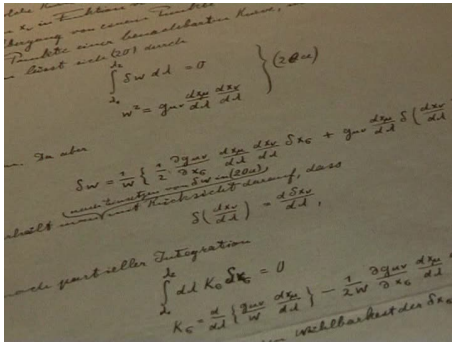


# Extragalactics, Cosmology and Relativity

## Relativistic gravitation and astrophysics



The aim of this METEOR is to improve your knowledge in relativistic gravitation and in some related astrophysical applications, going beyond the introduction provided in the framework of the FC2.5 fundamental course. It mainly consists in the acquisition of the skills required to tackle analytical developments in relativity, and their application to some current problems in theoretical and observational astrophysics, like for instance cosmology, black hole environments, gravitational radiation, gravitational waves analysis, perturbation techniques in weak field systems.

### Theory

by BERTRAND CHAUVINEAU

### Mathematics

- Tensorial calculus
- Curvature
- Geodesics. More advanced topics

### Gravitation theories

- General Relativity
- Scalar-tensors theories
- Weak field approximation
- Linearized theory. Gravitational waves
- Exact solutions: Schwarzschild, Kerr, Robertson-Walker, Kasner, ...

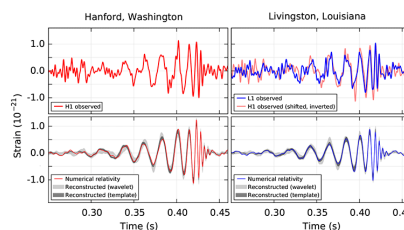
- Black hole solutions: Schwarzschild and Kerr's black holes

Gravitational waves data analysis & application

by TANIA REGIMBAU

- Backgrounds on cosmology
- Post-newtonian approximation. Conservation laws in General Relativity
- Gravitational waves radiation

- Deterministic signal search (binaries inspiralling and merging, match sampling, background estimation)
- Stochastic signal search (definition, sources, cross correlation statistics)
- Parameters' estimation by bayesian methods
- Localisation. Signal simulations (gaussian and non gaussian noises, astrophysical sources)



### Contact

✉ [Chauvineau@oca.eu](mailto:Chauvineau@oca.eu)