

Preface

Craig interpolation (CI), Beth definability (BD), and second-order quantifier elimination (SOQE) are notions that are relevant to several branches of computer science, such as proof theory, model theory, proof complexity, automated reasoning, automata theory, database theory, verification, databases, but also beyond that, for instance, in philosophy and linguistics. Informally, all three notions concern the existence and computation of formulas that preserve some semantic properties while using a restricted syntax. The broad interest of CI, BD, and SOQE has led to a large number of results, of both foundational and practical nature, and quite some cross-fertilization among the different fields.

The *Workshop on Craig Interpolation, Beth Definability, and Second-Order Quantifier Elimination (CI-BD-SOQE 2026)* aimed at joining these different communities in one place in order to further foster the exchange and present the newest findings, approaches and techniques as well as important open problems. It was part of the *9th Federated Logic Conference (FLoC 2026)*, and took place in Lisbon, Portugal on July 24–25, 2026. Being part of *FLoC* meant that a large audience was targeted since many related logic venues took part, directly before *CI-BD-SOQE*, after, or in the same time. The workshop continued a series of previous workshops on Craig interpolation, Beth definability, and second-order quantifier elimination:

- *Workshop on Craig Interpolation and Beth Definability (CIBD 2024)*
- *4th Workshop on Interpolation: From Proofs to Applications (iPRA 2022)*
- *Second Workshop on Second-Order Quantifier Elimination and Related Topics (SOQE 2021)*
- *First Workshop on Second-Order Quantifier Elimination and Related Topics (SOQE 2017)*

Relevant topics included abductive reasoning, algorithms for CI, BD, SOQE, applications of CI, BD, SOQE, automating circumscription, automating modal correspondence theory, CI and BD for specific logics, CI and BD in model theory, CI in program verification, forgetting in knowledge representation, generalizations of CI, generating explanations via CI, implementation of CI, BD, SOQE, ontology modularization and content extraction, proof complexity and feasible interpolation, proof systems for CI and BD, query rewriting on the basis of CI and BD, separability, solving constrained Horn clauses, solving formula equations, uniform interpolation, and all related tasks and techniques.

The workshop was organized by:

- Stefan Hetzl, TU Wien, Austria
- Jean Christoph Jung, TU Dortmund University, Germany
- Renate A. Schmidt, The University of Manchester, UK
- Christoph Wernhard, University of Potsdam, Germany

The organizers were supported by a program committee (PC) that helped both in evaluating submitted papers and in selecting invited speakers. It consisted of:

- Philippe Balbiani, IRIT, CNRS, University of Toulouse, France
- Michael Benedikt, University of Oxford, UK
- Maria Paola Bonacina, Università degli Studi di Verona, Italy
- James Delgrande, Simon Fraser University, Canada
- Silvio Ghilardi, Università degli Studi di Milano, Italy
- Alessandro Gianola, Universidade de Lisboa, Portugal

CI-BD-SOQE 2026: Workshop on Craig Interpolation, Beth Definability, and Second-Order Quantifier Elimination, at FLoC 2026: The 9th Federated Logic Conference, July 24–25, 2026, Lisbon, Portugal



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- Sam van Gool, ENS Paris-Saclay, France
- Helle Hvid Hansen, University of Groningen, Netherlands
- Andreas Herzig, IRIT, France
- Stefan Hetzl, TU Wien, Austria
- Raheleh Jalali, University of Bath, UK
- Jean Christoph Jung, TU Dortmund University, Germany
- Matthias Knorr, Universidade Nova de Lisboa, Portugal
- Patrick Koopmann, Vrije Universiteit Amsterdam, Netherlands
- Roman Kuznets, Czech Academy of Sciences, Czechia
- George Metcalfe, University of Bern, Switzerland
- Philipp Rümmer, University of Regensburg, Germany, and Uppsala University, Sweden
- Vladislav Ryzhikov, Birkbeck, University of London, UK
- Renate A. Schmidt, The University of Manchester, UK
- Viorica Sofronie-Stokkermans, Universität Koblenz-Landau, Germany
- Kewen Wang, Griffith University, Australia
- Georg Weissenbacher, TU Wien, Austria
- Christoph Wernhard, University of Potsdam, Germany
- Frank Wolter, University of Liverpool, UK
- Yizheng Zhao, Nanjing University, People's Republic of China

Upon our open call for papers we received 12 submissions: 4 full-length papers, 4 extended abstracts, and 4 abstracts of research published elsewhere. Every submission was peer reviewed by least two PC members. In all cases they gave constructive feedback that helped improving the final versions of the papers. In the end, the PC decided to accept all 12 submissions, which comprise this volume and which were also presented at the workshop.

Overall, *CI-BD-SOQE 2026* featured an exciting program with an overall number of six invited talks, twelve contributed talks, and the presentation of the upcoming volume *Theory and Applications of Craig Interpolation*, edited by Balder ten Cate, Jean Christoph Jung, Patrick Koopmann, Christoph Wernhard, and Frank Wolter. The invited talks were delivered by:

- Marta Bílková, Czech Academy of Sciences, Czechia
- Balder ten Cate, University of Amsterdam, Netherlands
- Arie Gurfinkel, University of Waterloo, Canada
- Alessandra Palmigiano, Vrije Universiteit Amsterdam, Netherlands
- Alexis Saurin, CNRS, France
- Amir Akbar Tabatabai, University of Groningen, Netherlands

The detailed program and further information about *CI-BD-SOQE 2026* can be found at the event homepage at <http://2026.ci-bd.soqe.org/>.

Last but not least, we would like to thank the local organizers of *FLoC 2026* for setting up everything perfectly in the workshop venue in Lisbon, and the TU Dortmund University for their generous support in funding the trip of one of the invited speakers.

Stefan Hetzl
Jean Christoph Jung
Renate A. Schmidt
Christoph Wernhard