

# Physikalisches Kolloquium

Donnerstag, 09.07.2026, 16:30 Uhr – Hörsaal 5F

## The Limits of Symmetry in Quantum Measurements

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Quantum measurements are often introduced as sharp yes-or-no tests: projective measurements that cleanly distinguish orthogonal quantum states. But quantum theory allows for a much broader class of measurements, known as POVMs, which can be "fuzzier" yet often more powerful. These generalized measurements are central to quantum information, as they can yield a proper advantage over standard projective measurements in tasks such as state estimation and discrimination.

But how far can a quantum measurement depart from being projective? Since in the simplest quantum systems (qubits), a particularly elegant measurement, the so-called symmetric informationally complete (SIC) measurement, sits at this extreme, it was tempting to suspect that symmetry and maximal non-projectivity might be deeply linked. We show that this intuition breaks down in higher dimensions: in larger quantum systems, the most strongly non-projective measurements are not always SICs, highlighting a richer geometry of measurements than suggested by the familiar qubit picture, as symmetry alone no longer determines what makes a measurement maximally non-projective.

**Ab 16:00 Uhr Kaffee, Tee und Gebäck im Foyer links neben dem Hörsaal 5H  
Math.-Nat.-Fakultät (Gebäude 25.22. Ebene 00)**

**Für die Dozenten der Physik  
Prof. Dr. Dagmar Bruß**

Herr Dr. Wyderka strebt ein Habilitationsverfahren an der HHU an.