Gauge invariance: quantization and geometry

Report of Contributions

https://indico.global/e/13074

Contribution ID: **1** Type: **not specified**

Complete sets of invariant fields in gauge theories and gravity from purely virtual particles

Tuesday 10 September 2024 13:45 (1 hour)

Presenter: ANSELMI, Damiano (University of Pisa, Italy)

Contribution ID: **2** Type: **not specified**

BV pushforward and applications

Tuesday 10 September 2024 10:00 (1 hour)

In the BV formalism the spaces of fields are presented as complexes whose cohomology returns the physical content. Different but equivalent complexes may be used, which turns out to be important conceptually and in practice. One useful operation is that of a partial integration (BV pushforward), which produces a chain map that, under some assumptions, is a quasiisomorphism. This has several applications: construction of observables (often as L_∞ representations), renormalization à la Wilson, highly nontrivial equivalences of theories. I will discuss some examples.

Presenter: CATTANEO, Alberto (University of Zurich, Switzerland)

Contribution ID: **3** Type: **not specified**

BV actions for extended geometry

Wednesday 11 September 2024 13:45 (1 hour)

Presenter: CEDERWALL, Martin (Chalmers University of Technology, Gothenburg, Sweden)

Contribution ID: **4** Type: **not specified**

Covariant phase space and L_∞ algebras

Monday 9 September 2024 16:15 (1 hour)

Motivated by the problem of giving a Hamiltonian description of nonlocal field theories such as string field theory, we propose a formula for the phase space symplectic structure of a generic Lagrangian field theory expressed in BV form.

Presenter: ERLER, Ted (Institute of Physics of the Czech Academy of Sciences)

Contribution ID: **5** Type: **not specified**

Fedosov product on differential forms and flat connections on differential graded manifolds

Monday 9 September 2024 11:30 (1 hour)

The Hochschild-Kostant-Rosenberg theorem relates negative cyclic homology of the functions on a differential graded manifold M to the de Rham complex of M. The natural A-infinity structure on negative cyclic homology corresponds to an A-infinity structure on the de Rham complex called the Fedosov product. (This product agrees with the usual one if either argument is closed, but it is not graded symmetric in general.) In this talk, we study the analogue of flat connections for this product: these are in bijection with flat connections for the usual product on the classical locus but appear to be different in general. The non-commutative analogue of the Gauss-Manin connection is our main example.

Presenter: GETZLER, Ezra (Northwestern University, USA)

Contribution ID: **6** Type: **not specified**

Comments on selected aspects of the antifield formalism

Monday 9 September 2024 10:00 (1 hour)

Presenter: HENNEAUX, Marc (International Solvay Institutes, Belgium)

Contribution ID: **7** Type: **not specified**

Monopoles, Dirac Strings and Generalised Symmetries

Thursday 12 September 2024 13:45 (1 hour)

Presenter: HULL, Chris (Imperial College London, UK)

Contribution ID: **8** Type: **not specified**

BV quantization in topological/holomorphic QFT

Tuesday 10 September 2024 11:30 (1 hour)

We discuss BV quantization that arises from topologically/holomorphically twisted quantum field theory. We illustrate some applications in topological/chiral algebraic index, topological B-model and mirror symmetry.

Presenter: LI, Si (Tsinghua University, China)

Contribution ID: **9** Type: **not specified**

Non-topological boundary conditions of perturbative Chern-Simons and AKSZ models

Wednesday 11 September 2024 10:00 (1 hour)

In Witten's CS/WZW correspondence the chiral WZW model appears from the chiral boundary condition imposed on the CS theory.
I will describe how similar boundary conditions (mixed chiral-antichiral) of the CS theory and of its AKSZ analogs produce many other interesting examples and how they explain, in particular, Poisson-Lie T-duality. Unlike the CS/WZW correspondence, this generalization is at the moment only perturbative; on the other hand, the perturbative renormalization leads quickly to the (generalized) Ricci tensor and hopefully still hides many interesting things. The calculation is done using the Batalin-Vilkovisky method and the main tool is a CS propagator compatible with the chiral boundary conditions. Based on joint works with J. Pulmann, F. Valach, and D. Youmans.

Presenter: SEVERA, Pavol (University of Geneva, Switzerland)

Contribution ID: **10** Type: **not specified**

On some applications of Igor's work in String Theory

Thursday 12 September 2024 16:15 (1 hour)

Presenter: SHATASHVILI, Samson (Trinity College Dublin, Ireland)

Contribution ID: **11** Type: **not specified**

Correlation functions and the homological perturbation lemma

Tuesday 10 September 2024 14:45 (1 hour)

Presenter: SZABO, Richard (Heriot-Watt University, Edinburgh, UK)

Contribution ID: **12** Type: **not specified**

Gauge fixing in coset spaces and supergravities

Wednesday 11 September 2024 11:30 (1 hour)

Presenter: VAN PROEYEN, Antoine (KU Leuven, Belgium)

Contribution ID: **13** Type: **not specified**

L_∞ morphisms for higher BV operators

Monday 9 September 2024 13:45 (1 hour)

I will introduce classical and quantum "thick morphisms" of supermanifolds. These are differential-geometric constructions that provide L-infinity morphisms for homotopy analogs of Poisson brackets; in particular, for homotopy brackets generated by higher-order Batalin-Vilkovisky type operators. They generalize ordinary smooth maps of supermanifolds with pullbacks on functions that are non-linear maps.

Presenter: VORONOV, Ted (Manchester University, UK)

Contribution ID: **14** Type: **not specified**

Homotopy Algebra Perspective on Quantum Field Theory

Tuesday 10 September 2024 16:15 (1 hour)

I will review recent progress on understanding perturbative quantum field theory within the realm of homotopy algebras.

Presenter: WOLF, Martin (University of Surrey, UK)

Contribution ID: **15** Type: **not specified**

Color-kinematics duality in BV formalism

Thursday 12 September 2024 14:45 (1 hour)

Presenter: ZABZINE, Maxim (Uppsala University, Sweden)

Contribution ID: **16** Type: **not specified**

Opening

Monday 9 September 2024 09:50 (10 minutes)

Contribution ID: **19** Type: **not specified**

From Gauge Theories to the octonionic Lie groupoid.

Thursday 12 September 2024 11:30 (1 hour)

We first review how one can turn the standard sigma model in to a gauge theory and under what conditions. This leads us to the notion of singular Riemannian foliations (SRFs) and equivalence of gauge theories leads to Morita equivalence of SRFs. This leads one looking at the octonionic singular foliation on Rˆ16. In this talk we provide a Lie groupoid generating this foliation and show that it has the minimal possible dimension.

Presenter: STROBL, Thomas (Claude Bernard University Lyon, France)

Contribution ID: **20** Type: **not specified**

Generalized connections for Courant algebroid in sigma models and gravity

Monday 9 September 2024 14:45 (1 hour)

Presenter: JONKE, Larisa (Rudjer Boskovic Institute, Zagreb)

Contribution ID: **21** Type: **not specified**

My interaction with Igor Batalin

Monday 9 September 2024 17:15 (15 minutes)

Presenter: BERING, Klaus (Masaryk University, Brno)

Contribution ID: **22** Type: **not specified**

Poster session

Tuesday 10 September 2024 17:30 (1h 30m)

Contribution ID: **23** Type: **not specified**

TBA

Wednesday 11 September 2024 14:45 (1 hour)

TBA

Presenter: KOTOV, Alexey (Hradec Králové University, Czech Republic)

Contribution ID: **24** Type: **not specified**

Geometry of Dirac-BFV quantization and quantum cosmology

Wednesday 11 September 2024 16:15 (1 hour)

Presenter: BARVINSKY, Andrei (Lebedev Physics Institute, Moscow, Russia)

Contribution ID: **25** Type: **not specified**

A BV field theory from super moduli space

Thursday 12 September 2024 10:00 (1 hour)

The BRST quantisation of the relativistic spinning particle pulls the path integral back to ist (super) moduli space and thereby interpolates between the space-time BV action and the BV-equation on super moduli space. This is perhaps the simplest toy model of super string field theory.

Presenter: SACHS, Ivo (Ludwig Maximilian University of Munich, Germany)