Oberseminar
zur
Algebra und Algebraischen Kombinatorik

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"Free simplicial arrangements with low multiplicities"

A *simplicial line arrangement* is a finite set $\mathcal{A}$ of lines in the real projective plane such that the induced cell decomposition is a triangulation. Despite being very natural geometric and combinatorial objects, their classification remains an open problem to this day.

However, there exists a longstanding catalogue published by Grünbaum, listing almost all currently known examples: since its publication, only three more additional examples have been discovered by Michael Cuntz. Thus, it is widely believed that -up to finitely many corrections- Grünbaum's catalogue is complete.

In this talk, we are interested in *free* simplicial arrangements and by Terao's factorization theorem we are led to study simplicial line arrangements $\mathcal{A}$ whose associated characteristic polynomials have only real roots. Among these arrangements, we classify those having the property that every point of the plane is incident with at most four lines of $\mathcal{A}$. It turns out that such an arrangement is automatically crystallographic and therefore inductively free. If every point of the plane is incident with at most five lines of $\mathcal{A}$ then we can prove that $\mathcal{A}$ consists of at most 40 lines, thereby supplying more evidence for the belief mentioned above.

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ab 14:15 Uhr, a410
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Alle Interessierten sind herzlich eingeladen.

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