Fakultät für Physik
Gravitationsphysik
A-1090 WIEN, BOLTZMANNGASSE 5, AUSTRIA

universität wien

E I N L A D U N G

Lunchseminar

zum Vortrag

von

Luis Cortes Barbado

(TU Vienna)

über

"Hawking versus Unruh effects: What do you see when you fall into a black hole?"

Abstract:
Arguably, the most important milestone of Quantum Field Theory in curved spacetime is the discovery by Stephen Hawking that black holes should evaporate by emitting a Planckian spectrum of particles, the so-called Hawking radiation. With a similar derivation, Bill Unruh postulated that accelerated observers in empty space should perceive a thermal bath of particles with temperature proportional to their acceleration, the so-called Unruh effect. It seems clear that, for an observer following an arbitrary trajectory outside a black hole, these two effect must be present together. But, how do they combine to give the observer's net particle perception? In this talk we will address this question, within a restricted but conceptually clear framework, by using the so-called effective-temperature function. Far from just getting a set of concrete quantitative results for different trajectories of the observer, we will obtain general results which are clearly interpretable in terms of well-known physical phenomena. Furthermore, these results will let us address some interesting questions: Which part of the radiation perceived can be assigned to Hawking radiation and which to the Unruh effect?
Can these two effects interfere destructively? Does always the Unruh temperature scale with the proper acceleration of the observer? Is it strictly necessary to form a horizon in order to have Hawking radiation emitted? Can Hawking radiation make a test particle to float nearby a black hole due to radiation pressure?

Zeit: Montag, 14.11.2016, **13.00**
Ort: Arbeitsgruppe: Gravitation, Währinger Straße 17,
common room 1. Stock

gez.: P. T. Chrusciel