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G-Tutte polynomials

Given a list of integer vectors, one can associate several mathematical objects, e.g., matroids, hyperplane arrangements, toric arrangements, zonotopes etc. Each has certain (quasi)polynomial invariants which possesses rich topological and enumerative information. Among others the Tutte polynomial detects Betti numbers of the complement of a complex hyperplane arrangement and the arithmetic Tutte polynomial acts similarly for toric arrangements. In this talk, we introduce G-Tutte polynomial for an abelian group G (with a weak assumption on the finiteness of torsions). Main examples are abelian Lie groups with finitely many connected components. It is a generalization of "Tutte polynomials" in the sense that $G = \mathbb{C}$ and $\mathbb{C}^*$ recovers Tutte and arithmetic Tutte polynomial, respectively. We see that many well known properties are shared also by G-Tutte polynomials. We also discuss the topology of the complement of corresponding "arrangements" for non-compact group G. This is a joint work with Ye Liu and Tan Nhat Tran (arXiv:1707.04551).