

# Cayley networks in Computer Science

Elena Konstantinova

*Sobolev Institute of Mathematics, Novosibirsk State University*

## **Abstract**

In this talk we present recent results on networks based on Cayley graphs which become more and more popular in computer science. The design and analysis of interconnection networks has been one of the main topics of research for the past years. Since 1986, when SIAM International Conference on Parallel Processing was held, Cayley graphs are used as a tool to construct vertex-symmetric interconnection networks. There are many advantages in using Cayley graphs as models for interconnection networks such as vertex-transitivity (the same routing algorithm is used for each vertex), edge-transitivity (every edge in the graph looks the same), hierarchical structure (allows recursive constructions), high fault tolerance (the maximum number of vertices that need to be removed and still have the graph remains connected), small degree and diameter. The progress on Cayley network analysis is shown due to the theory of Cayley graphs including open problems and applications. In particular, we discuss Hamiltonicity problem with relationships to generalized Gray codes, and Diameter problem with applications to computer and biological networks.