Scientific program

First Week

Time	Monday	Tuesday	Wednesday	Thursday	Friday
8:00-8 :30 8:30-9:00	Registration Openning				
9:00 – 10 :00	Adriana	Adriana	Adriana	Adriana	Adriana
10:00 - 10:45	Coffee Break/ Discussions				
10:45 - 11:45	Lia Vas (online)	Lia Vas (online)	Lia Vas (online)	Lia Vas (online)	Lia Vas (online)
11 :45- 13:45	Lunch				
13:45 - 14:45	Gilles/Danie	Gilles/Danie	Gilles/Danie	Gilles/Danie	Gilles/Danie Training Section
14:45 - 15:45	Adriana/ Training Section	Yolanda C. Casado (online)	Lia Vas/ Questions Section	Open Problems	Poster Section
15:45 - 16:20	Coffee Break/Discussions				
16:20 - 17:00	Dirceu Bagio	Hector Pinedo	Ben Steinberg (Online)	Mantese (Online)	Thaisa Tamusinas

Second Week

Time	Monday	Tuesday	Wednesday	Thursday	Friday
9:00 – 10 :00	Martín	Martín	Martín	Martín	Martín
10:00 - 10:45	Coffee Break/Discussions				
10:45 - 11:45	Hazrat	Hazrat	Hazrat	Hazrat	Hazrat
11 :45- 13:45	Lunch				
13:45 - 14:45	Femic (Online)	Femic (Online)	Free Afternoon	Femic (Online)	Mykola Khrypchenko
14:45 - 15:45	Martín/ Training Section	Guillermo Cortiñas	Free Afternoon	Guillermo Cortiñas	Poster Section
15:45 - 16:20	Coffee Break/Discussions		Free Afternoon	Coffee Break/Discussions	
16:20 - 17:00	Daniel Gonçalves	Alfigen Sebandal	Free Afternoon	Open Problems	

Introductory courses

Course 1
Title: **Introduction to group representations**
Duration: 5 hours
Lecturer's NAME: Mejía Castaño
Lecturer's given name: Luz Adriana
Lecturer's gender: Female
Lecturer's institution: Universidad del Norte
Lecturer's country: Colombia
Abstract of the course: This is an introductory course on finite group representations. The main objective is to show how this theory allows us to obtain structural results on finite groups, showing the importance of studying representations.

Course 2
Title: **TBA (on Leavitt Path Algebras)**
Duration: 5 hours
Lecturer's NAME: Lia
Lecturer's given name: Vas
Lecturer's gender: Female
Lecturer's institution:
Lecturer's country: United States
Abstract of the course: TBA

Course 3
Title: **TBA**
Duration: 5 hours
Lecturer's NAME: Elizabeth
Lecturer's given name: Gillaspy
Lecturer's gender: Female
Lecturer's institution:
Lecturer's country:
Abstract of the course: C*-algebras associated to etale groupoids have been studied for a long time and play an important role in the theory. About 10 years ago the speaker introduced rings associated to etale groupoids with totally disconnected unit space. These generalize both group rings and Leavitt path algebras and serve to unify ideas from operator theory and ring theory. Results in operator theory inspire purely algebraic results and conversely. In this mini-course we present some of the main ideas, examples and results in this area and highlight some active areas of research.

Advanced courses

Course 1

Title: **Finite Tensor Categories**

Duration: 5 hours

Lecturer’s NAME: Mombelli

Lecturer’s given name: Martin

Lecturer’s gender: Male

Lecturer’s institution: Universidad Nacional de Córdoba

Lecturer's country: Argentina

Abstract of the course: A tensor category is an abelian category together with a tensor product, a unit object subject to associativity and unity axioms. This concept, introduced by Maclane and Benabou, encode the category of representations of groups, Lie algebras and more generally of Hopf algebras. Finite tensor categories are tensor categories subject to some finiteness conditions. Basics examples come from the theory of finite dimensional Hopf algebras. Fintie tensor categories appear encoding symmetries of distinct mathematical structures. Their applications reach divers areas of mathematics: subfactor theory, quantum computing, topological varieties of low dimension, topological field theory, statistical mechanics and Hopf algebra theory. This makes the problem of their classification both a highly interesting and difficult one. In this course I will introduce the notion of finite tensor categories and its basic properties. We will present examples to illustrate the theory.

Course 2

Title: **TBA**

Duration: 3 hours

Lecturer’s NAME: Bojana

Lecturer’s given name: Femic

Lecturer’s gender: Female

Lecturer’s institution:

Lecturer's country: Servia

Abstract of the course:

Course 3

Title: **Advanced topics in Leavitt path algebras**

Duration: 5 hours

Lecturer’s NAME: Roozbeh

Lecturer’s given name: Hazrat

Lecturer’s gender: Male

Lecturer’s institution: Western Sydney University

Lecturer's country: Australia

Abstract of the course: The classification of Leavitt path algebras is one of the main topics in the theory which has not yet been completed. Finding a right invariant for

classification is one of the major problems in the theory. In this course we concentrate on the Graded Classification Conjecture, describing the notion of graded Grothendieck groups as a possible complete invariant for such algebras. We start with a short introduction on the graded methods in algebras and then describe the graded Grothendieck groups. Along the way we touch on the so called talented monoid of a directed graph which seems to capture a substantial amount of geometry of the graph.

Plenary Talks

Plenary Talk 1

Title: **Partial actions and Galois theory of commutative rings**

Duration: 1 hours

Lecturer's NAME: Pinedo Tapia

Lecturer's given name: Héctor

Lecturer's gender: Male

Lecturer's institution: Industrial university of Santander

Lecturer's country: Colombia

Abstract of the course: The concept of a Galois extension of commutative rings was introduced by Auslander and Goldman, in which they laid the foundations for separable extensions and defined the Brauer group of a commutative ring. Later, Chase, Harrison and Rosenberg developed a Galois theory of commutative rings by giving several equivalent definitions of a Galois extension and specifying, to the case of a Galois extension, the Amitsur cohomology seven terms exact sequence, given by Chase and Rosenberg. The Chase-Harrison- Rosenberg sequence can be viewed as a common generalization of the two most fundamental facts from Galois cohomology of fields: Hilbert's Theorem 90 and the isomorphism of the relative Brauer group with the second cohomology group of the Galois group. When working with abelian groups and having the purpose of presenting a Kummer's theory for commutative rings, Harrison constructed the group of the isomorphism classes of abelian G-extensions of a commutative ring. Since then much attention have been paid to the sequence and its parts subject to more constructive proofs, generalizations of Harrison's group and analogs in various contexts.

Another point of view is to replace global actions by partial ones. The latter are becoming an object of intensive research and have their origins in the theory of operator algebras, and were initiated by Exel. In the algebraic context, a partial action of a group G on a ring R consists of a family of ring isomorphisms $\alpha : \{ \alpha_g : D_{g^{-1}} \to D_g \}_{g \in G}$ such that any D_g is an ideal of R, α_e is the identity map of R and α_{gh} extends $\alpha_g \circ \alpha_h$, $g, h \in G$. The development of a Galois theory of partial actions was initiated in by Dokuchaev-Ferrero-Pâques, stimulating a growing algebraic activity around partial actions, while the partial cohomology of groups was introduced and studied by Kaoutit-Gómez-Torrecillas.

Having at hand partial Galois theory and partial group cohomology, we may ask now what would be the analog of the Chase-Harrison- Rosenberg exact sequence in the context of a partial Galois extension of commutative rings and to explore Harrison's construction to the context of partial Galois extensions. This talk is based on recent papers, where these questions were answered. The interested audience may find some other extension of Chase-Harrison-Rosenberg sequence.