Affine Sobolev Inequalities and Valuations

Franz Schuster* (TU Wien)*, Christoph Haberl* (New York University)

In this talk, I will present a new sharp affine L_p Sobolev inequality for functions on $\mathbb{R}^n$. This inequality strengthens and directly implies the previously known sharp affine L_p Sobolev inequality of Lutwak, Yang, and Zhang which in turn is stronger than the classical L_p Sobolev inequality of Aubin and Talenti. The geometry behind our new inequality is an L_p affine isoperimetric inequality which is based on recent advances in valuation theory by Ludwig.