

Pisier's inequality and the discrete cube

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A powerful inequality of Pisier provides not only a unified approach to various classical Gaussian inequalities, but also enables their extension to functions taking values in Banach spaces. The proof of this inequality, using rotational invariance, appears to be very specific to the Gaussian distribution, and the obvious analogue of this inequality on the discrete cube is known to be false. In recent work with Paata Ivanisvili and Sasha Volberg, we discovered a less obvious formulation of Pisier's inequality that, remarkably, provides a sharp analogue of the Gaussian inequality for the discrete cube. This inequality enabled us to settle a long-standing problem in the geometry of Banach spaces due to Enflo (1978). I will aim to explain this new inequality, where it comes from, some applications, and some mysteries that still surround it.