# Talk announcement

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# Asymptotic analysis and numerical approximation of some partial differential equations on networks

We consider three different model problems on one-dimensional networks with applications in gas, water supply, and district heating networks, as well as bacterial chemotaxis. On each edge of the graph representing the network, the dynamics are described by partial differential equations. Additional coupling conditions at network junctions are needed to ensure basic physical principles and to obtain well-posed systems. Each of the model problems under consideration contains an asymptotic parameter, which is assumed to be small, describing either a singular perturbation, different length scales, or different physical regimes. A central objective of our work is the investigation of the asymptotic behavior of solutions. Moreover, we focus on suitable numerical approximations based on Galerkin methods that are still viable in the asymptotic limit and preserve the structure and basic properties of the underlying problems.