1118-83-31 **Aghil Alaee*** (khangha@ualberta.ca). *Mass-angular momentum inequality for bi-axisymmetric black holes.*

One of the interesting problem in mathematical relativity is the geometric inequalities for black holes with symmetries, such as Dain inequality and extension of Penrose inequality for four dimensional axisymmetric black holes. Recently, the investigation of general relativity in higher dimensions has attracted a great deal of interest for a number of physical reasons, such as the gauge theory-gravity correspondence and string theory. In addition, known examples of Myers-Perry black hole, black ring, and black lens solutions in higher dimensions assure the existence of a rich variety of such objects whose mathematical properties are only just beginning to be uncovered. In this talk we show recent progress of the extension of Dain's inequality to higher dimensions. In particular, we show that extreme Myers-Perry initial data realize the unique absolute minimum of the total mass in a physically relevant (Brill) class of maximal, asymptotically flat, bi-axisymmetric initial data for the Einstein equations with fixed angular momenta and spherical topology. As a consequence, we prove the relevant mass-angular momentum inequality in this setting for 5-dimensional black holes with spherical horizon topology. (Received January 10, 2016)