

Institut für Diskrete Mathematik

## Combinatorics Seminar

Friday 15th March 12:30

Online meeting (Webex)

# Chromatic number is not tournament-local

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Scott and Seymour conjectured the existence of a function  $f$  such that, for every graph  $G$  and tournament  $T$  on the same vertex set,  $\chi(G) \geq f(k)$  implies that  $\chi(G[N_T^+(v)]) \geq k$  for some vertex  $v$ . We will disprove this conjecture even if  $v$  is replaced by a vertex set of size  $\mathcal{O}(\log |V(G)|)$ . As a consequence, we obtain a negative answer to a question of Harutyunyan, Le, Thomassé, and Wu concerning the analogous statement where the graph  $G$  is replaced by another tournament. Time permitting, we will also discuss the setting in which chromatic number is replaced by degeneracy, where a quite different behaviour is exhibited.

This is joint work with António Girão, Kevin Hendrey, Freddie Illingworth, Florian Lehner, Lukas Michel, and Raphael Steiner.

Meeting link:

<https://tugraz.webex.com/tugraz/j.php?MTID=m8500c46344212abf0fa37925da5ef9bf>

Joshua Erde, Mihyun Kang