

Dr João Faria Martins

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Research unique identifiers (last updated 14/12/2017):

• **Scopus Author ID:** [22134556500](#)

– Documents: 23

– Citations: Total citations 147 by 80 documents.

– h-index: 7

– Co-authors: 12

• **Mathematical Reviews:** [MR: 763465](#). Cited 145 times by 73 authors. Total Publications: 24.

• **Researcher ID:** [H-9070-2013](#)

• **ORCID ID:** orcid.org/0000-0001-8113-3646.

Research interests:

- higher dimensional category theory and topological quantum field theories;
- algebraic and geometric topology in dimensions 3 and 4; quantum topology;
- Mathematical aspects of Chern-Simons theory, BF-theory and generalisations;
- homotopical algebra and algebraic models for homotopy types;
- Hopf algebras and quantum (q-deformed) Lie groups;
- differential geometry (higher Lie and gauge theory);
- applications to condensed matter physics and quantum computing.

Published in: • Comm. Math. Phys. (2x); • TRANS. AMS (2x); • Adv. Math. (3x); • Compos. Math.; • Adv. Theor. Math. Phys. (2x); • DIFFER GEOM APPL (2x); • SIGMA; • J. Math. Phys.; • Homology, Homotopy Appl (4x); • J. Knot Theory Ramifications (2x); • Theory Appl. Categ.; • J. Geom. Phys., • Phys Rev B.

Refereed for: • Lett. Math. Phys.; • Math. Annalen; • Adv. Math.; • J. Geom. Phys, • SIGMA; • J. Knot Theory Ramifications (3x); • Homology, Homotopy Appl (2x) ; • J HOMOTOPY RELAT STR (3x); • J. Group Theory; • Theory Appl. Categ (2x); • COLLECT MATH; • Topol. Appl; • Proc. LMS.

Funding acquired:

Below, “[FCT](#)” denotes the “Portuguese national funding agency for science, research and technology”. The “monthly maintenance stipend” for post-doctoral and doctoral grants is: doctoral (abroad) €1710 + university fees + social security, postdoctoral (in Portugal) €1495 + social security. Plus subsidies for travelling, installation, thesis edition, etc.

Grants awarded (through competitive peer-review):

- SFRH/BPD/34138/2006 – 3 year postdoctoral fellowship. Funded by FCT. (12/2004 – 12/2007).
- SFRH/BPD/17552/2004 – 3 year postdoctoral fellowship. Funded by FCT. (01/2008 – 05/2008).
- SFRH/BD/IO04/2000 – 4 year doctoral fellowship. Funded by FCT. (09/2000 – 06/2004).

Participation in research projects funded by FCT:

- **As core CV member (a nuclear member whose CV supports the application):**

(50%)PTDC/MAT/098770/2008: *Topological Invariants via Diff. Geometry*, €100K.(03/12– 09/13).

(50%)UID/MAT/00297/2013: *Strategic funding of the centre CMA*, €185K per year.(01/15–12/20).

- **As one of the main redactors.**

(25%)PTDC/MAT/101503/2008: *New Geometry and Topology*, €120K. (01/10 – 06/13).

Employment history:

Previous position (10/2009 – 08/2016): Assistant professor. Mathematics Dept. Faculty of Sciences and Technology, Nova Lisbon University (UNL). Since 01/2014: a) executive committee member of the research centre CMA: “Centre for Mathematics and Applications of UNL”; b) member of the scientific commission of the PhD program in Mathematics at Nova.

06/2008–09/2009: Assistant researcher and invited assistant professor. University of Oporto.

12/2005–05/2008: Postdoctoral researcher (in Mathematics). Technical University of Lisbon.

Teaching: In total I have 13 years of experience in teaching Mathematics at university level, to students of Mathematics (up to Masters and PhD level), Physics and Engineering. I am consistently evaluated as a very good to excellent teacher by the students attending my lectures.

Education:

- December 2004: PhD in Mathematics, University of Nottingham. Thesis: “Quantum Topology and the Lorentz Group”. Supervisor: Prof John W. Barrett. (The viva took place in September 2004.)
- July 2000: Major (5 years first degree) in Applied Mathematics and Computing (“Licenciatura em Matemática Aplicada e Computação”). Technical University of Lisbon. Final mark of 18/20.

Organization of conferences and workshops

- Higher Gauge Theory, TQFT and Quantum Gravity (7-13 February 2011, Lisbon).

This event was financed by the ESF through the “Quantum Geometry and Quantum Gravity Network” and by FCT through the projects “New Geometry and Topology” and “Topological Invariants via Differential Geometry”. We had 50 participants and a budget of approx. 17K EURO. This was a pioneer event into addressing the importance of higher gauge theory in Physics and topology.

- Recent Advances in TQFT (10-14 September 2012, Lisbon).

This event was funded by the ESF through the network “Interactions of Low-Dimensional Topology and Geometry with Mathematical Physics” and by FCT.

- Co-organiser at the special session: “Higher Dimensional Algebra in Geometry and Quantum Field Theory”, of the the AMS-EMS-SPM International Meeting 2015. Oporto 10 - 13 June 2015.
- XVIIIth Oporto Meeting on Geometry Topology and Physics, 9-12th July '09, Oporto. FCT funded.
- Biennial Meeting of the Portuguese Mathematical Society, 14-15 July '14, Lisbon.
- I organised and co-organised the scientific sessions: “Geometry and Topology” and “Categorification” in the 2014 and 2016 meetings of the Portuguese Mathematical Society.
- Modelling Topological Phases of Matter TQFT, HQFT, premodular and higher categories, Yetter-Drinfeld and crossed modules in disguise. Leeds 5-8 July 2016.
- Higher Structures Lisbon (deformation theory, operads, higher categories developments & applications). Instituto Superior Técnico, Lisbon, 24-27 July 2017.
- Workshop on Higher Gauge Theory: Where should we look for higher gauge matter? University of Leeds 28th February – 2nd March 2018.

Outreach: In 2010, I conceived and co-organised the first edition of the school “Matnova”, an annual 5 days outreach summer school in Mathematics at UNL. Matnova is aimed at high achieving secondary school pupils. I was the chair organiser for the '15 edition (83 pupils). The summer school continued to happen even though I moved to Leeds University in 2016. Here is the page of 2017 edition: <http://eventos.fct.unl.pt/matnova2017/home>. Good ideas that have clearly proven to work perfectly should always go on!

Selected visits by invitation:

- University of Leeds. February 22 - February 26, 2016. *I was invited in order to explain my work on crossed module invariants of knotted surfaces and Yetter invariant.*
- University of Toronto. April 27 - 2 May 2015. *I was invited to explain my work on higher-dimensional holonomy, crossed module invariants of 2-knots and categorifications KZ-connection.*
- Mathematisches Institut, University of Göttingen. February 3-6, 2015. *I was invited to in order explain my work on higher-dimensional holonomy and categorifications of the KZ-connection.*
- Max Planck Institute, Bonn. May 6-10, 2014. *I was invited to in order to explain my work on higher-dimensional holonomy.*
- Centre for Quantum Geometry of Moduli Spaces, Aarhus University. July 27-29 , 2011. *I was invited to explain my work on categorifications of the Knizhnik-Zamolodchikov connection.*

Successful PhD and Masters supervisions

- PhD Supervisor (with Peter Gothen as co-advisor). Student Björn Gohla. Mathematics. University of Oporto. Thesis: “Mapping Spaces of Gray-Categories”.
- Erasmus (2014/15, at NOVA) PhD Advisor. Student: Kadir Emir. Osmangazi University (OGU), Eskisehir, Turkey. Thesis: “Homotopy of 2-crossed modules maps”.
- Masters co-advisor. Student: Marta Carreteiro. Mathematics. Technical University of Lisbon. Thesis: “Welded Braids and the Crossed Module Invariant”.