



复旦大学数学科学学院 数学综合报告会

午间学术报告会（一百三十）

报告题目：From bending of light to positive mass:
a non-PDE perspective

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报告地点：光华东主楼 2201

摘要：

The positive mass theorem is one of the milestone results in classical general relativity. Both the proof of Schoen-Yau and that of Witten heavily relied on sophisticated analysis of PDEs on manifolds and their methods imposed conditions only on some initial data. There appears to be a prevalent pursuit among physicists to seek a physical understanding to the positive mass. This talk seems to be of this nature. Penrose made a first attempt to study the physical incoherence of the negative mass by looking into the bending of light rays. Precise estimates of time delay of null geodesics were required. Recently, we reduce this problem to a spacetime causality comparison and the negative mass is ruled out by using the focusing theorem. This provides an elementary non-PDE viewpoint to understand the positive mass.

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