Advanced General Relativity

A course on the fundamentals of

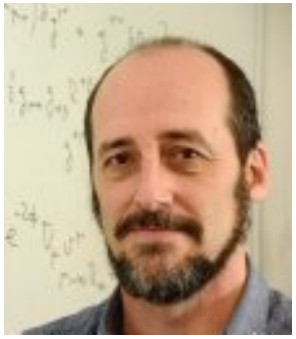
Gravitation and Spacetime

Black Holes – Classical and Quantum

Inflation and the Origin of Structure in the Universe

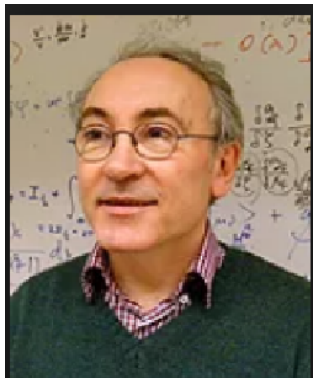
Roberto Emparan

General Formalism
Black Holes
Quantum Gravity



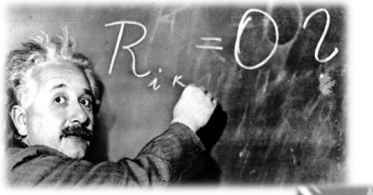
Jaume Garriga

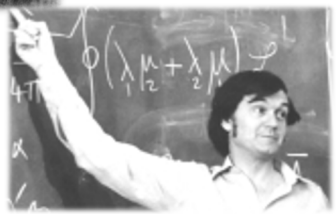
Relativistic Cosmology
Inflation
Cosmological perturbations



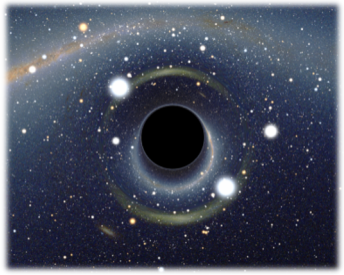
Pre-requisite: Introductory course to General Relativity

What will you learn?

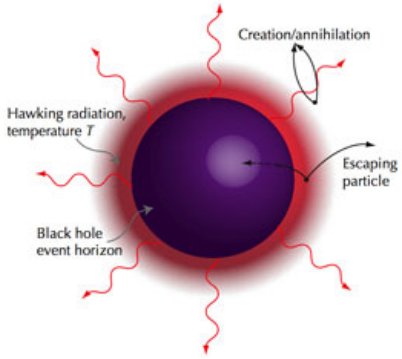




- Advanced techniques in GenRel
  - Lagrangian formulation, Causal Structure (Horizons)...

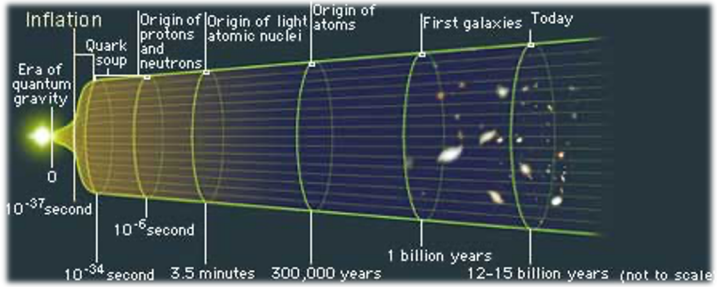


- Black Holes
  - Classical theory
  - Quantum effects – Hawking radiation
  - Black hole thermodynamics

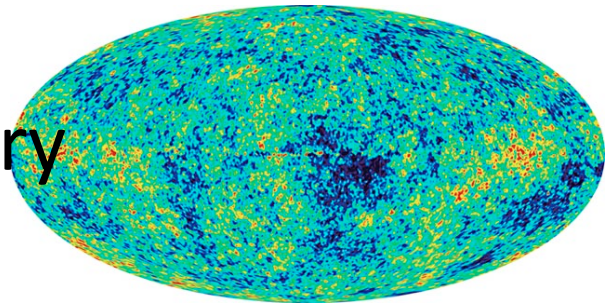


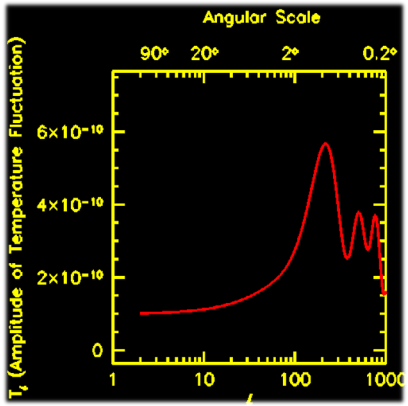
- Basic notions about
  Quantum theory of Gravity

What will you learn?



- Relativistic Cosmology
  - LTB, FLRW, dS universe
  - Inflation, global structure
- Cosmological perturbation theory
  - CMB, density perturbations
- Inflationary Universe
  - Origin of primordial fluctuations
    & large-scale structure





What is the course like?

- Theoretical – be ready for math
- On blackboard – we'll go into details
- Homework (weekly)

  complement to lectures

  essential practice

  evaluation*

* alternatively, exam if requested