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FAKULTÄT FÜR MATHEMATIK  
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Einladung zur öffentlichen Defensio von  
**Mag. rer. nat. Sophie Koch**

Thema der Dissertation:

## **On the special linear group over orders in quaternion division algebras - arithmetic and geometry**

Abstract: Let  $D$  be a central division algebra over an algebraic number field  $k$ . A maximal order  $L$  in  $D$  gives rise to an arithmetic subgroup  $H$  in the linear algebraic  $k$ -group  $SL(2, D)$ . The arithmetic subgroup acts properly discontinuously on a homogeneous space  $X$  associated to  $SL(2, D)$  and the quotient space  $X/H$  is non-compact. Following the general work of Borel and Serre,  $X/H$  has a natural compactification by adjoining finitely many boundary components  $e'(P)$ , one for each  $H$ -conjugacy class of proper parabolic  $k$ -subgroup  $P$  of  $SL(2, D)$ . The number of boundary components will be called the cusp number  $c(H)$  of  $H$ .

The main result is a precise description of the cusp number of  $SL(2, L)$ , where  $L$  is a maximal order in  $D$ . The cusp number depends on various invariants of the division algebra  $D$ , for instance the isomorphism classes and stable isomorphism classes of left  $L$ -ideals. We also give explicit examples of the calculation of cusp numbers, emphasizing the different cases which can occur.

Prüfungssenat:

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