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he / him / his
Date of Birth: 28/10/1988
Nationality: Portuguese
CV updated: 03/02/2023

Rui Soares Barbosa

Education

Oct 2010 – Oct 2015 **DPhil Computer Science**, University of Oxford, UK.
Thesis title: *Contextuality in quantum mechanics and beyond*
Supervisors: Samson Abramsky and Andreas Döring
Examiners: Prakash Panangaden (McGill) and Jamie Vicary (Oxford)
Secondments at: Université Paris Diderot (Paris 7) and Perimeter Institute for Theoretical Physics

Oct 2009 – Sep 2010 **MSc Mathematics and Foundations of Computer Science**, University of Oxford, UK.
(Mathematical Institute and Department of Computer Science)
Final Grade: 87 / 100 (distinction)
Dissertation title: *Interval domain(s) and Physics*
Dissertation supervisor: Andreas Döring

Sep 2006 – Jul 2009 **BSc Computer Science**, Universidade do Minho, Portugal.
(Department of Mathematics and Department of Informatics)
Final Grade: 19.2 / 20
Erasmus Semester (Spring 2009) at Centre of Software Technology, Universiteit Utrecht, The Netherlands

Positions

Feb 2020 – current **Staff Researcher**, INL – International Iberian Nanotechnology Laboratory.
Quantum and Linear-Optical Computation group.

Aug 2019 – Jan 2020 **Research Associate**, Lab for Foundations of CS, School of Informatics, University of Edinburgh.
Postdoc with Chris Heunen.

Jan 2015 – Jul 2019 **Research Assistant**, Quantum Group, Department of Computer Science, University of Oxford.
Postdoc with Samson Abramsky.

Aug 2016 – Dec 2016 **Simons–Berkeley Research Fellow**, Simons Institute for the Theory of Computing, UC Berkeley.
Fellowship to participate in the *Logical Structures in Computation* programme.

Jan 2016 – Dec 2021 **Junior Research Fellow**, Wolfson College, Oxford, UK.
Early-career fellowships awarded by Oxford and Cambridge colleges on the basis of research excellence.

2017/2018 & 2018/2019 & 2022/2023 **Invited Assistant Professor**, Department of Informatics, Universidade do Minho.
To lecture courses at graduate level.

Membership of scientific societies and professional associations

since 2022 **Founding Member**, IFIP Working Group 1.11/2.17: *Foundations of Quantum Computation*.
Working group of the International Federation for Information Processing under Technical Committees TC1 *Foundations of Computer Science* and TC 2 *Software: Theory and Practice*

Scholarships

2014 **PhD grant**, FCT – Portuguese Foundation for Science and Technology, SFRH/BD/94945/2013.

2010–2013 **Marie Curie Fellowship for Early Stage Researcher** (PhD).
Initial Training Network *MALOA – From MAthematical Logic to Applications, PITN-GA-2009-238381*.

2009/2010 **Santander Abbey Scholarship**.
Partial funding for one year of study (MSc).

2009 **Integration into Research Grant**, FCT – Portuguese Foundation for Science and Technology.
- *An algebraic approach to convolutional codes* supervised by Pedro Patrício.

2007/2008 & 2008/2009 **2 *New Talents in Mathematics* Fellowships**, Gulbenkian Foundation.
Introduction to research fellowships for undergraduates in Mathematics in Portuguese universities.
- 2008/2009: *Combinatorial algebraic topology and applications to graph decision problems and to concurrent computing*, supervised by Thomas Kahl.
- 2007/2008: *Mahler's measure*, supervised by Assis Azevedo.

Awards

2016 **Commendation as Runner-up, BCS/CPHC Distinguished Dissertation award**.
distinguishing PhD/DPhil dissertations in computer science in British universities.

2010 **Civil Government of Braga Prize**.
for having the best final grade (19.2) for any undergraduate degree at Universidade do Minho.

2009 & 2008 **Prize for Academic Merit**, *Universidade do Minho*.
for being top of the class in Computer Science, 1st and 2nd years.

2009 **Prize for Academic Merit**, *Ministry of Science, Tech. and Higher Ed., Portuguese Government*.

2007 **University of Minho Academic Council Prize**.
for having the best entry grade (19.4) to U Minho's BSc Computer Science.

2017 **1st place in CeNPLf 2007** (National Contest of Logic and Functional Programming).

2006 & 2007 **1st place in MIUP 2006 & 2nd place in MIUP 2007** (Portuguese ACM Programming Contest).

2006 **Bronze medal at International Physics Olympiad (IPhO 2006)**, *Singapore*.

2006 **Silver medal at Ibero-American Olympiad in Informatics (CIIC)**.

2006 **2nd place at Portuguese Olympiad in Informatics (ONI 2006)**.

Participation in research projects

Oct 2022 Sep 2025 *FoQaCiA – Foundations of Quantum Computational Advantage*, European Commission (Quantum Flagship) and NSERC – Natural Sciences and Engineering Research Council of Canada.
Contributed extensively to project design, proposal write-up, and project coordination.
INL is the coordinating partner of consortium involving 4 Canadian and 7 European partners.
Budget: €1.25m + $1.13m in total, €330k for INL.

Feb 2020 current Scientific Employment Stimulus (Institutional), FCT – Fundação para a Ciência e a Tecnologia (Portugal), CEECINST/00062/2018.
Employed as staff researcher at INL.

Aug 2019 Jan 2020 *Combining Viewpoints in Quantum Theory*, EPSRC – Engineering and Physical Sciences Research Council (UK), EP/R044759/1.
Employed as postdoc at U Edinburgh.

Apr 2016 Jul 2019 *Contextuality as a Resource in Quantum Computation*, EPSRC (UK), EPSRC EP/N018745/1.
Employed as postdoc, named researcher in grant application.

Jul 2015 Mar 2016 *James Martin Program on Bio-inspired Quantum Technologies*, Oxford Martin School.
Employed as postdoc at U Oxford.

Jan 2015 *Categorical Unification*, John Templeton Foundation.
Jun 2015 Employed as postdoc at U Oxford.

Supervision

PhD

current **Angelos Bampounis**, PhD in Applied Mathematics (MAP-PDMA), U Minho, Aveiro, & Porto.
with Pedro Patrício (CMAT, U Minho).

current **Raman Choudhary**, PhD in Computer Science (MAPi), U Minho, Aveiro, & Porto.
with Luís Paulo Santos (INESC TEC / U Minho).

current **Rafael Wagner**, PhD in Physics (MAPfis), U Minho, Aveiro, & Porto.
with Ernesto Galvão (INL) and Mikhail Vasilevskiy (U Minho).

MSc

current **José Guimarães**, MSc in Physics Engineering, U Minho.

current **António Pereira**, MSc in Physics Engineering, U Minho.

2022 **Daniel Carvalho**, MSc in Physics Engineering, U Minho.
Title: *On conditional quantum control* Other supervisor: José Nuno Oliveira (U Minho).

2018 **Ana Neri**, MSc in Physics Engineering, U Minho.
Title: *Towards quantum program calculation* Other supervisor: José Nuno Oliveira (U Minho)

Other

2022 **Amy Searle**, PhD student secondment from U Oxford.
Topic: *Contextuality and causal structure*

2020/21 **Ana Cruz**, Junior Research Grant.
Topic: *Partial Boolean algebras of composite systems*

2020/21 **Jaime Santos**, Junior Research Grant.
Topic: *A toy programmming language for quantum walks*

Paedagogical activities

Lecturing

2018/2019 **Invited Lecturer**, 8h module as part of course *Quantum Computing*, Universidade de Aveiro.
Doctoral Program in Computer Science of the Universities of Minho, Aveiro, and Porto (MAP-i).

2017/2018 & 2018/2019 **Invited Lecturer**, 25h module as part of course *Quantum Logic*, Universidade do Minho.
5th year Integrated MSc in Physics Engineering.

2017/2018 & 2018/2019 **Guest Lecturer** (2 lectures each year), *Categories, Proofs and Processes*, University of Oxford.
4th year undergraduate, MSc, and PhD students, Department of Computer Science.

Teaching

2013/2014 **Teaching Assistant & Demonstrator**, *Principles of Programming Languages*, U Oxford.
2nd or 3rd year undergraduates, Department of Computer Science.

2012/2013 **Teaching Assistant**, *Categories, Proofs and Processes*, University of Oxford.
4th year undergraduate, MSc, and PhD students, Department of Computer Science.

Academic juries and exams

PhD

26 Sep 2022 **External examiner for PhD thesis**, *Sivert Aasnæss*, DPhil Computer Science, U Oxford.
Title: *Comparing two cohomological obstructions to contextuality, and a generalised construction of quantum advantage with shallow circuits* Supervisors: Samson Abramsky & Jonathan Barrett

MSc

24 Jan 2022 **Examiner for MSc dissertation**, *Ana Catarina Sousa*, Dept. of Mathematics, U Minho.
Title: *Deductive systems for minimal quantum logic* Supervisor: José Carlos Espírito Santo

18 Sep 2019 **Examiner for MSc dissertation**, *Elena di Lavore*, MSc Maths & Found. Comp. Sci., U Oxford.
Title: *Morphisms of open games for iterated games* Supervisor: Jamie Vicary

21 Dec 2018 **Examiner for MSc Dissertation**, *Carlos Fitas*, Dept. of Mathematics, U Minho.
Title: *Categorical semantics of linear logic* Supervisor: José Carlos Espírito Santo

Other

23 Jul 2019 **Assessor for Confirmation of DPhil status**, *Maaike Zwart*, Dept. Comp. Sci., U Oxford.
(Internal viva examination for doctoral students at the end of 3rd year.)
Title: *On the non-compositionality of distributive laws for monads*

6 Oct 2017 **Assessor for Confirmation of DPhil status**, *Linde Wester*, Dept. Comp. Sci., U Oxford.
Title: *Classical and quantum structures of computation*

5 Oct 2017 **Assessor for Confirmation of DPhil status**, *Benjamin Musto*, Dept. Comp. Sci., U Oxford.
Title: *Diagrammatic semantics for quantum Latin squares, algebraic structures and quantum functions*

2013/2014 **Exam Marker**, *Principles of Programming Languages*, University of Oxford.

Membership and coordination of Program Committees

PC member 19th International Conference in Quantum Physics and Logic (QPL 2022).

PC co-chair 26th International Workshop on Algebraic Development Techniques (WADT 2022).
Chair of track on *Algebraic Approaches to Quantum Computation*

PC member 9th Conference on Algebra and Coalgebra in Computer Science (CALCO 2021).

PC member 18th International Conference in Quantum Physics and Logic (QPL 2021).

PC member 2nd DaLí – Dynamic Logic: New Trends and Applications, Workshop at FM 2019.

PC member 1st Q-turn Workshop: Changing Paradigms in Quantum Science (Q-turn 2018).

PC member 12th International Tbilisi Symposium on Language, Logic and Computation (TbiLLC 2017).

Other scientific refereeing

Journals *Physical Review Letters*, *Annales Henri Poincaré*, *Information and Computation*, *Journal of Logical and Algebraic Methods in Programming*, *Studia Logica*, *Quantum*, *New Journal of Physics*, *Entropy*, *Philosophical Transactions of the Royal Society A*, *Journal of Mathematical Psychology* (special issue on Foundations of Probability)

Conferences (subreviewer) Int'l Conference on Quantum Information Processing (QIP 2018, 2020), Int'l Conference on Quantum Physics and Logic (QPL 2013, 2016, 2017, 2018, 2019), Symposium on Logic in Computer Science (LiCS 2016), Int'l Colloquium on Automata, Languages, and Programming (ICALP 2015), Int'l Symposium on Mathematical Foundations of Computer Science (MFCS 2022), Symposium on Compositional Structures (SYCO 7)

Organisation of scientific meetings and seminars series

Scientific meetings

17 Jul 2021 **Organiser** (with Cihan Okay), *Mathematical Structures in Quantum Foundations*.
Parallel session of National Meeting of Portuguese Mathematical Society (ENSPM 2021).

4–6 Jul 2019 **Organiser**, *Contextuality as a Resource in Quantum Computation II*, University of Oxford.
Workshop organised in the context of EPSRC project.

20–22 Jun 2016 **Organiser**, *Contextuality as a Resource in Quantum Computation*, University College London.

7 Mar 2015 **Organiser**, *Quantum Group Workshop*, University of Oxford.
Research workshop of the Quantum Group, Department of Computer Science.

Event series

since Jun 2020 **Coordinator**, *QLOC seminar*.
Meetings of the *Quantum and Linear-Optical Computation* group at INL.

Nov 2013 – Jul 2019 **Convenor**, *Foundations Discussions, Wolfson College Quantum Foundations Research Cluster*.
Discussions on foundational topics in quantum theory and related areas open to the general public, including researchers and students from across different departments in the university.

Jan 2018 – Jul 2019 **Coordinator**, *OASIS: Oxford Advanced Seminar in Informatic Structures*.
Interdisciplinary seminar series of the *Foundations, Structures, and Quantum* research theme.

Jan 2017 – Dec 2017 **Coordinator**, *Quantum Lunch*.
Internal seminar of the Quantum Group.

Outreach activities

25 Nov 2022 Roundtable discussion '*Bits and qubits : à conversa sobre o futuro da computação*', with Yasser Omar (IST Lisboa) and Luís Paulo Santos (INESC TEC & U Minho) and moderation by Ana Noronha, Semana da Ciência e Tecnologia 2022, Ciência Viva, Lisboa.

03 Jan 2019 Industry outreach talk on quantum information, Checkmarx.

26 Apr 2017 Talk about career as researcher in quantum informatics, CS day, Universidade do Minho.

2 May 2012 Talk about PhD experience in quantum informatics, CS day, Universidade do Minho.

2007/2008 Biweekly contributor on science topics to student newspaper *ComUM*.

Publications

Note. All authors contributed fully to the research in every publication. They are typically listed in alphabetical order by last name (mine has sometimes appeared under 'S' but mostly under 'B') or in order of juniority. This is in line with common practice in mathematics and computer science – see e.g. the culture statement from the American Mathematical Society: `http://www.ams.org/profession/leaders/culture/CultureStatement04.pdf`

Refereed journal papers (6)

1. Rui Soares Barbosa and Chris Heunen
Sheaf representation of monoidal categories
to appear in *Advances in Mathematics*, 2023.
   - Pre-print at arXiv:2106.08896 [math.CT]

2. Ana Neri, Rui Soares Barbosa, and José Nuno Oliveira .
Compiling quantamorphisms for the IBM-Q Experience
IEEE Transactions on Software Engineering, 48(11): 4339–4356, 2022.
   - Pre-print at arXiv:2010.10510 [quant-ph]

3. Rui Soares Barbosa, Tom Douce, Pierre-Emmanuel Emeriau, Elham Kashefı, and Shane Mansfield .
Continuous-variable nonlocality and contextuality
Communications in Mathematical Physics, 391(3): 1047–1089, 2022.
   - Pre-print at arXiv:1905.08267 [quant-ph]
   - Presented at *16th International Conference on Quantum Physics and Logic (QPL 2019)*

4. Nadish de Silva and Rui Soares Barbosa .
Contextuality and noncommutative geometry in quantum mechanics
Communications in Mathematical Physics, 365(2): 375–429, 2019.
   - Pre-print at arXiv:1806.02840 [math.OA]
   - Earlier partial version "Partial and total ideals of von Neumann algebras" at arXiv:1408.1172 [math.OA]

5. Samson Abramsky, Rui Soares Barbosa, Giovanni Carù, and Simon Perdrix .
A complete characterisation of All-versus-Nothing arguments for stabilizer states
Philosophical Transactions of the Royal Society of London A: Mathematical, Physical and Engineering Sciences, 375 (2106): 20160385 (special issue on *Second quantum revolution: foundational questions*, G. Jaeger, A. Khrennikov, and P. Perinotti, eds), 2017.
   - Pre-print at arXiv:1705.08459 [quant-ph]
   - Presented at *14th International Conference on Quantum Physics and Logic (QPL 2017)*

6. Samson Abramsky, Rui Soares Barbosa, and Shane Mansfield .
Contextual fraction as a measure of contextuality
Physical Review Letters, 119: 050504, 2017.
   - Pre-print at arXiv:1705.07918 [quant-ph]
   - Earlier version "Quantifying contextuality via linear programming" presented at *13th International Conference on Quantum Physics and Logic (QPL 2016)* – publication withdrawn.
   - Poster presented at 21st Annual Conference on Quantum Information Processing (QIP 2018).

7. Samson Abramsky, Rui Soares Barbosa, Kohei Kishida, Raymond Lal, and Shane Mansfield .
Possibilities determine the combinatorial structure of probability polytopes
Journal of Mathematical Psychology, 74: 58–65 (special issue on *Foundations of Probability Theory in Psychology and Beyond*, E. N. Dzhafarov, J. V. Kujala, and R. Suck, eds), 2016.
   - Pre-print at arXiv:1603.07735 [quant-ph]

Refereed book chapters (2)

8. Rui Soares Barbosa, Shane Mansfield, and Martti Karvonen .
Closing Bell: Boxing black box simulations in the resource theory of contextuality
in *Samson Abramsky on Logic and Structure in Computer Science and Beyond*, A. Palmigiano and M. Sadrzadeh, eds, volume of *Outstanding Contributions to Logic* series, Springer, 2022.
   - Pre-print at arXiv:2104.11241 [quant-ph]
   - Presented at *18th International Conference on Quantum Physics and Logic (QPL 2021)*

9. Andreas Döring and Rui Soares Barbosa .
Unsharp values, domains and topoi
in *Quantum Field Theory and Gravity*, 65-–96, F. Finster, O. Müller, M. Nardmann, J. Tolksdorf, and E. Zeidler, eds, Springer Basel, 2011.
   - Pre-print at arXiv:1107.1083 [quant-ph]

Refereed conference papers (8)

10. Samson Abramsky and Rui Soares Barbosa .
The logic of contextuality
in *29th EACSL Annual Conference on Computer Science Logic (CSL 2021)*, C. Baier and J. Goubault-Larrecq, eds, *Leibniz International Proceedings in Informatics (LIPIcs)*, 183: 5:1–5:18, 2021.
   - Pre-print at arXiv:2011.03064 [quant-ph]
   - Earlier version presented at *17th International Conference on Quantum Physics and Logic (QPL 2020)* under the title *Partial Boolean algebras and the logical exclusivity principle*

11. Samson Abramsky, Rui Soares Barbosa, Martti Karvonen, and Shane Mansfield .
A comonadic view of simulation and quantum resources
in *34th Annual ACM/IEEE Symposium on Logic in Computer Science (LiCS 2019)*: 1–12, 2019.
   - Pre-print at arXiv:1904.10035 [quant-ph]
   - Presented at *3rd Symposium on Compositional Structures (SYCO 3)*
   - Presented at *16th International Conference on Quantum Physics and Logic (QPL 2019)*
   - Presented at *2nd Applied Category Theory Conference (ACT 2019)*
   - Related submission presented at *8th Conf. on Algebra and Coalgebra in Computer Science (CALCO 2019)*

12. Samson Abramsky, Rui Soares Barbosa, Nadish de Silva, and Octavio Zapata .
The quantum monad on relational structures
in *42nd International Symposium on Mathematical Foundations of Computer Science (MFCS 2017)*, K. G. Larsen, H. L. Bodlaender, and J.-F. Raskin, eds, *Leibniz International Proceedings in Informatics (LIPIcs)*, 83: 35:1–35:19, 2017.
   - Pre-print at arXiv:1705.07310 [cs.LO]
   - Presented at *17th Asian Quantum Information Science Conference (AQIS 2017)*
   - Presented at *15th International Conference on Quantum Physics and Logic (QPL 2018)*

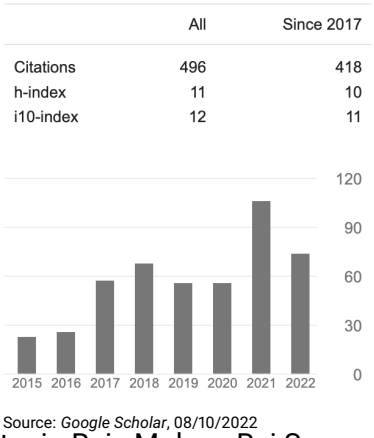
13. Samson Abramsky, Rui Soares Barbosa, Giovanni Carù, Nadish de Silva, Kohei Kishida, and Shane. Mansfield
Minimum quantum resources for strong non-locality
in *12th Conference on Theory of Quantum Computation, Communication and Cryptography (TQC 2017)*, M. M. Wilde, ed, *Leibniz International Proceedings in Informatics (LIPIcs)*, 73: 9:1–9:20, 2018.
   - Pre-print at arXiv:1705.09312 [quant-ph]
   - Presented at *14th International Conference on Quantum Physics and Logic (QPL 2017)*

14. Samson Abramsky, Rui Soares Barbosa, Kohei Kishida, Raymond Lal, and Shane Mansfield .
Contextuality, cohomology and paradox
in *24th EACSL Annual Conference on Computer Science Logic (CSL 2015)*, S. Kreutzer, ed, *Leibniz International Proceedings in Informatics (LIPIcs)*, 41: 211–228, 2015.
   - Pre-print at arXiv:1502.03097 [quant-ph]

15. Rui Soares Barbosa .
On monogamy of non-locality and macroscopic averages: examples and preliminary results
in *11th International Workshop on Quantum Physics and Logic (QPL 2014)*, B. Coecke, I. Hasuo, and P. Panangaden, eds, *Electronic Proceedings in Theoretical Computer Science*, 172: 36–55, 2014.
   - Pre-print at arXiv:1412.8541 [quant-ph]

16. Shane Mansfield and Rui Soares Barbosa .
Extendability in the sheaf-theoretic approach: construction of Bell models from Kochen–Specker models
in Informal Proceedings of Quantum Physics and Logic (QPL 2013), .
   - Pre-print at arxiv:1402.4827 [quant-ph]. Submitted to a journal.

17. Samson Abramsky, Shane Mansfield, and Rui Soares Barbosa .
The cohomology of non-locality and contextuality
in *8th International Workshop on Quantum Physics and Logic (QPL 2011)*, B. Jacobs, P. Selinger, and B. Spitters, eds, *Electronic Proceedings in Theoretical Computer Science*, 95: 1–15, 2012.
    - Pre-print at arXiv:1111.3620 [quant-ph]



Source: *Google Scholar*, 08/10/2022

Pre-prints (2)

18. Rafael Wagner, Zohar Schwartzman-Nowik, Ismael L. Paiva, Amit Te'eni, Antonio Ruiz-Molero, Rui Soares. Barbosa, Eliahu Cohen, and Ernesto F. Galvão
Quantum circuits measuring weak values and Kirkwood–Dirac quasiprobability distributions, with applications
arXiv:2302.00705 [quant-ph], 2023.

19. Rafael Wagner, Rui Soares Barbosa, and Ernesto F. Galvão .
Inequalities witnessing coherence, nonlocality, and contextuality
arXiv:2209.02670 [quant-ph], 2022.

Talks

Invited research seminars (13 + 4 junior seminars)

1. **Free transformations in the resource theory of contextuality**.
QCQMB colloquium (Quantum Contextuality in Quantum Mechanics and Beyond), online, 20 Oct 2021.
2. **Contextuality in logical form: Lindenbaum–Tarski duality for transitive partial CABA**.
CMAT Seminar, Centre of Mathematics, Universidade do Minho (online), 27 May 2021.
3. **Partial Boolean algebras: The logic of contextuality**.
3rd World Logic Day in Aveiro, Dept of Mathematics, Universidade de Aveiro (online), 14 Jan 2021.
4. **The quantum monad on relational structures: towards quantum finite model theory?**.
Oxford–Cambridge Resources and Co-resources Meet-up, Departmemt of Computer Science, University of Oxford (online), 15 Jul 2020.
5. **Acyclicity and Vorob'ev's theorem: deriving monogamy of non-locality and local macroscopic averages**.
LFCS Lunch, School of Informatics, University of Edinburgh, 15 Oct 2019.
6. **Contextuality as a resource yielding quantum advantage**.
Seminar CAPP (Calculi, Algorithms, Programs, & Proofs), Laboratoire d'Informatique de Grenoble, Université Grenoble Alpes, 26 Jun 2018.
7. **Monogamy of nonlocality and macroscopic averages**.
Logic Lounge Seminar of the Logical Structures in Computation Programme, Simons Institute for the Theory of Computing, UC Berkeley, 1 Dec 2016.
8. **Monogamy of nonlocality and macroscopic averages**.
Quantum Dynamics Seminar, Department of Mathematics, Royal Holloway University of London, 5 Feb 2015.
9. **Sheaf-theoretic framework for non-locality and contextuality**.
Lunch Seminar of the Quantum Information Team, Télécom ParisTech, 7 May 2013.
10. **Structural reason for monogamy relations (and local realism of some macroscopic correlations)**.
Groupe de travail Sémantique, Laboratoire PPS, Université Paris Diderot (Paris 7), Apr 2013.
11. **The logic of non-locality and quantum informatics**.
Physics Seminar, Centre of Physics, Universidade do Minho, 6 Mar 2013.

12. **Structural analysis of monogamy and macroscopic correlations**.
Seminar on Analytic Topology in Mathematics and Computer Science, Mathematical Institute, University of Oxford, 13 Feb 2013.
13. **The interval domain, values of physical quantities in a topos and space-time**.
Seminar on Aspects of Mathematical Foundations of Physics, Mathematical Institute, University of Oxford, 1 Dec 2010.
14. **The topology of a decision problem**.
Junior Seminar, Department of Pure Mathematics, Universidade do Porto, 30 Sep 2009.
15. **Mahler's measure**.
IV Brazilian Research Initiation Symposium, IMPA – Inst. for Pure & Applied Maths, Rio de Janeiro, 14 Nov 2008.
16. **Mahler's measure**.
National Meeting of 'Young Talents in Mathematics' programme, Universidade de Coimbra, 6 Sep 2008.
17. **Lehmer's conjecture**.
Junior Seminar, Department of Pure Mathematics, Universidade do Porto, 26 Mar 2008.

Invited talks at workshops (21)

18. **Causal contextuality and adaptive MBQC**.
5th Workshop on Quantum Contextuality in Quantum Mechanics and Beyond (QCQMB 2022), Prague, 18 Dec 2022.
19. **Contextuality as a resource: simulations, adaptivity comonad, and the (partial) algebraic-logical view**.
Resources in Computation Workshop, University College London, 21 Sep 2022.
20. **From Vorob'ev's theorem to monogamy of non-locality and local macroscopic averages**.
4th Workshop on Quantum Contextuality in Quantum Mechanics and Beyond (QCQMB 2021), Prague (online), 17 May 2021.
21. **Logic and quantum advantage**.
Logic and Structure in Computer Science and Beyond, Lorentz Center, Leiden, 11 Dec 2019.
22. **Resource theory of contextual behaviours**.
Workshop on Contextuality as a Resource in Quantum Computation II, University of Oxford, 4 Jul 2019.
23. **Acyclicity and Vorob'ev's theorem**.
3rd Workshop on Quantum Contextuality in Quantum Mechanics and Beyond (QCQMB 2019), Prague, 18 May 2019.
24. **Quantum vs classical: non-locality, contextuality, and informatic advantage**.
Q DAYS 2019 – QuantaLab Workshop in Quantum Computation, Universidade do Minho, 12 Apr 2019.
25. **Contextuality and advantage in informatic tasks**.
2nd Workshop on Quantum Contextuality in Quantum Mechanics and Beyond, Prague, 19 May 2018.
26. **Contextuality as a resource**.
Workshop on Combining Viewpoints in Quantum Theory, University of Edinburgh, 20 Mar 2018.
27. **The quantum monad on relational structures**.
Logical Structures in Computation Reunion Workshop, Simons Institute, UC Berkeley, 14 Dec 2017.
28. **Resource theory of contextuality**.
Workshop on Quantum Correlations, Contextuality and All That. . . Again and Again, International Institute of Physics, Natal, 22 Nov 2017.
29. **Monads, comonads, and quantum model theory without quantum logic**.
Dusko@60 – a conference in honour of 60th birthday of Dusko Pavlovic, University of Oxford, 10 Oct 2017.
30. **The contextual fraction and contextuality as a resource**.
Workshop on Quantum Contextuality in Quantum Mechanics and Beyond, Prague, 4 Jun 17.
31. **Towards a resource theory of contextuality**.
Workshop on Compositionality, Simons Institute for the Theory of Computing, UC Berkeley, 8 Dec 2016.
32. **The contextual fraction as a measure of contextuality**.
Workshop on Contextuality as a Resource in Quantum Computation, University College London, 22 Jun 2016.
33. **Possibilities determine the structure of the no-signalling polytope**.
Workshop on Information and Processes (WIP 2016), Université Paris Diderot (Paris 7), 28 Apr 2016.

34. **The sheaf-theoretic approach to non-locality and contextuality II**.
Workshop on Quantum Correlations, Contextuality and All That. . . Again, International Institute of Physics, Natal, 12 Nov 2015.
35. **A structural reason for monogamy and locality of average macroscopic behaviour**.
Workshop on Information and Processes (WIP 2013), CIAPA, Costa Rica (Tulane University), 17 Dec 2013.
36. **Information dependence and independence: from quantum mechanics to databases and back**.
Quantitative Analysis of Algebraic Systems (QAIS) Project Workshop, Universidade do Minho, 16 Sep 2013.
37. **Topologies on the spectral presheaf and co/contra-variant duality**.
First Workshop on Quantum Toposophy, Radboud Universiteit, Nijmegen, 13–14 Dec 2012.
38. **Unsharp values in the topos approach**.
Workshop Quantum and Classical Information Flow, Bellairs Research Inst., Barbados (McGill U), 9–14 Apr 2011.

Contributed talks (15)

39. **Contextuality in logical form: Duality for transitive partial CABAs**.
Topology, Algebra and Categories in Logic (TACL 2022), Coimbra, 22 Jun 2022.
40. **Closing Bell: Boxing black box correlations in the resource theory of contextuality**.
18th International Conference on Quantum Physics and Logic (QPL 2021), Gdańsk (online), 7–11 Jun 2021.
41. **Partial Boolean algebras and the logical exclusivity principle**.
17th International Conference on Quantum Physics and Logic (QPL 2020), Paris (online), 4 Jun 2020.
42. **A comonadic view of simulation and quantum resources**.
34th Annual ACM/IEEE Symposium on Logic in Computer Science (LiCS 2019), Simon Fraser University, Vancouver, 25 Jun 2019.
43. **Simulations of quantum resources and the degrees of contextuality (Early Idea)**.
8th Conference on Algebra and Coalgebra in Computer Science (CALCO 2019), University College London & Imperial College London, 3 Jun 2019.
44. **The quantum monad: Towards quantum finite model theory**.
15th International Conference on Quantum Physics and Logic (QPL 2018), Dalhousie University, Halifax, 7 Jun 2018.
45. **The quantum monad on relational structures**.
17th Asian Quantum Information Science Conference (AQIS 2017), National University of Singapore, 7 Sep 2017.
46. **The quantum monad on relational structures**.
42nd Int'l Symp. on Mathematical Foundations of Computer Science (MFCS 2017), Aalborg Universitet, 22 Aug 2017.
47. **Minimum resources for quantum contextuality**.
14th International Conference on Quantum Physics and Logic (QPL 2017), Radboud Universiteit, Nijmegen, 7 Jul 2017.
48. **The contextual fraction and contextuality as a resource**.
18th Växjö Conference on Quantum Foundations, Linnaeus University, Växjö, 13 Jun 2017.
49. **Quantifying contextuality via linear programming**.
13th Int'l Conference on Quantum Physics and Logic (QPL 2016), Strathclyde University, Glasgow, 8 Jun 2016.
50. **The support lattice and the structure of the no-signalling polytope**.
Workshop 10 years of Categorical Quantum Mechanics, University of Oxford, 18 Oct 2014.
51. **On monogamy of non-locality and macroscopic averages: examples and preliminary results**.
11th Workshop on Quantum Physics and Logic (QPL 2014), Kyoto University, 4 Jun 2014.
52. **Structural reason for monogamy**.
Workshop on Quantum Information and Foundations of Quantum Mechanics, University of British Columbia, 3 Jul 2013.
53. **Structural reason for monogamy and local macroscopic correlations**.
Postgraduate Conference on Quantum Fields, Gravity & Information, University of Nottingham, 4 Apr 2013.

Language Skills *

Portuguese Native speaker

	Understanding		**Speaking**		**Writing**
	Listening	Reading	Interaction	Production	Writing
English	C2 Proficient	C2 Proficient	C2 Proficient	C2 Proficient	C2 Proficient
French	B1 Independent	C1 Proficient	A2 Basic	A2 Basic	A2 Basic
Spanish	C1 Proficient	C2 Proficient	B2 Independent	B1 Independent	B1 Independent

** Common European Framework of Reference for Languages (CEFR) self-assessment level*