A TOPOLOGICAL THEORY OF TANGENT DISTRIBUTIONS

It has become apparent in the last few weeks that the uncertainty regarding international travel is too large. For this reason, we have decided to go fully online, and try to implement the best workshop possible under these (rather challenging) circumstances.

Our goal remains to bring together contact topology, hypoelliptic operator theory, and subRiemannian geometry. We want researchers from these three areas to learn from and interact with each other in meaningful ways. To this end, the workshop will provide three avenues:

- **Minicourses:** We will have lectures with the aim of leveling the background of the participants. The speakers will emphasise not just key ideas and techniques, but also open questions that may benefit from the interdisciplinary nature of the workshop.

- **Discussions:** These are the core of the workshop. On Monday, we will have a moderated *open discussion* whose ultimate goal is selecting a short list of *key questions* to be addressed during the week. Participants will distribute themselves into *working groups*, which will be meeting for the rest of the week in order to tackle the selected questions. We will wrap up the week with another open discussion in which groups will explain their progress.

- **Booklet:** We see this event not as a one-of, but as a first step towards a consistent collaboration between our communities. To facilitate this, we want to prepare a booklet containing outstanding open questions, insights collected during the week, and relevant bibliographic resources. To start this initiative, we are asking you to fill in a questionnaire during the time leading up to the workshop, letting us know about potential open questions and avenues of research. All your contributions will be shared through the workshop's website.

The four themes of the Workshop

We have pinpointed four concrete directions of potential interaction between our communities:

- The role of (sub)Riemannian curvature in Contact Topology.

- C^0-Contact Topology vs. Metric Geometry.

- Floer theory and its role in the study of subRiemannian geodesics.

- Hypoelliptic operators as a source of topological invariants of distributions.

These are quite speculative, but we hope they will serve to inspire some concrete questions from all of you. Furthermore, feel free to ignore these and bring forth other ideas relevant to the goals of the Workshop.

Discussions and working groups

We believe that the best we can do to have a fruitful meeting is to have the correct expertise, a list of intriguing open questions, and a helpful setup. In regards to the latter, we are planning the following:

- The whole event will take place on Microsoft Teams. The Lorentz Center will send you an email explaining how to join the "team" of the Workshop. Different channels will be available for each of the working groups.

- The minicourses will be recorded and be made available both through Teams and Youtube, so you may revisit them during or after the event.

- Before the workshop we will have already assembled a list of questions, which will be refined during the meeting. These will be revisited during the open discussion and during the question sessions after each course.

- Some of the attendees at the postdoc level will be tasked with note-taking during the working groups. These will eventually become part of the booklet (with the permission of the participants).

- Among the participants of the working groups, one of them will be chosen to serve as chair. Their task will be to take initiative, promote and moderate discussions, and report back to the whole group.

Schedule

The schedule of the workshop can be found below. The "open discussions" and "working groups" are the main events of the Workshop, so we really hope to see many of you there. We also encourage participants to attend the minicourses, since their purpose is to level everyone's background on the different topics.

Lastly, the purpose of the slots labelled as "break" is twofold: we recommend that you use the time to socially mix with your colleagues online, but also to get away from the screen a bit and stretch, make a cup of coffee... (we will of course try to keep a nice social atmosphere for those of you that decide to stick around!)

Please notice: the time in the schedule is Leiden time!

	Monday
13:00-13:30	Opening by the Lorentz Center and the organizers
13:30-14:30	P. Massot: *An overview of Contact and Symplectic Topology*, Part I
14:30-14:45	Questions
14:45-15:15	Break
15:15-16:15	D. Barilari: *Sub-Riemannian curvature in 3D contact manifolds*, Part I
16:15-16:30	Questions
16:30-17:00	Online social break
17:00-18:00	Open discussion

	Tuesday
13:20-13:30	Opening
13:30-14:15	P. Massot: *An overview of Contact and Symplectic Topology*, Part II
14:15-14:30	Questions
14:30-15:00	Break
15:00-15:45	D. Barilari: *Sub-Riemannian curvature in 3D contact manifolds*, II
15:45-16:00	Questions
16:00-16:30	Online social break + meeting session for PhD students
16:30-17:15	E. van Erp: *Hypoelliptic operators and index theory*, Part I
17:15-17:30	Questions
17:30-18:30	Working groups

	Wednesday
13:20-13:30	Opening
13:30-14:30	F. Lin: *Non-linear elliptic problems and their applications in Topology*
14:30-14:45	Questions
14:45-15:15	Break
15:15-16:15	Working groups
16:15-16:45	Break
16:45-17:45	E. van Erp: *Hypoelliptic operators and index theory*, Part II
17:45-18:00	Questions

	Thursday
13:20-13:30	Opening
13:30-14:30	P. Pansu: *The quasisymmetric Hölder equivalence problem*
14:30-14:45	Questions
14:45-15:15	Break
15:15-16:15	S. Seyfaddini: C^0-*Contact and Symplectic Topology*
16:15-16:30	Questions
16:30-17:00	Break
17:00-18:00	Working groups

	Friday
13:20-13:30	Opening
13:30-14:30	Working groups
14:30-14:45	Questions
14:45-15:15	Online social break
15:15-16:15	Concluding thoughts and next steps

Minicourses

- D. Barilari (U. Padova): *Sub-Riemannian curvature in 3D contact manifolds.*

- P. Massot (U. Paris-Saclay): *An overview of Contact and Symplectic Topology.*

- E. van Erp (Dartmouth College): *Hypoelliptic operators and index theory.*

- P. Pansu (U. Paris-Saclay): *The quasisymmetric Hölder equivalence problem.*

- S. Seyfaddini (IMJ-PRG, Paris): C^0-*Contact and Symplectic Topology.*

- F. Lin (Columbia U., US): *Non-linear elliptic problems and their applications in Topology.*