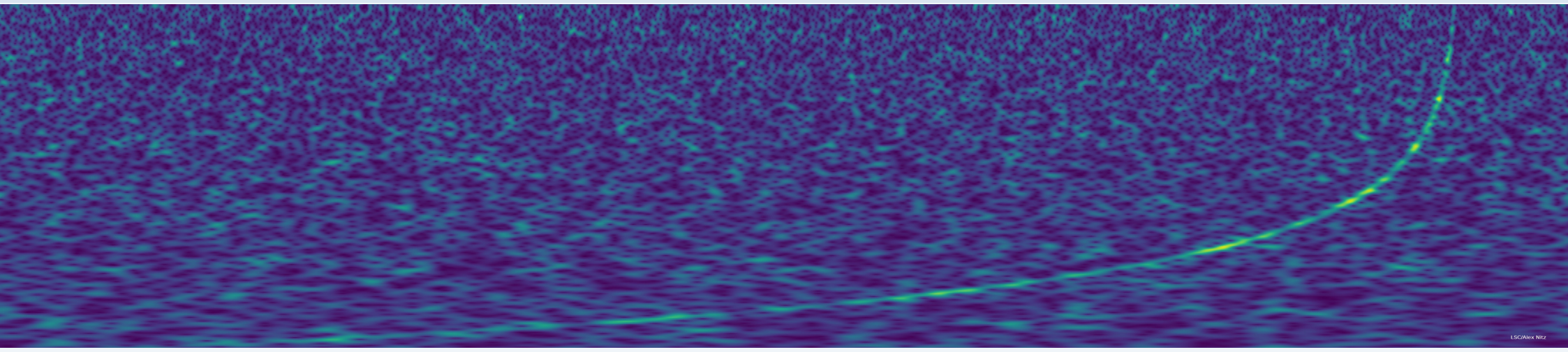
Institut de Physique Théorique

Theoretical physics courses



Gravitational waves in a nutshell

Michele Vallisneri (Caltech/JPL, IPhT)

The Fridays June 3rd, June 10th, June 17th, June 24th, July 1st from 10:00 to 12:15, in person at IPhT and online.

Open, non-interactive livestream at `youtube.com/ipht-tv`. Interactive videoconference: compulsory registration on the website `courses.ipht.fr`, to receive videoconference link. Please, stay updated (change of schedule, sanitary constraints...) by checking the course website.

The detection of gravitational waves (GWs) with ground-based interferometers opened a revolutionary vista on the Universe, upending our notions about the origin of stellar-mass black holes, and offering a spectacular multimessenger view of a binary neutron-star merger and of the ensuing radiation across the electromagnetic band.

From a fundamental-physics standpoint, GWs provide experimental access to the strong-field regime of general relativity and to precision tests of modified gravity.

This whirlwind tour of GW science is meant to give theoretical physicists and non-GW astrophysicists an appreciation of current topics of GW research, as well as an entry point to connect their work with GW applications or observations.

The five lectures will cover:

1. GW propagation and detection
2. GW generation and waveform models
3. Astrophysical GW sources, with focus on the LIGO-Virgo catalog
4. GW data analysis, with focus on tests of GR
5. Cosmology and cosmography with GWs

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