

Harvey Reall - Creases, corners and caustics: properties of non-smooth structures on black hole horizons

Wednesday 16 August 2023 14:00 (50 minutes)

The event horizon of a dynamical black hole is generically a non-smooth hypersurface. I shall describe the types of non-smooth structure that can arise on a horizon that is smooth at late time. This includes creases, corners and caustic points.

I shall discuss perestroikas” of these structures, in which they undergo a qualitative change at an instant of time. A crease perestroika gives an exact local description of the event horizon near the instant of merger” of a generic black hole merger. Other crease perestroikas describe horizon nucleation or collapse of a hole in a toroidal horizon. I shall discuss the possibility that creases contribute to black hole entropy, and the implications of non-smoothness for higher derivative terms in black hole entropy. This talk is based on joint work with Maxime Gadioux.