

The IAU Historical Instruments Working Group. 2: Harvard's Collection of Historical Scientific Instruments and its astronomical treasures

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Located in the new wing of the Science Center of Harvard University, the Collection of Historical Scientific Instruments contains one of the finest university collections of its kind in the world. With close to 20,000 artifacts dating from the early fifteenth century to the present, the Collection covers a broad range of disciplines, including astronomy, navigation, horology, surveying, geology, meteorology, mathematics, physics, biology, medicine, chemistry, experimental psychology, and communications. Noteworthy among these are scientific instruments that Harvard purchased in London with the help of Benjamin Franklin in 1764 after a disastrous fire destroyed the College's philosophical apparatus in the old Harvard Hall. The historical value of the instruments is greatly enhanced by original documents preserved in the Harvard University Archives and by over 6,500 books and pamphlets in the Collection's research library that describe the purchase and use of many of the instruments.

Of particular interest to historians of astronomy are instruments used by John Winthrop, Hollis Professor of Mathematics and Natural Philosophy, to observe the Transits of Venus in 1761 from Newfoundland and 1769 from Cambridge. These include clocks, telescopes (Figure 1), heliometers, and astronomical quadrants (Figure 2). These and related instruments were also used by Winthrop's successor, Samuel Williams, to observe the total solar eclipse of 1780 (during which Williams was the first to record Bailey's beads) and to survey the boundaries between New York, Massachusetts, and Canada. The Collection also has two exquisite grand orreries by Benjamin Martin of London and Joseph Pope of Boston (Figure 3), a Martin cometarium, the largest collection of sundials in North America, some early astrolabes (Figure 4) and globes, and the earliest Hadley's quadrant known.

The work of the Harvard College Observatory during the nineteenth century is documented in the Collection by a superb group of astronomical regulators, including many by William Bond and Son that delivered standard time to New England and the railroads. We also have the Observatory's first and second meridian circles by Troughton and Simms; early photometers used by HCO Director Edward C. Pickering; Henry Draper's 28-inch, silver-coated glass mirror used in the early observations of star spectra that culminated in the Henry Draper Catalog of spectral classifications; and the tailpiece of the 24-inch Bruce Doublet telescope used to make the photographic plates of the Great Magellanic Cloud from which Henrietta Leavitt derived the period-luminosity relation of the Cepheids.

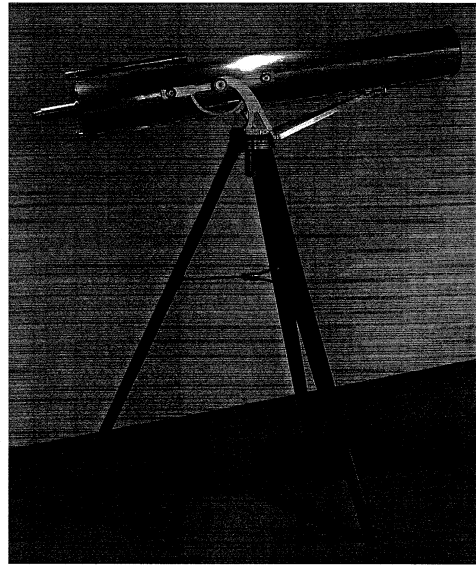


Figure 1. Four-foot Gregorian reflecting telescope made by James Short, London, c. 1768 under the supervision of Benjamin Franklin and used by John Winthrop to observe the transit of Venus in 1769 from Cambridge, Massachusetts.

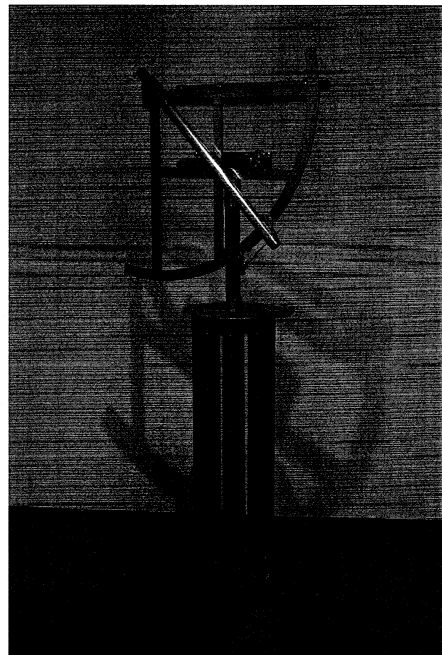


Figure 2. Astronomical quadrant by Jeremiah Sisson, London, c. 1765, also purchased with Franklin's help after the fire of 1764 and used by Winthrop to observe the transit of Venus in 1769.

Instruments of note from twentieth century laboratories at Harvard include the cloud chamber in which Jabez Curry Street discovered the cosmic muon (Figure 5), Theodore Lyman's spectrographs, apparatus used in the Pound-Rebka experiment to measure the gravitational redshift of light, and a spectro-heliometer designed for Sky Lab. Our collections continue to grow!



Figure 3. Grand orrery completed in 1786 after ten years of work by Boston clock maker, Joseph Pope. The cosmic sphere sits on the shoulders of cast brass figures representing Science and the State: Isaac Newton, Benjamin Franklin, and James Bowdoin (the Governor of Massachusetts). The orrery was purchased for Harvard in 1788 by public lottery.

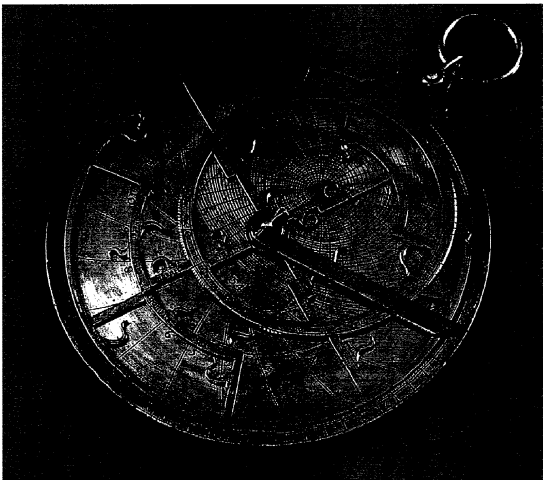


Figure 4. The oldest instrument in the CHSI is this astrolabe by Jean Fusoris, Paris, c. 1400.

Although Harvard University has been acquiring scientific instruments for teaching and research for over 300 years, it was not until 1947 that a serious attempt was made to preserve its historical apparatus as a resource for students and faculty. Here credit must go to David P. Wheatland and I. Bernard Cohen. Since the first exhibition of instruments was held in 1959, the Collection has grown rapidly both from within the University and from private donations. The Collection of Historical Scientific Instruments became affiliated with the Department of the History of Science in 1989. Like many other Harvard collections, its primary purpose is teaching and research, providing students and scholars with the opportunity to examine and work with artifacts that have made science possible.

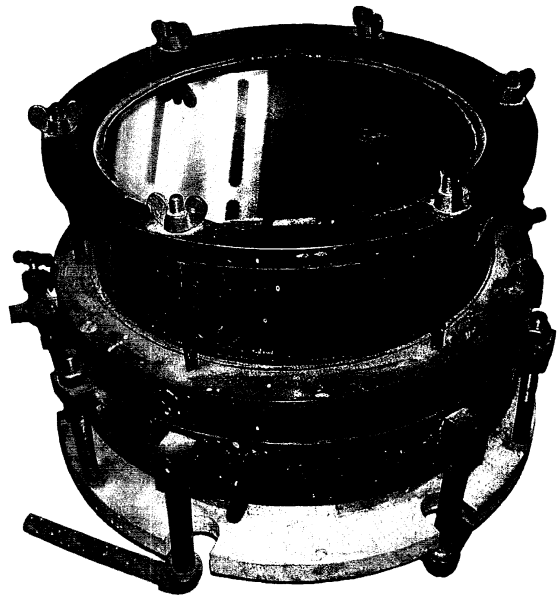


Figure 5. Cloud chamber built in 1936 by Harvard physicist, Jabez Curry Street, for the study of cosmic rays, and in which he first detected the muon.

The Collection has two public museum galleries (located in Science Center 136 and 251), a research library and instrument study room (Science Center 250), a conservation laboratory, and classroom. Curatorial offices are located in Science Center 251c. Please call ahead (617-495-2779) for library and gallery hours. We are wheelchair-accessible.

For more information, please contact the author.