Journées SL2R
Louvain-la-Neuve
11-12 décembre 2025

Jeudi 11 décembre

13h30-14h00 Accueil / Registration

14h00-14h50 Francesco D'ANDREA (Università di Napoli "Federico II")

Quantum Grassmannians, Old and New. The problem of constructing quantum flag manifolds and quantum Grassmannians was first posed by Manin in his Montréal lectures in the '80s. In this talk, I will give an overview of quantum Grassmannians, from their construction in terms of quantum minors to their recent description as graph algebras. I will also illustrate some open problems.

15h00-15h50 Quentin LABRIET (Université de Montréal)

An algebraic approach for bispectral rational functions. The Askey-Wilson scheme for orthogonal polynomials provides a way to organize the different families of such polynomials. They turn out to have some nice bispectral properties, and for finite families of orthogonal polynomials this can be described algebraically via the theory of Leonard pairs introduced by P. Terwilliger. After explaining quickly this theory I will describe a generalisation of this notion introduced to approach a classification for finite families of bispectral rational functions.

16h00-16h30 Pause

16h30-17h20 Hugo MATHEVET (Université de Reims Champagne-Ardenne)

Relative modality in generalized Takiff Lie algebras. Given a positive integer m and a Lie algebra $\mathfrak{g}$, the m^{th} generalized Takiff Lie algebra $\mathfrak{g}_m$ of $\mathfrak{g}$ is the space of m-jets on $\mathfrak{g}$ equipped with a natural Lie algebra structure. For an integer $n \geqslant m$, we define the (m,n)-modality of an adjoint orbit $\Omega_m \subset \mathfrak{g}_m$ to be the modality of the image of its pullback by the natural projection of $\mathfrak{g}_n$ on $\mathfrak{g}_m$.

In this talk we will introduce those different notions and establish key properties of (m,n)-modality in the quadratic case together with an explicit link to the index of the centralizers of elements in $\mathfrak{g}$.

19h30- Dîner.

Vendredi 12 décembre

9h00-9h50 Arthur MASSAR (Université Catholique de Louvain)

The Poisson–Fourier transform for bicrossed products. The quantum duality Principle of Drinfel'd states that any quantization $\mathcal{G}_\hbar$ of a Poisson–Lie group $\mathcal{G}$ should be dual as a quantum group to a quantization $\mathcal{G}^*_\hbar$ of the Poisson dual group $\mathcal{G}^*$. In this talk we will make sense of this principle for semi-direct products ($\mathcal{G} = G \ltimes V, \mathcal{G}^* = H \ltimes W$) with V, W abelian, where we can realise the quantizations $\mathcal{G}_\hbar$ and $\mathcal{G}^*_\hbar$ as a bicrossed product between G and H in the setting of locally compact quantum groups. A key role is played by suitable measure class isomorphisms $\eta_G : G \to \hat{W}$ and $\eta_H : H \to \hat{V}$ which we call *abelian approximations*. These give rise to a unitary operator $\mathcal{F}_\mathcal{G} : \mathrm{L}^2(\mathcal{G}) \to \mathrm{L}^2(\mathcal{G}^*)$, which induces an isomorphism of locally compact quantum group $\mathcal{F}_\mathcal{G} : \hat{\mathcal{G}}_\hbar \cong \mathcal{G}^*_\hbar$. We say that $\mathcal{F}_\mathcal{G}$ is a *Poisson–Fourier transform* between $\mathcal{G}$ and $\mathcal{G}^*$. After recalling elements of the theory of locally compact quantum groups and the bicrossed product construction in this setting, we discuss abelian approximations and the resulting Poisson–Fourier transform. If time permits, we conclude with a strategy to obtain abelian approximations from classical r-matrices of a specific form.

10h00-10h30 Pause

10h30-11h20 Philippe BONNEAU (Université de Lorraine, Metz)

On Lie 2-algebras actions. We will give a notion of action of a Lie 2-algebra on a differential manifold generalising that of (infinitesimal) action of a Lie algebra.

In the context of multisymplectic geometry (here 2-plectic), we will continue the generalisations to the notions of multisymplectic action, Hamiltonian action and comomentum map, by rediscussing the algebras of observables in these cases and their structures. (Joint work with V. Chloup, A. Gammella and T. Wurzbacher).

11h30-12h20 Hendrik DE BIE (Ghent University)

The (k,a)-generalized Fourier transform and Grushin operators. In their 2012 paper, Ben-Said, Kobayashi and Ørsted introduced a generalization of the Fourier transform depending on parameters k and a, by deforming the standard $\mathfrak{sl}_2$ relations satisfied by the regular Laplacian, norm squared and Euler operator. It is generally difficult to study the integral kernel of this new Fourier transform. I will report on recent progress. I will also connect this work with higher step Grushin operators, studied typically in the world of PDEs from an entirely different perspective. This is based on joint work with Denis Constales, Pan Lian, Frederick Maes and Nacer Nait Ali.

The *Journées SL2R* mailing-list : announcements of next editions and other related events.

To subscribe : send email (from the address to be subscribed) to `sympa@listes.math.cnrs.fr` with object `subscribe sl2r-conf Lastname Firstname` and let the message body empty. Click on the link received by email to confirm and wait for approval of moderators.

To post : (for subscribers only) send message to `sl2r-conf@listes.math.cnrs.fr` and wait for approval of moderators.

To unsubscribe : follow procedure indicated in each message footer.