Program

Monday, June 26.

  9:50 Registration

10:00 Ryan Spitler, Profinite rigidity and arithmetic groups, Lecture 1

11:00 Coffee break

11:30 Ismael Morales, The profinite and pro-p genera of free and surface groups, Lecture 1.

12:30 Lunch (CBM)

14:30 Yi Liu, Almost profinite rigidity of finite-volume hyperbolic 3-manifolds

15:30 Monika Kudlinska, On profinite properties of free-by-cyclic groups

Tuesday, June 27.

10:00 Ryan Spitler, Profinite rigidity and arithmetic groups, Lecture 2

11:00 Coffee break

11:30 Ismael Morales, The profinite and pro-p genera of free and surface groups, Lecture 2

12:30 Lunch (CBM)

14:30 Matthew Stover, Central extensions of real and complex hyperbolic lattices

15:30 Jonathan Fruchter, Virtual homology and profinite rigidity

16:30 Coffee break

17:00 Alejandra Garrido, Free factors and profinite completions

Wednesday, June 28.

  9:50 Ryan Spitler, Profinite rigidity and arithmetic groups, Lecture 3

10:50 Coffee break

11:20 Ismael Morales, The profinite and pro-p genera of free and surface groups, Lecture 3

12:20 Alex Lubotzky, First-order rigidity of high-rank arithmetic groups

13:20 Conference photo

13:45 Lunch (Goloso)

Thursday, June 29.

10:00 Chen Meiri, Conjugacy and word width in higher rank arithmetic groups

11:00 Coffee break

11:30 Amir Behar, Profinite non-rigidity of arithmetic groups

12:30 Lunch (CBM)

14:30 Holger Kammeyer, Profinitely solitary Chevalley groups

15:30 Dan Segal, Axiomatizable profinite groups

16:30 Coffee break

17:00 Pavel Zalesski, Profinite genus of free products with amalgamation and accessible groups.

Friday, June 30.

10:00 Martin Bridson, Grothendieck pairs, fixed point properties, and dimension

11:00 Coffee break

11:30 Pawel Piwek, Profinite rigidity of group extensions.

12:30 Lunch (CBM)

1. Abstracts

Amir Behar, Profinite non-rigidity of arithmetic groups.
It is still an open question whether $\mathrm{SL}(n, \mathbb{Z})$ is profinitely rigid. While the full answer to this question is still unknown, I will construct finite index subgroups of $\mathrm{SL}(n, \mathbb{Z})$ which are not profinitely rigid (at least when $n \geq 3$). These constructions can be generalized to show that a "typical" arithmetic group exhibits non-isomorphic finite index subgroups whose profinite completions are isomorphic. If time permits I will explain why this can not happen in the exceptional cases.

Martin Bridson, Grothendieck pairs, fixed point properties, and dimension.
In this talk I will use fibre-product constructions to produce Grothendieck pairs $P < G$ exhibiting a diversity of geometric behaviour. For example, one can produce triples of finitely generated, residually finite groups $M < P < G$, so that the inclusions induce isomorphisms of profinite completions, and M and G have Serre's property FA but P does not. Similar results can be proved for higher-dimensional fixed point properties. I shall also discuss how discrepancies in torsion and cohomological dimension can arise in Grothendieck pairs.

Jonathan Fruchter, Virtual homology and profinite rigidity.
The (co)homology of finite index subgroups of a finitely generated and residually finite group G can sometimes be read from the list of finite quotients of G. We will discuss how this simple observation can be used to profinitely distinguish some residually free groups.
Residually free (and fully residually free) groups are closely related to free groups, and enjoy many properties of the latter; moreover, the virtual homology of a residually free group G stores a great deal of information about G. This makes residually free groups a compelling object to study via virtual homology. We will explain how topological methods can be used to compute virtual homological invariants of (fully) residually free groups, and see how free, free abelian and surface groups play a special role within this class. Using these computations and additional structural properties of residually free groups, we will sketch how to profinitely distinguish direct products of free and surface groups from other finitely presented residually free groups. The talk is based on joint work with Ismael Morales.

Alejandra Garrido, Free factors and profinite completions.
One of the main open questions in profinite rigidity is attributed to Remeslennikov and asks whether finitely generated free groups are profinitely rigid. The answer to this still seems remote, but some success has been found on variants of it.
For example, one can ask whether a free factor of a group G can be detected from its profinite completion: if G has a subgroup H, whose closure in the profinite completion of G is a profinite free factor, must H be a free factor of G? This question is still hard, with positive known answer only when G itself is a free group.
I will report on joint work with A. Jaikin in which we provide a new proof of the above positive answer and extend it to the case when G is virtually free. The methods may be extended to other classes of groups if some interesting questions are answered on their completed group algebras.

Holger Kammeyer, Profinitely solitary Chevalley groups.
We examine which arithmetic subgroups of split simple algebraic groups over number fields are profinitely solitary so that the commensurability class of the profinite completion determines the commensurability class of the group among finitely generated residually finite groups. Assuming Grothendieck rigidity, we essentially solve the problem by Galois cohomological means. Joint work with Ryan Spitler.

Monika Kudlinska, On profinite properties of free-by-cyclic groups.
Much work has been done towards solving the problem of profinite rigidity within the class of fundamental groups of finite-volume 3-manifolds. In this talk, we will focus our attention on a related family of groups known as free-by-cyclic groups, which have natural connections with 3-manifolds. We will see that many properties of free-by-cyclic groups, such as hyperbolicity or the exponential growth rate of the monodromy when it is uniquely defined, are invariants of their profinite completion. As a consequence, we obtain various profinite rigidity results, including the almost profinite rigidity of generic free-by-cyclic groups amongst the class of all free-by-cyclic groups. This is based on joint work with Sam Hughes.

Alex Lubotzky, First-order rigidity of high-rank arithmetic groups.
The family of high-rank arithmetic groups is a class of groups playing an important role in various areas of mathematics. It includes $SL(n, Z)$, for $n > 2$, $SL(n, \mathbb{Z}[1/p])$ for $n > 1$, their finite index subgroups, and many more. A number of remarkable results about them have been proven including; Weil local rigidity, Mostow strong rigidity, Margulis Super rigidity, and the Schwartz-Eskin-Farb quasi-isometric rigidity. We will add a new type of rigidity: "first-order rigidity". Namely, if D is such a non-uniform characteristic zero arithmetic group and L is a finitely generated group which is elementary equivalent to D then L is isomorphic to D. This stands in contrast with Zlil Sela's remarkable work which implies that the free groups, surface groups, and hyperbolic groups (many of which are low-rank arithmetic groups) have many non-isomorphic finitely generated groups which are elementary equivalent to them. Based on a joint paper with Nir Avni and Chen Meiri (Invent. Math. 217(2019) 219-240).

Yi Liu, Almost profinite rigidity of finite-volume hyperbolic 3-manifolds.
In this talk, I'll explain a proof of the theorem that finite-volume hyperbolic 3-manifold groups are determined by their finite quotient groups up to finite ambiguity. I'll discuss further developments based on ideas in this work.

Ismael Morales, The profinite and pro-p genera of free and surface groups.
We will review some tools that have been used to approach the conjecture that free and surface groups are profinitely rigid. For example, we will sketch a proof of the facts that surface groups are profinitely rigid among limit groups, based on arguments of Calegary and Wilton, and among one-relator groups, which is done in joint work with Andrei Jaikin-Zapirain. We may also discuss the (non-absolute) profinite rigidity of direct products of free and surface groups.

Chen Meiri, Conjugacy and word width in higher rank arithmetic groups.
A basic question in group theory is what can we learn about a finitely generated and residually finite group from its profinite completion? In this talk, we will focus on the relation between the widths of conjugacy classes in a higher rank arithmetic group to the corresponding widths in the profinite completions of these groups and explain the connection to the Congruence Subgroup Property. This is joint work with Nir Avni.

Paweł Piwek, Profinite rigidity of group extensions.
Understanding group extensions with a fixed kernel and quotient is often necessary for answering questions in group theory - these also include the questions of profinite rigidity. In the first half of the talk I will introduce some general methods for determining when the classification of extensions with a fixed kernel and quotient 'carries over to the profinite setting', and when it is helpful for determining profinite rigidity of certain groups - usually within the class of all extensions of a certain type. In the second half I will present some of my own results, focusing on distinguishing central extensions of 2-orbifold groups by their profinite completions.

Ryan Spitler, Profinite rigidity and arithmetic groups.
There has recently been some progress made towards understanding the question of profinite rigidity for certain arithmetic groups. I will discuss one broad strategy for approaching this question, some of the works which have brought this strategy closer to fruition in certain cases, and some of the questions which remain to be answered. Much of the content relates to joint works with Martin Bridson, Ben McReynolds, and Alan Reid.

Dan Segal, Axiomatizable profinite groups.
I'll discuss the question of which profinite groups are determined up to isomorphism by a first-order sentence (in the language of groups).

Matthew Stover, Central extensions of real and complex hyperbolic lattices.
I will describe joint work with Domingo Toledo on residual finiteness for cyclic central extensions of fundamental groups of aspherical manifolds, its application to central extensions of (arithmetic) real and complex hyperbolic lattices, and connections profinite rigidity and other open problems.

Pavel Zalesski, Profinite genus of free products with amalgamation and accessible groups.
I shall talk about profinite genus of finitely generated residually finite accessible groups with a certain natural restriction on one-ended vertex groups in their JSJ-decompositions. Then I concentrate on profinite genus of free products $G_1 *_H G_2$ of such one-ended groups G_1, G_2 with finite amalgamation H.