Schedule

	Monday	Tuesday	Wednesday	Thursday	Friday
9:00 – 10:00	*welcome*	Feigin (zoom)	Zerbini	Etingof	Schneps
10:00 – 11:00	Felder	Massuyeau	Toledano-Laredo	Furusho	*break* (→ 10:30)
11:00 – 11:30	*break*	*break*	*break*	*break*	10:30 – Alekseev
11:30 – 12:30	Rubtsov	Vera	Schlotterer	Vergne (zoom)	
12:30 – 16:30	*lunch*	*lunch*	*lunch*	*lunch*	*lunch*
16:30 – 17:30	Dancso	Lecomte	*free*	Robertson	*the*
17:30 – 18:00	*break*	*break*	*afternoon*	*break*	*end*
18:00 – 19:00	Halacheva	Marin		Yaddaden	
19:00 – ...	*dinner*	*dinner*	*dinner*	*dinner*	

Titles and abstracts

Alekseev – Generalized pentagon and reduced coaction.
We present a version of the Drinfeld's pentagon equation for paths which are not necessarily straight, and which may have a finite number of transverse self-intersections. We apply a certain projection to this equation to obtain an explicit formula for the Kirillov–Kostant–Souriau (KKS) reduced coaction of an associator. This formula is closely related to recent works of Y. Kuno on the emergent associator equation, and of M. Ren on the reduced coaction Lie algebra.

The talk is based on joint works with F. Naef and M. Ren, `https://arXiv.org/abs/2402.19138` and `https://arXiv.org/abs/2409.08894`.

Dancso – Kashiwara–Vergne Solutions from Braids, Part I.
This series of two talks reinterprets the Alekseev–Enriquez–Torossian construction of Kashiwara–Vergne (KV) solutions from associators, using the language of moperads: monoids in the category of right modules over an operad. We introduce and describe the operadic structures underlying braids, the Drinfeld–Kohno Lie algebra, tangential and special derivations, and the corresponding groups. We show that any formality isomorphism between the "moperad of parenthesized braids with a frozen strand" and the "shifted Drinfeld–Kohno moperad" gives rise to a family of genus zero KV solutions, operadically generated by a single classical KV solution. As a partial converse, symmetric KV solutions (known to come from Drinfeld associators) give rise to moperad morphisms from parenthesized braids with a frozen strand to tangential automorphisms of free Lie algebras. Using moperad formality, we construct injective homomorphisms from the Grothendieck–Teichmüller groups to the KV symmetry groups. The first talk by Zsuzsanna Dancso will focus on the underlying structures and primary construction; the second talk by Iva Halacheva will address the symmetries and key arguments. Both talks present joint work with Guillaume Laplante-Anfossi, Marcy Robertson and Chandan Singh, available at `https://arxiv.org/pdf/2507.16243`.

Etingof – Periodic pencils of flat connections and their p-curvature.
A periodic pencil of flat connections on a smooth algebraic variety X is a linear family of flat connections

$$\nabla(s_1, ..., s_n) = d - \sum_{i=1}^{r} \sum_{j=1}^{n} s_j B_{ij} dx_i,$$

where $\{x_i\}$ are local coordinates on X and $B_{ij} : X \to \mathrm{Mat}_N$ are matrix-valued regular functions. A pencil is periodic if it is generically invariant under the shifts $s_j \mapsto s_j + 1$ up to isomorphism. I will explain that periodic pencils have many remarkable properties, and there are many interesting examples of them, e.g. Knizhnik–Zamolodchikov, Dunkl, Casimir connections and equivariant quantum connections for conical symplectic resolutions with finitely many torus fixed points. I will also explain that in characteristic

p, the p-curvature operators $\{C_i, 1 \leq i \leq r\}$ of a periodic pencil ∇ are isospectral to the commuting endomorphisms $C_i^* := \sum_{j=1}^n (s_j - s_j^p) B_{ij}^{(1)}$, where $B_{ij}^{(1)}$ is the Frobenius twist of B_{ij}. This allows us to compute the eigenvalues of the p-curvature for the above examples, and also to show that a periodic pencil of connections always has regular singularites. This is joint work with Alexander Varchenko.

Feigin (zoom talk) – Extensions of deform vertex algebras. Main examples - toroidal algebras.
There are an important relations : vertex algebras - tensor categories - quantum groups.. Actually in many cases it is a functor from the category of representations of quantum group to the category of representation of vertex algebra. This relationship is very important tool to work with vertex algebras . For example if we take the commutative ring object in the tensor category the the corresponding representation of vertex algebra has a structure of vacuum representation of some bigger vertex algebra. We can construct by this way many interesting new examples of vertex algebras . All this has be true for deform vertex algebras .Unfortunately we still have not good tools to study the representation category of deform vertex algebras.So it is important to study concrete examples. I try to explain how to construct extensions of the toroidal algebras .
It is very interesting that we get some version of the shifted toroidal algebras. The talk bases on unfinished paper with M.Jimbo and Zh. Mukhin

Felder – Quantum minimal surfaces and orthogonal polynomials with complex densities.
I will report on recent work with Jens Hoppe on the relation between quantum minimal surfaces and orthogonal polynomials with complex densities. The recurrence coefficients of orthogonal polynomials are positive solutions of difference equations of discrete Painlevé type and define representations of the Hermitian Yang-Mills algebra, realizing quantizations of minimal surfaces given by complex plane curves. I will also explain the relation to random normal matrices and mention some open problems.

Furusho – On additional structures of double shuffle relations.
In 2002, Racinet introduced the double shuffle Lie algebra, which originates from the double shuffle relations among multiple zeta values. In this talk, I will discuss specific properties of this algebra, Lie algebra, focusing on its special derivation property and on a new involutive action defined on it. This a joint work with B. Enriquez.

Halacheva – Kashiwara–Vergne Solutions from Braids, Part II.
See Dancso's abstract.

Lecomte – From nilpotent quotients of the fundamental group to homology.
With Benjamin, we study an integral version of a Beilinson's theorem relating nilpotent quotients of the fundamental group to relative homological groups.

Marin – TBA.
TBA

Massuyeau – The twist group and the Lie algebra of tree diagrams with beads.
Let V be a 3-dimensional handlebody. The twist group of V is the subgroup of the handlebody group (i.e., the mapping class group of V) that acts trivially on the fundamental group of V. The natural action of the handlebody group on (a Malcev-like completion of) the fundamental group of ∂V defines an embedding of the twist group into a Lie algebra of "special derivations", which can also be described as a Lie algebra of "tree diagrams with beads". At the graded level, we obtain analogues of the Johnson homomorphisms, whose images are constrained by analogues of Morita's traces (or "divergence cocycles"), providing new insights into the lower central series of the twist group. This is based on joint work with Kazuo Habiro, and ongoing work with Kazuo Habiro and Mai Katada.

Robertson – Homotopy Props before they were cool: Enriquez, quasi-categories, and 2-Segal spaces.
In their 2009 work on the quantisation of coboundary Lie bialgebras, Enriquez and Halbout introduced "quasi-categories" and "quasi-props". From today's perspective, these can be seen as early instances of

2-Segal spaces and commutative monoids in a category of 2-Segal spaces. I will sketch this reinterpretation, explain how it reframes Enriquez's constructions in modern homotopy-theoretic language, and suggest how it opens the door to new applications.

Rubtsov – Bessel Kernels and all that (old songs with new motives).
I shall discuss some elementary, less elementary and non-elementary aspects of analytic solutions to various forms of Bessel and "higher Bessel" equations. The main scopes include: Toric hypersurfaces periods, Landau–Ginzburg superpotentials, Landau discriminant singularities etc.

Schlotterer – Integration on higher-genus Riemann surfaces and string amplitudes.
This talk aims to illustrate the impact of Benjamin's work on string perturbation theory and complements Federico Zerbini's talk. Function spaces of polylogarithms on higher-genus Riemann surfaces which close under integration fruitfully synergize with string scattering amplitudes. I will present the construction of integration kernels for higher-genus polylogarithms and showcase their virtues in representing conformal-field-theory correlators entering string amplitudes. The meromorphic formulation in terms of so-called Enriquez kernels will be highlighted to take center stage in upcoming bootstrap approaches to superstring amplitudes beyond today's computational reach.

Schneps – Groupes de Grothendieck–Teichmüller, groupe de Kashiwara–Vergne, et complexes de courbes.
Grâce à des résultats récents reliant le groupe de Kashiwara–Vergne aux structures de Goldman–Turaev, les complexes de courbes fournissent un objet sur lequels les deux groupes agissent, ce qui permet de les comparer.

Toledano-Laredo – TBA.
TBA

Vera – Double lower central series and a double Johnson filtration for the Goeritz group of the sphere.
For a triple (K, X, Y) consisting of a group K and two normal subgroups X and Y of K, we introduce a double-indexed family of normal subgroups of K which we call the double lower central series. In particular, if $K = XY$ we show that this family allows us to recover the lower central series of K. If G is a group acting on K preserving X and Y, we show that the double lower central series induces a double-indexed filtration of G. We apply this theory to the group of isotopy classes of self-homeomorphisms of the 3-sphere S^3 which preserves the standard decomposition of S^3 as the gluing of two handlebodies. (Joint work with Kazuo Habiro.)

Vergne (zoom talk) – Moment map, Horn conditions for quiver representations, and Saturation.
TBA

Yaddaden – Bimodules with factorization structures and the geometry of the harmonic coproduct.
To study the combinatorics of the double shuffle relations for N-cyclotomic multiple zeta values from the point of view of associators, Racinet introduced a torsor $\mathrm{DMR}(N)$, whose key ingredient is a coproduct on a free associative algebra called the harmonic coproduct. For $N = 1$, Enriquez and Furusho built on ideas of Deligne and Terasoma to give a geometric interpretation of this coproduct via infinitesimal braid Lie algebras, yielding an alternative proof (independent of Furusho's earlier work) that associator relations imply double shuffle relations. To extend this result to general N, we work with de Rham objects—constructed from a crossed product algebra—and Betti objects—arising from the group algebra of the orbifold fundamental group of $(\mathbb{C}^\times \setminus \mu_N)/\mu_N$, where μ_N is the group of N-th roots of unity. We formulate the Enriquez–Furusho approach in terms of bimodules with factorization structures (i.e. as objects of a category BFS) and show that the general cyclotomic framework naturally fits this formalism. By considering a functor from the category BFS to the category of algebra morphisms, we provide a geometric interpretation of the harmonic coproduct in full generality. (This talk is based on an ongoing joint work with Benjamin Enriquez.)

Zerbini – Polylogarithms on Riemann surfaces.
Polylogarithms on genus-zero and genus-one Riemann surfaces arise from the KZ and the KZB connection, respectively. Using a higher-genus analogue of the KZB connection constructed by Enriquez, one can define analogues of polylogarithms on higher-genus Riemann surfaces, which are expected to find application in high-energy physics in the study of scattering amplitudes. In this talk, which complements Oliver Schlotterer's talk, we introduce the space of polylogarithms on a Riemann surface, and we present new results on its algebraic structure, based on joint work with Enriquez.