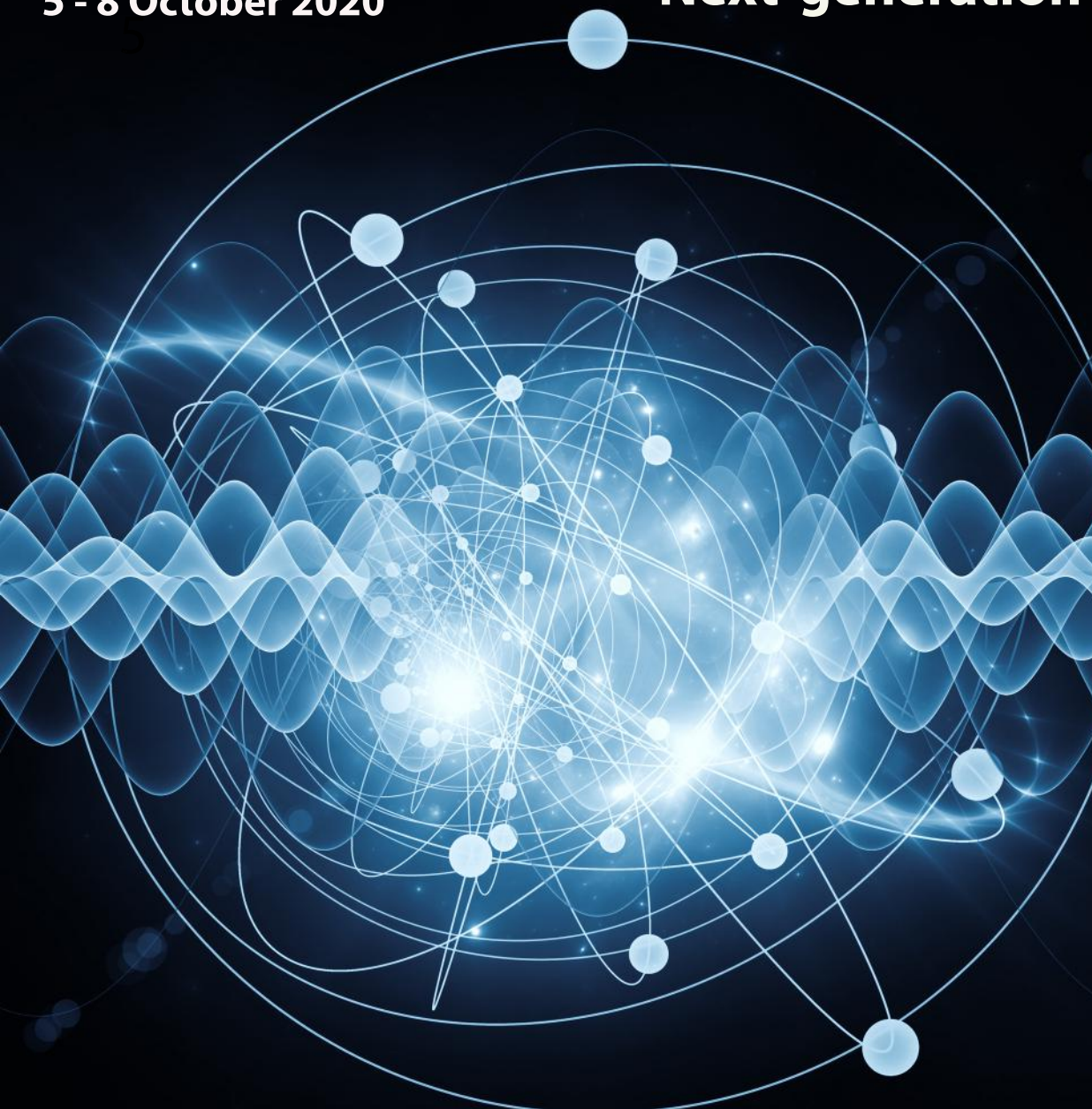


5 - 8 October 2020

Online Workshop on Next-generation quantum clocks



Atomic clocks are the most accurate measurement instruments ever realized. They have progressively improved their accuracy and stability, making a large number of fundamental physics tests possible in general relativity, the standard model, and many others. Impressive progresses have been made in the last two decades in the field of optical clocks, bringing their accuracy to 18 digits: this means less than 1 second inaccuracy over the age of the Universe. Up to now the large majority of optical clocks may be characterized as quantum technology of the first generation: these outstanding measurement machines are based on “classical” spectroscopy of atoms/ions, cooled and trapped in specialized experimental apparatus, but they do not exploit exotic quantum phenomena like collective effects or entanglement.

New perspectives are now on the horizon to realize the next generation of quantum clocks: collective behavior of atoms and ions, spin squeezing, entanglement, superradiance, nuclear transitions, application of quantum logic and other tricks can be exploited to further improve quantum clocks both in terms of stability and accuracy.

With 8 tutorial lectures given by world leading scientists, the workshop will be a great opportunity to learn about these new techniques and their application in the field of time and frequency metrology.

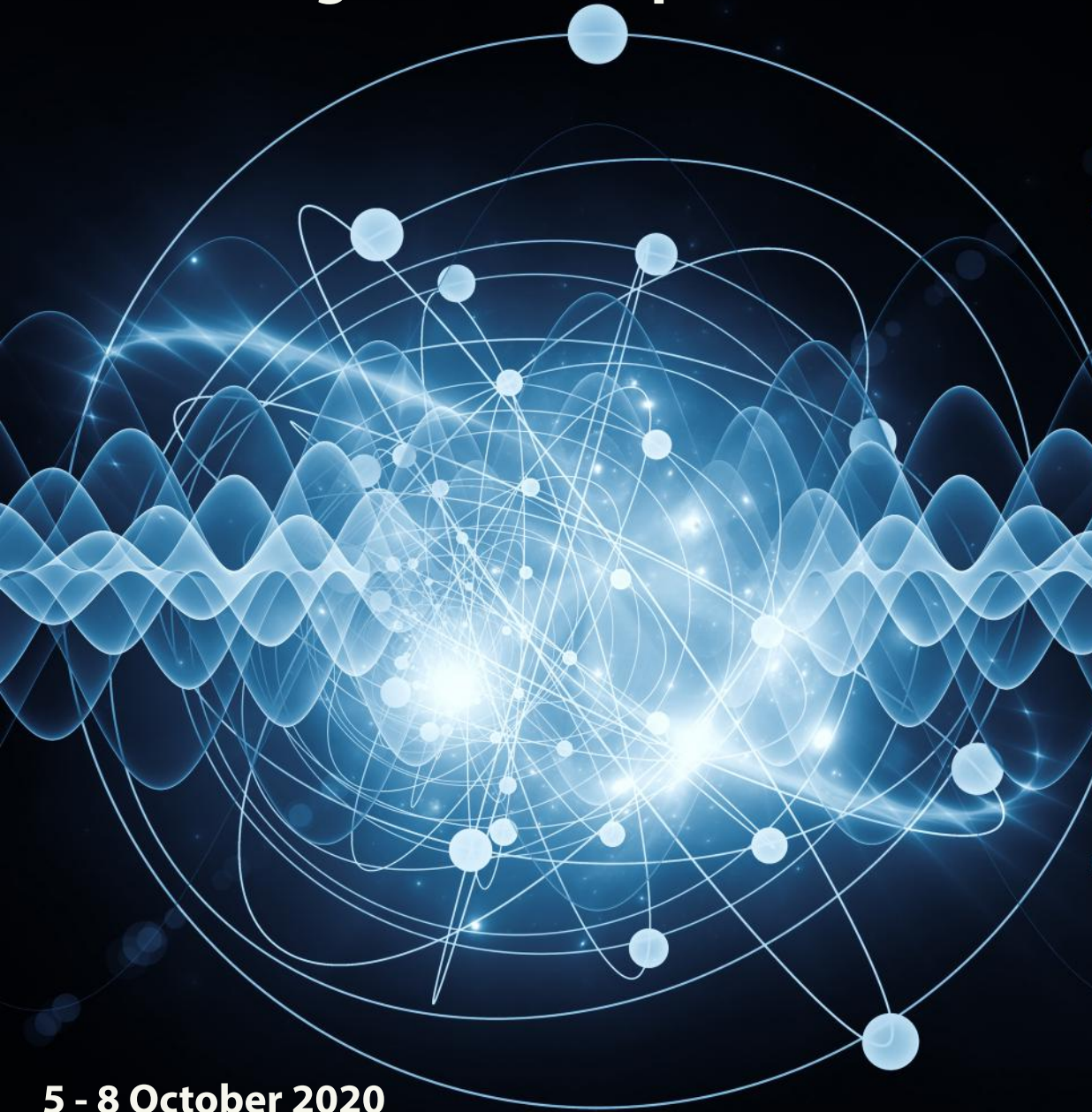
Students already involved in this field of research are warmly invited to present a poster about their most recent results. The best posters will have a 10 minutes’ oral presentation slot, while all other posters will be presented in dedicated web-rooms.

Register at:

<http://s.ic.fio/WorkshopNext-generationQuantumClocksOct2020>



Online Workshop on Next-generation quantum clocks



5 - 8 October 2020

Monday 5 October

Tutorials

14.00 -14.45 - **Entanglement** - Luca Pezzè, INO-CNR (I)

15.00 -15.45 - **Spin squeezing** - Daniel Benedicto ICFO (E)

16.00 -17.00 - **Student short talks**

Tuesday 6 October

Tutorials

14.00 -14.45 - **Rydberg clocks** - Matthew Jones,
Durham Univ. (UK)

15.00 -15.45 - **Super-radiance** - Stefan Alaric Schäffer,
NBI - Univ. Copenhagen (DK)

16.00 -17.00 **Poster**

Wednesday 7 October

Tutorials

14.00 -14.45 - **Ion gates** - Guido Wilpers, NPL (UK)

15.00 -15.45 - **Ion crystal clock** - Tanja Mehlstäubler,
PTB-QUEST (D)

16.00 -17.00 **Student short talks**

Thursday 8 October

Tutorials

14.00 -14.45 - **Quantum logic clock** - Piet O. Schmidt,
PTB-QUEST (D)

15.00 -15.45 - **Thorium clock** -Thorsten Schumm, TU Wien (A)

16.00 -17.00 - **Poster**

