

# *Introduction to the 41<sup>st</sup> International Conference on Logic Programming Special Issue*

MARTIN GEBSER

*University of Klagenfurt, Klagenfurt, Austria*

(e-mail: [martin.gebser@aau.at](mailto:martin.gebser@aau.at))

DANIELA INCLEZAN

*Miami University, Oxford, OH, USA*

(e-mail: [inclezd@miamioh.edu](mailto:inclezd@miamioh.edu))

FRANCESCO RICCA

*University of Calabria, Rende, Italy*

(e-mail: [francesco.ricca@unical.it](mailto:francesco.ricca@unical.it))

*submitted 19 August 2025; revised 19 August 2025; accepted 20 August 2025*

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**KEYWORDS:** logic programming methodology and applications, theory

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This issue of TPLP contains the regular papers of the 41<sup>st</sup> International Conference on Logic Programming (ICLP 2025), held at University of Calabria, Italy, from September 12 to September 19, 2025.

The International Conference on Logic Programming (ICLP), established in 1982 with its first edition in Marseille, France, is the premier global venue for presenting, discussing, and disseminating fundamental and applied research in all areas of logic programming and related interdisciplinary fields. It continues to serve the international logic programming community, covering a broad scope that includes:

- **Theoretical Foundations:** Formal and operational semantics, Non-monotonic reasoning, Reasoning under uncertainty, Knowledge representation, Semantic issues of combining logic and neural models, Complexity results.
- **Language Design and Programming Methodologies:** Concurrency and parallelism, Mobility, Interacting with ML, Logic-based domain-specific languages, Hybrid logical and imperative/functional languages, Programming techniques, Answer Set Programming, Inductive Logic Programming, Coinductive Logic Programming.

- **Program Analysis and Optimization:** Analysis, Transformation, Verification, Debugging, Profiling, Visualization, Logic-based validation of generated programs.
- **Implementation Methodologies:** Compilation, Parallel/distributed execution, Constraint implementation, Tabling, Logic-based prompt engineering, User interfaces.

Besides the main track, ICLP 2025 included two additional tracks:

- **IJCAI Fast Track**, dedicated to high-quality, revised versions of papers initially submitted to (but not accepted at) IJCAI 2025, which now meet TPLP's standards.
- **Recently Published Research (RPR) Track**, which provides a forum to present and discuss recent work on logic programming topics that was previously published at other venues but has not been presented at ICLP or other major logic programming-related conferences

ICLP 2025 continued the hybrid publication model used in recent editions, featuring both journal papers and Technical Communications (TCs). Papers of the highest quality were selected for rapid publication in this special issue of TPLP. The TCs include papers deemed by the Program Committee to be of good quality but not yet meeting TPLP's publication standards, accepted ICLP main track TC papers, as well as extended abstracts from the RPR Track.

## 1 Conference program

We received 93 submissions of abstracts across the main track, IJCAI Fast Track, and RPR Track. Out of these, 90 resulted in paper submissions, distributed as follows: ICLP main track regular papers (67 papers), ICLP main track TC papers (twelve papers), IJCAI Fast Track (six papers), and the RPR Track (five papers). The Program Chairs organized the refereeing process that involved the Program Committee and several external reviewers. Each paper was reviewed by at least three referees who provided detailed written evaluations. This yielded submissions short-listed as candidates for rapid communication. The authors of these papers revised their submissions in light of the reviewers' suggestions, and the papers were subject to a second round of reviewing. Of these candidates papers, 23 were accepted to appear for publication in the TPLP journal as rapid communications. Additionally, one paper from the IJCAI Fast Track was accepted for TPLP publication as well. The 24 papers selected for publication in TPLP are as follows:

- Felicidad Aguado, Pedro Cabalar, Brais Muñoz Castro, Gilberto Pérez, and Concepcion Vidal. *Comparing Non-minimal Semantics for Disjunction in Answer Set Programming*
- Mario Alviano, Wolfgang Faber, and Luis Angel Rodriguez Reiners. *ASP Chef Grows Mustache to Look Better*
- Damiano Azzolini, Marco Duca, Stefano Forti, Francesco Gallo, and Antonio Ielo. *Application Placement with Constraints Relaxation*
- Damiano Azzolini, Fabrizio Riguzzi, and Theresa Swift. *Integrating Belief Domains into Probabilistic Logic Programming*

- Lucia Balažová, Richard Comploi-Taupe, Susana Hahn, Nicolas Rühling, and Gottfried Schenner. *Smart Expansion Techniques for ASP-based Interactive Configuration*
- Alexander Beiser, Markus Hecher, and Stefan Woltran. *Automated Hybrid Grounding Using Structural and Data-Driven Heuristics* (Best Student Paper Award)
- Rachel Ben-Eliyahu-Zohary. *Splitting a Disjunctive Logic Program*
- Alessandro Bertagnon, Marcello Dalpasso, Michele Favalli, and Marco Gavanelli. *Fine-grained Timing Analysis of Digital Integrated Circuits in Answer Set Programming*
- Aysu Bogatarkan and Esra Erdem. *A General Framework for Dynamic MAPF using Multi-Shot ASP and Tunnels*
- Pierangela Bruno, Carmine Dodaro, Giuseppe Galatà, Marco Maratea, and Marco Mochi. *Improving ASP-based ORS Schedules through Machine Learning Predictions*
- Pedro Cabalar, Martín Diéguez, François Olivier, Torsten Schaub, and Igor Stéphane. *Towards Constraint Temporal Answer Set Programming*
- Angelos Charalambidis, Babis Kostopoulos, Christos Nomikos, and Panos Rondogiannis. *The Power of Negation in Higher-Order Datalog*
- Marco Cicalà, Daniel Jurjo, Jose F. Morales, Pedro Lopez-Garcia, and Manuel V. Hermenegildo. *Hiord<sup>#</sup>: An Approach to the Specification and Verification of Higher-Order (C)LP Programs*
- Wlodek Drabent. *Systematic Construction of Correct Logic Programs*
- Thomas Eiter, Tobias Geibinger, Nysret Musliu, Johannes Oetsch, and Tobias Kaminski. *ASP-FZN: A Translation-based Constraint Answer Set Solver*
- Jorge Fandinno, Christoph Glinzer, Zachary Hansen, Jan Heuer, Yuliya Lierler, Vladimir Lifschitz, Torsten Schaub, and Tobias Stolzmann. *ANTHEM: Answer Set Programming and Automated Theorem Proving* (Best Paper Award)
- Müge Fidan and Esra Erdem. *Finding Personalized Good-Enough Solutions to Unsatisfiable Stable Roommates Problems*
- Mohimenul Kabir, Supratik Chakraborty, and Kuldeep S Meel. *Counting Answer Sets of Disjunctive Answer Set Programs*
- Parth Padalkar and Gopal Gupta. *Symbolic Rule Extraction from Attention-Guided Sparse Representations in Vision Transformers*
- Etienne Payet. *Non-Termination of Logic Programs Using Patterns*
- Enrico Santi, Fabio Tardivo, Agostino Dovier, and Andrea Formisano. *GPU Accelerated Compact-Table Propagation*
- Johannes Schmidt, Mohamed Maizia, Victor Lagerkvist, and Johannes K. Fichte. *Complexity of Faceted Explanations in Propositional Abduction*
- Alice Tarzariol, Marco Maratea, and Mauro Vallati. *A CASP-based Solution for Traffic Signal Optimisation*
- Baturay Yilmaz and Esra Erdem. *Generating Solvable Benchmark Instances for Stable Roommates Problems with Optimization*

In addition to the TPLP papers, the Program Committee recommended 40 papers to be accepted as technical communications (36 from the main track and four from

the IJCAI Fast Track), to appear at Electronic Proceedings in Theoretical Computer Science (EPTCS), either as full papers or extended abstracts, of which 36 were presented at ICLP 2025 (four were withdrawn). Four papers were accepted for presentation among the submissions to the RPR Track.

The technical program of ICLP 2025 also included four keynote talks:

- Stefania Costantini. *Paso Double between Logic Programming and Epistemic Logics*
- Esra Erdem. *Applications of ASP in Robotic Construction*
- Georg Gottlob. *Using LLMs for Knowledge Base Construction and Curation*
- Vladimir Lifschitz. *Reasoning about Programs and User Guides*

## 2 Conference awards

The conference presented the following awards:

- **Best Paper Award:** Jorge Fandinno, Christoph Glinzer, Zachary Hansen, Jan Heuer, Yuliya Lierler, Vladimir Lifschitz, Torsten Schaub, and Tobias Stolzmann. *ANTHEM: Answer Set Programming and Automated Theorem Proving*
- **Best Student Paper Award:** Alexander Beiser, Markus Hecher, and Stefan Woltran. *Automated Hybrid Grounding Using Structural and Data-Driven Heuristics*.

Furthermore, after an in-depth analysis of citation indices (e.g., SCOPUS, Web of Science, and Google Scholar), two Test-of-Time awards were identified:

- **The John Alan Robinson 20-Year Test-of-Time Award:** Sabrina Baselice, Piero A. Bonatti, and Michael Gelfond (2005). *Towards an Integration of Answer Set and Constraint Solving*. In: Gabbrielli, M., Gupta, G. (eds) *ICLP 2005. Lecture Notes in Computer Science*, vol. 3668, pp. 52–66. Springer, Berlin, Heidelberg. [https://doi.org/10.1007/11562931\\_7](https://doi.org/10.1007/11562931_7)
- **The 10-Year Test-of-Time Award:** Martin Gebser, Amelia Harrison, Roland Kaminski, Vladimir Lifschitz, and Torsten Schaub (2015). *Abstract Gringo*. TPLP 15(4 – 5): 449–463. <https://doi.org/10.1017/S1471068415000150>

## 3 Affiliated events

In addition to the main technical program, ICLP 2025 hosted the 21<sup>st</sup> Doctoral Consortium on Logic Programming, the 2025 Autumn School on Logic Programming, and the following workshops:

- 32<sup>nd</sup> RCRA Workshop on Experimental Evaluation of Algorithms for Solving Problems with Combinatorial Explosion (RCRA 2025)
- 18<sup>th</sup> Workshop on Answer Set Programming and Other Computing Paradigms (ASPOCP 2025)
- 12<sup>th</sup> Workshop on Probabilistic Logic Programming (PLP 2025)
- 9<sup>th</sup> Workshop on Advances in Argumentation in Artificial Intelligence (AI<sup>3</sup> 2025)
- Third Prolog Education Workshop (PEG 2025)

- Second Annual Workshop on Prolog Improvement Proposals (PIPs)
- Workshop on Logic Programming and Legal Reasoning (LPLR 2025)
- 1<sup>st</sup> Workshop on Cognitive Architectures for Robotics: LLMs and Logic in Action (CARLA)

ICLP 2025 was co-located with the 35<sup>th</sup> International Symposium on Logic-Based Program Synthesis and Transformation (LOPSTR 2025) and the 27<sup>th</sup> International Symposium on Principles and Practice of Declarative Programming (PPDP 2025).

## 4 Conference organization

The organizers of ICLP 2025 are listed below.

### General chair:

- Francesco Ricca, University of Calabria, Italy

### Program chairs:

- Martin Gebser, University of Klagenfurt, Austria
- Daniela Incezan, Miami University, USA

### Organizing chairs:

- Carmine Dodaro, University of Calabria, Italy
- Antonio Ielo, University of Calabria, Italy
- Giuseppe Mazzotta, University of Calabria, Italy

### Workshop chairs:

- Pierangela Bruno, University of Calabria, Italy
- Jorge Fandinno, University of Nebraska at Omaha, USA

### Recently published research track chairs:

- Manuel Carro, IMDEA Software Institute and Universidad Politécnica de Madrid, Spain
- Mirosław Trzuszczynski, University of Kentucky, USA

### Doctoral consortium chairs:

- Markus Hecher, CNRS, Artois University, France
- Alice Tarzariol, University of Klagenfurt, Austria

### Autumn school chairs:

- Sarah Gaggl, TU Dresden, Germany
- Manuel Hermenegildo, IMDEA Software Institute and Universidad Politécnica de Madrid, Spain

### Programming contest chairs:

- Mario Alviano, University of Calabria, Italy
- Wolfgang Faber, University of Klagenfurt, Austria

**Publicity chairs:**

- Manuel Alejandro Borroto Santana, University of Calabria, Italy
- Francesco Calimeri, University of Calabria, Italy

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The external reviewers were:

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### Acknowledgments

We gratefully acknowledge the University of Calabria for hosting the conference on its campus. We also thank the Artificial Intelligence Journal (AIJ), the Italian Association for Artificial Intelligence (AIxIA), the Gruppo Ricercatori e Utenti Logic Programming (GULP), the US National Science Foundation (NSF), and the University of Calabria for their generous support of the student travel grants.

We extend our sincere gratitude to Enrico Pontelli, President of the Association of Logic Programming (ALP); Marco Gavanelli, ALP Conference Coordinator; and all members of the ALP Executive Committee. We gratefully acknowledge Mirek Truszczyński, Editor-in-Chief of TPLP, and the staff at Cambridge University Press for their valuable support. The EPTCS Editorial Board and, in particular, Rob van Glabbeek provided extraordinary help to publish the TCs. Our deep appreciation also goes to the Program Committee members, external reviewers, and the entire ICLP 2025 organizing committee led by Francesco Ricca for their tireless and exemplary contributions. Without you, this conference would not have been possible. We are especially thankful to all authors who submitted to ICLP 2025. Thank you for choosing this venue to share your ideas, hard work, and expertise.