

# CURRICULUM VITAE MARCELO ARENAS

Professor, Department of Computer Science  
Pontificia Universidad Católica de Chile  
Phone: +56 2 23545821  
Email: marenas@ing.puc.cl  
Http: marenas.sitios.ing.uc.cl

## SHORT BIO

I am a Professor at the Department of Computer Science at the Pontificia Universidad Católica de Chile, the director of the Millennium Institute for Foundational Research on Data and the former director of the Center for Semantic Web Research. I received a Ph.D. from the University of Toronto in 2005. My research interests are in the areas of data management, applications of logic in computer science and Semantic Web. I have received an IBM Ph.D. Fellowship (2004), a SIGMOD Jim Gray Doctoral Dissertation Award Honorable Mention in 2006 for my Ph.D. dissertation “Design Principles for XML Data”, the 2016 Semantic Web Science Association (SWSA) Ten-Year Award for the article “Semantics and Complexity of SPARQL” and nine best paper awards (PODS 2003, PODS 2005, ISWC 2006, ICDT 2010, ESWC 2011, PODS 2011, WWW 2012, ISWC 2014 and PODS 2019). I have served on multiple program committees and editorial boards, and I have chaired the program committees of ICDT 2015, ISWC 2015 and PODS 2018. I participated as an invited expert in the World Wide Web Consortium group that standardized a language for translating relational data into RDF. According to Google Scholar, my articles have received 7852 citations, and my h-index is 43.

## RESEARCH INTERESTS

- Database systems: relational databases, semistructured data, XML, graph databases
- Semantic Web
- Finite model theory
- Knowledge representation
- Formal verification

## EDUCATION

- Ph.D. in Computer Science. University of Toronto, Canada. September 2005. Thesis: “Design Principles for XML Data”.
- M.Sc. in Computer Science. Pontificia Universidad Católica de Chile, Chile. July 1998. Thesis: “Dynamic and Consistency Issues in Databases” (in Spanish).
- Industrial Engineer specializing in Computers (High Honours). Pontificia Universidad Católica de Chile, Chile. July 1998.
- B.A. in Engineering Science (High Honours). Pontificia Universidad Católica de Chile, Chile. March 1998.
- B.A. in Mathematics (High Honours). Pontificia Universidad Católica de Chile, Chile. October 1997.

## PUBLICATIONS

### Books

- [1] Marcelo Arenas, Pablo Barceló, Leonid Libkin and Filip Murlak. “*Foundations of Data Exchange*”. Cambridge University Press, 2014.

- [2] Marcelo Arenas, Pablo Barceló, Leonid Libkin and Filip Murlak. “*Relational and XML Data Exchange*”. Morgan & Claypool, 2010.

## Refereed journal papers

- [3] Marcelo Arenas, Georg Gottlob and Andreas Pieris. “*Expressive Languages for Querying the Semantic Web*”. ACM Transactions on Database Systems 43(3):13:1–13:45, 2018.
- [4] Serge Abiteboul, Marcelo Arenas, Pablo Barceló, Meghyn Bienvenu, Diego Calvanese, Claire David, Richard Hull, Eyke Hüllermeier, Benny Kimelfeld, Leonid Libkin, Wim Martens, Tova Milo, Filip Murlak, Frank Neven, Magdalena Ortiz, Thomas Schwentick, Julia Stoyanovich, Jianwen Su, Dan Suciu, Victor Vianu, Ke Yi. “*Research Directions for Principles of Data Management (Dagstuhl Perspectives Workshop 16151)*”. Dagstuhl Manifestos 7(1):1–29, 2018.
- [5] Renzo Angles, Marcelo Arenas, Pablo Barceló, Aidan Hogan, Juan Reutter and Domagoj Vrgoc. “*Foundations of Modern Graph Query Languages*”. ACM Computing Surveys 50(5):68:1–68:40, 2017.
- [6] Marcelo Arenas and Martín Ugarte. “*Designing a Query Language for RDF: Marrying Open and Closed Worlds*”. ACM Transactions on Database Systems 42(4):21:1–21:46, 2017.
- [7] Serge Abiteboul, Marcelo Arenas, Pablo Barceló, Meghyn Bienvenu, Diego Calvanese, Claire David, Richard Hull, Eyke Hüllermeier, Benny Kimelfeld, Leonid Libkin, Wim Martens, Tova Milo, Filip Murlak, Frank Neven, Magdalena Ortiz, Thomas Schwentick, Julia Stoyanovich, Jianwen Su, Dan Suciu, Victor Vianu and Ke Yi. “*Research Directions for Principles of Data Management (Abridged)*”. SIGMOD Record 45(4):5–17, 2016.
- [8] Marcelo Arenas, Elena Botoeva, Diego Calvanese and Vladislav Ryzhikov. “*Knowledge Base Exchange: The Case of OWL 2 QL*”. Artificial Intelligence 238, pages 11–62, 2016.
- [9] Marcelo Arenas and Gonzalo I. Díaz. “*The Exact Complexity of the First-Order Logic Definability Problem*”. ACM Transactions on Database Systems 41(2), article 13, 2016.
- [10] Marcelo Arenas, Bernardo Cuenca Grau, Evgeny Kharlamov, Sarunas Marciuska and Dmitriy Zheleznyakov. “*Faceted Search over RDF-Based Knowledge Graphs*”. Journal of Web Semantics 37–38:55–74, 2016.
- [11] Marcelo Arenas, Jonny Daenen, Frank Neven, Jan Van den Bussche, Martin Ugarte and Stijn Vansummeren. “*Discovering XSD Keys from XML Data*”. ACM Transactions on Database Systems 39(4), article 28, 2014.
- [12] Aidan Hogan, Marcelo Arenas, Alejandro Mallea and Axel Polleres. “*Everything You Always Wanted to Know About Blank Nodes*”. Journal of Web Semantics 27–28:42–69, 2014.
- [13] Marcelo Arenas, Jorge Pérez and Juan Reutter. “*Data Exchange beyond Complete Data*”. Journal of the ACM, 60(4), Article 28 (59 pages), 2013.
- [14] Marcelo Arenas, Pablo Barceló, Ronald Fagin and Leonid Libkin. “*Solutions and Query Rewriting in Data Exchange*”. Information and Computation 228–229:28–61, 2013.
- [15] Marcelo Arenas, Jorge Pérez, Juan Reutter and Cristian Riveros. “*The Language of Plain SO-tgds: Composition, Inversion and Structural Properties*”. Journal of Computer and System Sciences 79(6):763–784, 2013.
- [16] Carlos Buil-Aranda, Marcelo Arenas, Oscar Corcho and Axel Polleres. “*Federating Queries in SPARQL 1.1: Syntax, Semantics and Evaluation*”. Journal of Web Semantics 18(1):1–17, 2013.
- [17] Marcelo Arenas, Claudio Gutierrez, Daniel P. Miranker, Jorge Pérez and Juan F. Sequeda. “*Querying Semantic Data on the Web*”. SIGMOD Record 41(4):6–17, 2012.
- [18] Marcelo Arenas, Jorge Pérez, Juan Reutter and Cristian Riveros. “*Query Language based Inverses of Schema Mappings: Semantics, Computation, and Closure Properties*”. The VLDB Journal 21(6):823–842, 2012.
- [19] Marcelo Arenas, Ronald Fagin and Alan Nash. “*Composition with Target Constraints*”. Logical Methods in Computer Science 7(3), Article 13 (38 pages), 2011.
- [20] Marcelo Arenas, Pablo Barceló and Leonid Libkin. “*Regular Languages of Nested Words: Fixed Points, Automata, and Synchronization*”. Theory of Computing Systems 49(3):639–670, 2011.
- [21] Marcelo Arenas, Pablo Barceló and Juan Reutter. “*Query Languages for Data Exchange: Beyond Unions of Conjunctive Queries*”. Theory of Computing Systems 49(2):489–564, 2011.
- [22] Jorge Pérez, Marcelo Arenas and Claudio Gutierrez. “*nSPARQL: A navigational language for RDF*”. Journal of Web Semantics 8(4):255–270, 2010.

- [23] Marcelo Arenas, Jorge Pérez and Cristian Riveros. “*The Recovery of a Schema Mapping: Bringing Exchanged Data Back*”. ACM Transactions on Database Systems 34(4), Article 22 (47 pages), 2009.
- [24] Marcelo Arenas, Jorge Pérez, Juan Reutter and Cristian Riveros. “*Composition and Inversion of Schema Mappings*”. SIGMOD Record 38(3):17–28, 2009.
- [25] Jorge Pérez, Marcelo Arenas and Claudio Gutierrez. “*Semantics and Complexity of SPARQL*”. ACM Transactions on Database Systems 34(3), Article 16 (45 pages), 2009.
- [26] Rajeev Alur, Marcelo Arenas, Pablo Barcelo, Kousha Etessami, Neil Immerman and Leonid Libkin. “*First-Order and Temporal Logics for Nested Words*”. Logical Methods in Computer Science, 4(4:11):1–44, 2008.
- [27] Marcelo Arenas, Wenfei Fan and Leonid Libkin. “*On the Complexity of Verifying Consistency of XML Specifications*”. SIAM Journal on Computing, 38(3):841–880, 2008.
- [28] Marcelo Arenas and Leonid Libkin. “*XML Data Exchange: Consistency and Query Answering*”. Journal of the ACM, 55(2), Article 7 (72 pages), 2008.
- [29] Marcelo Arenas, Pablo Barceló and Leonid Libkin. “*Game-based Notions of Locality over Finite Models*”. Annals of Pure and Applied Logic, 152(1-3):3–30, 2008.
- [30] Marcelo Arenas. “*Normalization Theory for XML*”. SIGMOD Record, 35(4): 57–64, 2006.
- [31] Marcelo Arenas and Leonid Libkin. “*An Information-Theoretic Approach to Normal Forms for Relational and XML Data*”. Journal of the ACM, 52(2):246–283, 2005.
- [32] Marcelo Arenas and Leonid Libkin. “*A Normal Form for XML Documents*”. ACM Transactions on Database Systems (TODS), 29(1):195–232, 2004.
- [33] Marcelo Arenas, Leopoldo Bertossi and Jan Chomicki. “*Answer Sets for Consistent Query Answering in Inconsistent Databases*”. Theory and Practice of Logic Programming, 3(4+5):393–424, 2003.
- [34] Marcelo Arenas, Leopoldo Bertossi, Jan Chomicki, Xin He, Vijay Raghavan and Jeremy Spinrad. “*Scalar Aggregation in Inconsistent Databases*”. Theoretical Computer Science, 296(3):405–434, 2003.
- [35] Marcelo Arenas, Vasiliki Kantere, Anastasios Kementsietsidis, Iluju Kiringa, Renée J. Miller and John Mylopoulos. “*The Hyperion Project: From Data Integration to Data Coordination*”. SIGMOD Record 32(3):53–58, 2003.
- [36] Marcelo Arenas and Leopoldo Bertossi. “*Hypothetical Temporal Queries in Databases*”. Journal of Intelligent Information Systems, 19(2):231–259, 2002.
- [37] Leopoldo Bertossi, Marcelo Arenas and Cristian Ferretti. “*SCDBR: An Automated Reasoner for Specifications of Database Updates*”. Journal of Intelligent Information Systems, 10(3):253–280, 1998.

## Book chapters

- [38] Marcelo Arenas, Pablo Barceló, Leonid Libkin. “*Graph Path Navigation*”. In Encyclopedia of Big Data Technologies, Sherif Sakr, Albert Y. Zomaya, editors, 7 pages, Springer, 2019.
- [39] Marcelo Arenas and Jorge Pérez. “*Federation and Navigation in SPARQL 1.1*”. In Reasoning Web: Semantic Technologies for Advanced Query Answering - 8<sup>th</sup> International Summer School, T. Eiter and T. Krennwallner, editors, volume 7487 of Lecture Notes in Computer Science, pages 78–111, Springer, 2012.
- [40] Marcelo Arenas, Pablo Barceló and Juan Reutter. “*Datalog as a Query Language for Data Exchange Systems*”. In Datalog 2010, O. de Moor, G. Gottlob, T. Furche and A. Jon Sellers, editors, pages 302–320, Springer, 2010.
- [41] Marcelo Arenas. “*XML Integrity Constraints*”. In Encyclopedia of Database Systems, L. Liu and M. T. Özsu, editors, pages 3592–3597, Springer, 2009.
- [42] Marcelo Arenas. “*Normal Forms and Normalization*”. In Encyclopedia of Database Systems, L. Liu and M. T. Özsu, editors, pages 1917–1920, Springer, 2009.  
 Marcelo Arenas. Short entries in the Encyclopedia of Database Systems on normal forms: “*Second Normal Form (2NF)*” (page 2522), “*Third Normal Form*” (pages 3087–3088), “*Boyce-Codd Normal Form*” (pages 264–265) and “*Fourth Normal Form*” (pages 1166–1167).
- [43] Marcelo Arenas, Claudio Gutierrez and Jorge Pérez. “*On the Semantics of SPARQL*”. In Semantic Web Information Management: a model based perspective, R. de Virgilio, F. Giunchiglia and L. Tanca, editors, pages 281–307, Springer, 2009.

- [44] Marcelo Arenas, Claudio Gutierrez and Jorge Pérez. “*Foundations of RDF Databases*”. In Reasoning Web: Semantic technologies for information systems - 5<sup>th</sup> International Summer School, S. Tessaris and E. Franconi, editors, volume 5689 of Lecture Notes in Computer Science, pages 158–204, Springer, 2009.
- [45] Marcelo Arenas, Wenfei Fan and Leonid Libkin. “*Consistency of XML Specifications*”. In Inconsistency Tolerance, L. Bertossi, A. Hunter and T. Schaub, editors, volume 3300 of Lecture Notes in Computer Science (State-of-the-Art series), pages 15–41, Springer, 2005.
- [46] Marcelo Arenas and Leopoldo Bertossi. “*The Dynamics of Database Views*”. In Transactions and Change in Logic Databases, H. Decker, B. Freitag, M. Kifer, and A. Voronkov, editors, volume 1472 of Lecture Notes in Computer Science, pages 197–226, Springer, 1998.

### Edited special issues (for refereed journals)

- [47] Marcelo Arenas. Special issue on database theory (selected papers from the 18<sup>th</sup> International Conference on Database Theory – ICDT 2015). *Theory of Computing Systems* 61(1), 2017.
- [48] Marcelo Arenas. Special issue on database theory. *Journal of Computer and System Sciences* 77(3), 2011.
- [49] Marcelo Arenas and Michael I. Schwartzbach. Special issue on selected papers from the 11<sup>th</sup> International Symposium on Database Programming Languages (DBPL 2007). *Information Systems* 34(7), 2009.

### Edited conference proceedings

- [50] Marcelo Arenas, Martín Ugarte and Jan Van den Bussche. Proceedings of the 37<sup>th</sup> ACM SIGMOD-SIGACT-SIGAI Symposium on Principles of Database Systems (PODS 2018). ACM 2018.
- [51] Marcelo Arenas, Richard Hull, Wim Martens, Tova Milo, Thomas Schwentick. Foundations of Data Management (Dagstuhl Perspectives Workshop 16151). *Dagstuhl Reports* 6(4): 39–56, 2016.
- [52] Marcelo Arenas, Oscar Corcho, Elena Simperl, Markus Strohmaier, Mathieu d’Aquin, Kavitha Srinivas, Paul T. Groth, Michel Dumontier, Jeff Heflin, Krishnaprasad Thirunarayan and Steffen Staab. The Semantic Web - ISWC 2015 - 14<sup>th</sup> International Semantic Web Conference, Proceedings, Part I. Volume 9366 of Lecture Notes in Computer Science, Springer, 2015.
- [53] Marcelo Arenas, Oscar Corcho, Elena Simperl, Markus Strohmaier, Mathieu d’Aquin, Kavitha Srinivas, Paul T. Groth, Michel Dumontier, Jeff Heflin, Krishnaprasad Thirunarayan and Steffen Staab. The Semantic Web - ISWC 2015 - 14<sup>th</sup> International Semantic Web Conference, Proceedings, Part II. Volume 9367 of Lecture Notes in Computer Science, Springer, 2015.
- [54] Marcelo Arenas and Martín Ugarte. Proceedings of the 18<sup>th</sup> International Conference on Database Theory (ICDT 2015). Schloss Dagstuhl – Leibniz-Zentrum fuer Informatik, 2015.
- [55] Peter M. Fischer, Gustavo Alonso, Marcelo Arenas and Floris Geerts. Proceedings of the Workshops of the EDBT/ICDT 2015 Joint Conference (EDBT/ICDT). *CEUR Workshop Proceedings*, 2015.
- [56] Marcelo Arenas and Benjamin Bustos. Proceedings of the 28<sup>th</sup> International Conference of the Chilean Computer Science Society. IEEE Computer Society, 2009.
- [57] Marcelo Arenas and Michael I. Schwartzbach. Proceedings of the 11<sup>th</sup> International Symposium on Database Programming Languages (DBPL 2007). Springer, 2007.

### Refereed conference papers

- [58] Marcelo Arenas, Luis Alberto Croquevielle, Rajesh Jayaram, Cristian Riveros. “*Efficient Logspace Classes for Enumeration, Counting, and Uniform Generation*”. In Proceedings of the 38<sup>th</sup> ACM SIGMOD-SIGACT-SIGAI Symposium on Principles of Database Systems (PODS 2019), Amsterdam, The Netherlands, pages 59–73, 2019.  
**Note:** This article was awarded the best paper award in this conference.
- [59] Marcelo Arenas, Jorge Baier, Juan Navarro and Sebastian Sardina. “*On the Progression of Situation Calculus Universal Theories with Constants*”. In Proceedings of the 16<sup>th</sup> International Conference on Principles of Knowledge Representation and Reasoning (KR 2018), Tempe, AZ, USA, pages 484–493, 2018.

- [60] Renzo Angles, Marcelo Arenas, Pablo Barceló, Peter Boncz, George Fletcher, Claudio Gutierrez, Tobias Linddaaker, Marcus Paradies, Stefan Plantikow, Juan Sequeda, Oskar van Rest and Hannes Voigt. “G-CORE: A Core for Future Graph Query Languages”. In Proceedings of the SIGMOD International Conference on Management of Data (SIGMOD 2018), Houston, TX, USA, pages 1421–1432, 2018.
- [61] Marcelo Arenas, Martín Muñoz and Cristian Riveros. “Descriptive Complexity for Counting Complexity Classes”. In Proceedings of the 32<sup>nd</sup> Annual ACM/IEEE Symposium on Logic in Computer Science (LICS 2017), Reykjavik, Iceland, pages 1–12, 2017.
- [62] Marcelo Arenas, Francisco Maturana, Cristian Riveros and Domagoj Vrgoč. “A Framework for Annotating CSV-like Data”. 42<sup>nd</sup> International Conference on Very Large Data Bases (VLDB 2016), New Delhi, India, 2016. Proceedings of the VLDB Endowment 9(11):876–887.
- [63] Marcelo Arenas, Jorge Baier, Juan Navarro and Sebastian Sardina. “Incomplete Causal Laws in the Situation Calculus Using Free Fluents”. In Proceedings of the 25<sup>th</sup> International Joint Conference on Artificial Intelligence (IJCAI 2016), New York, NY, USA, pages 907–914, 2016.
- [64] Marcelo Arenas and Martín Ugarte. “Designing a Query Language for RDF: Marrying Open and Closed Worlds”. In Proceedings of the 35<sup>th</sup> ACM SIGMOD-SIGACT-SIGART Symposium on Principles of Database Systems (PODS 2016), San Francisco, CA, USA, pages 225–236, 2016.
- [65] Marcelo Arenas, Gonzalo I. Díaz and Egor V. Kostylev. “Reverse Engineering SPARQL Queries”. In Proceedings of the 25<sup>th</sup> International Conference on World Wide Web (WWW 2016), Montreal, Canada, pages 239–249, 2016.
- [66] Marcelo Arenas, Gabriel Diéguez and Jorge Pérez. “Bidirectional Constraints for Exchanging Data: Beyond Monotone Queries”. In Proceedings of the 24<sup>th</sup> International Joint Conference on Artificial Intelligence (IJCAI 2015), Buenos Aires, Argentina, pages 2698–2705, 2015.
- [67] Marcelo Arenas, Bernardo Cuenca Grau, Evgeny Kharlamov, Sarunas Marciuska and Dmitriy Zheleznyakov. “Faceted Search over Ontology-Enhanced RDF Data”. In Proceedings of the 23<sup>rd</sup> ACM International Conference on Information and Knowledge Management (CIKM 2014), Shanghai, China, pages 939–948, 2014.
- [68] Juan F. Sequeda, Marcelo Arenas and Daniel P. Miranker. “OBDA: Query Rewriting or Materialization? In Practice, Both!”. In Proceedings of the 13<sup>th</sup> International Semantic Web Conference (ISWC 2014), Riva del Garda, Trento, Italy, pages 535–551, 2014.  
**Note:** This article was awarded the best student paper award in this conference.
- [69] Marcelo Arenas, Gonzalo Díaz, Achille Fokoue, Anastasios Kementsietsidis and Kavitha Srinivas. “A Principled Approach to Bridging the Gap between Graph Data and their Schemas”. 40<sup>th</sup> International Conference on Very Large Data Bases (VLDB 2014), Hangzhou, China, 2014. Proceedings of the VLDB Endowment 7(8):601–612.
- [70] Marcelo Arenas, Georg Gottlob and Andreas Pieris. “Expressive Languages for Querying the Semantic Web”. In Proceedings of the 33<sup>rd</sup> ACM SIGMOD-SIGACT-SIGART Symposium on Principles of Database Systems (PODS 2014), Snowbird, UT, USA, pages 14–26, 2014.
- [71] Marcelo Arenas, Elena Botoeva, Diego Calvanese and Vladislav Ryzhikov. “Exchanging OWL 2 QL Knowledge Bases”. In Proceedings of the 23<sup>rd</sup> International Joint Conference on Artificial Intelligence (IJCAI 2013), Beijing, China, pages 703–710, 2013.
- [72] Marcelo Arenas, Jonny Daenen, Frank Neven, Jan Van den Bussche, Martin Ugarte and Stijn Vansummeren. “Discovering XSD keys from XML data”. In Proceedings of the SIGMOD International Conference on Management of Data (SIGMOD 2013), New York, USA, pages 61–72, 2013.  
**Note:** Invited to a special issue of ACM Transactions on Database Systems for selected papers of SIGMOD 2013.
- [73] Marcelo Arenas, Sebastián Conca and Jorge Pérez. “Counting beyond a Yottabyte, or how SPARQL 1.1 Property Paths will prevent adoption of the standard”. In Proceedings of the 21<sup>st</sup> International Conference on World Wide Web (WWW 2012), Lyon, France, pages 629–638, 2012.  
**Note:** This article was awarded the best paper award in this conference.
- [74] Juan F. Sequeda, Marcelo Arenas and Daniel Miranker. “On Directly Mapping Relational Databases to RDF and OWL”. In Proceedings of the 21<sup>st</sup> International Conference on World Wide Web (WWW 2012), Lyon, France, pages 649–658, 2012.
- [75] Alejandro Mallea, Marcelo Arenas, Aidan Hogan and Axel Polleres. “On Blank Nodes”. In Proceedings of the 10<sup>th</sup> International Semantic Web Conference (ISWC 2011), Bonn, Germany, pages 421–437, 2011.

- [76] Marcelo Arenas, Jorge Pérez and Juan Reutter. “*Data Exchange beyond Complete Data*”. In Proceedings of the 30<sup>th</sup> ACM SIGMOD-SIGACT-SIGART Symposium on Principles of Database Systems (PODS 2011), Athens, Greece, pages 83–94, 2011.  
**Note:** This article was awarded the best paper award in this conference, and it was invited to a special issue of the Journal of the ACM for selected papers of PODS 2011.
- [77] Marcelo Arenas and Jorge Pérez. “*Querying Semantic Web Data with SPARQL*”. In Proceedings of the 30<sup>th</sup> ACM SIGMOD-SIGACT-SIGART Symposium on Principles of Database Systems (PODS 2011), Athens, Greece, pages 305–316, 2011.
- [78] Carlos Buil-Aranda, Marcelo Arenas and Oscar Corcho. “*Semantics and Optimization of the SPARQL 1.1 Federation Extension*”. In Proceedings of the 8<sup>th</sup> Extended Semantic Web Conference (ESWC 2011), Heraklion, Greece, pages 1–15, 2011.  
**Note:** This article was awarded the best paper award in this conference.
- [79] Marcelo Arenas, Jorge Pérez, Juan Reutter and Cristian Riveros. “*Foundations of Schema Mapping Management*”. In Proceedings of the 29<sup>th</sup> ACM SIGMOD-SIGACT-SIGART Symposium on Principles of Database Systems (PODS 2010), Indianapolis, IN, USA, pages 227–238, 2010.
- [80] Marcelo Arenas, Ronald Fagin and Alan Nash. “*Composition with Target Constraints*”. In Proceedings of the 13<sup>th</sup> International Conference on Database Theory (ICDT 2010), Lausanne, Switzerland, pages 129–142, 2010.  
**Note:** This article was awarded the best paper award in this conference, and it was invited to a special issue of Logical Methods in Computer Science for selected papers of ICDT 2010.
- [81] Marcelo Arenas, Jorge Pérez, Juan Reutter and Cristian Riveros. “*Inverting Schema Mappings: Bridging the Gap between Theory and Practice*”. 35<sup>th</sup> International Conference on Very Large Data Bases (VLDB 2009), Lyon, France, 2009. Proceedings of the VLDB Endowment 2(1):1018–1029.
- [82] Marcelo Arenas, Pablo Barceló and Juan Reutter. “*Query Languages for Data Exchange: Beyond Unions of Conjunctive Queries*”. In Proceedings of the 12<sup>th</sup> International Conference on Database Theory (ICDT 2009), Saint-Petersburg, Russia, pages 73–83, 2009.  
**Note:** Invited to a special issue of Theory of Computing Systems for selected papers of ICDT 2009.
- [83] Jorge Pérez, Marcelo Arenas and Claudio Gutierrez. “*nSPARQL: A Navigational Language for RDF*”. In Proceedings of the 7<sup>th</sup> International Semantic Web Conference (ISWC 2008), Karlsruhe, Germany, volume 5318 of Lecture Notes Computer Science, pages 66–81, 2008.
- [84] Marcelo Arenas, Jorge Pérez and Cristian Riveros. “*The Recovery of a Schema Mapping: Bringing Exchanged Data Back*”. In Proceedings of the 27<sup>th</sup> ACM SIGMOD-SIGACT-SIGART Symposium on Principles of Database Systems (PODS 2008), Vancouver, Canada, pages 13–22, 2008.  
**Note:** Invited to a special issue of ACM Transactions on Database Systems for selected papers of PODS 2008.
- [85] Rajeev Alur, Marcelo Arenas, Pablo Barceló, Kousha Etessami, Neil Immerman and Leonid Libkin. “*First-Order and Temporal Logics for Nested Words*”. In Proceedings of the 22<sup>nd</sup> Annual IEEE Symposium on Logic in Computer Science (LICS 2007), Wroclaw, Poland, pages 151–160, 2007.  
**Note:** Invited to a special issue of Logical Methods in Computer Science for selected papers of LICS 2007.
- [86] Marcelo Arenas, Pablo Barceló and Leonid Libkin. “*Regular Languages of Nested Words: Fixed Points, Automata, and Synchronization*”. In Proceedings of the 34<sup>th</sup> International Colloquium on Automata, Languages and Programming (ICALP 2007), Wroclaw, Poland, volume 4596 of Lecture Notes in Computer Science, pages 888–900, 2007.
- [87] Marcelo Arenas, Pablo Barceló and Leonid Libkin. “*Combining Temporal Logics for Querying XML Documents*”. In Proceedings of the 11<sup>th</sup> International Conference on Database Theory (ICDT 2007), Barcelona, Spain, volume 4353 of Lecture Notes in Computer Science, pages 359–373, 2007.
- [88] Jorge Pérez, Marcelo Arenas and Claudio Gutierrez. “*Semantics and Complexity of SPARQL*”. In Proceedings of the 5<sup>th</sup> International Semantic Web Conference (ISWC 2006), Athens, GA, USA, volume 4273 of Lecture Notes in Computer Science, pages 30–43, 2006.  
**Note:** This article was awarded the best paper award in this conference.
- [89] Marcelo Arenas and Leonid Libkin. “*XML Data Exchange: Consistency and Query Answering*”. In Proceedings of the 24<sup>th</sup> ACM SIGMOD-SIGACT-SIGART Symposium on Principles of Database Systems (PODS 2005), Baltimore, MD, USA, pages 13–24, 2005.

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- [90] Marcelo Arenas, Pablo Barceló and Leonid Libkin. “*Game-based Notions of Locality over Finite Models*”. In Proceedings of the 18<sup>th</sup> Annual Conference of the European Association for Computer Science Logic (CSL 2004), Karpacz, Poland, volume 3210 of Lecture Notes in Computer Science, pages 175–189, Springer, 2004.
- [91] Anastasios Kementsietsidis and Marcelo Arenas. “*Data Sharing Through Query Translation in Autonomous Sources*”. In Proceedings of the 30<sup>th</sup> International Conference on Very Large Data Bases (VLDB 2004), Toronto, Canada, pages 468–479, 2004.
- [92] Marcelo Arenas, Pablo Barceló, Ronald Fagin and Leonid Libkin. “*Locally Consistent Transformations and Query Answering in Data Exchange*”. In Proceedings of the 23<sup>rd</sup> ACM SIGACT-SIGMOD-SIGART Symposium on Principles of Database Systems (PODS 2004), Paris, France, pages 229–240, 2004.
- [93] Denilson Barbosa, Alberto Mendelzon, Leonid Libkin, Laurent Mignet and Marcelo Arenas. “*Efficient Incremental Validation of XML Documents*”. In Proceedings of the 20<sup>th</sup> International Conference on Data Engineering (ICDE 2004), Boston, MA, USA, pages 671–682, 2004.
- [94] Marcelo Arenas and Leonid Libkin. “*An Information-Theoretic Approach to Normal Forms for Relational and XML Data*”. In Proceedings of the 22<sup>nd</sup> ACM SIGACT-SIGMOD-SIGART Symposium on Principles of Database Systems (PODS 2003), San Diego, CA, USA, pages 15–26, 2003.
- Note:** This article was awarded the best paper award in this conference and it was invited to a special issue of the Journal of the ACM for selected papers of PODS 2003.
- [95] Anastasios Kementsietsidis, Marcelo Arenas and Renée J. Miller. “*Mapping Data in Peer-to-Peer Systems: Semantics and Algorithmic Issues*”. In Proceedings of the SIGMOD International Conference on Management of Data (SIGMOD 2003), San Diego, CA, USA, pages 325–336, 2003.
- Note:** Also presented in the 2<sup>nd</sup> Hellenic Data Management Symposium (HDMS 2003), Athens, Greece, 2003.
- [96] Marcelo Arenas, Wenfei Fan and Leonid Libkin. “*On Verifying Consistency of XML Specifications*”. In Proceedings of the 21<sup>st</sup> ACM SIGACT-SIGMOD-SIGART Symposium on Principles of Database Systems (PODS 2002), Madison, WI, USA, pages 259–270, 2002.
- [97] Marcelo Arenas and Leonid Libkin. “*A Normal Form for XML Documents*”. In Proceedings of the 21<sup>st</sup> ACM SIGACT-SIGMOD-SIGART Symposium on Principles of Database Systems (PODS 2002), Madison, WI, USA, pages 85–96, 2002.
- Note:** Invited to a special issue of ACM Transactions on Database Systems for selected papers of SIGMOD/PODS 2002.
- [98] Marcelo Arenas, Wenfei Fan and Leonid Libkin. “*What’s Hard about XML Schema Constraints?*”. Proceedings of the 13<sup>th</sup> International Conference on Database and Expert Systems Applications (DEXA 2002), Aix en Provence, France, volume 2453 of Lecture Notes in Computer Science, pages 269–278, Springer, 2002.
- [99] Marcelo Arenas, Leopoldo Bertossi and Jan Chomicki. “*Scalar Aggregation in FD-Inconsistent Databases*”. In Proceedings of the 8<sup>th</sup> International Conference on Database Theory (ICDT 2001), London, UK, volume 1973 of Lecture Notes in Computer Science, pages 39–53. Springer, 2001.
- Note:** Invited to a special issue of Theoretical Computer Science for selected papers of ICDT 2001.
- [100] Marcelo Arenas, Leopoldo Bertossi and Jan Chomicki. “*Specifying and Querying Database Repairs using Logic Programs with Exceptions*”. In Proceedings of the 4<sup>th</sup> International Conference on Flexible Query Answering Systems (FQAS 2000), Warsaw, Poland, pages 27–41. Springer, 2000.
- [101] Marcelo Arenas, Leopoldo Bertossi and Michael Kifer. “*Applications of Annotated Predicate Calculus to Querying Inconsistent Databases*”. In Proceedings of the 6<sup>th</sup> International Conference on Rules and Objects in Databases (DOOD 2000), London, UK, volume 1861 of Lecture Notes in Artificial Intelligence, pages 926–941. Springer, 2000.
- [102] Marcelo Arenas, Leopoldo Bertossi, Loreto Bravo, Laura Gallardo and Achim Sydow. “*Environmental Information System for Analysis and Forecast of Air Pollution (Application to Santiago de Chile)*”. In Proceedings of the International Conference on Environmental Modeling and Simulation (ICEMS 2000), San Diego, CA, USA, pages 71–75, 2000.
- [103] Marcelo Arenas, Leopoldo Bertossi and Jan Chomicki. “*Consistent Query Answers in Inconsistent Databases*”. In Proceedings of the 18<sup>th</sup> ACM SIGACT-SIGMOD-SIGART Symposium on Principles of Database Systems (PODS 1999), Philadelphia, PA, USA, pages 68–79, 1999.

- [104] Marcelo Arenas, Leopoldo Bertossi and Jan Chomicki. “*Query Evaluation in Almost Consistent Databases using Residues*”. In Proceedings of the 18<sup>th</sup> International Conference of the Chilean Computer Science Society (SCCC 1998), Antofagasta, Chile, pages 8–14. IEEE CS Press, 1998.

## Refereed journal and conference short papers

- [105] Marcelo Arenas. “*Database Theory Column Report on PODS 2018*”. SIGACT News 49(4):55–57, 2018.
- [106] Juan Sequeda, Marcelo Arenas and Daniel P. Miranker. “*Ontology-Based Data Access Using Views*”. In Proceedings of the 6<sup>th</sup> International Conference on Web Reasoning and Rule Systems (RR 2012). Vienna, Austria, pages 262–265, 2012.
- [107] Marcelo Arenas, Elena Botoeva, Diego Calvanese, Vladislav Ryzhikov and Evgeny Sherkhonov. “*Exchanging Description Logic Knowledge Bases*”. In Proceedings of the 13<sup>th</sup> International Conference on Principles of Knowledge Representation and Reasoning (KR 2012). Rome, Italy, pages 563–567, 2012.
- [108] Marcelo Arenas, Claudio Gutierrez and Jorge Pérez. “*Some Remarks on the Paper semQA: SPARQL with Idempotent Disjunction*”. IEEE Transactions on Knowledge and Data Engineering 23(4):638–639, 2011.
- [109] Anastasios Kementsietsidis, Marcelo Arenas and Renée J. Miller. “*Managing Data Mappings in the Hyperion Project*”. In Proceedings of the 19<sup>th</sup> International Conference on Data Engineering (ICDE 2003). Bangalore, India, pages 732–734, 2003.

## Refereed workshop papers

- [110] Marcelo Arenas, Elena Botoeva, Egor V. Kostylev and Vladislav Ryzhikov. “*A note on computing certain answers to queries over incomplete databases*”. In Proceedings of the 11<sup>th</sup> Alberto Mendelzon Workshop on Foundations of Data Management (AMW 2017), Montevideo, Uruguay, 2017.
- [111] Marcelo Arenas, Georg Gottlob and Andreas Pieris. “*A Datalog-Based Language for Querying RDF Graphs*”. In Proceedings of the 10<sup>th</sup> Alberto Mendelzon Workshop on Foundations of Data Management (AMW 2016), Panama City, Panama, 2016.
- [112] Carlos Buil-Aranda, Marcelo Arenas, Martín Ugarte and Michel Dumontier. “*A preliminary investigation into SPARQL query complexity and federation in Bio2RDF*”. In Proceedings of the 9<sup>th</sup> Alberto Mendelzon Workshop on Foundations of Data Management (AMW 2015), Lima, Peru, 2015.
- [113] Bernardo Cuenca Grau, Evgeny Kharlamov, Dmitriy Zheleznyakov, Marcelo Arenas and Sarunas Marciuska. “*Enabling Faceted Search over OWL 2 with SemFacet*”. In Proceedings of the 11<sup>th</sup> International Workshop on OWL: Experiences and Directions (OWLED 2014), Riva del Garda, Italy, 2014.
- [114] Bernardo Cuenca Grau, Evgeny Kharlamov, Dmitriy Zheleznyakov, Marcelo Arenas and Sarunas Marciuska. “*On Faceted Search over Knowledge Bases*”. In Proceedings of the 27<sup>th</sup> International Workshop on Description Logics (DL 2014), Vienna, Austria, 2014.
- [115] Marcelo Arenas, Gabriel Diéguez and Jorge Pérez. “*Expressiveness and Complexity of Bidirectional Constraints for Data Exchange*”. In Proceedings of the 8<sup>th</sup> Alberto Mendelzon Workshop on Foundations of Data Management (AMW 2014), Cartagena, Colombia, 2014.
- [116] Marcelo Arenas, Georg Gottlob and Andreas Pieris. “*Expressive Languages for Querying the Semantic Web*”. In Proceedings of the 8<sup>th</sup> Alberto Mendelzon Workshop on Foundations of Data Management (AMW 2014), Cartagena, Colombia, 2014.
- [117] Marcelo Arenas, Elena Botoeva, Diego Calvanese and Vladislav Ryzhikov. “*Computing Solutions in OWL 2 QL Knowledge Exchange*”. In Proceedings of the 26<sup>th</sup> International Workshop on Description Logics (DL 2013), Ulm, Germany, pages 4–16, 2013.
- [118] Marcelo Arenas, Jorge Pérez and Emanuel Sallinger. “*Towards General Representability in Knowledge Exchange*”. In Proceedings of the 7<sup>th</sup> Alberto Mendelzon Workshop on Foundations of Data Management (AMW 2013). Puebla, Mexico, 2013.
- [119] Marcelo Arenas, Elena Botoeva, Diego Calvanese, Vladislav Ryzhikov and Evgeny Sherkhonov. “*Representability in DL-Lite<sub>R</sub> Knowledge Base Exchange*”. In Proceedings of the 25<sup>th</sup> International Workshop on Description Logics (DL 2012), Rome, Italy, 2012.



- [120] Marcelo Arenas, Elena Botoeva and Diego Calvanese. “*Knowledge Base Exchange*”. In Proceedings of the 24<sup>th</sup> International Workshop on Description Logics (DL 2011), Barcelona, Spain, 2011.
- [121] Marcelo Arenas, Mariano Consens and Alejandro Mallea. “*Revisiting Blank Nodes in RDF to Avoid the Semantic Mismatch with SPARQL*”. In W3C Workshop RDF Next Steps. Stanford, CA, USA, 2010.
- [122] Marcelo Arenas and Leopoldo Bertossi. “*On the Decidability of Consistent Query Answering*”. In Proceedings of the 4<sup>th</sup> Alberto Mendelzon Workshop on Foundations of Data Management (AMW 2010). Buenos Aires, Argentina, 2010.
- [123] Marcelo Arenas, Claudio Gutierrez, and Jorge Pérez. “*An extension of SPARQL for RDFS*”. In Proceedings of the Joint workshop on Semantic Web, Ontologies, and Databases (SWBD-ODSIS 2007). Vienna, Austria, volume 5005 of Lecture Notes in Computer Science (invited paper).
- [124] Vasiliki Kantere, Iluju Kiringa, John Mylopoulos, Anastasios Kementsietsidis and Marcelo Arenas. “*Coordinating Peer Databases Using ECA Rules*”. In Proceedings of the International Workshop on Databases, Information Systems and Peer-to-Peer Computing (DBISP2P 2003). Berlin, Germany, volume 2944 of Lecture Notes in Computer Science, pages 108–122. Springer, 2003.
- [125] Marcelo Arenas and Leopoldo Bertossi. “*Hypothetical Temporal Reasoning with History Encoding (Extended Abstract)*”. In Proceedings of Workshop on Reasoning about Actions: Foundations and Applications (part of ESSLLI 1998), Saarbrueken, Germany, 1998.
- [126] Marcelo Arenas and Leopoldo Bertossi. “*Hypothetical Temporal Queries in Databases*”. In Proceedings of the 5<sup>th</sup> International Workshop on Knowledge Representation Meets Databases (KRDB 1998): Innovative Application Programming and Query Interfaces, Seattle, WA, USA, pages 4.1–4.8, 1998.

## Refereed conference demos and posters

- [127] Bernardo Cuenca Grau, Evgeny Kharlamov, Sarunas Marciuska, Dmitriy Zheleznyakov and Marcelo Arenas. “*SemFacet: Faceted Search over Ontology Enhanced Knowledge Graphs*”. In Proceedings of the 15<sup>th</sup> International Semantic Web Conference (ISWC 2016), Kobe, Japan, 2016.
- [128] Gonzalo Díaz, Marcelo Arenas and Michael Benedikt. “*SPARQLByE: Querying RDF data by example*”. Demo, 42<sup>nd</sup> International Conference on Very Large Data Bases (VLDB 2016), New Delhi, India, 2016. Proceedings of the VLDB Endowment 9(13): 1533-1536.
- [129] Marcelo Arenas, Bernardo Cuenca Grau, Evgeny Kharlamov, Sarunas Marciuska and Dmitriy Zheleznyakov. “*Towards Semantic Faceted Search*”. Poster, in Proceedings of the 23<sup>rd</sup> International World Wide Web Conference (WWW 2014), Seoul, Korea, pages 219–220, 2014.
- [130] Bernardo Cuenca Grau, Evgeny Kharlamov, Sarunas Marciuska, Dmitriy Zheleznyakov, Marcelo Arenas and Ernesto Jimenez-Ruiz. “*SemFacet: Semantic Faceted Search over Yago*”. Demo, in Proceedings of the 23<sup>rd</sup> International World Wide Web Conference (WWW 2014), Seoul, Korea, pages 123–126, 2014.
- [131] Juan F. Sequeda, Marcelo Arenas and Daniel Miranker. “*A Completely Automatic Direct Mapping of Relational Databases to RDF and OWL*”. Poster, 10<sup>th</sup> International Semantic Web Conference (ISWC 2011), Bonn, Germany, 2011.
- [132] Marcelo Arenas, Pablo Barceló and Leonid Libkin. “*Game-based Notions of Locality*”. Short presentation, 18<sup>th</sup> Annual IEEE Symposium on Logic in Computer Science (LICS 2003), Ottawa, Canada, 2003.

## Patents

- [133] Marcelo Arenas, Gonzalo Diaz, Achille Fokoue, Anastasios Kementsietsidis and Kavitha Srinivas. “*Determining the schema of a graph dataset*”. United States Patent No 9,710,496, July 18, 2017.

## World Wide Web Consortium (W3C) documents

- [134] Marcelo Arenas, Alexandre Bertails, Eric Prud'hommeaux and Juan Sequeda. “*A Direct Mapping of Relational Data to RDF*”, W3C Recommendation 27 September 2012, <http://www.w3.org/TR/rdb-direct-mapping/>.

# ACADEMIC HONORS

## Awards

- Award for being the most inspiring professor in the Department of Computer Science, Pontificia Universidad Católica de Chile, 2017.
- 2016 Semantic Web Science Association (SWSA) Ten-Year Award for the article “Semantics and Complexity of SPARQL”, which was published in the International Semantic Web Conference 2006.
- Award Scopus Chile 2013 in Computer Science, awarded by Elsevier to researchers with high scientific productivity, with the support of the National Research Council for Science and Technology of Chile (CONICYT).
- “Ramón Salas Edwards” Award 2012 of the Institute of Engineers of Chile to the best research on engineering in the period 2009 - 2011.
- Best Paper Awards
  - 38<sup>th</sup> ACM SIGMOD-SIGACT-SIGAI Symposium on Principles of Database Systems (PODS 2019), Amsterdam, The Netherlands, 2019.
  - (Google Best Paper Award) 21<sup>st</sup> International Conference on World Wide Web (WWW 2012), Lyon, France, 2012.
  - 30<sup>th</sup> ACM SIGMOD-SIGACT-SIGART Symposium on Principles of Database Systems (PODS 2011), Athens, Greece, 2011.
  - 8<sup>th</sup> Extended Semantic Web Conference (ESWC 2011), Heraklion, Greece, 2011.
  - 13<sup>th</sup> International Conference on Database Theory (ICDT 2010), Lausanne, Switzerland, 2010.
  - 5<sup>th</sup> International Semantic Web Conference (ISWC 2006), Athens, GA, USA, 2006.
  - 24<sup>th</sup> ACM SIGMOD-SIGACT-SIGART Symposium on Principles of Database Systems (PODS 2005), Baltimore, MD, USA, 2005.
  - 22<sup>nd</sup> ACM SIGACT-SIGMOD-SIGART Symposium on Principles of Database Systems (PODS 2003), San Diego, CA, USA, 2003.
- Best Student Paper Award
  - 13<sup>th</sup> International Semantic Web Conference (ISWC 2014), Riva del Garda, Trentino, Italy, 2014.
- SIGMOD Jim Gray Doctoral Dissertation Award Honorable Mention for Ph.D dissertation “Design Principles for XML Data”, Chicago, IL, USA, 2006.
- College of Engineering Research Award, Pontificia Universidad Católica de Chile. Received in the years 2014, 2013, 2010 and 2007.
- 2008 Outstanding Teaching Award, Pontificia Universidad Católica de Chile.
- College of Engineering Teaching Award, Pontificia Universidad Católica de Chile, 2006.
- Best Student of Industrial Engineering in the Computer Science field, Class 1998, Pontificia Universidad Católica de Chile.

## Fellowships and Scholarships

- IBM Ph.D. Fellowship 2004-2005.
- Ontario Graduate Scholarship 2001-2004, Canada.
- Connaught Scholarship 2000-2001, University of Toronto, Canada.

# STUDENTS AND POSTDOCTORAL FELLOWS SUPERVISED

## Graduated PhD Students

- Martín Ugarte. *"Building a Query Language for the Web of Data: Efficiency in an Open World"*. Pontificia Universidad Católica de Chile, September 2015.
- Jorge Pérez. *"Schema Mapping Management in Data Exchange Systems"*. Pontificia Universidad Católica de Chile, May 2011.
- Sebastián Castillo. *"Blocking Logics: A Class of Paraconsistent Logics, with Applications to the Theory of Computing and Discussion Groups"*. Universidad de Chile, November 2007 (co-supervised with Renato Lewin).

## Graduated Masters Students

- Luis Alberto Croquevielle. *"Efficient Logspace Classes For Enumeration, Counting, And Uniform Generation"*. Pontificia Universidad Católica de Chile, April 2019.
- Martín Muñoz. *"Descriptive Complexity for Counting Complexity Classes"*. Pontificia Universidad Católica de Chile, December 2017 (co-supervised with Cristian Riveros).
- Gabriel Diéguez. *"On the complexity of Bidirectional Constraints for Data Exchange"*. Pontificia Universidad Católica de Chile, December 2014.
- Gonzalo Díaz. *"A Principled Approach to Bridging the Gap between Graph Data and their Schemas"*. Pontificia Universidad Católica de Chile, September 2013.
- Andrés Letelier. *"Optimization of Semantic Web Queries using SPARQL Pettern Trees"*. Pontificia Universidad Católica de Chile. August 2013.
- Sebastián Conca. *"Semantics and Complexity of SPARQL 1.1 Property Paths"*. Pontificia Universidad Católica de Chile. March 2012.
- Juan Reutter. *"Extending Query Languages for Data Exchange"*. Pontificia Universidad Católica de Chile. March 2009.
- Cristian Riveros. *"Recovering Information in Data Exchange"*. Pontificia Universidad Católica de Chile. July 2008.

## Masters Students (in course)

- Matías San Martín. Pontificia Universidad Católica de Chile.
- Pedro Bahamondes. Pontificia Universidad Católica de Chile.
- Thomas Reisenegger. Pontificia Universidad Católica de Chile (co-supervised with Juan Reutter).

## Postdoctoral Scholars Mentored

- Francisco Vial. Pontificia Universidad Católica de Chile, August 2017 - May 2019.
- Domagoj Vrgoč. Pontificia Universidad Católica de Chile, July 2014 - July 2016.
- Carlos Buil-Aranda. Pontificia Universidad Católica de Chile, October 2012 - September 2015.

## Postdoctoral Scholars (in course)

- Martín Ugarte. Pontificia Universidad Católica de Chile.

## Related experience

- External examiner, Yaacov Weiss, The Hebrew University of Jerusalem, October 2017.
- External examiner, Ph.D. defense committee, Sergio Abriola, Universidad de Buenos Aires, March 2017.
- External examiner, Cristina Civili, Sapienza Università di Roma, Italy, December 2015.
- External examiner, Freddy Priyatna, Universidad Politécnica de Madrid, Spain, October 2015.
- External examiner, Katja Losemann, Universität Bayreuth, Germany, September 2015.
- External examiner, Ph.D. defense committee, Juan Sequeda, University of Texas at Austin, USA, September 2014.
- External examiner, Ph.D. defense committee, Xin Wang, University of Edinburgh, UK, June 2013.
- External examiner, Ph.D. defense committee, Wenyuan Yu, University of Edinburgh, UK, June 2013.
- External examiner, Ph.D. defense committee, Sebastian Skritek, Vienna University of Technology, Austria, April 2013.

## FUNDING

### Grants (as principal investigator)

- Director of “*Millennium Institute for Foundational Research on Data*”. June 2018 - June 2023. Budget: 6,000,000 USD.
- FONDECYT Grant (# 1161473) “*Descriptive Complexity for Function Complexity Classes*”. April 2016 - April 2019. Budget: 93,000 USD.
- Director of “*Millennium Nucleus Center for Semantic Web Research*” (# NC120004). December 2013 - February 2018. Budget: 1,500,000 USD.
- FONDECYT Grant (# 1131049) “*Building the right query language for the Web of data*”. March 2013 - March 2015. Budget: 63,000 USD.
- FP7-PEOPLE-2009-IRSES Grant (# 247601) “*Net2 - Network for Enabling Networked Knowledge*”. July 2010 - June 2013. Budget: 354,000 EUR.  
Partners in this project: National U. of Ireland, Free U. of Bozen/Bolzano, Vienna U. of Technology, U. of Koblenz-Landau, Delft U. of Technology, U. of Chile, PUC-Rio, African Advanced Institute for Information & Communication Technology, U. of South Africa and Shanghai Jiao Tong U.
- FONDECYT Grant (# 1090565) “*SPARQL for RDF Data with RDFS Vocabulary and Blank Nodes: Semantics, Complexity and Implementation*”. March 2009 - March 2012. Budget: 83,000 USD.
- FONDECYT Grant (# 1070732) “*Metadata Management for Relational and XML Data Exchange Systems*”. March 2007 - March 2009. Budget: 32,000 USD.
- FONDECYT Grant (# 1050701) “*Data Exchange in Relational and XML Data*”. March 2005 - March 2007. Budget: 31,000 USD.

## PROFESSIONAL EXPERIENCE

- Professor, Department of Computer Science, Pontificia Universidad Católica de Chile, 2017 - present.
- Visiting researcher, Department of Computer Science, University of Oxford, July 2012 - July 2013.
- Associate professor, Department of Computer Science, Pontificia Universidad Católica de Chile, 2009 - 2016.
- Assistant professor, Department of Computer Science, Pontificia Universidad Católica de Chile, 2005 - 2009.
- Summer intern at IBM Almaden Research Center, San Jose, CA, USA, July 2004 - September 2004.
- Full-time junior faculty member, Department of Computer Science, Pontificia Universidad Católica de Chile, August 1998 - August 2000.

- Guest researcher, German National Research Center for Information Technology, Institute for Computer Architecture and Software Technology (GMD-FIRST), Berlin, Germany, February 1999.
- Guest researcher, Laboratoire d'informatique de Marseille, Faculté des sciences de Luminy, Université de la Méditerranée, Marseille, France, January 1999.

## TEACHING EXPERIENCE

Courses taught at the Pontificia Universidad Católica de Chile:

- Introduction to Programming: 1'1999, 1'2000, 1'2006, 1'2007, 1'2008, 1'2009, 2'2009, 2'2010, 1'2011.
- Advanced Programming: 2'1998, 1'1999, 2'1999, 1'2000.
- Discrete Mathematics: 2'2013, 2'2014.
- Logic for Computer Science: 2'2005, 1'2008, 1'2010, 2'2011, 2'2013, 2'2015.
- Finite Model Theory: 2'2006, 2'2008, 2'2010, 1'2015.
- Computational Complexity: 1'2009, 1'2011, 1'2014.
- Advanced Topics in Database Systems: 1'2006 (Foundations of XML), 1'2007 (Data integration).
- Topics in Computer Science: 1'2007 (Model checking), 2'2011 (Theory of computing).
- Advanced Topics in Theory of Computing: 1'2012, 1'2016, 1'2017, 1'2018, 1'2019.
- Design and Analysis of Algorithms: 2'2016, 2'2017, 2'2018.

## PROFESSIONAL ACTIVITIES

### Service Experience

- Member of the OECD Global Science Forum Expert Group on Digital Skills for Data-Intensive Science, November 2018 - present.
- Member of the ACM Symposium on Principles of Database Systems (PODS) Executive Committee, May 2017 - present.
- Leader of the Graph Query Languages task force (GraphQL) of The Linked Data Benchmark Council (LDBC), June 2015 - June 2018.
- Member of The International Conference on Database Theory (ICDT) Council, 2014 - 2018.
- Invited Expert - RDB2RDF Working Group. The World Wide Web Consortium (W3C), 2009 - 2012.
- Member of the evaluation committee for FONDECYT (basic research program), National Research Council for Science and Technology, Chile, 2007 - 2010.
- Associate Information Director - ACM Special Interest Group on Management Of Data (SIGMOD), 2005 - 2009.
- Evaluator for the Natural Sciences and Engineering Research Council of Canada (NSERC), the National Research Council for Science and Technology of Chile (CONICYT), the Research Foundation - Flanders (FWO), the National Agency for the Evaluation of Universities and Research Institutes of Italy (ANVUR), the Netherlands Organization for Scientific Research (NWO), the National Agency for the Promotion of Science and Technology of Argentina (ANPCYT), the Israel Science Foundation (ISF) and the Swiss National Science Foundation (SNSF).
- Member of the ACM PODS 2016 Alberto O. Mendelzon Test-of-Time Award Selection Committee.
- Member of the SIGMOD 2014 Travel Award Selection Committee.

## Editorships

- Member editorial board, Journal of Web Semantics, October 2016 - present.
- Associate editor, ACM Transactions on Database Systems, January 2016 - present.
- Member editorial advisory board, Information Systems, July 2012 - present.
- Member editorial board, Journal of Information and Data Management, 2009 - 2015.
- Guest editor, special issue on selected papers from the 18<sup>th</sup> International Conference on Database Theory (ICDT 2015), Theory of Computing Systems 61(1), 2017.
- Guest editor, special issue on database theory, Journal of Computer and System Sciences 77(3), 2011.
- Guest editor, special issue on selected papers from the 11<sup>th</sup> International Symposium on Database Programming Languages (DBPL 2007), Information Systems 34(7), 2009.

## Conference Committees

### Program Chair

- 37<sup>th</sup> ACM SIGMOD-SIGACT-SIGART Symposium on Principles of Database Systems (PODS 2018)
- 14<sup>th</sup> International Semantic Web Conference (ISWC 2015), Bethlehem, PA, USA, 2015 (co-chaired with Oscar Corcho, U. Politécnica de Madrid, Spain)
- 18<sup>th</sup> International Conference on Database Theory (ICDT 2015), Brussels, Belgium, 2015.
- 28<sup>th</sup> International Conference of the Chilean Computer Science Society (SCCC 2009), Santiago, Chile, 2009 (co-chaired with Benjamín Bustos, U. de Chile, Chile)
- 3<sup>rd</sup> Alberto Mendelzon International Workshop on Foundations of Data Management (AMW 2009). Arequipa, Peru, 2009 (co-chaired with Leopoldo Bertossi, Carleton U., Canada)
- 11<sup>th</sup> International Symposium on Database Programming Languages (DBPL 2007). Vienna, Austria, 2007 (co-chaired with Michael I. Schwartzbach, U. Aarhus, Denmark)
- Workshop on Emerging Research Opportunities in Web Data Management (EROW 2007). Barcelona, Spain, 2007 (co-chaired with Jan Hidders, U. of Antwerp, Belgium)

### Program Committee Member

- ACM SIGMOD-SIGACT-SIGART Symposium on Principles of Database Systems (PODS): 2016 (San Francisco, CA, USA), 2013 (New York, USA), 2010 (Indianapolis, IN, USA), 2008 (Vancouver, Canada), 2006 (Chicago, IL, USA)
- ACM SIGMOD International Conference on Management of Data (SIGMOD): 2012 (Scottsdale, AZ, USA), 2011 (Athens, Greece)
- International Conference on Very Large Data Bases (VLDB): 2016 (New Delhi, India)
- International Conference on Database Theory (ICDT): 2020 (Copenhagen, Denmark), 2017 (Venice, Italy), 2012 (Berlin, Germany), 2007 (Barcelona, Spain)
- International World Wide Web Conference (WWW): 2015 (Florence, Italy), 2014 (Seoul, Korea)
- International Semantic Web Conference (ISWC): 2014 (Trentino, Italy), 2010 (Shanghai, China), 2008 (Karlsruhe, Germany)
- Extended Semantic Web Conference (ESWC): 2014 (Anissaras, Greece), 2009 (Heraklion, Greece), 2008 (Tenerife, Spain)
- Conference on Artificial Intelligence (AAAI): 2013 (senior program committee member on the AI and the Web track, Bellevue, WA, USA), 2012 (Toronto, Canada)
- International Workshop on Graph Data management Experiences and Systems (GRADES): 2019 (Amsterdam, The Netherlands), 2018 (Houston, TX, USA), 2017 (Chicago, IL, USA), 2016 (Redwood Shores, CA, USA)
- International Conference on Web Reasoning and Rule Systems (RR): 2015 (Berlin, Germany), 2014 (Athens, Greece), 2011 (Galway, Ireland), 2010 (Bressanone, Italy), 2009 (Chantilly, VA, USA), 2008 (Karlsruhe, Germany)

- Workshop on Logic, Language, Information and Computation (WoLLIC): 2014 (Valparaiso, Chile), 2012 (Buenos Aires, Argentina)
- International Symposium on Mathematical Foundations of Computer Science (MFCS): 2009 (Novy Smokovec, High Tatras, Slovakia)
- ACM Conference on Information and Knowledge Management (CIKM): 2014 (Shanghai, China), 2011 (group leader in the DB track, Glasgow, Scotland), 2008 (Napa Valley, CA, USA), 2007 (Lisbon, Portugal)
- International Web Rule Symposium (RuleML): 2015 (Berlin, Germany)
- Latin American Theoretical Informatics (LATIN): 2006 (Valdivia, Chile)
- International Symposium on Foundations of Information and Knowledge Systems (FoIKS): 2010 (Sofia, Bulgaria)
- International Symposium on Database Programming Languages (DBPL): 2005 (Trondheim, Norway)
- International Conference on Conceptual Modeling (ER): 2009 (Gramado, Brazil)
- British National Conference on Databases (BNCOD): 2013 (Oxford, UK)
- Brazilian Symposium on Databases (SBBD): 2015 (Itaipava, Brazil), 2014 (Curitiba, Brazil), 2007 (João Pessoa, Brazil), 2006 (Florianopolis, Brazil)
- International Conference of the Chilean Computer Science Society (SCCC): 2005 (Valdivia, Chile)
- International Workshop on Data Engineering Meets the Semantic Web (DESWeb): 2015 (Seoul, Korea), 2014 (Chicago, IL, USA)
- International Workshop on Hyperlinking in the Web of Linked Things (WLT): 2014 (Santiago, Chile)
- Workshop on Discovering Meaning On the Go in Large Heterogeneous Data (LHD): 2011 (Barcelona, Spain)
- International Workshop on Managing Data Throughout its Lifecycle (DaLi): 2011 (Hannover, Germany)
- Ph.D. Workshop on Innovative Database Research (IDAR): 2011 (Athens, Greece), 2010 (Indianapolis, IN, USA)
- Doctoral Consortium, International Conference on Web Reasoning and Rule Systems (DC-RR): 2013 (Mannheim, Germany)
- International Workshop on Inconsistency and Incompleteness in Databases: 2006 (Munich, Germany)
- International Workshop on Logical Aspects and Applications of Integrity Constraints (LAAIC): 2006 (Krakow, Poland), 2005 (Copenhagen, Denmark)
- ACM International Workshop on Web Information and Data Management (WIDM): 2005 (Bremen, Germany)
- Semantic Web and Linked Open Data Workshop (SW-LOD): 2015 (Ensenada B.C., Mexico)
- Annual International Symposium on Information Management and Big Data (SIMBig): 2015 (Cusco, Peru)

## SOME TALKS

- *“Foundations of Querying Graphs”*. Summer School, 1<sup>st</sup> Iberoamerican Knowledge Graphs and Semantic Web Conference, Villa Clara, Cuba, June 2019.
- *“Foundations of modern graph query languages”*. Ad Hoc on SQL Extensions Property Graphs, June 2017.
- *“A note on computing certain answers to queries over incomplete databases”*. 11<sup>th</sup> Alberto Mendelzon International Workshop on Foundations of Data Management (AMW 2017), Montevideo, Uruguay, June 2017.
- *“Consistent Query Answering: a personal perspective”*. Invited talk at the Special Event in Honor of Leo Bertossi’s Induction as First AMW Fellow, Montevideo, Uruguay, June 2017.
- *“The Semantic Web: a lightweight data integration platform”*. Invited talk at the Information Communications Technologies & High Performance Computing Workshop, Chile–Japan Academic Forum 2016, Puerto Natales, Chile, November 2016.
- *“Foundations of Data Exchange and Metadata Management”*. Invited talk at the Ron Fagin Special Event, ACM SIGMOD/PODS Conference, San Francisco, CA, USA, June 2016.
- *“Classical DB Questions on New Kinds of Data”*, with Pablo Barceló. Tutorial given at the Dagstuhl seminar Foundations of Data Management. Schloss Dagstuhl, Germany, April 2016.

- “*Querying Semantic Web Data With SPARQL*”, with Jorge Pérez. Tutorial given at the 1<sup>st</sup> School on Efficient Extraction of Semantic Web Data, Santiago, Chile, January 2015.
- “*From the Web of Documents to the Web of Data*”. Invited talk at the 1<sup>st</sup> Workshop on Big Data, Santiago, Chile, November 2014.
- “*Querying Semantic Web Data with SPARQL (and SPARQL 1.1)*”. A talk given at Beihang University, China, November 2014.
- “*Querying Semantic Web Data with SPARQL (and SPARQL 1.1)*”. A talk given at Peking University, China, November 2014.
- “*Expressive Languages for Querying the Semantic Web*”. Invited talk at Dagstuhl seminar Querying and Reasoning Under Expressive Constraints. Schloss Dagstuhl, Germany, August 2014.
- “*Expressive Languages for Querying the Semantic Web*”. 33<sup>rd</sup> ACM SIGMOD-SIGACT-SIGART Symposium on Principles of Database Systems (PODS 2014), Snowbird, UT, USA, June 2014.
- “*From the Web of Documents to the Web of Data*”. A talk given at the INDO-CHILE Workshop on Big Data, Goa, India, June 2014.
- “*Discovering XSD Keys from XML Data*”. A talk given at Beihang University, China, August 2013.
- “*Querying Semantic Web Data with SPARQL (and SPARQL 1.1)*”. Invited tutorial at the 29<sup>th</sup> British National Conference on Databases (BNCOD 2013), Oxford, UK, July 2013.
- “*Discovering XSD Keys from XML Data*”. A talk given at the University of Oxford, UK, May 2013.
- “*RDF and SPARQL: Two basic components of the Web of data*”. A talk given at the Universidad de Valladolid, Spain, April 2013.
- “*Descriptive Complexity for Function Complexity Classes*”. A talk given at the University of Edinburgh, Edinburgh, Scotland, UK, January 2013.
- “*Navigation in SPARQL 1.1*”. A talk given at the Free University of Bozen-Bolzano, Italy, January 2013.
- “*Navigation in SPARQL 1.1*”. A talk given at the University of Oxford, UK, November 2012.
- “*Data Exchange and Metadata Management*”. Invited talk at Dagstuhl seminar Foundations and Challenges of Change and Evolution in Ontologies. Schloss Dagstuhl, Germany, October 2012.
- “*Paths in semantic search: A back and forth story*”. Invited talk at Dagstuhl seminar Semantic Data Management. Schloss Dagstuhl, Germany, April 2012.
- “*Data Exchange beyond Complete Data*”. Invited talk at Dagstuhl seminar Foundations of distributed data management. Schloss Dagstuhl, Germany, October 2011.
- “*Exchanging more than Complete Data*”. Invited talk at the 5<sup>th</sup> International Conference on Web Reasoning and Rule Systems (RR’11). Galway, Ireland, August 2011.
- “*Exchanging more than Complete Data*”. Invited talk at the 24<sup>th</sup> International Workshop on Description Logics (DL 2011), Barcelona, Spain, July 2011.
- “*Querying Semantic Web Data with SPARQL: State of the Art and Research Perspectives*”. Invited tutorial at the 30<sup>th</sup> ACM SIGMOD-SIGACT-SIGART Symposium on Principles of Database Systems (PODS 2011), Athens, Greece, June 2011.
- “*Data Exchange in the Relational and RDF Worlds*”. Invited talk at the 3<sup>th</sup> International Workshop on Semantic Web Information Management (SWIM 2011), Athens, Greece, June 2011.
- “*Schema Mapping Management in Data Exchange Systems*”. Invited tutorial at the V Alberto Mendelzon International Workshop on Foundations of Data Management (AMW 2011), Santiago, Chile, May 2011.
- “*Datalog as a Query Language for Data Exchange Systems*”. Datalog 2.0, Oxford University, UK, March 2010.
- “*Semantic Web: Query Languages for RDF and RDFS*”. Workshop on Emerging Topics in the Web, Santiago, Chile, November 2009.
- “*Foundations of RDF Databases*”. Invited tutorial at Reasoning Web: Semantic technologies for information systems - 5<sup>th</sup> International Summer School, Brixen-Bressanone, Italy, August 2009.
- “*The Recovery of a Schema Mapping*”. Symposium on XML, Logic and Automata, Grantown-on-Spey, Scotland, UK, July 2008.



- “*SPARQL over RDF, and its possible extensions to RDFS*”. Invited talk at the Joint SWDB & ODBIS workshop on Semantic Web, Ontologies, Databases (SWDB-ODBIS 2007), Vienna, Austria, September 2007.
- “*SPARQL - Where are we? Current state, theory and practice*”, with Claudio Gutierrez, Bijan Parsia, Jorge Pérez, Axel Polleres and Andy Seaborne. Tutorial given at the 4<sup>th</sup> European Semantic Web Conference (ESWC 2007), Innsbruck, Austria, June 2007.
- “*RDF and SPARQL: Two Basic Components of the Semantic Web*”. A talk given at The University of Edinburgh, Edinburgh, Scotland, UK, 2007.
- “*Locality of Queries and Transformations*”. Invited talk at the 4<sup>th</sup> IFIP International Conference on Theoretical Computer Science, Santiago, Chile, 2006.
- “*XML Data Exchange*”. 2<sup>nd</sup> International Workshop on Exchange and Integration of Data, Brixen-Bressanone, Italy, 2006.
- “*Locally Consistent Transformations and Query Answering in Data Exchange*”. A talk given at The Isaac Newton Institute, University of Cambridge, UK, 2006.
- “*XML Data Exchange: Consistency and Query Answering*”. Workshop on Web Information Retrieval, Santiago, Chile, 2005.
- “*XML Data Exchange: Consistency and Query Answering*”. 24<sup>th</sup> ACM SIGMOD-SIGACT-SIGART Symposium on Principles of Database Systems (PODS 2005), Baltimore, MD, USA, 2005.
- “*XML Data Exchange: Consistency and Query Answering*”. A talk given at The University of Edinburgh, Edinburgh, Scotland, UK, 2005.
- “*XML Data Exchange: Consistency and Query Answering*”. Invited talk at Dagstuhl seminar Foundations of Semistructured Data, Wadern, Germany, 2005.
- “*Well-designed XML Data*”. A talk given at IBM Almaden Research Center, San Jose, CA, USA, 2004.
- “*Well-designed XML Data*”. A talk given at IBM T.J. Watson Research Center, Hawthorne, NY, USA, 2004.
- “*Locally Consistent Transformations and Query Answering in Data Exchange*”. A talk given at The State University of New York, Buffalo, NY, USA, 2004.
- “*An Information-Theoretic Approach to Normal Forms for Relational and XML Data*”. 22<sup>nd</sup> ACM SIGACT-SIGMOD-SIGART Symposium on Principles of Database Systems (PODS 2003), San Diego, CA, USA, 2003.
- “*What’s Hard about XML Schema Constraints?*”. 13<sup>th</sup> International Conference on Database and Expert Systems Applications (DEXA 2002), Aix en Provence, France, 2002.
- “*A Normal Form for XML Documents*”. 21<sup>st</sup> ACM SIGACT-SIGMOD-SIGART Symposium on Principles of Database Systems (PODS 2002), Madison, WI, USA, 2002.
- “*A Normal Form for XML Documents*”. A talk given at Carleton University, Ottawa, Canada, February 2002.

## SCIENTIFIC AND PROFESSIONAL SOCIETIES

- Association for Computing Machinery (ACM)