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Knowledge through Measurement

Time, Einstein, and Metrology with the coolest stuff in the universe

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At the beginning of the 20th century Einstein changed the way we think about Time. At the beginning of the 21st century Einstein's thinking is shaping one of the cornerstones of modern metrology and a scientific and technological wonder of contemporary life: atomic clocks, the best timekeepers ever made. Such super-accurate clocks are essential to industry, commerce, and science; they are the heart of the Global Positioning System (GPS), which guides cars, airplanes, and hikers to their destinations. Today, atomic clocks are still being improved, using atoms cooled to incredibly low temperatures. Atomic gases reach temperatures less than a billionth of a degree above Absolute Zero. Super-cold atoms are at the heart of atomic clocks that realize the definition of the second to about one part in 10^16. Other atomic clocks operate with accuracies of one second in the age of the universe. Metrology with such clocks allow tests of some of Einstein's strangest predictions.

This will be a lively, multimedia presentation, including experimental demonstrations and down-to-earth explanations about some of today's most exciting science.