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The search for the Aether : From Roemer to Einstein, who abolished it to get $E=mc^2$

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This talk concerns the highly unlikely connection between attempts to locate an absolute frame of reference in the universe, and Einstein's equation between mass and energy*. The Aether, a ghostly vortex foam, which all scientists before 1900 believed filled the universe, provided the frame of reference against which the speed of light was to be measured, giving Maxwell's fixed speed and a medium to support light propagation in vacuum. The excellent agreement between Fresnel's Aether drag theory (assuming an Aether) and Michelson's null result caused a major crisis in Physics around 1900. The resolution to this was found in Einstein's relativity, while the resolution to a second crisis, understanding back-body radiation, led to the birth of quantum mechanics. I'll describe the history of measurements of the speed of light from the ancient Greeks, through Roemer, Bradley, Wheatstone, Fresnel, Faraday, Fizeau, Foucault, Maxwell and Michelson. I'll end with relativity and quantum schemes for faster than light communication. * "Lightspeed". J.C.H.Spence. Oxford University Press (2019).