

## 1. Lyuben Lichev

We have  $n$  vertices, edges arrive one by one and at arrival, they get one of  $c$  colours uniformly at random.

• Rainbow spanning tree: Frieze, Krivelevich  
 $\Leftrightarrow$  appearance of  $n-1$  colours whp ( $c=n-1$ )

• Rainbow Ham. cycle: Ferber, Krivelevich:  
for  $c=(1+\epsilon)n$  RHC exists, when we have  $2n(\log n + \log \log n + w(1))$  edges whp.  
Ferber:  $c=n$ , RHC appears whp if we have  $Kn \log n$  edges for large const  $K$

Q: Is it true that a RHC exists upon arrival of  $n$  colours? Can we prove a sharp threshold result?

## 2. Igor Balla

Let  $G \boxtimes H$  be graph with  $v \times x$ . see  $V_G \times V_H$  and  $(u,v) \sim (u',v')$  iff  $uu' \in E(G)$  or  $u=u'$ ,  $vv' \in E(H)$  or  $v=v'$ , and  $(u,v) \neq (u',v')$ .

Let  $\varphi(G) = \lim_{k \rightarrow \infty} d(G^{\boxtimes k})^{\frac{1}{k}}$

Conj (Alon):  $\varphi(G(n, \frac{1}{2})) = \Theta(\log n)$

Q: For a fixed  $k$ , can you show that  $d(G^{\boxtimes k}) \leq O(\log^k n)$  for  $k=2,3,\dots$ ?

## 3. Matt Kwah

Conj: For every  $n$ - $v \times x$  tournament, there is an acyclic subgraph with chromatic number  $\geq n^{\frac{3}{4} - o(1)}$ .

Thm (Fox-K-Sudakov):  $\chi \geq n^{\frac{5}{8}}$

## 4. Amadeo Squeglia

Conj (ED, L, W):  $G \subseteq C_n^k$  with  $\delta(G) \geq k+1$  implies  $G$  is Hamiltonian

Thm (ED, G, MC, P, S): Let  $G \subseteq P_n^k$ ,

$\forall v. d(v) \geq \min\{k+2, d_{P_n^k}(v)\}$ . Then  $G$  has Hamiltonian path.

Conj  $d(v) \geq \frac{d_{P_n^k}(v)}{2} + 2$

## 5. Mihyun Kang

Let  $P(n,m)$  be a random graph on  $v \times x$  set  $[n]$  with  $m$  edges that are embeddable in the plane (random planar graph).

Thm (K-tuktak): For every  $\epsilon > 0$

• if  $m < (1-\epsilon)n$ , then whp  $\chi(P(n,m)) \leq 3$ ,  
• if  $m > (1+\epsilon)n$ , then whp  $\chi(P(n,m)) = 4$

Conj: If  $\frac{m-n}{n^{\frac{3}{4}}} \rightarrow 0$ , then  $\chi(P(n,m)) \leq 3$ ,

if  $\frac{m-n}{n^{\frac{3}{4}}} \rightarrow \infty$ , then  $\chi(P(n,m)) = 4$ .

$\hookrightarrow$  coming from 2-core kernel