



Sommersemester 2015

Oberseminar  
Geometrische Analysis und Mathematische Relativitätstheorie

Am Donnerstag, den 07.05.2015 spricht um 15:45 Uhr im Raum N16

Prof. Dr. Stoytcho Yazadjiev  
(Sofia University)

über das Thema

**Uniqueness of Einstein-Maxwell spacetimes with a photon sphere**

We consider the problem of uniqueness of static and asymptotically flat Einstein-Maxwell spacetimes with a photon sphere  $P3$ . We are using a naturally modified definition of a photon sphere for electrically charged spacetimes with the additional property that the one-form  $i_{\xi}F$  is normal to the photon sphere. For simplicity we are restricting ourselves to the case of zero magnetic charge and assume that the lapse function regularly foliates the spacetime outside the photon sphere. With this information we prove that  $P3$  has constant mean curvature and constant scalar curvature. We also derive a few equations which we later use to prove the main uniqueness theorem, i. e. the static asymptotically flat Einstein-Maxwell spacetimes with a non-extremal photon sphere are isometric to the Reissner-Nordström one with mass  $M$  and electric charge  $Q$  subject to  $Q^2/M^2 \leq 9/8$ .

Hierzu wird herzlich eingeladen.

C. Cederbaum, G. Huisken, C. Nerz