

**Speaker:** Paulina Fust

**Title:** Continuous Group Cohomology and Ext-Groups

**Abstract:** We prove that the continuous cohomology groups of a locally profinite group  $G$  with coefficients in a smooth  $k$ -representation  $\pi$  of  $G$  are isomorphic to the Ext-groups  $\text{Ext}_G^i(1, \pi)$  computed in the category of smooth  $k$ -representations of  $G$ . Furthermore, we prove that the continuous cohomology groups of a  $p$ -adic reductive group with coefficients in an admissible unitary  $\mathbb{Q}_p$ -Banach space representation  $\Pi$  are finite-dimensional. As an application of this result, we show that the continuous cohomology of  $SL_2(\mathbb{Q}_p)$  with values in non-ordinary irreducible  $\mathbb{Q}_p$ -Banach space representations of  $GL_2(\mathbb{Q}_p)$  vanishes.