



Center for the Topology and Quantization of Moduli Spaces



The 2007 Master Class Programme at CTQM

Berezin-Toeplitz Quantization

19-23 MARCH 2007

Lecturer:

– MARTIN SCHLICHENMAIER
(Université du Luxembourg)



The Berezin-Toeplitz (BT) quantization scheme supplies simultaneously an operator and a deformation quantization for quantizable Kähler manifolds. Moduli spaces often carry a natural structure of a quantizable Kähler manifold and the BT scheme turns out to be very useful in this context.

The goal of the course is to present the basics of the BT quantization. The geometric set-up will be a Kähler manifold and an associated holomorphic quantum line bundle. The BT operators will be operators on the space of global holomorphic sections of this line bundle and all its tensor powers. Their semi-classical asymptotics produces a deformation quantization adapted to the Kähler structure.

Mapping class groups and Thurston's Boundary of Teichmüller Space

3 – 18 APRIL 2007

This master class will cover the following topics :

Generators and relations for mapping class groups (MCG) of a surface. The action of the MCG on Teichmüller space, and on spaces of foliations (dynamics, limit sets and domains of discontinuity). The action of the MCG on the Harvey curve complex, the arc complex, the complex of domains, on the complex of boundary graphs and on other simplicial complexes. I will describe old and new results, including joint work with John McCarthy.



Lecturer:

– ATHANASE PAPADOPOULOS (Université Louis Pasteur, Strasbourg)

Electric-Magnetic Duality and the Geometric Langland's Programme

13 – 24 AUGUST 2007

Lecturer:

– ANTON KAPUSTIN (Caltech)



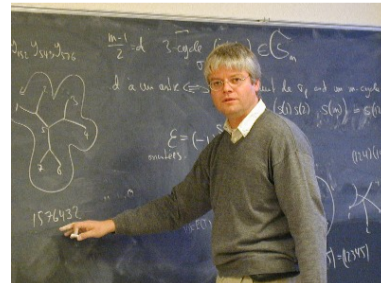
The Montonen-Olive conjecture states that $N=4$ supersymmetric Yang-Mills theories with gauge groups G and LG are isomorphic. It can be viewed as a nonabelian version of the electric-magnetic duality of the Maxwell theory.

The deduction of the central statements of the geometric Langland's programme from the Montonen-Olive duality will be explained. Certain generalizations of the Montonen-Olive duality and their mathematical implications will also be discussed.

Integral TQFT

15-26 OCTOBER 2007

According to Atiyah and Segal's axioms, a Topological Quantum Field Theory (TQFT) describes how to compute quantum invariants of 3-dimensional manifolds by cutting and pasting. In this course, we will review the skein-theoretical approach to TQFT and then focus on the $SO(3)$ -TQFTs at odd primes. They admit a natural integral structure, meaning, among other things, that we get representations of surface mapping class groups by matrices with integer coefficients. The aim of the course is to explain how this goes, and to discuss applications to 3-manifold topology and to perturbative expansion of the invariants.



Lecturer:

– GREGOR MASBAUM (Paris VII)

A limited amount of financial support will be available for PhD students and post docs to attend the master classes.

All participants should register online at <http://www.ctqm.au.dk>. The registration deadline is a month prior to the starting date of each master class.

Center for the Topology and Quantization of Moduli Spaces

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