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Always a Good Time! The NRC Atomic Fountain Clock; Canada's Primary Frequency Standard

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The accurate measurement of time is of critical importance to society as it provides the means to synchronize events in our lives. The world has ever-increasing demands for precise time in fields such as automation, energy grids, smart cities, financial markets, fundamental research, and global positioning and navigation. Since the world moved to an atomic definition of time in the 1960s, caesium fountain clocks have provided the most accurate realization of the SI second. At the National Research Council, the NRC-FCs2 fountain clock has been operating as a primary frequency standard for Canada since 2020. It is used to contribute to the steering of International Atomic Time, as well as Canada's official timescale. I will outline the design and performance of the clock, describe the current efforts to re-evaluate the systematic shifts that limit the uncertainty, and discuss the upcoming redefinition of the SI second.

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