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# Seminar über Quanten-, Atom- und Neutronenphysik (QUANTUM)

Dec. 21, 2023 at 2 p.m.  
IPH Lorentzraum 05-127

Prof. Jörg Pretz  
Forschungszentrum Jülich

## **Spin Polarization Experiments at Storage Rings: Axion Searches and Electric Dipole Moments**

Electric Dipole Moments (EDMs) of elementary particles, including hadrons, are considered as one of the most powerful tool to study CP-violation beyond the Standard Model. Such CP-violating mechanisms are searched for to explain the dominance of matter over anti-matter in our universe. Hypothetical dark matter particles, like axions or axion-like-particles, induce an oscillating EDM. EDMs of charged particles can be measured in storage rings. Due to an EDM, the spin vector will experience a torque resulting in a change of the original spin direction which can be determined with the help of a polarimeter. Although the principle of the measurement is simple, the smallness of the expected effect makes this a challenging experiment requiring new developments in various experimental areas.

The talk will focus on first results obtained at the Cooler Synchrotron COSY at Forschungszentrum Jülich and will also discuss future plans.

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