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ABSTRACTS

POSTERS

Carlo Buccisano: Derived D-modules

In derived algebraic geometry the classical notion of D-modules is not meaningful: it ignores the derived structure of a scheme, being defined as Qcoh on X_{dR}. There are two different notions of derived D-modules in the literature: one by Beraldo and another one by Toën and Vezzosi. We'll explain how they arise, their relations to (derived) Lie algebroids and representations thereof, and how one can prove they are equivalent.

Sergei Burkin: A canonical self-coherent approach to homotopy coherent structures

We describe a construction of a category from an operad, or to be precise, of a complete Segal space from a dendroidal complete Segal space. Categories constructed in this manner allow to encode homotopy coherent structures via Segal conditions. This shows that theory of homotopy coherent structures, or at least the part based on Segal conditions, is inherently recursive.

Jonathan Clivio: Graded Frobenius algebras and graph complexes

Graph complexes are used to model moduli spaces of surfaces. On the other hand, surfaces or more precisely 2D-cobordism provide a PROP for Frobenius algebras. The homology of an oriented closed manifold also forms a Frobenius algebra up to some mysterious signs. These signs can however be explained by using appropriate graph complex models of the moduli spaces of the cobordisms.

Gabriel Corrigan: Equivariant retractions of untwisted spines

In 1986, the introduction of Culler-Vogtmann Outer space allowed for a much more geometric understanding of the outer automorphism groups of free groups. Outer space allowed for applications of topological techniques, which have proved extremely fruitful. More recently, Charney and Vogtmann, with various collaborators, have constructed an Outer space for the outer automorphism groups of right-angled Artin groups - a much

wider class of groups which are of current interest in geometric group theory and low-dimensional topology. The dimension of the 'spine' of the Outer space gives an upper bound on the virtual cohomological dimension (VCD) of the so-called untwisted subgroup of outer automorphisms. However, in a departure from the free group case, this bound is not always tight. We investigate this phenomenon, and give examples that show that the gap between this natural bound and the VCD can be arbitrarily large.

Debattam Das: Reciprocity in the Hecke Groups

An element g in a group G is called *reciprocal* if there exists $h \in G$ such that $g^{-1} = hgh^{-1}$. The reciprocal elements are also known as 'real elements' or 'reversible elements' in the literature. In this paper, we consider the Hecke groups which are Fuchsian groups of the first kind and generalization of the modular group. We have classified and parameterized the reciprocal classes in the Hecke groups. This generalizes a result by Sarnak on the reciprocal elements in the modular group.

Arye Deutsch: Floer Spectral Sequence Via Coherent Chain Complexes and Flow Categories

In this poster we show: given a manifold M, with a Smale–Morse function f, and a pointed tangential structure X, there is a spectral sequence that converges to the X-bordism homology of M (for example stable homotopy of M), with a Morse-like description of the r-th page and the differentials.

Anna Fokma: Jiggling, an h-principle without homotopical assumptions

The jiggling lemma of Thurston shows that any triangulation can be jiggled (read: perturbed) to be transverse to a distribution. We generalize the jiggling lemma to the statement that any section of a fibre bundle can be jiggled to produce a piecewise smooth solution of a given open and fiberwise dense differential relation of first order. Using simplicial sets, we understand this as an h-principle without homotopical assumptions for piecewise smooth solutions of such partial differential relations.

Roger Garrido Vilallave: How to spot a wild hypercommutative algebra

This poster presents an innovative method for constructing hypercommutative algebras from Batalin-Vilkovisky algebras, highlighting a geometric context where these constructions arise naturally. Additionally, it introduces a new theorem related to this construction and explores some of its Consequences.

Tallak Manum: An exposition on the additivity theorem Additivity of Little Disk Operads within ∞-Operads

This poster presents an exposition of Dunn-Lurie's additivity theorem, $E_n \otimes E_m \simeq E_{m+n}$, within the framework of ∞-operads. We describe the n-th little disk operad E_n as a topological operad and discuss the Bordmann-Vogt tensor product's role in formulating the theorem. Additionally, we explore weak operads' approximation of ∞-operads and outline a proof given by Yonatan Harpaz based on a proof given by Jacob Lurie. This poster aims to convey the key concepts essential for understanding Dunn-Lurie's additivity theorem and to give some illustrations of key concepts.

Zhouhang Mao: Hochschild Witt homology as relative cyclotomic spectrum

In order to demystify the topological Hochschild homology of associative $\mathbb{F}_p$-algebras and its variants, Kaledin proposed an explicit complex, called the Hochschild–Witt complex, which conjecturally represents the topological restriction homology. In this poster, we propose a relative version of Kaledin's Hochschild–Witt homology, which is equipped with a relative cyclotomic structure, directly comparable with the topological restriction homology. We also explain how to compare with Kaledin's original construction via trace theory.

Federico Mocchetti: Algebras over internal operads and idempotent objects

Given a symmetric monoidal ∞-category $\mathcal{C}$, we define what an internal operad O within $\mathcal{C}$ is and describe algebras over it. We demonstrate

then that various levels of enrichment can be transferred from the base category $\mathcal{C}$ to the category of algebras $Alg_O(\mathcal{C})$. Given this, we also show that the tensoring action on algebras that are coproduct-idempotent is trivial. Finally, we present an example from the stable motivic homotopy category.

Katherine Novey: Ordinary TQFTs Cannot Distinguish Simply Connected 6-Manifolds

Work by David Reutter and Chris Schommer-Pries has shown that TQFTs can distinguish stable diffeomorphism classes of even-dimensional manifolds subject to certain finiteness conditions. In particular, simply connected 6-manifolds with finite π_2 are diffeomorphic if and only if they cannot be distinguished by TQFTs, and it was conjectured that this result holds for all simply connected 6-manifolds. We present a pair of non-diffeomorphic simply connected 6-manifolds with infinite π_2 that are indistinguishable by TQFTs, disproving the conjecture.

Muhammed Erkam Özdemir: Minimal Euler Characteristic of a Group

In this poster, we will define an invariant, $q_{2n}(G)$, for a group G by considering the minimal Euler characteristic over all $(n-1)$-connected $2n$-manifolds having fundamental group G, as proposed by Alejandro Adem and Ian Hambleton. Then, utilizing CW-complexes, we will establish both upper and lower bounds for this invariant. As an application in, we will demonstrate the restriction of abelian groups appearing as fundamental groups of rational homology 4-spheres.

Lucas Piessevaux: Bordism with involutions and an Adams spectral sequence

In this work in progress, we describe the construction of an Adams spectral sequence for genuine C_2 spectra based on C_2-equivariant unoriented bordism. This construction goes through the universal property of the latter in terms of 2-torsion equivariant formal group laws at elementary abelian 2-groups, which uses its refinement to a global spectrum. Further, its E_2-page can be computed from classical Adams E_2-pages by a

Bockstein spectral sequence. Additionally, we sketch how this equivariant Adams spectral sequence can be categorified to form a synthetic deformation of C_2-spectra. We further outline some potential computation applications of this spectral sequence to chromatic equivariant homotopy theory for C_2-spectra.

Shaul Ragimov: Semi-additive alternating powers

We investigate representations of the symmetric group derived from characters, particularly within the higher semi-additive context. This leads to a generalized m-th alternating power, encompassing classical symmetric and alternating powers, as well as symmetric and exterior powers of categories as described by N. Ganter and M. Kapranov. We introduce a notion of twisted power operations and demonstrate that in algebraically closed examples of interest, these two notions are related by dimension, modulo a height-dependent shift. This yields an induction formula for the dimension of an alternating power. Utilizing this formula, we compute dimensions of alternating powers with height smaller or equal to 2. For categories of height n with a cyclotomically closed unit, any element in the Pontrjagin dual of the n+1 homotopy group of the sphere yields a character of the symmetric group . The resulting alternating powers form a commutative algebra in the category of Z-graded objects endowed with a Koszul symmetric monoidal structure. Particularly in height 0, this reproduces the exterior algebra as a graded-commutative algebra. We leverage this to establish connections between generating functions of dimensions of alternating powers corresponding to different elements in the Pontrjagin dual of the n+1 homotopy group of the sphere .

Mária Šimková: A minimal model of finite simplicial set (algorithmic approach)

The poster presents a computation of minimal Sullivan model for finite simplicial sets equipped with effective homology. In particular, we provide a sequence of instructions on how to calculate its generators using Whitney elementary forms.

Baylee Schutte: Projective span of Wall manifolds

The projective span of a smooth manifold is defined to be the maximal number of linearly independent tangent line fields. We initiate a study of projective span, highlighting its relationship with the span, a more classical invariant. We calculate the projective span for all Wall manifolds, which are certain mapping tori of Dold manifolds. This is joint with Mark Grant and based on our paper "Projective span of Wall manifolds," Bol. Soc. Mat. Mex. 30(75) (2024).