

## **Network Coding and the Rank Metric**

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In the context of network coding, one or multiple sources of information attempt to transmit messages to various terminals through a network of intermediate nodes. In order to maximize the network throughput, the nodes are allowed to recombine the received packets before forwarding them towards the sinks. The underlying network can be error-free or subjected to an adversarial noise.

In this talk, I will give an introduction to network coding and its methods. In particular, I will show how rank-metric codes provide an efficient solution to the problem of error amplification in network transmissions. The second part of the talk is devoted to the mathematical aspects of the theory of rank-metric codes and related combinatorial objects, such as  $q$ -polymatroids.