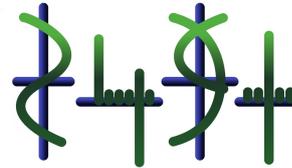# Summer School

Singular Integrals on Nilpotent Lie Groups and Related Topics

17.08.–20.08.2020

Information, schedule, & abstracts

Organizers:

Christian Jäh (Göttingen, Germany)

Pablo Ramacher (Marburg, Germany)

Ingo Witt (Göttingen, Germany)

Contents

1 Schedule

The introductory course on Singular Integrals on Euclidean Space is given by Christian Jäh (Göttingen) and the advanced courses are given by

- Véronique Fischer (Bath) *Title*

- Davide Barilari (Paris?) *Title*

- Alessio Martini (Birmingham) *Title*

- Xinfeng Wu (Beijing) *Title*.

The Q & A sessions are reserved for in-depth questions and discussions on the presented material. There is time for short communications of the participants as indicated. If you want to give a talk but have not indicated that on your registration, please talk to one of the organizers as soon as possible.

Time	August 17	August 18	August 19	August 20
9:00–9:50	Jäh	Fischer	Barilari	Wu
9:50–10:10	Coffee	Coffee	Coffee	Coffee
10:10–11:00	Jäh	Barilari	Wu	Martini
11:10-12:00	Fischer	Wu	Martini	Fischer
12:00–14:00	Lunch	Lunch	Lunch	Lunch
14:00–14:50	Barilari	Martini	Fischer	Barilari
15:00–15:50	Wu	Q & A	Q & A	Wu
15:50–16:10	Coffee	Coffee	Coffee	Coffee
16:10–17:00	Martini	Short Comm.	Short Comm.	Martini
17:10–18:30	Social	Fischer	Barilari	Q & A and Closing

2 Sponsors

3 Abstracts

4 Where to go for lunch?

- Bakery Küster (Google Maps).
  They have a great selection of hot and cold sandwiches, salads, and other snacks. Not to forget sweets.
  Here is a link to the Cafe menu. (German)

- Bakery Holzofenbäckerei (Google maps).
  Here you can get sandwiches, soup, and some other snacks.

- Zentralmensa (Google maps). This is the main mesa on the central campus. This is about 20 minutes walk from the institute. The menu can be found here (choose Zentralmensa in the drop-down). The menu is also displayed in English at the mensa.
  In the Café Zentral a selection of sandwiches and pizzas as well as sweets is offered.

5 Where to go for dinner?

6 The University and the city of Göttingen

7 RTG 2491 - Fourier Analysis and Spectral Theory

The Research Training Group (RTG) Fourier Analysis and Spectral Theory is a joint research and graduate education programme funded by the German Science Foundation (DFG). It is based at the Mathematical Institute, University of Göttingen, with participating researchers from the University of Hanover. The initiative started October 1st, 2019 with the opening of ten PhD positions and one postdoctoral position.

The RTG Fourier Analysis and Spectral Theory is taking an interdisciplinary and innovative approach to the classical and powerful machinery modern harmonic and Fourier analysis and spectral theory. We focus on its development in the context of mathematical physics, topology and analytic number theory.

A core theme of the RTG is analysis and spectral geometry on Riemannian manifolds, in particular, locally symmetric spaces or more generally spaces acted on by groups. Besides a topological structure, in many interesting cases they also have some arithmetic or combinatorial structure, and one of the key questions involves the fascinating interplay between the spectral properties of certain associated operators on the one hand, and geometric, topological or arithmetic properties on the other. Some prototypical examples of this interaction featured in this RTG are the spectral theory of Cayley graphs of groups; analytic L^2-invariants, which link harmonic analysis to topology; and the resolvent and scattering theory of geometric differential operators on singular manifolds. A cornerstone at the interface of modern analytic number theory and harmonic analysis is the theory of automorphic forms, viewed as eigenfunctions of a family of operators on a locally symmetric space. Fourier and harmonic analysis also appear prominently in many applications of classical analytic number theory, in the representation theory of Lie groups and groupoids, and in the construction of quantum field theories with microlocal methods.

On the methodological side we draw from a variety of analytic techniques, such as microlocal analysis, symbolic calculus, trace formulas and Plancherel theory, Fourier analysis in numerous variations, spectral and scattering theory of operators, but also classical analysis such as a careful analysis of oscillatory integrals.