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【563】Classical many-body time crystals

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Discrete time crystals are a many-body state of matter where time translation symmetry is spontaneously broken in a periodically driven system. In view of the intense debate regarding the minimal requirements for the realization of a discrete time crystal, here we present a very pedagogical example of a many-body time crystal using coupled parametric resonators. We use classical bifurcation theory to study this resonator network and provide a clear distinction between an effective *single mode* and a truly *many body* time-translation symmetry breaking. We experimentally demonstrate this paradigm using two coupled mechanical oscillators, thus providing a clear route for time crystals realizations in real materials.

Authors: HEUGEL, Toni (ETH Zurich); OSCITY, Matthias; Dr EICHLER, Alexander (ETH Zurich); Prof. ZILBERBERG , Oded (ETH Zurich); Dr CHITRA, R. (ETH Zurich)

Presenter: HEUGEL, Toni (ETH Zurich)

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