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[82] When time became atomic –time measurement between astronomy and atomic physics after World War II

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Today, atomic clocks are among the most emblematic instruments for precision measurement. In the pursuit of the next decimal after the comma, all kinds of cutting edge quantum techniques are mobilized, such as entanglement, atom trapping or laser cooling. Only 70 years ago, improvement of time measurement was predominantly thought of in terms of new astronomical instruments, the perfection of star catalogues or the formulae of celestial mechanics.

In this talk I want to present how atomic physicists gradually arrived in timekeeping during the decades after World War II. What were their motives to get involved with atomic clock research? How was the new technique received by the traditional “Keepers of time” in national observatories? What was the role of atomic clocks in the more general evolution of time and frequency metrology? My goal is to show that the answers to these questions are more complex than a simple, linear story of increasing precision would suggest.

I will focus on two examples from France and Switzerland: the former was seat of the World Time Bureau at the Paris Observatory during the period in question and mobilized renowned physicists like Alfred Kastler (Nobel laureate of 1966) to work on atomic clocks. Despite this accumulated prestige, it was not the French Republic but the small Republic and Canton of Neuchâtel that managed to build and operate the first atomic clocks on the European mainland in the late 1950s.

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