Spacetimes and orbits of Bumpy Black Holes SARAH VIGELAND,
SCOTT HUGHES, MIT — Observations show the existence of many extremely
compact, massive objects which are generally believed to be black holes. Precise
observations have the potential to determine if these black hole candidates have the
multipolar structure predicted by general relativity. Collins and Hughes proposed
analyzing these systems by considering "bumpy black holes": objects that are al-
most, but not quite, black holes. In this talk we extend the work of Collins and
Hughes. We describe how to add bumps to a Kerr background that correspond to
modifying in a prescribed way the multipolar structure of the black hole spacetime.
We describe the effect of the bumps by describing how the frequencies of motion
change using Hamilton-Jacobi techniques.

Sarah Vigeland
MIT