Two-dimensional buoyancy driven flows with Navier-slip boundary conditions

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While usually the Navier-Stokes equations are equipped with either no-slip or free-slip boundary conditions, this talk is focused on the Navier-slip boundary conditions that interpolate between these two and, depending on the underlying problem, better reflect the physical behavior of the fluid. We are discussing two buoyancy driven applications, first Rayleigh-Bénard convection with rough boundaries, where the major interest lies in bounds on the heat transfer through the fluid, while the second application is a partially diffusive setting, where we are interested in the well-posedness, long time behaviour and linear stability of the system.