PROGRAM

Southern Regional Algebra Conference (SRAC 2021)
Milledgeville, Georgia, USA
March 19 - 21, 2021

Organizing Committee

Prof. Robert Blumenthal (Dept. Chair)
Dr. Guy R. Biyogmam
Dr. Simplice Tchamna
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List of Participants

1. H. Melis Tekin Akcin (Hacettepe University)
2. Mehsin Jabel Atteya* (University of Leicester, Graduate Student)
3. Ayman Badawi* (American University of Sharjah)
4. Irfan Bagci* (University of North Georgia)
5. Guy Roger Biyogmam* (Georgia College & State University)
6. Meaza Fantahun Bogale (Auburn University)
7. Charles Burnette* (Xavier University of Louisiana)
8. Mahir Bilen Can* (Tulane University)
9. Henry Chimal-Dzul* (Ohio University, Graduate Student)
10. Manfred Dugas (Baylor University)
11. Gabriella D'Este* (University of Milano)
12. Nil Orhan Ertaş* (Bursa Technical University)
13. Jimoh Fawaz (New Mexico State University, Graduate Student)
14. Jorg Feldvoss* (University of South Alabama)
15. Davide Fusi* (University of South Carolina Beaufort)
16. Luyining (Elaine) Gan (University of Nevada, Reno)
17. Blaise Heider (University of Central Missouri)
18. Daniel Herden* (Baylor University)
19. Olivier Heubo-Kwegna* (Saginaw Valley State University)
20. Garrett Johnson* (North Carolina Central University)
21. Lee Klingler* (Florida Atlantic University)
22. Korkeat Korkeathikhun* (University of North Carolina at Chapel Hill, Graduate Student)
23. Jean B Nganou* (University of Houston-Downtown)
24. Nham Ngo* (University of North Georgia)
25. Bach Nguyen* (Xavier University of Louisiana)
26. Tolulope Oke* (Texas A&M University, Graduate Student)
27. P. Chella Pandian (Srimad Andavan Arts and Science College)

28. Alexandra Pasi* (Baylor University, Graduate Student)
29. Lokendra Paudel* (University of South Carolina - Salkehatchie)
30. Cornelis Pillen* (University of South Alabama)
31. Jackson Rebrovich* (Baylor University)
32. Tony Se* (West Virginia University)
33. Yiyang She* (Tulane University, Graduate Student)
34. Steve Szabo* (Eastern Kentucky University)
35. Tin-Yau Tam* (University of Nevada, Reno)
36. Simplice Tchamna* (Georgia College & State University)
37. Jose A. Velez-Marulanda* (Valdosta State University)
38. Corey Wolfe (Tulane University, Graduate Student)
39. Eunkyung You (Abraham Baldwin Agricultural College)

Presenter*

SCHEDULE OF PRESENTATIONS

Friday, March 19 2021

Afternoon

	Zoom Room 1
12:30 pm -1:10 pm	Zoom meeting room goes live
1:15 pm - 1:25 pm	Opening remarks
1:30 pm - 1:55 pm	Nham Ngo: *Singularities of G-saturation*
2:00 pm - 2:25 pm	Tin-Yau Tam: *Conjugacy of inverse and adjoint for complex orthogonal group*
2:30 pm - 2:55 pm	Garret Johnson: *Quantized nilradicals of parabolic subalgebras of sl(n)*
	Coffee Break
3:30 pm - 3:55 pm	Irfan Bagci: *On Whittaker modules for Lie superalgebra.*
4:00 pm - 4:25 pm	Guy R. Biyogmam: Lie-*derivations of Leibniz algebras*
4:30 pm - 4:55 pm	Jorg Feldvoss: *Semi-Simple Leibniz Algebras.*

Saturday, March 20 2021

Morning

Concurrent session	**Zoom Room 1**
8:00 am - 8:25 am	Olivier Heubo-Kwegna: *Projective Star Operations on Polynomial Rings*
8:30 am - 8:55 am	Ayman Badawi: *On (m, n)-closed ideals of commutative ring*
9:00 am - 9:25 am	Simplice Tchamna: *On $\star$-Prüfer ring extensions*
	Coffee Break
10:00 am - 10:25 am	Lokendra Paudel: *The Group of Divisibility of a Finite Intersection of Valuation Overrings of Affine Domains*
10:30 am - 10:55 am	Lee Klingler: *Semi-clean group rings*
11:00 am - 11:25 am	Henry Chimal-Dzul: *Characterizations of some classes of Morita context rings*

Concurrent session	**Zoom Room 2**
8:00 am - 8:25 am	Yiyang She: *Strong Gelfand Subgroups of $F \wr S_n$*
8:30 am - 8:55 am	Mehsin Jabel Atteya: *Symmetric Skew n-Antisemigeneralized Semideri vation of (σ,τ)-Anticommutative Rings*
9:00 am - 9:25 am	Daniel Herden: *Reduced finitary incidence algebras and their automorphisms.*
	Coffee Break
10:00 am - 10:25 am	Jackson Rebrovich: *The Group of Algebra Automorphisms of the Group of Units of a Finitary Incidence Algebra*
10:30 am - 10:55 am	Alexandra Pasi: *Forcing $\aleph_1$-Free Groups to be Free*
11:00 am - 11:25 am	Cornelis Pillen: *On Donkin's Tilting Module Conjecture and groups of type G_2*

Saturday, March 20 2021

Afternoon

Zoom Room 1

1:00 pm - 1:25 pm	Bach Nguyen: *Root of unity quantum cluster algebras and discriminants*
1:30 pm - 1:55 pm	Jose Velez-Marulanda: *A deformation theory of finite dimensional modules over repetitive algebras*
2:00 pm - 2:25 pm	Gabriella D'Este: *Baer-Kaplansky classes determined by numerical invariants*
	Coffee Break
3:00 pm - 3:25 pm	Nil Orhan Ertaş: *On Almost Projective Modules*
3:30 pm - 3:55 pm	Tony Se: *A study of generalized semidualizing modules*
4:00 pm - 4:25 pm	Mahir Bilen Can: *From Flag Varieties to Equivariant Embeddings*

Sunday, March 21 2021

Morning

Zoom Room 1

8:00 am - 8:25 am	Davide Fusi: *Using arc spaces to study rationality and unirationality*
8:30 am - 8:55 am	Charles Burnette: *Periods of iterated rational functions over a finite field*
9:00 am - 9:25 am	Steve Szabo: *A taxonomy of Dedekind finite rings and reflexive rings*
	Coffee Break
10:00 am - 10:25 am	Jean B. Nganou: *Profinite completions: Case of MV-algebras.*
10:30 am - 10:55 am	Korkeat Korkeathikhun: *Nilpotent varieties in symmetric spaces and twisted affine Schubert varieties*
11:00 am - 11:30 am	Closing meeting

Zoom Room 2
March 20: 8:30 am - 8:55 am

Symmetric Skew n-Antisemigeneralized Semideri vation of (σ,τ)-Anticommutative Rings

Mehsin Jabel Atteya
University of Leicester

The study of derivation was initiated during the 1950s and 1960s. Derivations of rings got a tremendous development in 1957, when Posner established two very striking results in the case of prime rings. J. Bergen introduced the notion of semiderivations of a ring R which extends the notion of derivation of a ring R, as follows: $d : R \longrightarrow R$ is a semiderivation of R if there exists a function $g : R \longrightarrow R$ such that (i) $d(xy) = d(x)g(y) + xd(y) = d(x)y + g(x)d(y)$ for all x, yR and (ii) $d(g(x)) = g(d(x))$ for all $x \in R$. In 2020, Mehsin Jabel Atteya [4] introduced the definition of (σ, τ)-Homgeneralized derivations of semiprime rings with some results as follows: let R be a ring and σ, τ be automorphism mappings of R. An additive mapping $H\colon R \to R$ is called a (σ, τ)-Homogeneralized derivation of R if $H(xy) = H(x)H(y) + H(x)\sigma(y) + \tau(x)h(y)$, where $h\colon R \to R$ is (σ, τ)-Homoderivation of R for all $x, y \in R$.
The main purpose of this paper is to introduce the definition of (σ,τ)-anticommutative rings. Furthermore, we employing the symmetric skew n-antisemigeneralized semiderivation of (σ,τ)-anticommutative rings. This article divided into two sections, in the first section, we emphasize on the definition of (σ,τ)-anticommutative rings while in the second section, we study the symmetric skew n-antisemigeneralized semiderivation of (σ,τ)-anticommutative prime rings and (σ,τ)-anticommutative semiprime rings. Examples of various results have also been included..

Zoom Room 1
March 20: 8:30 am - 8:55 am

On (m, n)-closed ideals of commutative ring

Ayman Badawi
American University of Sharjah

Let R be a commutative ring with $1 \neq 0$, and let I be a proper ideal of R. Recall that I is an n-absorbing ideal if whenever $x_1 \cdots x_{n+1} \in I$ for $x_1, \ldots, x_{n+1} \in R$, then there are n of the x_i's whose product is in I. We define I to be a semi-n-absorbing ideal if $x^{n+1} \in I$ for $x \in R$ implies $x^n \in I$. More generally, for positive integers m and n, we define I to be an (m, n)-closed ideal if $x^m \in I$ for $x \in R$ implies $x^n \in I$. A number of examples and results on (m, n)-closed ideals are discussed in this paper..

Zoom Room 1
3:30 pm - 3:55 pm

On Whittaker modules for Lie superalgebras

Irfan Bagci
University of North Georgia

B. Kostant defined Whittaker modules for finite dimensional complex semisimple Lie algebras. Since then, a number of others have further developed the idea of Whittaker modules for Lie algebras. Whittaker modules for Lie superalgebras were defined by Bagci, Christodoulopoulou, and Weisner. Unlike the Lie algebra setting, simple finite dimensional modules for a finite dimensional nilpotent Lie superalgebra are not always one dimensional. This creates an additional challenge for producing Lie algebra results in the Lie superalgebra setting. For this reason we restrict to basic classical Lie superalgebras of type I. Recently, we have given a description of simple Whittaker modules for basic classical Lie superalgebras of type I. In this talk we will discuss the simple modules and a description of these modules for type I simple Lie superalgebras.

Zoom Room 1
March 19: 4:00 pm - 4:25 pm

Lie-derivations of Leibniz algebras

Guy Roger Biyogmam
Georgia College & State University

In this talk, we discuss a notion of derivation on Leibniz algebras relative to the Liezation functor; call it Lie-derivation. This concept generalizes derivations for non-Lie Leibniz algebras. We present properties of several interesting subalgebras of the Lie algebra of these Lie-derivations. We draw attention to the subalgebra of Lie-derivations whose images are contained in the Lie-center (call them Lie-central derivations), and the subalgebra of Lie-derivation in which the image is contained in the second term of the lower Lie-central series of the Leibniz algebra, and that vanishes on Lie-central elements. In particular, we discuss some interrelations between these subalgebras and Lie-isoclinism.

Zoom Room 1
March 21: 8:30 am - 8:55 am

Periods of iterated rational functions over a finite field

Charles Burnette
Xavier University of Louisiana

Joint work with
Eric Schmutz

Choose a uniform random degree d polynomial f in $\mathbb{F}_q[x]$. In this talk, we will estimate the expected value of the ultimate period of f under compositional iteration. We also determine the joint distribution of the small cycle lengths in the directed graph over $\mathbb{F}_q$ with edge set $\{(v, f(v)) \mid v \in \mathbb{F}_q\}$. The proofs rely on Lagrange interpolation and the method of factorial moments. Similar results are proved for rational functions.

Zoom Room 1
March 20: 4:00 pm - 4:25 pm

From flag Varieties to Equivariant Embeddings

Mahir Bilen Can
Tulane University

Let G be a reductive group. A spherical G-variety is a normal, irreducible variety X such that a Borel subgroup of G has an open orbit in X. The set of spherical varieties includes all toric varieties, all symmetric varieties, all partial flag varieties, as well as all reductive algebraic monoids. Since every partial flag variety is spherical, it is natural to wonder which Schubert varieties are spherical. In a joint work with Hodges, we showed earlier that if the semisimple rank of G is two, then all smooth Schubert varieties in any partial flag variety of G are spherical. More recently, after our work, Hodges and Yong proposed a general conjecture for the sphericality of Schubert varieties. In this talk, first, I will summarize these developments. Then I will explain some of my recent work on a related family of varieties.

Zoom Room 1
March 20: 11:00 am - 11:25 am

Characterizations of some classes of Morita context rings

Henry Chimal-Dzul
Ohio University

Joint work with
Sergio López-Permouth (Ohio University)
and
Steve Szabo (Eastern Kentucky University)

Morita context rings are one of the most important types of rings in algebra. Many interesting examples of rings have been constructed through them. It is then natural to study necessary and sufficient conditions under which Morita context rings belong to a certain class of rings. In this talk we consider this problem for the classes of NI, weakly 2-primal, and 2-primal rings. We connect a characterization of an NI Morita context ring to Köthe's conjecture.

Zoom Room 1
March 20: 2:00 pm - 2:25 pm

Baer-Kaplansky classes determined by numerical invariants

Gabriella D'Este
University of Milano

Joint work with
Derya Keskin Tutuncu (Hacettepe University, Ankara, Turkey)
and
Rachid Tribak (CRMEF TTH , Tanger , Morocco)

I would like to present two papers (one with Derya Keskin Tutuncu and one with Derya Keskin Tutuncu and Rachid Tribak) on the so-called Baer - Kaplansky classes. These are classes of modules with the property that two modules in these classes with isomorphic endomorphism rings are actually isomorphic. I will describe Baer - Kaplansky classes with exactly one, two or infinitely many indecomposable modules. Some of these classes have the following property: if two modules X and Y are both direct sum of n indecomposable modules and their endomorphism rings are isomorphic abelian groups or isomorphic vector spaces, then X and Y are isomorphic.

Zoom Room 1
March 20: 3:00 pm - 3:25 pm

On Almost Projective Modules

Nil Orhan Ertaş
Bursa Technical University

We investigate the relation between almost projective modules and generalized projective modules. These concepts are useful for the study on the finite direct sum of lifting modules. It is proved that; if M is generalized N-projective for any modules M and N, then M is almost N-projective. And also we show that if M is almost N-projective and N is lifting, then M is im-small N-projective. We also discuss the question of when the finite direct sum of lifting modules is again lifting.

Zoom Room 1
March 19: 4:30 pm - 4:55 pm

Semi-Simple Leibniz Algebras

Jorg Feldvoss
University of South Alabama

Leibniz algebras were introduced by Bloh and Loday as non-commutative analogues of Lie algebras. Many results for Lie algebras have been proven to hold for Leibniz algebras but there are also several results that are not true in this more general context.
In the talk I will describe the structure of finite-dimensional semi-simple Leibniz algebras over a field of characteristic zero. They are hemi-semidirect products of a semi-simple Lie algebra $\mathfrak{g}$ and a certain completely reducible $\mathfrak{g}$-module. Then I will apply this to derive some results on the derivations of such Leibniz algebras.

Zoom Room 1
March 21: 8:00 am - 8:25 am

Using arc spaces to study rationality and unirationality

Davide Fusi
University of South Carolina Beaufort

Arc spaces were introduced by J. Nash in 1968 and, in recent years, they have been applied to several problems in algebraic geometry. Roughly speaking, given a complex algebraic variety X of dimension n, the m-th jet scheme $J_m(X)$ of X is the scheme of morphisms from $\mathbb{C}[t]/t^{m+1}$ to X. For every $p > q$, the morphisms $\mathbb{C}[t]/t^{p+1} \to \mathbb{C}[t]/t^{q+1}$ induce natural truncations maps $\pi_{p,q} : J_p(X) \to J_q(X)$. The arc space $J_\infty(X)$ of X is the inverse limit of the ordered set given by the jet schemes and truncations maps. In 2006, P. Ionescu and F. Russo gave rationality and a unirationality criteria in terms of special closed subschemes of the Chow variety of X, $\mathrm{Chow}(X)_x$, parametrizing 1-cycles with rational components passing through a point x of X_{reg}. The rationality criterion was further studied and improved by the author. In this talk, we discuss how, due to their local nature, the criteria can be formulated in terms of arc spaces. The advantage of the criteria in terms of arc spaces is that they allow us to work with explicit equations. These seem more feasible for concrete situations in which the equation of a variety embedded in the projective space is given.

Zoom Room 2
March 20: 9:00 am - 9:25 am

Reduced Finitary Incidence Algebras and Their Automorphisms

Daniel Herden
Baylor University

Let $I(P)$ denote the incidence algebra of some locally finite poset $(P, \leq)$ over some field F and $\sim$ some equivalence relation on the set of generators of $I(P)$. Then $I(P, \sim)$ is the subset of $I(P)$ of all the elements that are constant on the equivalence classes of $\sim$. If $\sim$ satisfies certain conditions, then $I(P, \sim)$ is a subalgebra of $I(P)$

and is called a reduced incidence algebra. We extend this notion to finitary incidence algebras $FI(P)$ for any poset $(P, \leq)$. We investigate reduced finitary incidence algebras $FI(P, \sim)$ and determine their automorphisms in some special cases.

Zoom Room 1
March 20: 8:00 am - 8:25 am

Projective Star Operations on Polynomial Rings

Olivier Heubo-Kwegna

Saginaw Valley State University

We consider the polynomial ring $S := K[X_0, \ldots, X_n]$ over a field K and the rings $R_i := K[\frac{X_0}{X_i}, \ldots, \frac{X_n}{X_i}]$ for $0 \leq i \leq n$. We introduce the notion of a projective star operation on S and relate it to the classical star operations on the R_i's. We show that the projective Kronecker function ring $\mathbf{PKr}(S, \star)$ of S is the intersection of the Kronecker function rings $\mathbf{Kr}(R_i, \star_i)$, $0 \leq i \leq n$, where the $\star_i$'s are pairwise compatible e.a.b. star operations on the R_i's and $\star$ is a projective star operation on S built from the $\star_i$'s.

Zoom Room 1
March 20: 2:30 pm - 2:55 pm

Quantized nilradicals of parabolic subalgebras of $\mathfrak{sl}(n)$

Garrett Johnson
North Carolina Central University

Joint work with
Andrew Jaramillo

Let P_J be the standard parabolic subgroup of $SL(n)$ obtained by deleting a subset J of negative simple roots and let $P_J = L_J U_J$ be the standard Levi decomposition. Multiplication $L_J \times P_J \to P_J$ induces a coaction $\mathcal{O}(P_J) \to \mathcal{O}(L_J) \otimes \mathcal{O}(P_J)$ on the coordinate rings. We study the quantum analogue $\mathcal{O}_q(P_J) \to \mathcal{O}_q(L_J) \otimes \mathcal{O}_q(P_J)$ of this coaction and the corresponding subalgebra of coinvariants. When the deformation parameter q is nonzero and not a root of unity, the algebra of coinvariants is isomorphic to a quantized nilradical of a parabolic subalgebra of the Lie algebra $\mathfrak{sl}(n)$. We discuss properties of quantum minors in the quantized nilradicals. This is joint work with Andrew Jaramillo.

Zoom Room 1
March 20: 10:30 am - 10:55 am

Semi-clean group rings

Lee Klingler

Florida Atlantic University

Joint work with
Alan Loper, Warren McGovern, and Matthew Toeniskoetter

We call the commutative ring R a *clean ring* if every element of R can be written as the sum of a unit and an idempotent. The notion of a clean ring was defined by Nicholson [1977] in a study of exchange rings and lifting idempotents. Ye [2003] introduced the notion of semiclean rings: R is called a *semiclean ring* if every element of R can be written as the sum of a unit and a periodic element, where $r \in R$ is called *periodic* if there are natural numbers $k < n$ such that $r^k = r^n$. In joint work with Alan Loper, Warren McGovern, and Matthew Toeniskoetter, we show that, if R is a local ring and G is a torsion abelian group, then the group ring $R[G]$ is semiclean.

Zoom Room 1
March 21: 10:30 am - 10:55 am

Nilpotent varieties in symmetric spaces and twisted affine Schubert varieties

Korkeat Korkeathikhun
University of North Carolina at Chapel Hill

We relate the geometry of Schubert varieties in twisted affine Grassmannian and the nilpotent varieties in symmetric spaces. This extends some results of Achar-Henderson in the twisted setting. We also get some applications to the geometry of the order 2 nilpotent varieties in certain classical symmetric spaces.

Zoom Room 1
March 21: 10 am - 10:25 am

Profinite completions: Case of MV-algebras

Jean B Nganou
University of Houston-Downtown

The talk starts by establishing the fact that the profinite completion construction is a covariant functor from the category of (universal) algebras of a given type into the category of the corresponding Stone algebras. Next, the attention is restricted to the category of MV-algebras where we compute the profinite completion of a general MV-algebra. We obtain that the profinite completion of an MV-algebra is the direct product of all its finite simple homomorphic images. As immediate byproducts of our description, we obtain simpler proofs of some previously known results such as the profinite completion of a Boolean algebra, the action of profinite completions on the Boolean center of regular MV-algebras, the characterization of MV-algebras that are isomorphic to their own profinite completions.

Zoom Room 1
March 19: 1:30 pm - 1:55 pm

Singularities of G-saturation

Nham Ngo
University of North Georgia

Let G be a semisimple algebraic group defined over an algebraically closed field. We provide some criteria for normality and rational singularities of G-saturation under certain circumstances. Our results are applied to determine when the commuting variety over simple Lie algebra of low rank is normal and Cohen-Macaulay. We also present some interesting connections between injective modules and normality (resp. rational singularities) of their G-saturations. Finally, we generalize a machinery used to study singularities of nilpotent orbit closures

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Zoom Room 1
March 20: 1:00 pm - 1:25 pm

Root of unity quantum cluster algebras and discriminants

Bach Nguyen
Xavier University of Louisiana

As a noncommutative analog of cluster algebras, quantum cluster algebras were defined by Berenstein and Zelevinsky in 2005. Since then, such algebras have been an active research area with important applications in the study of canonical bases, combinatorics and representation theory. We extend this theory to the setting of root of unity, which links the theory of cluster algebras to the theory of PI algebras and open new directions to study representation theory of such algebras. As application, we compute the discriminant of the quantum unipotent cell algebras for arbitrary symmetrizable Kac–Moody algebras. This is a joint work with K. Trampel and M. Yakimov.

Zoom Room 2
March 20: 10:30 am - 10:55 am

Forcing $\aleph_1$-Free Groups to be Free

Alexandra Pasi
Baylor University

Joint work with
Daniel Herden

$\aleph_1$-free groups, abelian groups whose countable subgroups are free, are objects of both algebraic and set-theoretic interest. Illustrating this, we note that $\aleph_1$-free groups, and in particular the question of when $\aleph_1$-free groups are free, were central to the resolution of the Whitehead problem as undecidable. In elucidating the relationship between $\aleph_1$-freeness and freeness, we prove the following result: an abelian group G is $\aleph_1$-free in a countable transitive model of ZFC (and thus by absoluteness, in every transitive model of ZFC) if and only if it is free in some generic model extension. We would like to answer the more specific question of when an $\aleph_1$-free group can be forced to be free while preserving the cardinality of the group. For groups of size $\aleph_1$, we establish a necessary and sufficient condition for when such forcings are possible. We also identify a number of existing and novel forcings which force such $\aleph_1$-free groups of size $\aleph_1$ to become free with cardinal preservation. These forcings lay the groundwork for a larger project which uses forcing to explore various algebraic properties of $\aleph_1$-free groups and develops new set-theoretical tools for working with them.

Zoom Room 1
March 20: 10:00 am - 10:25 am

The Group of Divisibility of a Finite Intersection of Valuation Overrings of Affine Domains

Lokendra Paudel
University of South Carolina - Salkehatchie

The group of divisibility of an integral domain is the multiplicative group of nonzero principal fractional ideals of the domain. The goal of this presentation is to describe the group of divisibility of a finite intersection of valuation overrings of the domain $D = k[x_1, x_2, ..., x_n]$, where k is a field and $x_1, x_2, ..., x_n$ are indeterminates for k. In particular, we focus on the case for $n \leq 3$..

Zoom Room 2
March 20: 11:00 am - 11:25 am

On Donkin's Tilting Module Conjecture and groups of type G_2

Cornelis Pillen
University of South Alabama)

Tilting modules for reductive algebraic groups over fields with positive characteristics feature prominently in new approaches towards finding character formulas for simple modules. A long-standing conjecture by Donkin says that certain tilting modules are isomorphic to indecomposable injective modules when restricted to the

Frobenius kernel of the algebraic group. It was recently shown that the conjecture does not hold for a group of type G_2 and characteristic 2. In this talk we verify Donkin's conjecture for G2 and characteristic 3.

Zoom Room 2
March 20: 10:00 am - 10:25 am

The Group of Algebra Automorphisms of the Group of Units of a Finitary Incidence Algebra

Jackson Rebrovich
Baylor University

The group of algebra automorphisms of a finitary incidence algebra was completely classified by N. Khripchenko. In this talk, I will take this a step further and, using a special type of normal subgroup, classify the algebra automorphisms of the group of units of the finitary incidence algebra over the integers.

Zoom Room 1
March 20: 3:00 pm - 3:55 pm

A study of generalized semidualizing modules

Tony Se
West Virginia University

Let R be a noetherian commutative ring. A finitely generated R-module C is called *semidualizing* if $\mathrm{Hom}_R(C,C) \cong R$ and $\mathrm{Ext}^{\geqslant 1}_R(C,C) = 0$. Semidualizing modules are generalizations of canonical modules of Cohen-Macaulay rings. We will loosen the definition of a semidualizing module, study the properties of these new classes of modules, compare them with semidualizing modules, and pose some questions about them.

Zoom Room 2
March 20: 8:00 am - 8:25 am

Strong Gelfand Subgroups of $F \wr S_n$

Yiyang She
Tulane University

Joint work with
Mahir Bilen Can and Liron Speyer.

Let G be a group and let H be a subgroup. If all irreducible representations of G restrict to multiplicity free H representations, then (G,H) is said to be a strong Gelfand pair. In this talk we will present our recent results on the strong Gelfand pairs of finite wreath products.

Zoom Room 1
March 21: 9:00 am - 9:25 am

A taxonomy of Dedekind finite rings and reflexive rings

Steve Szabo
Eastern Kentucky University

A taxonomy of Dedekind finite rings and reflexive rings will be given with a particular eye on symmetrically reflexive rings. Connections to minimal rings and Morita context rings will also be discussed.

Zoom Room 1
March 19: 2:00 pm - 2:25 pm

Conjugacy of inverse and adjoint for complex orthogonal group

Tin-Yau Tam
University of Nevada, Reno

Joint work with
Luyining (Elaine) Gan
University of Nevada, Reno

C.R. DePrima and C.R. Johnson [The range of $A^{-1}A^*$ in $\mathrm{GL}(n,\mathbb{C})$, Linear Algebra Appl. **9** (1974), 209–222] proved that for a given $A \in \mathrm{GL}(n,\mathbb{C})$, its inverse A^{-1} and its complex conjugate transpose A^* are similar if and only if $A = B^{-1}B^*$ for some $B \in \mathrm{GL}(n,\mathbb{C})$. The transform $B \mapsto B^{-1}B^*$ can be viewed as a generalized Cayley transform. We show by examples that the result does not hold for $\mathrm{SL}(n,\mathbb{C})$, a real simple Lie group, and for $\mathrm{O}(n,\mathbb{C})$, a non-connected simple complex Lie group. We show that similar result of DePrima and Johnson holds for $\mathrm{SO}(n,\mathbb{C})$ where $n = 2,3,4,6$ and they are connected simple complex Lie groups.

Zoom Room 1
March 20: 9:00 am - 9:25 am

On $\star$-Prüfer ring extensions

Simplice Tchamna
Georgia College & State University

Joint work with
Lokendra Paudel

Let $\star$ be a star operation on a ring extension $R \subseteq S$. The ring extension $R \subseteq S$ is said to be a *$\star$-Prüfer* if $R_{[\mathfrak{p}]} \subseteq S$ is a Prüfer extension for each $\star$-prime ideal $\mathfrak{p}$ of R. We study properties of $\star$-Prüfer extensions. In particular, we investigate the transfer of star-Prüfer properties from the extension $R \subseteq S$ to the extension $R[X] \subseteq S[X]$ of polynomial rings, where X is an indeterminate over S.

Zoom Room 1
March 20: 1:30 pm - 1:55 pm

A deformation theory of finite dimensional modules over repetitive algebras

Jose A. Velez-Marulanda
Valdosta State University

Let Λ be a basic finite dimensional algebra over an algebraically closed field $\mathbf{k}$, and let

$$R(\widehat{\Lambda}, \widehat{V})$$

be the repetitive algebra of Λ. In this article, we prove that if $\widehat{V}$ is a left $\widehat{\Lambda}$-module with finite dimension over $\mathbf{k}$, then $\widehat{V}$ has a well-defined versal deformation ring $R(\widehat{\Lambda}, \widehat{V})$, which is a local complete Noetherian commutative $\mathbf{k}$-algebra whose residue field is also isomorphic to $\mathbf{k}$. We also prove that $R(\widehat{\Lambda}, \widehat{V})$ is universal provided that $\underline{\mathrm{End}}\mathrm{R}(\widehat{\Lambda}, \widehat{V})(\widehat{V}) = \mathbf{k}$ and that in this situation, $R(,)$ is stable after taking syzygies. We apply the obtained results to finite dimensional modules over the repetitive algebra of the 2-Kronecker algebra, which provides an alternative approach to the deformation theory of objects in the bounded derived category of coherent sheaves over $\mathbb{P}^1_{\mathbf{k}}$.