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Definability, decidability, and computability

Organizers:

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Gödel's Incompleteness Theorems reveal the fundamental complexity of arithmetic, both in negative sense, i.e., the undecidability of the theory of the natural numbers, but also in positive sense that first-order language of fields is far more expressive than one might think. The structures born from the interaction of logic and number theory/arithmetic geometry are at the center of extensive and intensive study at the frontier of computability theory, model theory, number theory and arithmetic geometry.

Among the topics at the core of the program, the focus will be on:

- Decidability and computability, e.g. Hilbert Tenth Problem over arithmetically significant domains.
- Definability, e.g., definability of valuations, definability in arithmetic geometry.
- Computability, e.g., effectiveness and complexity of countable structures.

In addition to the activities listed below, there will be a weekly seminar with speakers from the participants and/or short-term visitors as well as possibly ad-hoc talks on "hot topics".

We will have the following activities:

Introductory School "Definability, Decidability, and Computability"
(September 8-12, 2025)

Workshop "Definability in Number Theory and Arithmetic Geometry"
(October 20-24, 2025)

Conference "Definability and Computability"
(December 8-12, 2025)



Call for participation: The Hausdorff Research Institute offers visiting positions for the whole period of the trimester program (for senior scientists, postdocs and PhD students). The Due-date for applications **March 2, 2025 (CET)**. Please send applications (including CV and, for postdocs and PhD students, contact information for at least one potential reference) using our online application form at <https://math-events.uni-bonn.de/e/him2025-tp3>
In addition numerous fellowships for shorter periods are available.