

Joint Proceedings of the 20th and 21st Reasoning Web Summer Schools

RW 2024, September 19–22, 2024, Bucharest, Romania
RW 2025, September 25–28, 2025, Istanbul, Turkey

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■ Preface

The Reasoning Web Summer School (RW) is an established annual event, now in its 21st edition, which since 2020 has been organised under the umbrella of the Declarative AI conference. The purpose of RW is to disseminate recent advances in reasoning techniques and relevant topics related to ontologies, rules, logic, the semantic web, linked data, and knowledge graph applications. RW features a series of lectures delivered by internationally recognized experts. These sessions combine tutorial-style presentations with opportunities for discussion, allowing participants to build a solid foundation and engage with current research challenges. The summer school serves as a valuable meeting point for MSc and PhD students, postdoctoral researchers, and senior scholars alike.

The 20th edition of RW (RW 2024) took place in Bucharest, Romania, from September 19th to 22nd, 2024. Centered on the theme “Data and Knowledge,” the program featured eight engaging lectures delivered by leading experts covering foundational topics in knowledge representation, logical reasoning, query answering, and the integration of data-driven and symbolic methods.

- **Patrick Betz & Christian Meilicke** (University of Mannheim, Germany): *Rule-Based Knowledge Graph Completion*
- **Cristina Feier** (Technical University of Cluj-Napoca, Romania): *Fine-Grained Complexity of Ontology Mediated Query Answering*
- **Eleonora Giunchiglia** (TU Wien, Austria): *Deep Learning with Logical Requirements*
- **Jean Christoph Jung** (TU Dortmund, Germany): *Reverse Engineering Queries From Data Examples*
- **Egor Kostylev** (University of Oslo, Norway): *Foundations of Graph Neural Networks*
- **Jerzy Marcinkowski** (University of Wrocław, Poland): *Towards Multiset-Semantics Database Theory: How I Learned to Stop Worrying and Love Linear Algebra*
- **Josef Urban** (Czech Technical University in Prague, Czechia): *Machine Learning and Theorem Proving*
- **Nikolay Yakovets** (TU Eindhoven, Netherlands): *Property Graph Data Management*

The 21st edition of the school (RW 2025) took place in Istanbul, Türkiye from September 25th to 28th, 2025, hosted by the Kadir Has University. The program consisted of eight three-hour courses given over four days by distinguished experts in the field:

- **Camille Bourgaux** (CNRS & DI ENS, Paris, France): *Inconsistency-Tolerant Semantics Based on Preferred Repairs*
- **Esra Erdem, Aysu Bogatarkan & Muge Fidan** (Sabanci University, Istanbul, Türkiye): *Human-Centered ASP Applications: Representation & Reasoning*
- **Patrick Koopmann** (Vrije Universiteit Amsterdam, Netherlands): *Explaining Reasoning Results for Description Logic Ontologies*
- **Markus Krötzsch** (TU Dresden, Germany): *Modern Datalog: Concepts, Methods, Applications*
- **Antonella Poggi** (Sapienza University of Rome, Italy): *From One-Level to Multi-Level Ontology-Based Data Management*
- **Francesco Ricca & Giuseppe Mazzotta** (University of Calabria, Italy): *ASP Essentials: Modelling & Efficient Solving*
- **Luciano Serafini** (Fondazione Bruno Kessler, Trento, Italy): *Neuro-Symbolic Artificial Intelligence*

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- **Przemysław Walega** (Queen Mary University of London, United Kingdom): *Reasoning About Time in DatalogMTL*

We are grateful to all of our speakers in both editions for preparing and delivering inspiring tutorials, which were essential to the success of RW 2024 and RW 2025. We also want to thank the young researchers who attended the schools for their active engagement and questions, which made the schools lively and stimulating events and provides motivation for the continued organization of the school in the coming years.

Let us also extend our sincere thanks to the general chairs of Declarative AI 2024 and 2025 (Hasan Dağ, Anni-Yasmin Turhan, Ahmet Soylu and Dimitru Roman) and all of the members of the Declarative AI local organization teams, in particular, Mehmet Nafiz Aydin (local chair for RW 2025), with whom we had frequent exchanges during the preparation of the event, and Mert İlhan Ecevit, who provided us assistance throughout the school.

Following tradition, the lecturers were invited to submit a chapter to accompany their tutorials. The present volume collects 6 contributions from RW 2025 and 3 contributions from RW 2024. These contributed chapters provide excellent introductions to the school topics and can serve as useful resources both for students and young researchers who are interested in joining the field and for established researchers who will find up-to-date summaries of the current state-of-the-art. In order to make the chapters widely available, we decided to publish these proceedings in OASICs (OpenAccess Series in Informatics). We would like to extend our thanks to the Dagstuhl Publishing staff for accompanying us in the transition to this open proceedings series.

October 2025

RW 2024 Chairs

Yazmín Ibáñez García
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RW 2025 Chairs

Alessandro Artale
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