1172-53-183      **Zhongshan An\*** (`zhongshan.an@uconn.edu`), 341 Mansfield Rd U1009, Storrs, CT 06269, and **Michael Anderson**. *Initial boundary value problem of Einstein equations.*

In general relativity, spacetime metrics satisfy the Einstein equations, which are wave equations in the harmonic gauge. The Cauchy problem for the vacuum Einstein equations has been well-understood since the work of Choquet-Bruhat. For an initial data set satisfying the vacuum constraint equations, there exists a solution to the vacuum Einstein equations and it is geometrically unique in the domain of dependence of the initial surface. On contrast, the initial boundary value problem (IBVP) has been much less understood. To solve for an vacuum metric in a region with time-like boundary, one needs to impose boundary conditions to guarantee geometric uniqueness of the solution. However, due to gauge issues occurring on the boundary, there has not been a satisfying choice of boundary conditions. In this talk I will discuss obstacles in establishing a well-defined IBVP for vacuum Einstein equations and the geometric uniqueness problem. Then I will talk about some new results in a joint work with Michael Anderson. (Received August 29, 2021)