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The Discovery of the Two Fluid Theory and Second Sound in Helium II

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Colleagues and friends recently celebrated the one hundredth birthday of Laszlo Tisza at MIT. Tisza's discovery of the two fluid model of Helium II and prediction of second sound were recalled on that occasion. We review the controversial discovery of second sound and its modern applications. The two fluid theory of Helium II and the prediction of the existence of two forms of sound propagation make Laszlo "Laci" Tisza one of the important figures of twentieth century physics. Tisza died on April 15, 2009, his obituary is in the July issue of Physics Today. In this talk we explore the remarkable story of the discovery of second sound and mention some of the ways in which second sound is enabling landmark studies in quantum turbulence and prospects for observing second sound in a uniform superfluid gas of ultracold Fermi atoms.