

## MP 16: Quantum Field Theory in 2 Dimensions

Zeit: Donnerstag 8:30–9:50

Raum: 30.45: 201

MP 16.1 Do 8:30 30.45: 201

**Symmetries and discretizations of the  $O(3)$  nonlinear sigma model** — ●RAPHAEL FLORE — TPI, Universität Jena, Deutschland

Nonlinear sigma models possess many interesting properties like asymptotic freedom, confinement or dynamical mass generation, and hence serve as toy models for QCD and other theories. We derive a formulation of the  $N=2$  supersymmetric extension of the  $O(3)$  nonlinear sigma model in terms of constrained field variables. Starting from this formulation, it is discussed how the model can be discretized in a way that maintains as many symmetries of the theory as possible. Finally, recent numerical results related to these discretizations are presented.

MP 16.2 Do 8:50 30.45: 201

**Particle aspects of two-dimensional conformal field theories** — ●WOJCIECH DYBALSKI<sup>1</sup> and YOH TANIMOTO<sup>2</sup> — <sup>1</sup>Zentrum Mathematik, Technische Universität München, D-85747 Garching, Germany — <sup>2</sup>Dipartimento di Matematica, Università di Roma "Tor Vergata", Via della Ricerca Scientifica 1, I-00133 Roma, Italy

Particle aspects of two-dimensional conformal field theories are investigated, using methods from algebraic quantum field theory. The results include asymptotic completeness in terms of (counterparts of) Wigner particles in any vacuum sector and the existence of (counterparts of) infraparticles in any charged sector of a given chiral conformal field theory. Moreover, an interesting interplay between infraparticle's momentum and the superselection structure is demonstrated in a large class of examples. This phenomenon resembles electron's momentum superselection in quantum electrodynamics.

MP 16.3 Do 9:10 30.45: 201

**Local Commutators and Deformations in Conformal Chiral Quantum Field Theories** — ●ANTONIA KUKHTINA — Institut für theoretische Physik, Universität Göttingen

We study the general form of Möbius covariant commutation relations in conformal chiral quantum field theories and show that they are intrinsically determined up to structure constants, which are subject to an infinite set of constraints. The deformation theory of these commutators is controlled by a cohomology complex, whose cochain spaces are built up out of functions that are subject to a more complicated symmetry property, a generalization of the anti-symmetry of the Lie algebra case.

MP 16.4 Do 9:30 30.45: 201

**Construction of Models in Boundary Quantum Field Theory** — ●MARCEL BISCHOFF — Department of Mathematics, University of Rome "Tor Vergata", Italy

One approach to quantum field theory is the study of nets of von Neumann algebras on a given space-time. In this operator algebraic approach lately a new construction of local and time-translation (but in general not conformal) covariant nets on Minkowski half-plane was given by Longo and Witten by taking as input a chiral conformal net and an element of a semi-group associated to the net. The elements of this abstractly defined semi-group can be seen as deformations of the trivial (conformal) boundary net.

We investigate the construction of non-trivial elements for a family of chiral nets, which therefore give rise to further boundary quantum field theory models.