



## Gravity Seminar

**Title:** Effects of caustics on wave propagation in curved spacetimes

**Speaker:** Abraham Harte (Max Planck Institute for Gravitational Physics, Albert Einstein Institute)

**Date:** Thu 12th April 2012 at 4:00PM

**Location:** CASL Seminar Room – Belfield Office Park

**Abstract:** Linear waves generated by small disturbances are well-understood near those disturbances. The standard picture breaks down, however, once characteristic rays starting at the disturbance form caustics. I discuss wave equations associated with linear fields propagating in generic curved spacetimes (which includes many ordinary acoustic and electromagnetic equations in flat spacetime). I show that there is a sense in which the leading-order singularity structure of Green functions associated with such equations transforms according to a simple rule after each encounter with a caustic of the light cone. This is established by showing that a portion of the Green function in a generic spacetime can be understood via a Green function in an appropriate geometry associated with gravitational plane waves. Plane wave Green functions are, in turn, computed exactly. Some implications are also discussed for the dependence of, e.g., a charge's self-field on its past history. [Please note the seminar will be at the Meeting Room (not Seminar Room) in CASL-UCD]

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