

# LIOUVILLE EQUATIONS WITH CONICAL BOUNDARY CONDITIONS

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The problem of finding and classifying constant curvature metrics with conical singularities has a long history bringing together several different areas of mathematics. Such metrics corresponds to solutions to a Liouville type equation with conical boundary conditions. This talk will focus on the particularly difficult spherical case where many new phenomena appear. When some of the cone angles are bigger than  $2\pi$ , uniqueness fails and existence is not guaranteed; smooth deformation is not always possible and the moduli space is expected to have singular strata. I will give a survey of several recent results regarding this singular uniformization problem, where "resolution of singularities" is the key idea in the analysis, which can be seen as an analogue of the Deligne–Mumford compactification of Riemann moduli spaces. Based on joint works with Rafe Mazzeo and Bin Xu.