" and expected their dresses to cover them. I was most comfortable in oversized boots and didn't care if they showed below the hem of my skirt. To expose Vassar students to new thinking about women's roles and lives, I invited progressive thinkers like Louisa May Alcott, Lucy Stone and Elizabeth Cady Stanton to speak at our school. Julia Ward Howe came and recited her "Battle Hymn of the Republic" for us.

Having overcome my earlier reluctance to socialize, I began to host teas for my students in the Observatory. My popular "Dome parties" were held in June, and for them I composed a poem for each student. In 1871, apparently impressed by Julia Ward Howe's words and music, two of my students wrote a song for our gathering that year which began, "We are singing for the glory of Maria Mitchell's name …" The second verse continued

"She leads us thro' the mazes of hard Astronomy, She teaches us Nutation and the laws of Kepler three, Th'inclination of their orbits and their eccentricity, Good woman that she be. Part of the last verse was "Let her name be sung forever, till through space her praises whiz, Good woman that she is."

Despite my students' dedication and admiration, I learned that in much of the United States, women and women's intelligence were not highly regarded. When I traveled to Russia in 1873, I found that thousands of women were studying science in St. Petersburg, ***and*** attending a medical school for women. The contrast I encountered at my first meeting of the Social Science Association in Boston when I returned was glaring: there I heard President of Harvard College Charles Eliot proclaim, "The minds of women are as different from men as are their bodies…

They cannot bear the stress of hard study." Hearing this from a fellow academician made me even more determined to work toward freeing women from suffocating ideas and roles.

In 1875, I met with Elizabeth Cady Stanton, Mary Livermore, Julia Ward Howe, Lucy Stone, and Susan B. Anthony in New York City to help plan a women's congress. We established the American Association for the Advancement of Women to work for women's rights, including our right to vote. I have worked hard in this organization, serving for a time as its President. As chair of the Committee on Science, I have promoted the cause of science education. In 1878, at the meeting of the fourth Congress of the AAW in Philadelphia, I presented a paper entitled, "The Need for Women in Science" in which I asked,

"Does anyone suppose that any woman in all the ages has had a fair chance to show what she could do in science? ... The **laws of nature** are not discovered by accidents; **theories** do not come by chance, even to the greatest minds; they are not born of the hurry and worry of daily toil; they are diligently sought, they are patiently waited for, they are received with cautious reserve, they are accepted with reverence and awe. And until able women have given their lives to investigation, it is idle to discuss the question of their capacity for original work."

When the backlash against the women's movement began, I spoke in favor of forfeiting traditional mannerly treatment in order to gain equality, "It wears upon me," I wrote, "When I hear a woman say, 'Men are no longer so ready to give up a seat in the train car, since the women's agitation arose.' Is such a statement true? If true is it of any consequence? Also – one grain of fair-dealing is worth more than a bushel of *courtesy*."

In fact, I have never been shy about asking difficult questions. Questions about the limitations placed on women; questions about scientific theories; questions about religious ideas traditionally accepted as truth. After the untimely death of my 3 year old sister Eliza, I asked many of these thorny questions in the Quaker meeting on Nantucket. The explanations I was given did not satisfy my need for logical reasons. I soon left that meeting and sought fellowship at the Unitarian Church in town, where I attended regularly but never joined. There my questions about life after death, the ultimate purpose of suffering, and our place in the universe were welcomed.

In studying the cosmos as an astronomer, I have become aware of the immense voids between the members of our solar system. I once wrote in my journal, "If God expresses infinite force by the mechanical powers at work in Nature, if he shows the infinite Artist in the wonderful beauty of nature, infinite wisdom in the creation of mind, what does he express by vacant spaces? Does he typify his own infinite loneliness?"

At Vassar I have often met with colleagues of Unitarian "leaning" for discussion, especially of my favorite topic, the immortality of the Soul. A fellow faculty member Frances Woods recalls that I once wrote," Let us have truth, even if the truth be the awful denial of the good God. We must face the light and not bury our heads in the earth. I am hopeful that scientific investigation, pushed on and on, will reveal new ways in which God works, and bring to us deeper revelations of the wholly unknown."

This remains my fervent hope.

Thank you.