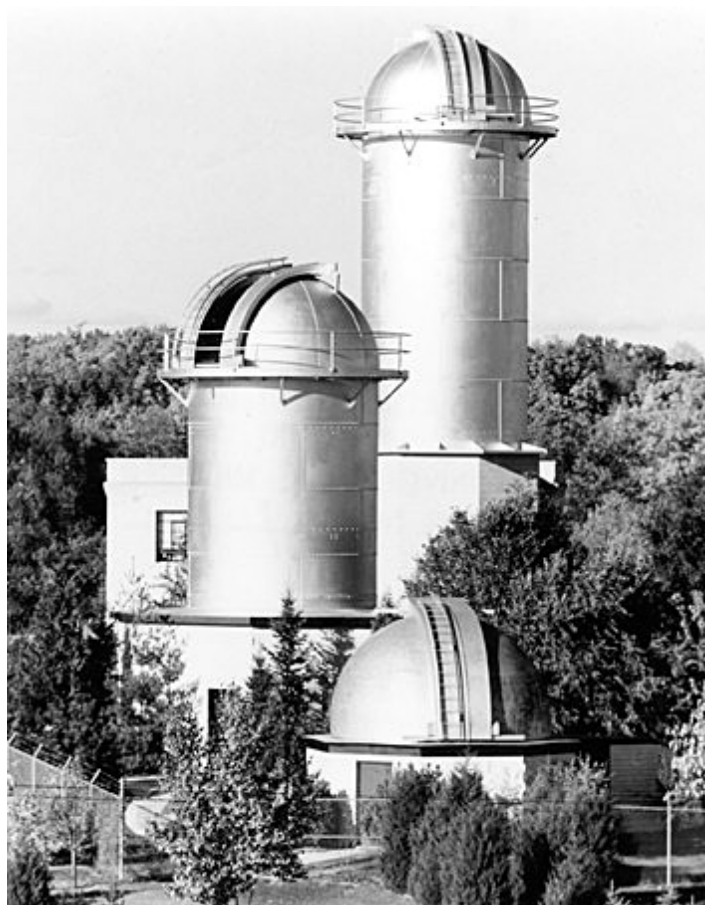


The History of the McMath-Hulbert Observatory

by Dave Snyder
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A businessman who developed an interest in astronomy eventually interested one of his sons and a Wayne County judge as well. The three of them founded an observatory on Lake Angelus (near Pontiac Michigan). Because of their innovative use of motion pictures to study the moon and the sun, the University of Michigan quickly started a collaboration with this new observatory. After the initial attempts to study the moon, the main preoccupation of the observatory was the sun. Between the three partners, they had experience with mechanical engineering needed to construct the needed equipment and with raising money for buying

materials (however much of the labor was donated which reduced the costs).

Research work at the McMath-Hulbert Observatory included:

- The motion of solar prominences (first determining the motion perpendicular to the line of sight and later motion both perpendicular and parallel to the line of sight).
- Measurements of solar prominences using hydrogen, calcium and other elements in the sun's atmosphere.
- Energy changes in the solar prominences.
- Observations of earth's atmosphere. Such observations were obtained by observing how light from the sun was absorbed.
- Radio frequency emissions at the time of solar flares.

An chronology of events follows:

- 1922 - Two businessmen, Francis C. McMath and his son Robert R. McMath had an interest in Astronomy and acquired a 3" telescope.
- 1925 - Francis McMath, Henry S. Hulbert (a Judge from Wayne County Michigan), and William Joseph Hussey (then director of the [Detroit Observatory](#)) arranged to fly a balloon to observe a solar eclipse in New York, but weather conditions prevented any observations.
- 1926 - A 4" refractor was constructed. It was driven with a spring clock.
- 1927 - Robert designed and built a dome to house the 4" telescope built earlier.
- 1928 - A motor was installed to drive the 4" telescope. That summer, motion pictures were made of the moon with this new observatory. Then director of the University of Michigan Astronomy Department, Ralph H. Curtiss, saw these motion pictures and decided to collaborate with the two McMath's. The intent was to produce an instrument that would produce celestial motion pictures. Curtiss died before the project was finished. (Apparently the idea of celestial motion pictures originated at this time as the concept was described as "novel").
- 1929 - Hulbert teamed up with the two McMath's. All three were made honorary curators of astronomical observation at the request of Dr. Curtiss.
- 1930 - McMath, McMath and Hulbert started operations at a new observatory located on Lake Angelus (near Pontiac Michigan). There was one building with a 16 foot dome that housed a 10.5" equatorial telescope.
- 1931 - Heber Doust Curtis accepted the position of University of Michigan's Director of Observatories. He suggested that the observatory be named the McMath-Hulbert Observatory in recognition of the three founders.
- 1932 - The original intent of the celestial motion pictures was educational, but it became clear that such pictures had scientific value as well. With that in mind a motion picture of the sun was produced. This required a new instrument called a spectroheliokinematograph. This instrument was attached to the end of the 10.5" refractor. Such pictures showed solar prominences.
- 1933 - An extensive project was undertaken to produce a telescope drive that would smoothly track. This eventually involved a partnership with the Detroit Edison company. Only late in the year was a completely satisfactory drive produced.
- 1933 - Neil Cook McMath (Robert's brother) joined the effort.
- 1934 - By this time Curtis had shown the pictures taken at the McMath-Hulbert Observatory to a large number of people including lay audiences and scientists. The scientific audience was impressed both with the novelty and with the insights gained from the movies.
- 1936 - A 50 foot tower was constructed designed solely for solar observations. The Mt. Wilson Observatory gave technical assistance and loaned some equipment (including a diffraction grating).

Funding was provided by the University and the McGregor Fund. This tower had a spectrograph well that dropped 31 feet into the ground. With this tower it was possible to observe prominences in three dimensions and to observe the sun's light in both hydrogen and calcium. The focal length could be any of 50, 40, 20 or 6 feet. The Spectrograph had a focal length of either 15 or 30 feet. In addition to the other equipment, there was a radial velocity spectrograph.

- 1936 - The work of the McMath-Hulbert Observatory gave proof that the light pressure theory of solar prominences (popular at the time) could not be true.
- 1938 - An auxiliary photoelectric guiding mechanism was constructed.
- 1939 - A technique for measuring motions of solar material along the line of sight was developed (previously only measurements of motions perpendicular to the line of sight could be made).
- 1939 - The property on which the three buildings were built was deeded to the University.
- 1940 - After the death of F. C. McMath, a 24" Cassegrain (a reflector telescope) was completed, but not made use of until the next year. This telescope was designed so various instruments could be attached. In honor, it was named the F. C. McMath Memorial Telescope. This telescope was later moved to [Peach Mountain](#) where it is now used by the University Lowbrow Astronomers.
- 1941 - A new building known as the McGregor building in memory of Tracy W. McGregor was constructed (a tower 75 foot high). This instrument allowed the sun's energy changes to be measured (among other things). There were 3 spectrographs and a diffraction grating.
- 1941 - The 10.5" telescope was replaced with the new 24" telescope.
- 1955 - A Vacuum Spectrograph was constructed. This was one of the last big astronomical instruments to be built without government assistance.
- 1958-1959 - The 24" telescope was moved from Lake Angelus to [Peach Mountain](#).
- 1961 - Robert McMath became chairman of AURA, Inc. (an astronomy research organization). See [Portage Lake Observatory](#) for more information on AURA.
- 1979 - The University ends its support for the McMath-Hulbert Observatory.

There were several publications between 1950-1966 relating to solar research conducted at the McMath Hulbert Observatory. The McMath-Hulbert Observatory still exists.



Photo Credits

The photograph at the beginning of this page shows the McMath-Hulbert Observatory shortly after McGregor building was constructed in 1941 and is used with permission of the McMath-Hulbert Observatory.

The second photograph was taken by Bill Blevins on November 2, 2003. On that date a group of Lowbrows took a field trip to the McMath-Hulbert Observatory. [A Field Trip to the McMath-Hulbert Observatory](#) has photographs taken during that field trip.

For More Information

- [The McMath-Hulbert Observatory.](#)
- [The McMath-Hulbert Observatory Facebook Page.](#)

Links

- [The History of the University of Michigan Observatories located in Ann Arbor, Dexter and Pontiac Michigan, Arizona, Chile and South Africa.](#)
- [Bibliography.](#)
- [The Home Page for the University Lowbrow Astronomers.](#)
- [The University of Michigan Astronomy Department.](#)
- [The University of Michigan Gateway.](#)
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