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Preface to the special issue: Constructive analysis, types and exact real numbers

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The title *Constructive analysis, types and exact real numbers* covers the wide field of research dealing with ‘precise’ computations on continuous structures. The adjective ‘precise’ is used here in an informal way, referring to computations where the rounding off of the output and the approximative nature of the input are explicitly taken into account in some way.

The research field ranges from practical implementations of (higher type) real number computations, via questions about high level programming languages for real numbers, to questions about the semantics of these languages and the correctness of algorithms over continuous structures. Thus, it relates to such topics as type theory, realisability and constructive logic, coalgebras, domains and formal topology. We have presented the field in a survey article in this volume.

This special issue emerged from the small Types workshop: ‘Constructive analysis, types and exact real numbers’, which was held at the Radboud University of Nijmegen, the Netherlands, 3–4 October 2005. The invited speakers were Martín Escardó and Norbert Müller. Submission to this special issue was open, so the papers are not limited to those presented at the workshop. The workshop was sponsored by the EC Coordination action 510966 ‘Types for Proofs and Programs’ and the Netherlands Organization for Scientific Research (NWO). Parallel to the workshop, a friendly competition[†]/benchmark session for implementations of exact real arithmetic was organised.

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