



# **Seminar announcement**

**Tuesday, June 20, 2023**

**1:00 pm**

**WSI, Seminar room S 101**

## **“Continuous time crystal in semiconductors: Robustness and melting”**

We demonstrate the realization of continuous time crystals (CTCs) in semiconductors based on the dissipative electron-nuclearspin system. CTC represents the spontaneous and persistent breaking of translational symmetry in time. Our study establishes robust CTC dynamics (limit cycle) over a wide range of control parameters, including laser power, temperature, and magnetic field. The coherence time of the periodic oscillations, indicative of the ideal ordering of "time atoms" within the CTC, is defined by the experimental measurement time and extends to several hours. Additionally, we observe the presence of chaotic oscillations, signaling the melting of the CTC. The chaotic regime manifests as the broadening of spectral density peaks, indicating a deviation from ideal translational invariance in time. Our findings provide insights into the dynamic regime of CTC melting, including Lyapunov exponents and correlation dimensions. Finally, we present a model describing the required conditions for the CTC behavior in our system.

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