

Earth travels in its orbit at least 210 Earth diameters in 42.5 hours.³ If R is the radius of Earth's circular orbit, the planet covers a distance of $2\pi R$ per year, which puts the lower limit for the radius at 9.2×10^7 km; consequently, the lower limit of the speed of light is 140 000 km/s.

Probably the first person to actually calculate the speed of light was Huygens in 1678. Rømer communicated his results to Huygens in a letter before the paper was published. In his famous *Traité de la Lumière*,⁴ Huygens wrote that Rømer's results had not yet been published. Huygens's book appeared in 1690, but it had been written before 1678. In that year, he presented his theory on light at the academy.

Like Rømer, Huygens seemed barely interested in the exact value of the speed of light. He estimated Earth's diameter to be 12 750 km and the diameter of its orbit to be 24 000 Earth diameters. According to Rømer's observations, light traverses this distance in 22 minutes. To keep things simple, Huygens rounded the speed down to 1000 diameters per minute, or 212 400 km/s. Without the rounding, his speed of light would have been 232 000 km/s. It was Edmund Halley, in 1694, who found that Rømer's 22 minutes should instead be 17 minutes; thus Halley gave the speed of light as approximately 300 000 km/s.

The conclusion must be that Rømer is not directly responsible for any of the values of the speed of light attributed to him. He probably was aware that the data were uncertain. But he was the first one to prove that the speed of light is finite—a scientific breakthrough that is essential to modern physics. If the speed of light were not finite, we probably would have to stick to a platinum bar in Paris for the standard meter.

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Clarifying Teller's Science Story

Two points in our recent article on Edward Teller's scientific life (PHYSICS TODAY, August 2004, page 45) require correction.

In our description of Teller's students, we incorrectly stated that Arthur Kantrowitz's thesis was on the generation of hypersonic molecular beams. Actually, his thesis was on heat capacity lags in gas dynamics.¹ Kantrowitz's invention of high-intensity sources for molecular beams came later in his career.²

Maurice Goldhaber has emphasized that the situation with respect to possible nuclear resonances in (γ, n) or $(\gamma, fission)$ reactions was quite unclear at the time of George C. Baldwin and G. Stanley Klaiber's papers on these reactions.³ That was because the rapid rise of their yield to a prominent peak with increasing energy, followed by a slower fall off was then thought to have been due to the competition between the rapidly rising density of nuclear states and the eventual domination of other reaction channels at higher energies. Goldhaber realized, however, that there could be an analogy between a possible collective nuclear resonance and the restrahl resonance (essentially the transverse optical phonon frequency) in polar crystals. Goldhaber sought out Teller because of his paper, with Russell Lyddane and Robert Sachs, relating the restrahl frequency to the asymptotic behavior of the crystal's dielectric function.⁴ Goldhaber and Teller, in their paper together, went on to predict *universal*, giant photo-nuclear resonances.⁵

References

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