Conference on Ring Theory,

dedicated to the 60th birthday of Professor Eduardo Marcos.

December, 1st to 5ft, 2014

DMAT-CCE/UFES

Index

Plenary conference

Name	Ibrahim Assem
Instituition	Universite de Sherbrooke, Quebec
Title	The first Hochschild group of a cluster tilted algebra: Old and new results

Abstract

This is a survey on four joint works with Juan Carlos Bustamante, Maria Andrea Gatica, Kiyoshi Igusa, Maria Julia Redondo, Ralf Schiffler and Rachel Taillefer. We consider the case where an algebra B is a split extension of another algebra C by a C − C −bimodule E and show the existence of a map between the first Hochschild cohomology groups : HH1B → HH1C. In case C is triangular of global dimension at most 2 and B is the relation extension of C, we prove that is surjective and compute its kernel. These results are then applied to study the first Hochschild groups of cluster-tilted algebras. (see references on page 11)

Name	Claude Cibils
Instituition	Universite de Montpellier, França
Title	Invariants of a free linear category.

Abstract

This is joint work in progress with Eduardo Marcos.

The study of invariants of finite groups by Hilbert, Noether, and others had geometric origins: finite group actions on affine space and resulting quotients. By the Chevalley–Shephard–Todd theorem (1954) the ring of invariants of a finite group acting homogeneously on a polynomial algebra over the complex numbers is again a polynomial algebra if and only if the group is generated by pseudoreflections. In 1976 and 1978 Kharchenko and Lane proved independently that the algebra of invariants of a finite group acting homogeneously on a tensor algebra over any field is always free.
We infer first a result in (modular) finite group representation theory concerning fixed points in a tensor product of modules. Then we consider a free category over a field and a finite group acting on the generating vector spaces with the action extended to autofunctors, e.g. a finite group acting linearly on the arrows of a quiver and the action is extended to an action by automorphisms of the path algebra. We obtain that the category of invariants is again free. Observe that in general sub-categories of a free category are not free (consider for instance poset incidence categories).

Name	Miguel Ferrero
Institution	Universidade Federal do Rio Grande do Sul, Brasil
Title	Maximal ideals in polynomial rings and a question by Beidar

Abstract

In this lecture we consider maximal ideals in polynomial rings. For this it is necessary to introduce the unitary strongly prime radical of a ring. Then we compute the Brown-McCoy radical of a polynomial ring in several indeterminates. The results we are considering here are contained in a paper published in collaboration with R. Wisbauer in 2002.
The question on whether a unitary strongly prime ring has always a large center was formulated by K. Beidar. There were some opened questions on maximal ideals in polynomial rings related with Beidar's question. There is an answer to Beidar's question obtained by Chebotar in a paper published in 2008. Using this we will consider the questions which were opened in our paper again. I want to thank A. del Rio who collaborated with me in the consideration of Beidar's question during some time years ago.

Plenary conference

Name	Vyacheslav Futorny
Institution	IME- Universidade de São Paulo, Brasil
Title	Classification of irreducible weight representations of the Lie algebra of vector fields on a torus

Abstract

We will discuss a classification of irreducible weight modules over Lie algebra of vector fields on any dimensional torus. This is a recent joint result with Y.Billig (Canada). It generalizes a classical result of O.Mathieu for Virasoro algebra.

Name	Maria Inés Platzeck
Institution	Universidad Nacional del Sur, Argentina
Title	Modules over endomorphism rings

Abstract

For a finite dimensional algebra Λ over an algebraically closed field K and for a basic Λ-module M , we study M with its natural structure as a module over the endomorphism ring $End_\Lambda (M)$. In particular, given the ordinary quiver of Λ and its relations, and given the representation associated with the Λ-module M , we describe the representation associated with M as a module over $End_\Lambda (M)$. We describe a family of l summands of the $End_\Lambda (M)$-module M , where l is the number of pairwise non-isomorphic simple modules of Λ. We study conditions for these summands to be all non-zero and for them to be indecomposable and pairwise non-isomorphic modules.
This reports joint work with Melina Verdecchia.

Name	Sonia Trepode
Instituion	Universidad de Mar del Plata, Argentina
Title	Representation finite m-cluster tilted algebras of Euclidean type.

Abstract

This is a joint work with Elsa Fern´ndez, which is still in progress. In this talk we note that, in contrast with 1-cluster tilted algebras, the type is not well defined for m-cluster tilted algebras. We also observe that, in contrast with 1-cluster tilted algebras, m-cluster tilted algebras of Euclidean type can be of finite representation type. Both remarks come from an example of an m-cluster tilted algebra of type An and An , shown by Viviana Gubitosi in her Ph.D. thesis.
We study when m-cluster tilted algebras arising from an Euclidean quiver are of finite representation type. For such algebras, we characterize represen-tation finite type in terms of the position of the summands of the m-cluster tilting object in the cluster category. Finally, when the m-cluster tilted algebra arises from a quiver of type $\tilde{A}n$, we get a more precise description of representation finite type in terms of m-relations extensions of representation finite iterated tilted algebras of type $\tilde{A}n$ or of type An.

Name	Octávio Mendoza
Instituion	Universidad Nacional Autonoma de México, México
Title	Relative Igusa-Todorov functions for abelian length-categories

Abstract

Joint work in process with Marcelo Lanzilotta and Corina Saenz.
We developed the theory of the X-relative Igusa-Todorov functions in an abelian length-category C, with enough projectives, where X is a precovering and a generator class in C. In the case when C=mod (A), for some artin algebra A, and X is the class of projective modules in C, we recover the usual Igusa-Todorov functions. We use the setting of the Auslander-Solberg relative homological theory to generalize the original Igusta-Todorov's results.

Plenary conference

Name	Patrick Le Meur
Instituition	Université Paris Diderot , França
Title	The Strong Global Dimension of Piecewise Hereditary Algebras

Abstract

The strong global dimension of #nite dimensional algebras was de#ned by Ringel as the supremum of the lengths of the minimal resolutions of the indecomposable objects in the homotopy category of bounded complexes of projective modules of #nite type. Many people have studied this invariant in view of answering the question asked by Ringel whether the strong global dimension is #nite if and only if the given algebra is piecewise hereditary. An algebra is called piecewise hereditary when its bounded derived category is equivalent to that of a hereditary abelian category. A positive answer to Ringel's question was given by Happel and Zacharia in 2010.
This talk will report on a recent collaboration with Edson Ribeiro Alvares and Eduardo N. Marcos during which we obtained characterisations of the strong global dimension of a given piecewise hereditary algebra. The talk will present these characterisations from various viewpoints such as tilting mutations, Auslander-Reiten theory, or generating hereditary abelian subcategories of the bounded derived cat-egory. It appears that the strong global dimension can be easily interpreted in terms of classical results on piecewise hereditary algebras like the Happel-Rickard- Scho#eld theorem or the description of the bounded derived category of a hereditary abelian category by Happel.
A detailed preprint on this work is available at arXiv:1305.5213 [math.RT].

Name	Viktor Bekkert
Instituion	Universidade Federal de Minas Gerais, Brasil
Title	Indecomposable modules over the algebras of polynomial integro-differential operators

Abstract

We study the representation type of the blocks of generalized weight modules of finite length for the algebras of polynomial integro-differential operators. In tame cases indecomposable modules are described. This is joint work in progress with Volodymyr Bavula and Vyacheslav Futorny.

Name	Marcelo Lanzilotta
Instituion	Universidad de la Republica, Uruguay
Title	Iguza-Todorov functions for radical square zero algebras

Abstract

We study the behaviour of the Igusa-Todorov functions for algebras which radical square zero algebras. We show that the left and right φ dimension coincide in this case. We give bounds for the φ and the ψ dimension and describe the algebras for which these bounds are obtained. We also describe modules for which the φ dimension is realized. (M. Lanzilotta, E. N. Marcos, G. Mata)

Minicourses

Minicourse 1 - Intermediate Level (4 sessions)

Name	Edson Ribeiro Alvares
Instituion	Universidade Federal do Paraná, Brasil
Title	*Derived categories*
Abstract	
TBA	

Minicourse 2 - Basic Level - (3 sessions)

Name	Paula Cadavid
Instituion	IME-Universidade de São Paulo, Brasil
Title	*Estruturas algébricas sobre grafos orientados.*
Abstract	
O objetivo do minicurso é apresentar o Teorema de Gabriel. Tal teorema caracteriza as K-álgebras de dimensão finita, onde K é um corpo algebricamente fechado, em termos de grafos orientados. Neste contexto um grafo orientado é chamado carcás ou aljava. Primeiro vamos ver como construir uma álgebra a partir de um carcás, depois vamos definir o carcás ordinário, que é o carcás associado a uma álgebra dada. Finalmente, iremos visualizar as representações de uma álgebra, isto é seus módulos, usando carcases. Session 1. Carcases e álgebras de caminhos. Session 2. Ideais admissíveis e quocientes de álgebras de caminhos. Session 3. Carcás ordinário de uma álgebra e o Teorema de Gabriel.	

Contributed Talks

Name	Corina Saenz
Instituion	Universidad Nacional Autonoma de México, México
Title	Stratifying Systems.
Abstract	
In this taller we will vive the definition and main prosperareis of the Stratifying Systems. We will give some examples.	

Name	Sonia Maria Fernandes
Instituion	Universidade Federal de Visçosa, Brasil
Title	The φ-Dimension: a new homological measure
Abstract	
In [5], K. Igusa and G. Todorov introduced two functions φ and ψ, which are natural and important homological measures generalising the notion of the projective dimension. These Igusa-Todorov functions have become into a powerful tool to understand better the finitistic dimension conjecture. In this paper, for an artin R-algebra A and the Igusa-Todorov function φ, we characterise the φ-dimension of A in terms either of the bi-functors Ext^i_A (−, −) or Tor's bi-functors Tor^i_A (−, −). Furthermore, by using the first characterisation of the φ-dimension, we show that the finiteness of the φ-dimension of an artin algebra is invariant under derived equivalences. As an application of this result, we generalise the classical Bongartz's result [?, Corollary 1] as follows: For an artin algebra A, a tilting A-module T and the endomorphism algebra B = End-A (T)^op , we have that φ dim (A) − pd T ≤ φ dim (B) ≤ φ dim (A) + pd T.	
References [1] M. Haim, M. Lanzilotta, G. Mata. The Igusa-Todorov function for co-modules. arxiv:1106.4285v4, (2011). [2] F. Huard, M. Lanzilotta. Self-injective right artinian rings and Igusa-Todorov functions. Algebras and Representation Theory, 16, (3), (2013), 765-770. [3] F. Huard, M. Lanzilotta, O. Mendoza. An approach to the Finitistic Dimension Conjecture. J. of Algebra 319, (2008), 3918-3934. [4] F. Huard, M. Lanzilotta, O. Mendoza. Finitistic dimension through infinite projective dimension. Bull. London Math. Soc. 41, (2009), 367-376. [5] K. Igusa, G. Todorov. On the finitistic global dimension conjecture for artin algebras. Representation of algebras and related topics, 201-204. Field Inst. Commun., 45, Amer. Math. Soc., Providence, RI, 2005. [6] Y. Kato. On Derived equivalent coherent rings. Comm. in algebra 30, (2002), 4437-4454. [7] S. Pan, C. Xi. Finiteness of finitistic dimension is invariant under derived equivalences. J. of Algebra 322, (2009), 21-24. [8] D. Xu. Generalized Igusa-Todorov function and finitistic dimensions. Arch. Math. 100, (2013), 309-322.	

Name	Elisa Cañede
Instituion	Universidade Federal de Alagoas, Brasil
Title	Leibniz Algebras and Graph Theory
Abstract	
Leibniz algebras arise as a natural generalization of the Lie algebra, when seeking to provide answers to mathematical models required in Quantum Mechanics and Superstring Theory. It was Jean-Louis Loday in 1992 who emphasized the interest of these algebraic structures regarding the homological studies. Thus, began a very active line of research in the pursuit of classification and characterizations of Leibniz algebras and its homology. In these studies it is essential to know the properties of algebras as nilpotency, solubility, special graduations and character of algebra in order to address the classification. Therefore, the primary goal of this talk is to show some of these properties and to translate them to the language of Graph Theory and vice versa. Finally it will be presented the recent open work with Regina Aquino trying to relate the Leibniz algebras with the Koszul algebras.	

Contributed Talks

Name	Virginia Rodrigues
Instituion	Universidade Federal de Santa Catarina, Brasil
Title	Equivariantization of an abelian K-linear category
Abstract	
Let C be an abelian K-linear category and a finite group G. An action of G on C is a family of additive K-linear funtors {Fg : C → C}g□G with natural isomorphisms γg,h : Fg ◦Fh → Fgh and γ0 : IC → F1 such that some conditions are satisfied. The category C G is called the equivariantization of C by G. We show that C G is an abelian K-linear category and present some related examples.	

Name	Mykola Khrypchenko
Instituion	IME-Universidade de São Paulo, Brasil
Title	The Exel's construction as an adjoint functor
Abstract	
It is well-known from [1, Theorem 4.2] that each partial action of a group G on a set X corresponds to an action of the Exel's monoid S(G) on X. It is easy to see that S(G) is E-unitary and the maximum group image of S(G) is isomorphic to G. We show that with any (unital) action of an E-unitary inverse monoid S on a set X one can associate a partial action of the maximum group image G(S) of S on X in such a way that for S=S(G) we get the above correspondence. Moreover, we prove that these two constructions can be seen as a pair of adjoint functors between suitable categories. The author thanks FAPESP of Brazil for the financial support (process 2012/01554-7).	
References:[1] R. Exel, Partial actions of groups and actions of inverse semigroups, Proc. Amer. Math. Soc. 126 (1998), no. 12, 3481-3494.	

Name	Hernan Giraldo
Instituion	Universidad de Antioquia, Colombia
Title	Heart of irreducible morphisms of category of modules over repetitive algebras
Abstract	
In [1] H. Giraldo and H. Merklen studied irreducible morphisms in the categories $\mathcal{C}(\mathcal{A})$ and $\mathrm{D}^- (\Lambda)$, where $\mathcal{C}(\mathcal{A})$ is the category of complexes over an abelian Krull-Schmidt category $\mathcal{A}$ and $\mathrm{D}^- (\Lambda)$ is the derived category of the bounded above complexes of finite generate left modules, over an Artin algebra Λ. In this work we continue the same study of irreducible morphism having one finite irreducible truncation and the irreducible morphisms of category of modules over repetitive algebras.	
References :[1] Giraldo, H., and Merklen, H. Irreducible morphisms of categories of complexes. Journal of Algebra 321, 10 (2009), 2716 - 2736.	

Name	Fernando Borges
Instituion	IME-Universidade de São Paulo, Brasil
Title	c-Cluster Algebra
Abstract	
In this talk we present a new class of cluster algebra with coefficients of Dynkin type A, which we call c-cluster algebra. In order to obtain the cluster variables of a c-cluster algebra, we give a generalization of the Caldero-Chapoton map.	

Contributed Talks

Name	Guillaume Douville
Instituion	Universite de Sherbrooke, Quebec
Title	Unfoldings of cluster algebras of type B and C.

Abstract

We prove that cluster algebras based on a valued quiver (or a skew-symmetrizable matrix) of type B and C can be viewed as quotients of (well known) cluster algebras of type A and D, via unfoldings. As a consequence, we obtain an efficient way to compute the cluster variables of type B and C, a geometric interpretation (in terms of triangulations), and a description of the mutation classes for those types. We also give a short proof that the positivity conjecture holds for cluster algebras of type B and C.

Name	Wagner de Oliveira Cortes
Instituion	Universidade Federal do Rio Grande do Sul, Brasil
Title	Description of Partial Actions

Abstract

We study partial actions on basic k algebras, where k is a field. We get a surprising result that all partial actions on this kind of algebras are essencially, given by extension, by zero, of a global action of a subgroup, a concept which we define during our explanation.

This is a joint work with Eduardo Marcos.

Name	Mykhailo Dokuchaev
Instituion	IME - Universidade de São Paulo, Brasil
Title	The relative Brauer group of a partial Galois extension and the second partial cohomology group.

Abstract

In [2] S.U. Chase, D.K. Harrison e A. Rosenberg developed a Galois theory of commutative rings, which was generalized in [3] for the context of partial actions. Also in [2], as a consequence of the results on Amitsur cohomology obtained in [1], a seven terms exact sequence was given, involving the relative Brauer group of a Galois extension of commutative rings, several cohomology groups and Picard groups. The sequence generalized simultaneously the two most fundamental facts of Galois cohomology, i.e. the Hilbert 90 Theorem and the Crossed Product Theorem, which says that the relative Brauer group is isomorphic to the second cohomology group of the Galois group. In [4], in collaboration with M. Khrypchenko, we worked out a cohomology theory based on partial actions, which gave the appropriate concepts for a generalization of the Chase-Harrison- Rosenberg exact sequence for the setting of partial actions. This generalization was elaborated in interaction with A. Paques and H. Pinedo in [5] and [6]. Let α be a partial action of a finite group G on a commutative ring R such that Rα R is a partial Galois extension with Galois groups G. Then according to [7], for an arbitrary partial 2-cocycle ω Z 2 (G, R), the crossed product R ∗α,ω G is an Azumaya Rα -algebra with CR∗α,ω G (R) = R. This φ permits us to construct a homomorphism H 2 (G, α, R) → B(R/Rα), which in the case of a Galois extension of fields is the classical isomorphism, mentioned above. We will present some details about φ. (in collaboration with A. Paques e H. Pinedo)

1] S. U. Chase, A. Rosenberg, Amitsur cohomology and the Brauer groups, Mem. Amer. Math. Soc. 58 (1965), 34–79, [2] S. U. Chase, D. K. Harrison, A. Rosenberg, Galois theory and Galois cohomology of commutative rings, Mem. Amer. Math. Soc. 52 (1965) 1–19. [3] M. Dokuchaev, M. Ferrero, A. Paques, Partial actions and Galois theory, J. Pure Appl. Algebra (2007) 208: 77-87. [4] M. Dokuchaev, M. Khrypchenko, Partial cohomology of groups, Preprint. [5] M. Dokuchaev, A. Paques, H. Pinedo, Partial Galois cohomology, extensions of the Picard group and related homomorphisms, Preprint. [6] M. Dokuchaev, A. Paques, H. Pinedo, Partial generalized crossed products and a seven-term exact sequence, Preprint. [7] A. Paques, A. Sant'Ana, When is a crossed product by a twisted partial action Azumaya, Comm. Algebra (2010) 38: 1093-1103.

Contributed Talks

Name	Artem Lopatin
Instituion	Universidade de Campinas, Brasil
Title	Identities of the sum of two PI-algebras.
Abstract	
We consider the following question posted by K.I. Beidar and A.V. Mikhalev (1995) for a ring R=A+B: is it true that if subrings A and B satisfy polynomial identities, then R also satisfies a polynomial identity? Although this question remains open in general, the positive answer is known in many cases. In 1962 O.H. Kegel established that if A and B are nilpotent, then R is also nilpotent. By the result of Bahturin and Giambruno (1994), if A and B are commutative rings, the the question also has the positive answer. It was shown by M. Kepczyk and E.R. Puczylowski in 2001 that it is enough to assume that A is a left or right ideal. We established new conditions when the question has the positive answer and found the identity that holds in R in this case.	

Posters

Name	Alex Sierra
Instituion	IME/Universidade de São Paulo, Brasil
Title	Group Actions and Coverings of Brauer Graph Algebras
Abstract	
It will be developed, in almost a complete way, a theory of group actions and coverings on Brauer graphs that parallels the theory of group actions and coverings of algebras. In particular, it will be shown that any Brauer graph can be covered by a tower of coverings of Brauer graphs such that the topmost covering has multiplicity function identically one, no loops and no multiple edges.	

Name	Clézio Aparecido Braga
Instituion	Universidade Estadual do Oeste do Paraná, Brasil
Title	Continuous Limits of Tilting Modules
Abstract	
In this work, we will present some conditions over a family of left tilting modules over a ring R, in the sense to construct a continuous system of tilting modules whose direct limit is also a tilting modules and as an exemple, we will show a countable family of tilting modules over a post projective component of a finite dimensional hereditary algebra and obtain its direct limit.	

Posters

Name	Cristian Schmidt
Instituion	Universidade Federal do Paraná, Brasil
Title	A study of hereditary categories with tilting object

Abstract

The aim of this work is to make a study about hereditary categories with tilting object using exceptional objects and the perpendicular category associated to this exceptional object. More specifically, we will prove the following theorem: Let H be a connected hereditary abelian k-category with finite dimensional homomorphism and extension spaces. If H has a tilting object, is not derived equivalent to some modH (H hereditary algebra) and H0 = 0, then H is derived equivalent to cohX for some weighted projective line X. First, we will briefly present some basic properties of hereditary categories with a tilting object. After this, we define exceptional objects and perpendicular categories and we study their properties, and finally, we proof the theorem aforementioned, using some tools of quasitilted algebras and canonical algebras.

Name	Sara Pinter
Instituion	Universidade Federal de Santa Catarina, Brasil
Title	Objetos duais em categorias trançadas

Abstract

Dada uma categoria monoidal objetos duais são fundamentais para definir uma categoria rígida. Segundo Joyal A. e Street R. uma categoria monoidal é dita autônoma à esquerda (à direita) quando todo objeto tem um dual à esquerda (à direita) e é dita autônoma ou rígida se todo objeto tem um dual à esquerda e um dual à direita. Joyal A. e Street R. provaram que toda categoria monoidal trançada autônoma à esquerda é rígida. Neste trabalho apresentamos uma outra prova deste resultado.

Name	Francisco B. Medeiros and Heily Wagner
Instituion	IME-Universidade de São Paulo and Universidade Federal do Paraná, Brasil
Title	On shod algebras with finite strong global dimension

Abstract

The strong global dimension of finite-dimensional algebra A is the maximum width of indecomposable bounded complexes of finite-dimensional projective right A-modules. Happel and Zacharia (2008) proved that A is a quasitilted algebra which is not hereditary if and only if the strong global dimension and the global dimension are two. They proposed to investigate algebras with finite strong global dimension such that this dimension and the global dimension coincides. We begin to look at the case three. The shod algebras were introduced by Coelho and Lanzilotta (1999) as those where each indecomposable module has injective dimension at most one or the projective dimension at most one. The algebra A is strictly shod if it is shod and not quasitilted, and in this case its global dimension is three. Our question was: Is A a strictly shod algebra if and only if its strong global dimension and its global dimension are equal three? This is not true in any direction. This conclusion comes from the fact that for each integer n greater than two we construct a strictly shod algebra with strong global dimension n. [This is a joint work in progress with Eduardo N. Marcos.]

Posters

Name	Caio Barcellos
Instituion	DMAT/Universidade Federal do Espírito Santo, Brasil
Title	Módulos

Abstract

Uma das coisas que diferenciam a abordagem moderna da Álgebra Comutativa é a ênfase maior em módulos, e não somente ideais. A vantagem dessa abordagem é a simplificação e clareza no desenvolvimento das ideias. Podemos observar que um ideal I e o anel quociente A/I são ambos exemplos de módulos e poderão ser tratados dessas duas formas.
Temos como objetivo trabalhar os conceitos básicos de álgebra comutativa para o estudo de decomposição primária (decompor ideais como interseção de ideais primários). Tal estudo está relacionado com a decomposição de uma variedade algébrica em suas componentes irredutíveis.
Nesse trabalho vamos definir conceitos básicos como módulos, submódulos e sequências exatas.
A proposição 1, que envolve diagramas comutativos e sequências exatas, é o principal resultado estudado nessa primeira parte do trabalho. Orientador: Renato Fehlberg Junior

Name	Rosana Vargas
Instituion	USPLeste
Title	Álgebras Ada simplesmente conexas

Abstract

Em \cite{ACLV}, introduzimos e estudamos as álgebras ada que são definidas pela propriedade de que todos os módulos projetivos indecomponíveis e todos os módulos injetivos indecomponíveis estão em $\mathcal{L}_{A} \cup \mathcal{R}_{A}$. Para tais álgebras descrevemos totalmente suas componentes de Auslander-Reiten.
Outra noção que abordamos no estudo das álgebras ada foi a de álgebra simplesmente conexa. Quando supomos que A é uma álgebra de dimensão finita sobre um corpo algebricamente fechado, podemos pensar quando ela é simplesmente conexa. Uma álgebra triangular A é chamada simplesmente conexa se o grupo fundamental de toda apresentação de A for trivial, para mais detalhes, ver \cite{AP}. Em \cite{S1}, Skowro\'nski relaciona o fato da álgebra A ser simplesmente conexa com o anulamento do primeiro grupo de Cohomologia de Hochschild $\HH^{1} (A)$ de A com coeficientes no bimódulo ${}_{A}A_{A}$. A equivalência destas condições vale para várias classes de álgebras, entre elas para as álgebras inclinadas, ver \cite{L}. Mostramos que esta equivalência também vale para álgebras ada:\\
\textbf{Teorema} ~\cite{ACLV} Seja A uma álgebra ada sobre um corpo algebricamente fechado. Então A é simplesmente conexa se e somente se $\HH^{1}(A) = 0$. Mais ainda, se este é o caso, então o anel de Cohomologia de Hochschild $\HH^\bullet(A)$ reduz-se ao corpo base.

References:
\bibitem{A1}{\sc I. Assem}, {\it Left Sections and the left part of an Artin Algebra},Colloq. Math. 116 (2009), 273-300 \bibitem{AC} {\sc I.~ Assem, F.~ U.~ Coelho}, {\it Two-sided gluings of tilted algebras}, J. Algebra {\bf 269} (2) (2003), 456-479. \bibitem{ACT} {\sc I. Assem, F. U. Coelho, S. Trepode}, {\it The left and the right parts of a module category} J. Algebra {\bf 281} (2) (2004), 518-534.\bibitem{ACLV} {\sc I. Assem, D. Castonguay, M. Lanzilotta, R. R. S. Vargas}, {\it Algebras Determined by their supports}, Journal of Pure and Applied Algebra, {\bf 216} (5), (2012), 1134-1145.\bibitem{AP} {\sc I. Assem, J. A. de la Pe\~na}, {\it The fundamental groups of a triangular algebra}, Comm. Algebra {\bf 24} (1) (1996), 187-208.\bibitem{L} {\sc P.~Le Meur}, {\it Topological invariants of piecewise hereditary algebras}, Trans. Amer. Math. Soc. {\bf 363} (4) (2011), 2143-2170.\bibitem{S1} {\sc A. Skowro\'nski}, {\it Simply connected algebras and Hochschild cohomologies}, Proc. ICRA VI, Can. Math. Soc. Conf. Proc. {\bf 14} (1993) 431-447.\bibitem{S2} {\sc A. Skowro\'nski}, {\it On artin algebras with almost all indecomposable modules of projective or injective dimension at most one}, Cent. Eur. J. Math. {\bf 1} (2003), 108-122.

Addendum
to the plenary conferences

Name	Ibrahim Assem
Instituition	Universite de Sherbrooke, Quebec
Title	The first Hochschild group of a cluster tilted algebra: Old and new results

Abstract

This is a survey on four joint works with Juan Carlos Bustamante, Maria Andrea Gatica, Kiyoshi Igusa, Maria Julia Redondo, Ralf Schiffler and Rachel Taillefer. We consider the case where an algebra B is a split extension of another algebra C by a C − C −bimodule E and show the existence of a map between the first Hochschild cohomology groups : HH1B → HH1C. In case C is triangular of global dimension at most 2 and B is the relation extension of C, we prove that is surjective and compute its kernel. These results are then applied to study the first Hochschild groups of cluster-tilted algebras. (see references on page 11)

References:
[1] Assem, I., Gatica, M.-A., Schiffler, R. and Taillefer, R., Work in progress.
[2] Assem, I., Redondo, M. J. and Schiffler, R., On the first Hochschild cohomology group of a cluster tilted algebra, submitted for publication.
[3] Assem, I., Bustamante, J.C., Igusa, K. and Schiffler, R., The first Hochschild cohomology group of a cluster tilted algebra revisited, International Journal of Algebra and Computation, Vol. 23, No. 4 (2013) 729-744..
[4] Assem, I. and Redondo, M. J., The first Hochschild cohomology group of a schurian cluster-tilted algebra, Mansucripta Math. 128 (2009) 373-388.

Name	Francisco César Polcino Millies
Instituition	IME-Universidade de São Paulo
Title	Essential idempotents in group algebras and minimal cyclic codes

Abstract

Error correcting codes can be defined from ideals in finite group algebras. Minimal codes, in the semisimple case, are those defined from primitive idempotents of the algebra. We shall show that, when moving from cyclic to abelian codes, there is no gain at the level of minimal codes. Actually if the abelian group envolved is not cyclic, all minimal codes are repetition codes and, in general, every minimal abelian code is equivalent to a minimal cyclic code. However, non-minimal abelian codes can be more convenient.
All these result follow from studying a special kind of idempotents. In the talk, we shall introduce the necessary ideas and definitions and all techniques envolved are actually ring-theoretical.

Addendum

to the poster session

Name	Marcelo Silva
Instituion	IME-USP
Title	Incidence piecewise hereditary algebras

Abstract

The class of piecewise hereditary algebras plays an important role in the Representation Theory of Algebras. Classifying all algebras in this class is a complicated problem. The aim of our study is to classify basic algebras which are both piecewise hereditary and incidence algebras. In this presentation, we will describe the incidence algebras which are derived equivalent to hereditary algebras of types $\mathbb{A}_n$, $\widetilde{\mathbb{A}}_n$, $\mathbb{D}_n$ and $\mathbb{E}_6$. Also, we will illustrate an interesting example and we will state a theorem on the global dimension of incidence piecewise hereditary algebras.

Name	Wilson Fernando Mutis Cantero
Instituion	IME-USP
Title	A liberdade da álgebra envelopante universal U (gl 3) como módulo sobre as subalgebras de deslocamento de argumento

Abstract

Na teoria de Representações de algebras de Lie, muitas vezes é importante o estudo de pares (U (g), B) onde U (g) ´e a a ´lgebra envelopante universal de uma K- álgebra de lie g e B e´uma certa subalgebra comutativa de U (g). Um dos interesses no estudo destes pares ´e determinar se U (g) é livre como B-m ´odulo, em geral, é poss ıvel alcançar muitas consequ^encias positivas deste fato. Nessa linha de estudo o famoso teorema de B. Kostant (1963)[2] afirma que, se g ´e uma C- álgebra de lie semisimples ent ão a sua a ´ lgebra envelopante universal U (g) é um m ódulo livre sobre seu centro. Tambem S. Ovsienko (2003) [3] mostra que U (gl N) ´e um m ódulo a esquerda (direita) livre sobre a sua subalgebra de Gelfand-Tsetlin. Em particular, os caracteres da subalgebra de Gelfand-Tsetlin de U (gl N) parametrizam os modulos de Gelfand-Tsetlin irredutiveis genericos. Igualmente, um an´alogo do teorema de Kostant para a classe de algebras filtradas especiais ´e provado por V. Futorny e S. Ovsienko (2005)[4], eles estabelecem o seguinte resultado chave para estas ´algebras:

Teorema 1. Seja U uma k-´algebra filtrada especial. Se g 1 , · · · , g t U são elementos que comutam entre si cujas imagens graduada formam uma interseção completa para a algebra graduada associada de U, então U ´e livre como k [g 1 , · · · , g t]-m ódulo a esquerda(ou direita).

Em nestas notas s˜ao apresentados os c álculos que mostram que a álgebra envolopante universal U(gl 3) ´e um A µ -m ódulo livre (a esquerda ou dereita), onde A µ é a correspondente subalgebra comutativa de U(gl 3) obtida pelo m´etodo de deslocamento de argumento associada ao par^ametro µ gl 3 . Os c álculos s˜ao feitos usando um conjunto explicito de geradores da subalgebra A µ S (gl N) apresentado em [6], alem de utilizar o teorema 1.1, a proposição 2.1 e o lema 2.2 de [4].

References: [1] V. Futorny, S. Ovsienko. Fibers of characters of Gelfand-Tsetlin modules, Trans. AMS to appear.[2] B. Kostant. Lie groups representations on polynomial rings Amer. J. Math, 85, (1963),321-404.[3] S. Ovsienko. Strongly nilpotent matrices and Gelfand-Tsetlin modules J. Linear Algebra and Appl,365, (2003), 349-367.[4] V. Futorny, S. Ovsienko. Kostant's theorem for special filtered algebras Bull. London Math. Soc, 37,(2005), 187-199.[5] V. Futorny, A. Molev. Gelfand-Tsetlin and Bethe jet schemes for gl N.[6] V. Futorny, A. Molev. Quantization of the shift argument subalgebras in type A. Preprint, (2013)