



UNIVERSITÀ DI PISA

QUANTUM FIELDS AND TOPOLOGY

ENORE GUADAGNINI

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| Anno accademico | 2021/22 |
| CdS | FISICA |
| Codice | 328BB |
| CFU | 6 |

| Moduli | Settore/i | Tipo | Ore | Docente/i |
|-----------------------------|-----------|---------|-----|------------------|
| QUANTUM FIELDS AND TOPOLOGY | FIS/02 | LEZIONI | 36 | ENORE GUADAGNINI |

Obiettivi di apprendimento

Conoscenze

By the end of the course, the students will have acquired knowledge on general methods of quantization of gauge theories and of the so-called topological field theories, Chern-Simons and BF theories; basic notions of low dimensional topology: manifolds, knots and links, homotopy equivalence, ambient isotopy equivalence; polynomial invariants of links, framed links, use of the skein relation, Alexander-Conway, Jones and HOMFLY polynomials, linking number and related Gauss integral, fundamental group of a manifold and of the complement of a link, Seifert surface, surgery on three manifolds and the Lickorish fundamental theorem; solution of the abelian Chern-Simons theory in a generic 3-manifold.

Modalità di verifica delle conoscenze

Presentation of a specific argument by the student, final oral examination

Capacità

perturbative computations in field theory, determination of the link polynomials, computations of the fundamental group

Modalità di verifica delle capacità

the student provides a presentation of a specific argument discussed in the course

Prerequisiti (conoscenze iniziali)

basic notions of quantum field theory

Ultimo aggiornamento 11/08/2021 17:31