16 Álgebra

1. **Expositor:** Elizabeth Manosalva
Financiado por ANID-FONDECYT postdoctorado N° 3230329
Afiliación: Departmento de Matemáticas, Universidad de Chile.
Título: Clasificación de módulos irreducibles para el álgebra de Hecke afín degenerada.
Resumen: Sea $G(\ell, 1, n)$ un grupo de reflexiones complejas, cuyas representaciones irreducibles están indexadas ℓ-particiones, es decir una sucesión de ℓ particiones con n cajas en total . Sea $H_{\ell,n}$ el álgebra de Hecke afín degenerado de tipo $G(\ell, 1, n)$ definido en [1], o también llamado álgebra de Hecke graduado generalizado en [2]. En esta charla veremos la definición de los $H_{\ell,n}$-módulos irreducibles $S^{\lambda\backslash\mu}$, para ℓ-particiones λ, μ y que para cierto subalgebra $\mathfrak{u}$ de $H_{\ell,n}$, todo $H_{\ell,n}$-módulo $\mathfrak{u}$-diagonalizable puede ser obtenido como uno de estos. Esta clasificación tiene una aplicación al álgebra de Cherednik racional asociado al grupo $G(\ell, 1, n)$ ya que esta posee un subálgebra isomorfo a $H_{\ell,n}$ [3].

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2. **Expositor:** Steen Ryom-Hansen
Afiliación: Universidad de Talca
Título: La forma seminormal en el algebra de Temperley-Lieb
Resumen: En la charla presentamos resultados de `https://arxiv.org/abs/2303.10682`, obtenidos en colaboración con K. Ormeño. Empezamos con una breve introducción a la teoría general de formas seminormales. Luego, usando ideas derivadas del álgebra de KLR, explicamos como aplicar esa teoría al álgebra de Temperley-Lieb $\mathbb{TL}_n^{\mathbb{F}_p}$ definida sobre $\mathbb{F}_p$.

3. **Expositor:** Stephen Griffeth
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Afiliación: Instituto de Matemáticas, Universidad de Talca
Título: One-dimensional representations of spherical Cherednik algebras and diagonal coinvariant rings of complex reflection groups

Resumen: We explain a program, initiated in [1] and continued in [2], that aims to relate representation theory to algebraic combinatorics. The representation-theoretic portion of the program is the classification and description of one-dimensional representations of the spherical rational Cherednik algebra associated with a complex reflection group. As pointed out in [2], even partial information about this set of representations leads to highly non-trivial information about the diagonal coinvariant ring of the group.

Joint work with:
Carlos Ajila, Instituto de Matemáticas, Universidad de Talca,Talca, Chile.

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4. **Expositor:** Carlos E. Parra

Partially supported by ANID+Fondecyt/Regular+1200090

Afiliación: Universidad Austral de Chile

Título: Recollements of additive functor categories

Resumen: Recollements of abelian categories are useful decompositions of an abelian category into two smaller ones and, in some situations (e.g., the category $[\mathcal{A}, \mathsf{Ab}]$ of contravariant additive functors from a small preadditive category $\mathcal{A}$ to the category of abelian groups Ab), they are known to be in bijection with TTF triples. Concretely, if $(\mathcal{C}, \mathcal{T}, \mathcal{F})$ is a TTF triple in $[\mathcal{A}, \mathsf{Ab}]$, then the category $[\mathcal{A}, \mathsf{Ab}]$ can see as a recollement by the two abelian categories $\mathcal{T}$ and $\mathcal{C} \cap \mathcal{F}$. We say that this is a recollement by **additive functor categories**, when $\mathcal{T}$ and $\mathcal{C} \cap \mathcal{F}$ are equivalent to categories of contravariant additive functors over some small preadditive categories. In this sense, we characterize the recollement by additive functor categories in terms of idempotent ideals over the respective small preadditive category, recovering a theorem of Psaroudakis and Vitória (see [3]).

Joint work with:

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5. **Expositor:** Sinem Odabasi

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Afiliación: Universidad de Murcia

Título: Model structures on functor categories

Resumen: The study of functor categories takes up an important part of (Categorical) Homological Algebra as it covers certain fundamental objects such as modules, (N-)chain complexes and quiver representations etc. The question of interest in this talk is how to ensure the existence of projective/injective model structures on more general functor categories covering the known ones in the category of chain complexes of modules over any ring. This question was adressed firstly in [1] for quiver representations and resolved in [2] under certain conditions. In this talk, we present our approach to the question which is different from [2].

Joint work with:
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6. **Expositor:** Camilo González

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Afiliación: Departamento de Matemática, Facultad de Ciencias Físicas y Matemáticas, Universidad de Concepción. **Título:** Noncommutative Symmetric functions in superspace.

Resumen: Symmetric functions are very interesting objetcs due to their applications in several areas of mathematics and physics [1]. In the recent years, it was introduced a new class of symmetric functions, which involve the usual variables $x = (x_1, x_2 \ldots)$ together with anticommutative variables $\theta = (\theta_1, \theta_2, \ldots)$, which are called symmetric functions in superspace or simply supersymmetric functions. The theory of symmetric functions in superspace has proved to have very good results extending several of the known ones in symmetric functions [3, 4, 5, 6, 7, 8, 9, 10]. Actually in [11] were introduced quasisymmetric functions in superspace, which turns out to be a Hopf Algebra. The algebra of noncommutative symmetric functions in superspace was obtained as the Hopf dual of the quasisymmetric functions. In this talk, we present some result about the structure of this last algebra [12]. Moreover we introduced a type of noncommutative Ribbon Schur functions in superspace, which are dual with the Fundamental quasisymmetric functions in superspace defined by [11]. Thanks to duality, we obtain some properties about this Fundamental quasisymmetric functions and also relations about the Schur and the Skew-Schur functions in superspace [13].

Joint work with:
Diego Arcis, Universidad de La Serena, Chile.
Sebastian Marquez, Universidad Autónoma de Chile, Chile.

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7. **Expositor:** Luis Lomelí
Afiliación: Pontificia Universidad Católica de Valparaiso
Título: SL_* groups over local rings and quaternion algebras with involution
Resumen: We look at recent developments on the theory of SL_* groups introduced by J. Pantoja and J. Soto-Andrade, where we focus on local commutative and non-commutative rings with involution. Given a ring with involution $(R, *)$, let $A = \mathrm{M}(n, R)$ be the matrix ring endowed with the $*$-transpose involution. We study the questions of Bruhat generation and Bruhat presentation for $\mathrm{SL}_*(2, A)$, in addition to the $*$-Euclidean property for A. We explore reduction modulo the Jacobson radical for such rings and look at cases where $\mathrm{SL}_*(2, A)$ is generated by its Bruhat elements, depending on the characteristic. Interesting cases arise with quaternion algebras with standard and non-standard involution.

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8. **Expositor:** Mauricio Godoy
Afiliación: Universidad de la Frontera.
Título: TBA
Resumen: