

Institut für Diskrete Mathematik

**Seminar für Kombinatorik und Optimierung**

Friday 8th January 14:15

Online meeting (Webex)

**A Cantor-Bernstein-type theorem for spanning trees in infinite graphs**

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We consider the problem of when an infinite graph can be decomposed into an edge-disjoint union of  $\lambda$  many spanning trees for a cardinal  $\lambda$ . Clearly it is necessary that the graph contains  $\lambda$  many edge-disjoint spanning trees, and also that the graph can be covered with  $\lambda$  many spanning trees. We show that these conditions are also sufficient.

For infinite  $\lambda$  we use characterisations of when a graph contains  $\lambda$  many edge-disjoint spanning trees or can be covered with  $\lambda$  many spanning trees due to Erdős and Hajnal, and Laviolette, and also give new simple proofs of these results. For finite  $\lambda$  we prove a stronger statement using infinite matroids which can be seen as a generalisation of the Cantor-Bernstein theorem.

Joint work with Pascal Gollin, Attila Joó, Paul Knappe and Max Pitz.

Meeting link:

<https://tugraz.webex.com/tugraz/j.php?MTID=m1cd0904285a119237aa9a7ce985ad803>

Meeting number: 137 149 1265

Password: JYc3B3dunG2

Joshua Erde, Mihyun Kang