

Operads 2006, Strasbourg 10-11 November 2006

Abstracts

Wolfgang Bertram, *Homotopes and conformal deformations of symmetric spaces and of projective geometries.*

Abstract. Certain algebraic structures, such as associative and Jordan algebraic ones, naturally come in families that are parametrized by a "continuous" parameter set, and hence these families can be considered as deformations of the structure one starts with. We call them "conformal deformations" since they have very interesting and strong geometric properties: they always lift to deformations of associated global, or geometric, objects such as (Lie-)groups, symmetric spaces and (generalized) projective geometries. The theory of such global deformations is purely algebraic and works in arbitrary dimension and over general base fields or -rings.

Reference : <http://fr.arxiv.org/abs/math.RA/0606449>

Pierre-Louis Curien, *Operads, clones, and distributive laws.*

Abstract. We show how non-symmetric operads (or multicategories), symmetric operads, and clones, arise from three suitable monads on Cat , each extending to a monad on profunctors thanks to a distributive law. The presentation relies on recent work by Fiore, Gambino, Hyland, and Winskel on a theory of generalized species of structures, but, for the multicategory case, this essentially goes back to Burroni's T-categories (1971). Cooperads and properads can also be accounted for in this way.

Alice Fialowski, *Versal deformations of algebraic structures.*

Abstract. In both algebraic and analytic situations, one can usually define a characteristic deformation of a given object, which describes all other nonequivalent deformations: it induces all the others and is unique up to the infinitesimal level. I will introduce such a deformation and sketch a construction.

Michael K. Kinyon, *Coquecigrues of Leibniz algebras: a survey of recent progress.*

Abstract.

Olga Kravchenko, *Strong homotopy Lie bialgebras and Manin triples.*

Abstract. A Lie bialgebra structure on a vector space is the following data: a Lie bracket and a Lie cobracket with a compatibility condition. This is a typical setup which can be formalised by a notion

of a prop. An alternative approach consists in constructing a differential graded Lie algebra which governs this structure, and in looking for self-commuting elements in it. This way we get a natural definition of a strong homotopy Lie bialgebra (also called an L_∞ bialgebra). Geometric objects behind Lie bialgebras are Manin triples. We develop a strong homotopy version of this correspondence.

Muriel Livernet, *From left modules to algebras over an operad: application to combinatorial Hopf algebras.*

Abstract. The aim of the talk is to show that many combinatorial Hopf algebras arise from operad theory. That is, the Hopf structure and some freeness and cofreeness results are the consequences of an operad structure. This theorem is an application of a careful study of the forgetful functor from S-modules to graded vector spaces applied to left modules over an operad. operads2006abstracts

Claude Roger, *Quantification par déformations dans le cas Unimodulaire.*

Abstract. Les résultats cohomologiques connus pour l'algèbre de Lie des champs de vecteurs unimodulaires (ie. à divergence nulle) montrent que les méthodes usuelles de déformation ne peuvent pas s'appliquer. Nous passons en revue quelques méthodes possibles utilisant les structures algébriques à homotopie près."

Bruno Vallette, *How to use Manin's products to prove Deligne's conjecture for Loday algebras with Koszul property.*

Abstract. In this talk, we will give a conceptual definition of Manin products in any category endowed with two coherent monoidal products. This construction can be applied to associative algebras, non-symmetric operads, operads, colored operads, and prop(erad)s presented by generators and relations. These two products, called black and white, are dual to each other under Koszul duality functor. These products allow us to define natural operations on the chain complex defining cohomology theories of algebras. With these operations, we are able to prove that Deligne's conjecture holds for a general class of operads and is not specific to the case of associative algebras. Finally, we prove generalized versions of a few conjectures raised by M. Aguiar and J.-L. Loday related to the Koszul property of operads defined by black products. These operads provide infinitely many examples for this generalized Deligne's conjecture.

Michel Van den Bergh, *Double Poisson algebras.*

Abstract. We develop Poisson geometry for non-commutative algebras. This generalizes the bi-symplectic geometry which was introduced by Crawley-Boevey, Etingof and Ginzburg. Our (quasi-)Poisson brackets induce classical (quasi-)Poisson brackets on representation spaces. As an application we show that the moduli spaces of representations associated to the deformed multiplicative preprojective algebras recently introduced by Crawley-Boevey and Shaw carry a natural Poisson structure.