A general approach to transversal versions of Dirac-type theorems

Olaf Parczyk (Freie Universität Berlin)

Given a collection of hypergraphs $\mathbf{H} = (H_1, \dots, H_m)$ with the same vertex set, an m-edge graph $F \subset \bigcup_{i\in[m]} H_i$ is a transversal if there is a bijection $\phi\colon E(F) \to [m]$ such that $e \in E(H_{\phi(e)})$ for each $e \in E(F)$. How large does the minimum degree of each H_i need to be so that $\mathbf{H}$ necessarily contains a copy of F that is a transversal? Each H_i in the collection could be the same hypergraph, hence the minimum degree of each H_i needs to be large enough to ensure that $F \subseteq H_i$. In this talk, we discuss a unified approach to this problem by providing a widely applicable sufficient condition for this lower bound to be asymptotically tight. This is general enough to recover many previous results in the area and obtain novel transversal variants of several classical Dirac-type results for (powers of) Hamilton cycles.

This is joint work with Pranshu Gupta, Fabian Hamann, Alp Müyesser, and Amedeo Sgueglia.