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Introduction to the 42nd International Conference on Logic Programming Special Issue

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1 Introduction

This issue of TPLP contains the regular papers of the 42nd International Conference on Logic Programming (ICLP 2026), which took place in Lisbon, Portugal, from July 20 to July 23, 2026, as part of the Federated Logic Conference 2026 (FLoC).

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, and Complexity results.
- **Language design and programming methodologies:** Concurrency and parallelism, Mobility, Interacting with Machine learning, Logic-based domain-specific languages, Hybrid logical and imperative/functional languages, Programming techniques, Answer Set Programming, Inductive Logic Programming, and Coinductive Logic Programming.

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

Besides the main track, ICLP 2026 included the additional track:

- **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 2026 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.

2 Conference program

We received 83 submissions of abstracts across the main track and RPR Track. Out of these, 70 resulted in paper submissions, distributed as follows: ICLP main track regular papers (48 papers), ICLP main track TC papers (17 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 two submissions to be directly accepted for rapid communications in TPLP, and more shortlisted as candidates for rapid communication in TPLP. The authors of the latter papers revised their submissions in light of the reviewers' suggestions, and the papers were subject to a second round of reviewing, of which 17 were accepted. In total, these 19 contributions were accepted to appear for publication in the TPLP journal:

- M. Alviano, L. Grillo, N. Leone, F. Lo Scudo. *Logic-Guided Data Extraction with Answer Set Programming and Large Language Models.*
- G. Amato, F. Scozzari. *Experimental evaluation of optimal abstract operators for sharing and linearity analysis.*
- R. Bankosegger, T. Eiter, J. Oetsch *Answer-Set-Programming-based Abstractions for Reinforcement Learning.*
- R. Brancas, V. Manquinho, R. Martins. *ProDebug: An Automated Debugging System for Prolog.*
- A. Charalambidis, G. Chatziagapis, B. Kostopoulos, P. Rondogiannis. *Equilibrium Semantics and Strong Equivalence for Higher-Order Logic Programs.*
- A. Charalambidis, B. Kostopoulos, P. Rondogiannis. *From Time to Space: The Impact of Linearity in Higher-Order Datalog.*

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- A. Cuteri, G. Mazzotta, F. Ricca. *2-ASP(Q) programs with weak constraints: Complexity and efficient implementation.*
- M. Diéguez, S. Hahn, T. Schaub, I. Stéphan. *Reducing Arbitrary Metric Temporal Formulas into Logic Programs under Answer Set Semantics.*
- J. Fandinno, Y. Lierler, T. Schaub. *Parametric Modular Answer Set Programs Made Declarative.*
- J. Fandinno, P. Cabalar, T. Schaub, P. Wanko. *flingo - Instilling ASP Expressiveness into Linear Integer Constraints.*
- S. Hahn, A. Nemes, J. Romero, T. Schaub. *Meta-Programming for Linear-time Temporal Answer Set Programming.*
- A. Ielo, F. Doria, S. Castellanos-Paez, M. Maratea, F. Percassi, M. Vallati. *Long-term Power Grid Planning via Answer Set Programming.*
- D. Jurjo-Rivas, D. Ferreiro, M. Ciccalè, J. Morales, P. López-García, M. Hermenegildo. *Exploiting Multiple Abstract Call Patterns for Optimizing Run-Time Checks.*
- A. Liu, J. Idogun, S. Stoller, Y. Tong. *Efficiency of Analysis of Transitive Relations using Query-Driven, Ground-and-Solve, and Fact-Driven Inference.*
- F. Pennino, B. Raimondi, M. Rondelli, A. Gurioli, M. Gabbrielli. *From Reasoning to Code: GRPO Optimization for Underrepresented Languages.*
- A. Rader, A. Russo. *Accelerating NeurASP with vectorization and caching.*
- E. Skvortsov, Y. Xia, S. Bowers, O. Garg, B. Ludäscher. *Diamonds Are Forever: Stabilization Semantics for Unrestricted Aggregation and Recursion in Logica.*
- O. Vašíček, J. Arias, J. Davíla, J. Fiedor, G. Gupta, B. Křena, J. Němec, T. Vojnar. *Event Calculus Meets Hybrid ASP.*
- E. Yanakieva, A. Bieniusa, S. Dumbrava. *A Datalog Framework for Conflict-Free Replicated Data Types.*

In addition to the TPLP papers, the Program Committee recommended 35 papers to be accepted as TCs, to appear at Electronic Proceedings in Theoretical Computer Science (EPTCS), either as full papers or extended abstracts. One of these papers was withdrawn after acceptance. Five papers were accepted for presentation among the submissions to the RPR Track.

The technical program of ICLP 2026 also included two keynote talks:

- Mario Alviano. *ASP in the Loop: From Structured Prompting to Agentic Logic Programming*;
- Peter Stuckey. *From CLP(R) to MiniZinc: there and back again*.

3 Conference awards

The conference presented the following awards:

- **Best Paper Award**: Charalambidis, G. Chatziagapis, B. Kostopoulos, P. Rondogiannis. *Equilibrium Semantics and Strong Equivalence for Higher-Order Logic Programs*.

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- **Best Student Paper Award**: R. Bankosegger, T. Eiter, J. Oetsch. *Answer-Set-Programming-based Abstractions for Reinforcement Learning*.

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** (ex aequo): Luke Simon, Ajay Mallya, Ajay Bansal, Gopal Gupta (2006). *Coinductive Logic Programming*. In *Logic Programming. ICLP 2006. Lecture Notes in Computer Science*, vol. 4079, pp. 330–345, Springer, 2006. Enrico Pontelli, Tran Cao Son (2006). *Justifications for Logic Programs Under Answer Set Semantics*. In *Logic Programming. ICLP 2006. Lecture Notes in Computer Science*, vol. 4079, pp. 196–210, Springer, 2006.
- **The 10-Year Test-of-Time Award:** Martin Gebser, Roland Kaminski, Benjamin Kaufmann, Max Ostrowski, Torsten Schaub, and Philipp Wanko (2016). *Theory Solving Made Easy with Clingo 5*. In TCs of the 32nd Int. Conf. on Logic Programming, ICLP 2016, New York City, USA, October 16–21, 2016, OASIcs, Schloss Dagstuhl – Leibniz-Zentrum für Informatik, https://doi.org/10.4230/OASIcs.ICLP.2016.2.

4 Affiliated events

In addition to the main technical program at ICLP 2026, FLoC 2026 hosted the 22nd Doctoral Consortium on Logic Programming, the 2026 Summer School on Logic Programming, and the following workshops:

- 33rd RCRA Workshop on Experimental Evaluation of Algorithms for Solving Problems with Combinatorial Explosion (RCRA 2026).
- 19th Workshop on Answer Set Programming and Other Computing Paradigms (ASPOCP 2026).
- 2nd Workshop on Cognitive Architectures for Robotics: LLMs and Logic in Action (CARLA).
- EULP 2026, Workshop on End-user Logic Programming.
- Fourth Prolog Education Workshop (PEG 2026).
- Third Annual Workshop on Prolog Improvement Proposals (PIPs).

ICLP 2026 has been organized as part of the FLoC 2026, which brings together 10 leading international conferences focused on mathematical logic and its applications in computer science.

5 Conference organization

The organizers of ICLP 2026 are listed below.

General Chairs

- Ricardo Rocha, University of Porto, Portugal.
- Vítor Santos Costa, University of Porto, Portugal.

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Program Chairs

- Wolfgang Faber, University of Klagenfurt, Austria.
- Laura Giordano, University of Piemonte Orientale, Italy.

Workshop Chair

- Miguel Areias, University of Porto, Portugal.

Doctoral Consortium Chairs

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

Summer School Chairs

- Joaquín Arias, Universidad Rey Juan Carlos, Spain.
- Marco Maratea, University of Calabria, Italy.

Programming Contest Chairs

- Mario Alviano, University of Calabria, Italy.
- Johannes K. Fichte, Linköping University, Sweden.
- Arnaud Lequen, Linköping University, Sweden.

Publicity Chairs

- Emanuele De Angelis, IASI-CNR, Italy.
- Zachary Hansen, University of Nebraska Omaha, USA.

Web Chair

- Michael Morak, University of Klagenfurt, Austria.

Program Committee

- Salvador Abreu, NOVA-LINCS / University of Evora.
- Mario Alviano, University of Calabria.
- Nicos Angelopoulos, University College London.
- Joaquín Arias, Universidad Rey Juan Carlos.
- Marcello Balduccini, Saint Joseph's University.
- Mutsunori Banbara, Nagoya University.
- Elena Bellodi, University of Ferrara.
- Bart Bogaerts, KU Leuven.
- Pedro Cabalar, University of Corunna.
- Roberta Calegari, Alma Mater Studiorum–University of Bologna.
- Francesco Calimeri, University of Calabria.
- Angelos Charalambidis, Harokopio University.
- Stefania Costantini, University of L'Aquila.
- Alessandro Dal Palù, University of Parma.
- Carmine Dodaro, University of Calabria.
- Agostino Dovier, University of Udine.

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- Thomas Eiter, TU Wien.
- Esra Erdem, Sabanci University.
- François Fages, INRIA Saclay.
- Jorge Fandinno, University of Nebraska Omaha.
- Johannes K. Fichte, Linköping University.
- Fabio Fioravanti, University of Chieti-Pescara.
- Andrea Formisano, University of Udine.
- Gerhard Friedrich, University of Klagenfurt.
- Sarah Alice Gaggl, TU Dresden.
- Marco Gavanelli, University of Ferrara.
- Martin Gebser, University of Klagenfurt.
- Ricardo Gonçalves, NOVA University Lisbon.
- Gopal Gupta, The University of Texas at Dallas.
- Markus Hecher, CNRS, Artois University.
- Giovambattista Ianni, University of Calabria.
- Daniela Inclezan, Miami University.
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- Francesca Alessandra Lisi, University of Bari Aldo Moro.
- Yanhong A. Liu, Stony Brook University.
- Marco Maratea, University of Calabria.
- Viviana Mascardi, DIBRIS, University of Genova.
- Jose F. Morales, IMDEA Software Institute and Technical University of Madrid.
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- Roland Yap, National University of Singapore.
- Jia-Huai You, University of Alberta.
- Zhizheng Zhang, Southeast University.
- Neng-Fa Zhou, CUNY Brooklyn College and Graduate Center.

Additional reviewers

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Robbe Van den Eede	Gioacchino Sterlicchio	Johanna Groven
Salvatore Fiorentino	Javier Romero	Tobias Geibinger
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