HAUSDORFF RESEARCH INSTITUTE
FOR MATHEMATICS

UNIVERSITÄT BONN

Workshop

"Formalization of Mathematics"

June 17 - 21, 2024

organized by

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Time measurement: CEST

- **Monday, June 17**

08:30 - 09:00	*Arrival and Self-Registration*
09:00 - 09:10	*Welcome by HIM Director Christoph Thiele*
09:10 - 09:30	*Introduction and Organizational Matters by Workshop Organizers*
09:30 - 10:10	**Floris an Doorn** *Towards a formalized proof of Carleson's theorem*
10:10 - 10:40	*Coffee break*
10:40 - 11:20	**William Farmer** *An Alternative Approach to Formal Mathematics that Prioritizes Communication over Certification*
11:20 - 12:00	**Christoph Benzmüller** *Comments on the formalisation and automation of foundational theories from the point of view of LogiKEy*
12:00 - 13:30	*Lunch break*
13:30 - 14:30	**Who am I** *All participants present their research/workshop interests in 2 min*
14:30 - 16:00	**Workgroup 1** *A) Formalizing Carleson, B) Math activities for the general public*
16:00 - 16:30	*Coffee break*
16:30 - 18:00	**Workgroup 2** *A) Boolos Curious Inference, B) HoTT Lean*
from 18:00 on	*Get-Together*

- **Tuesday, June 18**

09:00 - 09:40	**Kevin Buzzard** *Capturing mathematical equality*
09:40 - 10:20	**Cyril Cohen** *Building Measure Theory using Hierarchy Builder*
10:20 - 10:50	*Group Photo and Coffee break*
10:50 - 11:30	**Lawrence Paulson** *Formalising Advanced Mathematics in Isabelle/HOL*
11:30 - 12:10	**Yves Bertot** *Reconciling Type theory with the use of a single type of numbers for mathematical education at introductory levels*
12:10 - 14:00	*Lunch break*
14:00 - 16:00	**Workgroup 1** *A) Applications of Proof assistants in teaching, B) Formalizing Carelson*
16:00 - 16:30	*Coffee break*
16:30 - 18:30	**Workgroup 2** *A) Porting Hierarchy Builder, B) HoTT Lean*

- **Wednesday, June 19**

09:00 - 09:40	**Natarajan Shankar** *Beautiful Formalizations and Proofs*
09:40 - 10:20	**Jacques Carette** *Unavoidable Mathematics*
10:20 - 10:50	*Coffee break*
10:50 - 11:20	**Georges Gonthier** *Programming Mathematics: Tools and Challenges*
11:30 - 12:10	**Patrick Massot** *From informal to formal and back*
12:10 - 14:00	*Lunch break*
14:00 - 16:00	**Panel Discussion** *How do we formalize (most of) mathematics?*
16:00 - 16:30	*Coffee break*
16:30 - 18:30	**Workgroup 1** *A) How to expand the role of formal mathematics in mathematical practice, B) Differences between proofs of programs and proofs in mathematics, C) Hierarchy builder.*

- **Thursday, June 20**

09:00 - 09:40	**Mohammad Abdulaziz** *Formalising the Theory of Combinatorial Optimisation*
09:40 - 10:20	**Florian Rabe** *HOL+Dependent Types + Subtyping*
10:20 - 10:50	*Coffee break*
10:50 - 11:20	**Katja Bercic / Jure Taslak** *Lean-HoG: Incorporating a database of graphs into a proof assistant*
11:30 - 12:10	**Johan Commelin** *Condensed Type Theory*
12:10 - 14:00	*Lunch break*
14:00 - 16:00	**Workgroup 1** *A) Polynomials in Lean, B) Raising Academic recognition for Formalizations/Implementations, C) Hierarchy builder, D) HoTT Lean*
16:00 - 16:30	*Coffee break*
16:30 - 18:30	**Workgroup 2** *A) Formal to informal and back (NLP, NLU, CNL, Autoformalization ...), B) Publication norms for formalized math, C) Understanding practical differences between theorem prover type systems*

- **Friday, June 21**

09:00 - 09:40	**Jeremy Avigad** *Verifying elliptic curve computations on blockchain*
09:40 - 10:20	**Robert Lewis** *Teaching Lean vs. teaching with Lean*
10:20 - 10:50	*Coffee break*
10:50 - 11:20	**Claudio Sacerdoti Coen** *A taste of ELPI*
11:30 - 12:10	**Wojciech Nawrocki** *Extending the Lean user interface with widgets (a tutorial)*
12:10 - 14:00	*Lunch break*
14:00 - 16:00	**Workgroup 1** *A) HoTT Lean, B) How to make formal logic more palatable to mathematics practitioners*
16:00 - 16:30	*Coffee break*
16:30 - 18:30	**Workgroup 2** *B) Theory Builder*