Séminaire N. Bourbaki

En direct sur la chaîne youtube de l'IHP

SAMEDI 27 MARS 2021

16h30 Thomas BLOOM
Quantitative inverse theory of Gowers uniformity norms, *after F. Manners*

Gowers uniformity norms are the central object of higher-order Fourier analysis, one of the cornerstones of additive combinatorics, and play an important role in both Gowers' proof of Szemerédi's theorem and the Green-Tao theorem. The inverse theorem states that if a function has a large uniformity norm, which is a robust combinatorial measure of structure, then it must correlate with a nilsequence, which is a highly structured algebraic object. This was proved in a qualitative sense by Green, Tao, and Ziegler, but with a proof that was incapable of providing reasonable bounds. In 2018 Manners achieved a breakthrough by giving a new proof of the inverse theorem. Not only does this new proof give a wealth of new insights but it also, for the first time, provides quantitative bounds, that are at worst only doubly exponential. This talk will give a high-level overview of what the inverse theorem says, why it is important, and the new proof of Manners.