

Olaus Roemer Biography

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Biography

Olaus Roemer was born in Jutland on September 25, 1644. He studied astronomy at the University of Copenhagen and traveled to Paris where he found his calling in observing the motions of Jupiter's largest satellites.

Gian Dominico Cassini, a colleague of Roemer's, had made very accurate observations of the orbits, and it was possible to predict precisely when a moon would be eclipsed as it passed behind Jupiter. Roemer discovered, to his surprise, that the predicted times did not agree with observations. When the Earth came around the Sun and was approaching Jupiter, the eclipses happened earlier than predicted. When the Earth was moving away from Jupiter, the eclipses occurred later. Roemer assumed the disparity was caused by the different distances light had to travel to get from Jupiter to the Earth.

But how to determine that speed? As great a personage as Galileo had tried and failed, but the scale he used was too small. He tried to measure the speed of light as it was flashed from one hilltop to another. Roemer's scale was much larger; he had nearly a billion kilometers. All he had to do was to note the timing of an eclipse of one of the moons when Earth was closest to Jupiter, and again when the Earth was farthest away. His calculation showed that light traveled about 141,000 miles (227,000 km) in a single second. That was a bit short of the actual number; today's value is 186,282 miles (299,792 km) per second. At that speed, a particle of light would travel around the Earth's equator 7.5 times in a single second.

Today the speed of light is a fundamental yardstick. When it was announced in 1676 it was scarcely noticed. Indeed, it was not until James Bradley's work nearly fifty years later that the speed of light returned from oblivion. After Roemer returned to Copenhagen, he worked on reforming the Danish system of weights and measures, helped get the controversial Gregorian calendar into use, and worked with Gabriel Daniel Fahrenheit (1686-1736) to establish his new system of temperature. Roemer was also known as a talented inventor of clocks and mechanical devices, including a micrometer, astronomical instruments, and a new thermometer. He died on September 19, 1710.