SCHEDULE (19-23 May)

Monday
9:00-10:30 : Bost
10:30-11:00 : Coffee break
11:00-12:30 : Le Bras
14:00-15:30 : Burgos
15:30-16:00 : Coffee break
16:00-17:00 : Discussion

Tuesday
9:00-10:30 : Le Bras
10:30-11:00 : Coffee break
11:00-12:30 : Dauser
14:00-15:30 : Bost
15:30-16:00 : Coffee break
16:00-17:00 : Discussion

Wednesday
9:00-10:30 : Burgos
10:30-11:00 : Coffee break
11:00-12:30 :Wagner
Free afternoon

Thursday
9:-00-10:30 : Dauser
10:30-11:00 : Coffee break
11:00-12:30 : Charles
14:00-15:30 : Wagner
15:30-16:00 : Coffee break
16:00-17:00 : Discussion

Friday
9:00-10:30 : Charles
10:30-11:00 : Coffee break
11:00-12:00 : Talk/Discussion

ABSTRACTS

Arakelov Geometry

- **François Charles**: *Infinite-dimensional geometry of numbers and affine schemes in Arakelov geometry*

  The goal of these lectures will be twofold: first, we will describe joint work with Bost on infinite-dimensional versions of the classical topic of geometry of numbers. This will serve as an introduction to a (partial) working theory of Hermitian quasi-coherent sheaves in Arakelov geometry. Then we will introduce the notion of A-schemes as a number field analogue – mixing arithmetic and transcendental data – of varieties fibered over a curve and will describe applications of our general results on the geometry of numbers to the study of positivity and affineness properties of such objects. This is joint work with Bost.

- **Jean-Benoît Bost**: *Talk 1: A tendencious introduction to Arakelov geometry*

  This lecture aims to do two things: (i) to give a tutorial introduction to Arakelov geometry, with a special emphasis on its starting points, concerning Hermitian vector bundles on arithmetic curves and arithmetic surfaces and their real valued invariants (notably the Arakelov degree of Hermitian vector bundles over an arithmetic curve, or the Arakelov intersection numbers of two Hermitian line bundles on some arithmetic surface); (ii) to provide a rough idea of how Arakelov geometry may be used to establish actual Diophantine statements.

  The treatment of this material will be somewhat prejudiced by my attempt to emphasize aspects of Arakelov geometry which - I believe - should ultimately be understood in terms of analytic geometry à la Clausen-Scholze.

  Talk 2: An introduction to formal-analytic arithmetic surfaces

  This lecture will give an introduction to formal-analytic arithmetic surfaces. These objects and their Arakelov geometry constitute the object of study of some recent joint work with François Charles, and turn out to admit significant applications to concrete Diophantine results, as demonstrated by the recent work of Calegari, Dimitrov, Tang on the rational independence of special values of L-functions. Moreover they have some "obvious" points of contact with analytic geometry à la Clausen-Scholze.

- **José Ignacio Burgos Gil**: *Talks 1 & 2: An introduction to Higher dimensional Arakelov theory*

  In these talks I will assume that the audience is familiar with algebraic geometry but not that much with complex differential geometry.

  The talks will start with a discussion of differential currents. Using them we will introduce the arithmetic Chow groups and their basic properties. Then we will comment on the theory of arithmetic characteristic classes of hermitian vector bundles. We will discuss the problem of defining the push forward of a hermitian vector bundle. This will lead to discuss analytic torsion and the Quillen metric. Finally we will compare the pushforward of arithmetic Chow groups with the pushforward of hermitian vector bundles stating the arithmetic Riemann Roch theorem.

Analytic Geometry

The goal of this series of six talks is to give an overview of Clausen-Scholze's analytic geometry: what it is about and what it is/could be good for, with an eye towards arithmetic geometry.

- Light condensed sets and abelian groups, analytic rings (Arthur-César Le Bras)
- Analytic rings: examples (Arthur-César Le Bras)
- Analytic stacks (Adam Dauser)
- Examples of analytic stacks: schemes, complex and p-adic analytic spaces (Ferdinand Wagner)
- Examples of analytic stacks: Betti and de Rham stacks (Adam Dauser)
- Examples of analytic stacks: the gaseous base stack (Ferdinand Wagner)