Commutative Algebra Session

Monday June 21st

1.30-2.00 PM	Ideal Containment in Commutative rings - Abdeslam Mimouni
2.05-2.35 PM	Variations of Prime ideals and Factorization of Ideals in Leavitt Path Algebras - Sarah Aljohani
2.40-3.10 PM	Nilpotent Symplectic Alternating Algebras - Layla Sorkatti
3.15-3.45 PM	Break
3.50-4.20 PM	On the Weil's Positivity Criterion and its Applications - Sami Omar
4.25-4.55 PM	Multiplicatively Collapsing and Rewritable Algebra - Mayada Shahada
5.00-5.30 PM	Zero-power valued homogeneralized derivations of semiprime rings with involution - Mehsin Atteya

Session Chairs: Prof. Ayache, Dr. Matar & Dr. Mayada

Virtual Room 1A

Commutative Algebra Session

Tuesday June 22nd

1.30-2.00 PM	On Primal Spaces - Echi Othman
2.05-2.35 PM	When is a fixed ring comparable to all overrings? - Ahmed Ayache
2.40-3.10 PM	The locally nilradical for modules over commutative rings - Annet Kyomuhangi
3.15-3.45 PM	Break
3.50-4.20 PM	Paulsen's Problem for Matrix Frames - Jasim Ismaeel
4.25-4.55 PM	Intermediate rings in a FIP or FCP integral extensions of commutative rings - Ali Jaballah

Session Chairs: Prof. Ayache, Dr. Matar & Dr. Mayada

Virtual Room 1A

Commutative Algebra Session

Abstracts

Prof. Abdeslam Mimouni (amimouni@kfupm.edu.sa)
Department of Mathematics and Statistics
King Fahd University of Petroleum & Minerals

Ideal Containment in Commutative rings

Let R be a commutative ring with identity. An ideal I of R is said to be a big ideal (resp. an upper big ideal) if whenever $J \subset I$ (resp. $I \subset J$), $J^n \subset I^n$ (resp. $I^n \subset J^n$) for every $n \geq 1$; and R itself is a big ideal ring provided that every ideal of R is a big ideal. In this paper we study the notions of big ideals, upper big ideals and big ideal rings in different contexts of commutative rings such us integrally closed domains, pullbacks and trivial ring extensions etc. We show that the notions of big and upper big ideals are completely different. The notion of big ideal is correlated to the notion of basic ideal and the notion of upper big ideal is correlated to the notion of C-ideals. We give a new characterization of Prüfer domains via big ideal domains and we characterize some particular cases of pullback rings that are big ideal domains. Also we gave some classes of big and upper big ideals in rings with zero-divisors via trivial ring extensions.

Dr. Sarah AlJohani (sarah.aljohani@slu.edu)
Saint Louis University

Variations of prime ideals and factorization of ideals in Leavitt Path Algebras

In this paper we describe three different variations of prime ideals: strongly irreducible ideals, strongly prime ideals and insulated prime ideals in the context of Leavitt path algebras. We characterize conditions under which a proper ideal of a Leavitt path algebra is a product of finitely many ideals of these types.

Commutative Algebra Session

Abstracts

Dr. Layla Sorkatti (layla.sorkatti@bath.edu)
University of Khartoum

Nilpotent Symplectic Alternating Algebras

We first give some general overview of symplectic alternating algebras and then focus in particular on the structure of nilpotent symplectic alternating algebras.

Dr. Sami Omar (samiomar2016@icloud.com)
University of Tunis

On Weil's Positivity criterion and its Applications

In this talk, we first discuss an innovative approach for Weil's positivity criterion for the Riemann hypothesis in the framework of automorphic L-functions as part of the Langlands program. Then, we derive estimates for the rank of elliptic curves and for the class number of an imaginary quadratic field. Finally, we particularly highlight analogous statements in the case of function fields where the Riemann hypothesis has been proven.

Commutative Algebra Session

Abstracts

Dr. Mayada Shahada (mshahada@uob.edu.bh)
Department of Mathematics
University of Bahrain

Multiplicatively Collapsing and Rewritable Algebras

A semigroup S is called n-collapsing, if for every $a_1, \ldots, a_n$ in S, there exist functions $f \neq g$ (depending on $a_1, \ldots, a_n$) such that

$$a_{f(1)} \cdots a_{f(n)} = a_{g(1)} \cdots a_{g(n)};$$

it is called collapsing if it is n-collapsing, for some n. More specifically, S is called n-rewritable if f and g can be taken to be permutations; S is called rewritable if it is n-rewritable for some n. Semple and Shalev extended Zelmanov's Fields Medal solution of the restricted Burnside problem by proving that every finitely generated residually finite collapsing group is virtually nilpotent. In this talk, we consider when the multiplicative semigroup of an associative algebra is collapsing. In particular, we prove the following conditions are equivalent, for all unital algebras A over an infinite field: the multiplicative semigroup of A is collapsing, A satisfies a multiplicative semigroup identity, and A satisfies an Engel identity. We deduce that, if the multiplicative semigroup of A is rewritable, then A must be commutative.

Prof. Echi Othman (echi@kfupm.edu.sa)
Department of Mathematics and Statistics
King Fahd University of Petroleum & Minerals

On Primal Spaces

Let $f : X \to X$ be a function. Then $A(f) = \{O \subseteq X : f^{-1}(O) = O\}$ defines an Alexandroff topology on X. A topological space X is called a *primal space* if its topology coincides with an $A(f)$ for some mapping $f : X \to X$. In this talk we will discuss products of primal spaces and give necessary and sufficient conditions for a primal space to be spectral (homeomorphic to the prime spectrum of a commutative ring). We review also old and new results about this concept (already done by T. Richmond, S. Lazzar, J. Vielma, . . .).

Session Chairs: Prof. Ayache, Dr. Matar & Dr. Mayada

Virtual Room 1A

Commutative Algebra Session

Abstracts

Prof. Ahmed Ayache (aaayache@uob.edu.bh)
Department of Mathematics
University of Bahrain

When is a fixed ring comparable to all overrings?

Let R be integral domain with quotient field K. An overring R_o of R is said to be comparable if $R_o \neq R$, $R_o \neq K$, and each overring of R is comparable to R_o under inclusion. We do provide necessary and sufficient conditions for which R has a comparable overring. Several consequences are derived, especially for minimal overrings, or in the case where the integral closure of R is a comparable overring, or also when each chain of distinct overrings of R is finite.

Dr. Annet Kyomuhangi (annet.kyomuhangi@gmail.com)
Department of Mathematics
Makerere University

The locally nilradical for modules over commutative rings

Let R be a commutative unital ring and a $\in$ R. We introduce and study properties of a functor $a\Gamma_a(-)$, called the locally nilradical on the category of R-modules. $a\Gamma_a(-)$ is a generalization of both the torsion functor (also called section functor) and Baer's lower nilradical for modules. Several local-global properties of the functor $a\Gamma_a(-)$ are established. As an application, results about reduced R-modules are obtained and hitherto unknown ring theoretic radicals as well as structural theorems are deduced.

Abstracts

Dr. Jasim Ismaeel (jmid9p@umsystem.edu)
University of Missouri

Paulsen's Problem for Matrix Frames

The Paulsen Problem in frame theory asks for an upper bound on the distance between two types of Parseval frames of vectors. Hamilton and Moitra gave a proof of this problem using the notion of radial isotropy. In this talk, we generalize the Paulsen Problem to matrix frames being the main tool in many applications. To do that, we view the matrix frame as a representation of a certain quiver and use a generalized notion of radial isotropy for matrices. This is based on a joint work with Calin Chindris.

Dr. Mehsin Atteya (mehsinatteya88@gmail.com)
Department of Mathematics
Al-Mustansiriyah University

Zero-Power Valued Homogeneralized derivations of Semiprime Rings with Involution

The main purpose of this paper is to introduce and study the definition of homogeneralized derivations via associative rings. Let R be a ring and let H be an additive mapping $H: R \to R$. Then H is called a homogeneralized derivation of R if $H(xy) = H(x)H(y) + H(x)y + xh(y)$, where $h: R \to R$ is a homoderivation of R for all $x, y \in R$. It is called an anti-homogeneralized derivation of R if $H(xy) = H(y)H(x) + H(y)x + yh(x)$, where $h: R \to R$ is an anti-homoderivation of R for all $x, y \in R$. Accurately, we prove the commutativity with other cases of a ring that satisfied certain conditions.

Commutative Algebra Session

Abstracts

Prof. Ali Jaballah (ajaballah@sharjah.ac.ae)
University of Sharjah

Intermediate rings in a FIP or FCP integral extensions of commutative rings

An extension R\subset S of commutative rings is said to be

1-FIP extension, if the extension has only finitely many intermediate rings, and

2-FCP extension, if every chain of intermediate distinct rings is finite.

We investigate in this work FIP and FCP extensions when S is integral over R. We establish several results characterizing these extensions, determining their length, and finding the number of intermediate rings.