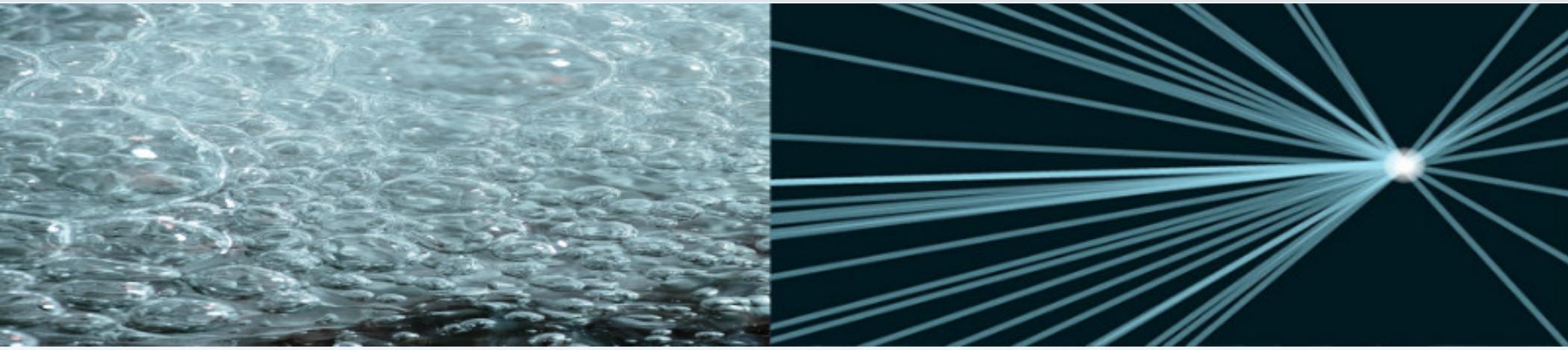


Theoretical physics courses



Lorentzian methods in conformal field theory

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At IPhT on Fridays 27 September and 4, 11, 18 October 2019

Paraphrasing Alexander Polyakov, "Conformal Field Theory is a way to learn about elementary particles by studying boiling water". There is a technical statement behind this joke: Euclidean Conformal Field Theory, under certain conditions, can be rotated to the Lorentzian signature, and vice versa. This means that even statistical physicists studying finite-temperature phase transitions on a lattice should learn about the Minkowski space! The goal of this course will be to explain various classical and recent results pertaining to this somewhat surprising conclusion.

Plan of the course:

- elementary introduction to Euclidean CFT in $d > 2$ dimensions;
- the Osterwalder–Schrader theorem about the Wick rotation of general reflection-positive Euclidean Quantum Field Theories, and its limitations;
- the Lüscher–Mack theorem about continuation of CFT correlation functions to the Lorentzian cylinder, and its limitations;
- recent results about the analytic structure of Lorentzian CFT correlators.

