

Contribution Title:	THE BLACK HOLE STABILITY PROBLEM IN GENERAL RELATIVITY
Authors:	M. Dafermos, I. Rodnianski
Presenting author:	Dafermos M.
Affiliation:	DPMMS, University of Cambridge
E-mail:	md384@dpmms.cam.ac.uk
Invited speaker:	Topical session
YRS seminar:	NO

Understanding the behaviour of linear waves on black hole backgrounds is a central problem in general relativity, intimately connected with the nonlinear stability of the black hole spacetimes themselves as solutions to the Einstein equations—a major open question in the subject. Nonetheless, it is only very recently that even the most basic boundedness and quantitative decay properties of linear waves have been proven in a suitably general class of black hole exterior spacetimes. This talk will review our current mathematical understanding of waves on black hole backgrounds, beginning with the classical boundedness theorem of Kay and Wald on exactly Schwarzschild exteriors and ending with very recent boundedness and decay theorems (proven in collaboration with Igor Rodnianski) on a wider class of spacetimes. This class of spacetimes includes in particular slowly rotating Kerr spacetimes, but in the case of the boundedness theorem is in fact much larger, encompassing general axisymmetric stationary spacetimes whose geometry is sufficiently close to Schwarzschild and whose Killing fields span the null generator of the horizon.