Two-dimentional conformal field theory

14M266 | *Pavlo Gavrylenko*

Heures (Hebdo)	4.0
Cours	2.0
Exercices	2.0
Pratique	0.0
Total	56.0

Langue	anglais
Semestre	Printemps
Mode d'évaluation	Examen oral
Session	Juillet
Format de l'enseignment	Cours, exercices

Cursus	Type	ECTS
Baccalauréat universitaire en mathématiques	N/A	-
Baccalauréat universitaire en mathématiques, informatique et sciences numériques	N/A	-
Maîtrise universitaire en mathématiques	N/A	-
Maîtrise universitaire en mathématiques, informatique et sciences numériques	N/A	-

Objectifs

Description

2d CFT is a tool that is used in two seemingly unrelated areas, string theory and critical phenomena in 2d statistical mechanics. I will use the latter application to demonstrate the main ideas and constructions of CFT. The main examples will be massless free boson and free fermion, 2d Ising model, etc. We will start from basic definitions of quantum field theory in the path integral approach and in the operator formalism to perform some explicit computations, and also to derive conformal Ward identities. We will see how conformal invariance fixes the structure of the field theory, what is Virasoro algebra and its conformal blocks, and how this works in some particular examples. We also plan to discuss extended conformal symmetry, like Kac-Moody algebras. A lot of attention will be paid to the free field realizations of Virasoro and other conformal algebras.