

**Cheeger's differentiation theorem
and the multilinear Kakeya inequality**

TUOMAS ORPONEN
University of Helsinki

A theorem of Cheeger states that a doubling metric measure space (X, d, μ) supporting a Poincaré inequality is a Lipschitz differentiability space: every real-valued Lipschitz function on X is μ a.e. differentiable with respect to some member in a countable family of charts to Euclidean spaces. In the talk, I explain how Cheeger's theorem is connected with the multilinear Kakeya problem in \mathbb{R}^n . The connection yields a relatively short new proof of Cheeger's theorem. This is joint work with David Bate and Ilmari Kangasniemi.