**Speaker:** **Nikolai Wyderka, Heinrich-Heine-Universität Düsseldorf**

**Title:** **The Geometry of Non-Projective Quantum Measurements**

**Date:** **Monday, June 8, 14:00 pm (s.t.)**

**Place:** **Seminar room 915**

## Title: The Geometry of Non-Projective Quantum Measurements

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 longerdetermines what makes a measurement maximally non-projective.