ICM 1998, Berlin, Aug. 18–27

Abstracts of Plenary and Invited Lectures

Section:

13. Combinatorics

1991 MS Classification: 52C17
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Recent developments on the sphere-packing problem.

A report on recent work (mostly by J. H. Conway, E. M. Rains and myself, but also mentioning C. Bachoc, J. Bierbrauer, A. Bonnecaze, A. R. Calderbank, Y. Edel, Y. Kitaoka, G. Nebe, H. -G. Quebbemann, P. Solé, A. Vardy and others) on the sphere-packing problem, proceeding from dimension 3 to 128. For example: a little-known 3-D analogue of the planar lattice A_2; a putative list of *all* the best packings in dimensions 3 to 8; an astonishing property of the densest packings known in 9 dimensions; codes over $\mathbb{Z}/4\mathbb{Z}$ and the E_8 and Leech lattices; new nonlattice packings in dimensions below 32; shadow lattices and new bounds for unimodular and N-modular lattices; tensor products; new record kissing numbers.