**Oberseminar Arrangements and Symmetries**
Nick Proudfoot, Oregon, “Equivariant log concavity in the cohomology of configuration spaces”

*Abstract:* June Huh proved in 2012 that the Betti numbers of the complement of a complex hyperplane arrangement form a log concave sequence. But what if the arrangement has symmetries, and we regard the cohomology as a representation of the symmetry group? The motivating example is the braid arrangement, where the complement is the configuration space of $n$ points in the plane, and the symmetric group acts by permuting the points. I will present an equivariant log concavity conjecture, and show that one can use the theory of representation stability to prove infinitely many cases of this conjecture for configuration spaces.

Interessierte können den Vortrag über [Zoom](https://zoom.us) (Meeting ID: 623 2605 3276 Passcode: arrsym21) hören.

**Oberseminar Lie-Theorie**
Prof. Dr. Gerhard Röhrle, RUB, "OVERGROUPS OF REGULAR UNIPOTENT ELEMENTS IN REDUCTIVE GROUPS"

*Abstract:* There is a long and remarkable history of the study of the subgroup structure of reductive algebraic groups. This in particular involves overgroups of special elements. I shall report on recent joint work with Michael Bate and Ben Martin where we study reductive subgroups $H$ of a reductive linear algebraic group $G$ such that $H$ contains a regular unipotent element of $G$. We show that under suitable hypotheses, such subgroups are $G$-irreducible in the sense of Serre; this means such $H$ are not contained in a proper parabolic subgroup of $G$. This work generalizes previous results of Malle, Testerman and Zalesski. Time permitting I shall indicate analogous results for Lie algebras and for finite groups of Lie type.

Interessierte können den Vortrag auch über [Zoom](https://zoom.us) (Meeting ID: 649 2742 3608 Passcode: math) hören.
Seminar über Komplexe Geometrie
Johanna Neuhaus, RUB, “The Saturation Problem for SL_2-Subgroups of Classical Groups”
Abstract: Let S in G be an embedding of complex reductive groups. The ring of S-invariant polynomials C[X] over the projective variety X=G*[v_lambda] in P(V_lambda), where v_lambda denotes a highest weight vector of an irreducible G-representation V_lambda of highest weight lambda, is finitely generated. We can ask about non-trivial S-invariant polynomials and their (minimal) degrees. Furthermore, if S and G are fixed, we can ask about the existence of a (universal) N>0 such that there exists a non-trivial S-invariant polynomial of degree N on X if C[X] contains non-trivial S-invariant elements. We call the minimal N with this property the saturation coefficient of S in G. In my talk I discuss the case where S is an SL_2-subgroup of a classical group. I discuss the saturation coefficient for several types of SL_2-subgroups (such as the regular and the principal SL_2-subgroups) in detail, and provide an upper bound for the coefficient in the arbitrary case.

Oberseminar Kombinatorik
Laura Escobar, WUSL, "Determining the complexity of Kazhdan-Lusztig varieties"
Abstract: Kazhdan-Lusztig varieties are defined by ideals generated by certain minors of a matrix, which are chosen using a combinatorial rule. These varieties are of interest in commutative algebra and the study of Schubert varieties. Each Kazhdan-Lusztig variety has a natural torus action from which one can construct a polyhedral cone. The complexity of this torus action can be computed from the dimension of the cone and, in some sense, indicates how close the variety is to the toric variety of the cone. In joint work with Maria Donten-Bury and Irem Portakal we address the problem of classifying which Kazhdan-Lusztig varieties have a given complexity. We do so by utilizing the rich combinatorics of Kazhdan-Lusztig varieties.

Seminar über Komplexe Geometrie
Nicholas Lindsay, Universität Köln, “Hamiltonian S^1-actions on complete intersections”
Abstract: Dessai and Wiemeler proved that the only 6-dimensional complete intersections admitting a smooth circle action are the projective space and the quadric hypersurface. In this talk I will discuss a result in which I prove that "most" complete intersections with dimension a multiple of 8 do not admit a Hamiltonian circle action satisfying a certain mild hypothesis. The hypothesis is slightly awkward to state but it is satisfied if components of the fixed point set...
have dimension at most two. The proof uses a rigidity formula for the signature due to Jones and Rawnsley. Time permitting I will discuss some further questions.

**Conference: Two days in Symplectic Dynamics**
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