
Groups admitting affine crystallographic actions*Dietrich Burde* (Univ. Wien)

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| TUE/P3 17:00–17:20 |
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In this talk I will discuss affine and nil-affine crystallographic actions of groups. In the seventies J. Milnor studied fundamental groups of complete affinely flat manifolds. In this context he proved that any virtually polycyclic group Γ admits a faithful and properly discontinuous action by affine transformations $x \mapsto Ax + b$ on some Euclidean space \mathbb{R}^n . He conjectured that Γ can act also with compact quotient in this way, i.e., that Γ admits an affine crystallographic action. This was an open problem for a long time. However, it turned out to be false in general. In a more general setting however, every virtually polycyclic group Γ admits a so called *nil-affine* crystallographic action. We will explain this generalization and present joint work with Karel Dekimpe, Sandra Deschamps and Kim Vercaemmen on this topic. This includes results on the "generalized Auslander conjecture", on simply transitive actions of a given Lie group G on some other nilpotent Lie group N , on the translation to the Lie algebra level, and on the study of associated compatible algebra structures on the Lie algebra of N .