

On variational characterizations of exact solutions in general relativity

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Abstract: In this talk, I will report on the progress of a joint project with Marcus Khuri and Gilbert Weinstein, where we introduce a new characterization of the exact solutions to the Einstein Maxwell equation; namely the Reissner-Nordstrom metrics and the Majumdar-Papapetrou metrics. Those metrics are characterized as saturating a set of inequalities, often categorized as the Penrose-type inequalities, where several versions have been proved as the Positive Mass Theorem and the Riemannian Penrose Inequality.