

LAURA FONTANELLA

E-mail: laura.fontanella@gmail.com

Webpage: <https://www.i2m.univ-amu.fr/perso/laura.fontanella>

Languages: Italian (native language), English (fluent), French (fluent)

RESEARCH INTERESTS

Mathematical logic, set theory, classical realizability, philosophy of mathematics.

PROFESSIONAL ACTIVITIES

01/10/2020 – TO DATE	MAÎTRE DE CONFÉRENCES (I.E. LECTURER) AT UPEC RESEARCH AT LACL TEACHING AT THE IUT SÉNART FONTAINEBLEAU
01/10/2017 – 30/09/2019	POSTDOC at the UNIVERSITY AIX MARSEILLE INSTITUT DE MATHÉMATIQUES, Marseille. Grant: <i>Labex Archimède</i>
16/07/2016 – 30/09/2017	Pregnancy and maternity
01/06/2014 – 31/05/2016	POSTDOC at the HEBREW UNIVERSITY EINSTEIN INSTITUTE OF MATHEMATICS, Jerusalem. Grant: <i>Marie Curie IEF</i>
23/08/2015 – 03/10/2015	INVITED RESEARCH PROGRAM at the ISAAC NEWTON INSTITUTE (Cambridge, UK). Projet: <i>Mathematical, Foundational and Computational aspects of the Higher Infinite</i> .
01/01/2013 – 31/03/2014	POSTDOC at the UNIVERSITY OF VIENNA KURT GÖDEL RESEARCH CENTER, Vienna Grant: <i>FWF research fundings</i>
01/10/2012 – 31/12/2012	VISITING RESEARCHER at the UNIVERSITY OF VIENNA KURT GÖDEL RESEARCH CENTER, Vienna Grant: <i>ESF Exchange Grant and FWF research fundings</i>
01/10/2011 – 30/09/2012	ATER (researcher and teaching assistant) at the UNIVERSITY PARIS 7 Department of Mathematics, research at the IMJ, Paris
01/10/2008 – 12/12/2012	PHD at the UNIVERSITY PARIS 7 Department of Mathematics, IMJ, Paris Grant: <i>Allocation de Recherche</i>
01/10/2008 – 30/09/2011	MONITEUR (teaching assistant) at the UNIVERSITY PARIS 7 Department of Mathematics, Paris

EDUCATION

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| 2008 - 2012 | DOCTORATE at the UNIVERSITY PARIS 7
Doctorate in Mathematics: <i>Logic and foundations of computer science</i> ,
Thesis defended on 12/12/2012 |
| 2007-2008 | MASTER 2 [Msc.] at the UNIVERSITY PARIS 7
Dep. of Mathematics. Domain: <i>Logic and foundations of computer science</i> . |
| 2006-2007 | MASTER 1 [MSc.] at the UNIVERSITY PARIS 1-SORBONNE
Department of Philosophy. Domain: <i>Logic and Philosophy of Science</i> . |
| 2003-2006 | LAUREA TRIENNALE [BSc.] at the UNIVERSITY ROMA TRE
Department of Philosophy. Domain: <i>Logic and Computer Science</i> .
Graduated with full marks: 110/110 cum laude. |

GRANTS, FELLOWSHIPS

- **BOURSE LABEX ARCHIMÈDE (postdoc fellowship), *principal investigator***
Host institution: UNIVERSITY AIX MARSEILLE, I2M.
Period: 01/10/2017 -30/09/2018
- **MARIE CURIE IEF FELLOWSHIP, *principal investigator***
Postdoctoral research grant funded by the EUROPEAN UNION.
Project title: Large properties at small cardinals. Project N. 624381.
Host institution: HEBREW UNIVERSITY OF JERUSALEM, Einstein Institute of Mathematics.
Period: 01/06/2014 -31/05/2016
Total EU grant funding: 192464 €
- **FWF RESEARCH FUNDINGS**
Project title: Forcing Creatures, Oracle and large continuum. Project N. P 23875
Host institution: UNIVERSITY OF VIENNA, Kurt Gödel Research Center.
Leader of the project: Dr. Jakob Kellner. Period: 01/05/2013 - 31/03/2014.
- **FWF RESEARCH FUNDINGS**
Project title: Set Theory: Dichotomies and definable well-orders. Project N. P 22430-N13
Host institution: UNIVERSITY OF VIENNA, Kurt Gödel Research Center.
Leader of the project: Sy D. Friedman. Period: 01/01/2013 - 30/04/2013.
- **FWF RESEARCH FUNDINGS**
Project title: HOD and higher descriptive set theory. Project N. P 23316
Host institution: UNIVERSITY OF VIENNA, Kurt Gödel Research Center.
Leader of the project: Sy D. Friedman. Period: 16/11/2012 - 31/12/2012.
- **ESF EXCHANGE GRANT, *principal investigator***
Short term visiting grant funded by the EUROPEAN SCIENCE FOUNDATION.
Host institution: UNIVERSITY OF VIENNA, Kurt Gödel Research Center.
Period: 01/10/2012 - 15/11/2012
Total ESF grant funding: 3030 €
- **ALLOCATION DE RECHERCHE (PhD fellowship)**
Host institution: UNIVERSITY PARIS 7, IMJ and Equipe de logique.
Start date: 01/10/2008. End: 30/09/2011
- **ERASMUS FELLOWSHIP**
Student exchange programme funded by the EUROPEAN UNION
Bachelor level. Host university: UNIVERSITY PARIS 1-SORBONNE.
Start date: 01/10/2005. End: 30/06/2006

PUBLICATIONS

Journal papers

1. L. Fontanella and G. Geoffroy. *Preserving cardinals and weak forms of Zorn's lemma in realizability models*. Accepted (with minor revisions) for publication in MATHEMATICAL STRUCTURES IN COMPUTER SCIENCE.
2. L. Fontanella. *Axioms as definitions: revisiting Poincaré and Hilbert*. PHILOSOPHIA SCIENTIAE vol. 23 (1), pp. 167-183 (2019).
3. L. Fontanella et M. Magidor. *Reflection of stationary sets and the tree property at the successor of a singular cardinal*, JOURNAL OF SYMBOLIC LOGIC, vol. 82 (1), 272-291 (2017).
4. *Square and Delta reflection*, with Y. Hayut. To appear in ANNALS OF PURE AND APPLIED LOGIC. Vol. 167 (8), pp. 663 - 683 (2016).
5. *Fragments of strong compactness, families of partitions and ideal extensions*, with P. Matet. FUNDAMENTA MATHEMATICAE, vol. 234, pp. 171- 190 (2016).
6. *The Tree Property at both $\aleph_{\omega+1}$ and $\aleph_{\omega+2}$* , with S. D. Friedman. FUNDAMENTA MATHEMATICAE, vol. 229, pp. 83-100 (2015)
7. *The Strong Tree Property at successors of singular cardinals*, JOURNAL OF SYMBOLIC LOGIC, vol. 79 (1), pp. 193 - 207 (2014).
8. *Strong tree properties for small cardinals*. JOURNAL OF SYMBOLIC LOGIC, vol. 78 (1), pp. 317-333 (2013).
9. *Strong tree properties for two successive cardinals*. ARCHIVE FOR MATHEMATICAL LOGIC, vol. 51 (5-6), pp. 601-620 (2012).

In Proceedings

9. *Oscillations and their applications in partition calculus* (survey), with B. Velickovic. Proc. of the Young Set Theory Workshop 2009, Centre de Recerca Matematica, eds. Asperó et al., p. 13-38 (2011).

In books

10. L. Fontanella. *How to chose new axioms for set theory?* **Invited paper** for the book *Reflections on the Foundations of Mathematics: Univalent Foundations, Set Theory and General Thoughts*, SPRINGER 2019. Eds.: S. Centrone, D. Kant et D. Sarikaya.

Ph.D Thesis

11. *Large Properties at Small Cardinals*, University Paris 7. Advisor: Prof. Boban Velickovic.
Available at <http://www.logique.jussieu.fr/~fontanella/papers/phdthesis.pdf>

TALKS

The slides and videos of my talks are available at <https://www.i2m.univ-amu.fr/perso/laura.fontanella>

Invited Talks and Tutorials

- 15/09/2018 COLLOQUIUM LOGICUM, Bayreuth, Germany.
Realizability models and the Axiom of Choice
- 17/05/2018 SÉMINAIRES DU LABORATOIRE CEPERC, Université Aix Marseille, France
Le naturalisme dans les mathématiques
- 09/11/2017 CHOCOLA, Lyon
Realizability: from Curry-Howard to Forcing
- 10/10/2017 SET THEORY WORKSHOP, CIRM, Marseille
From Forcing to Realizability
- 05 - 09/09/2016 ENTIA ET NOMINA, Warsaw. Tutorial, **keynote speaker**.
The choice of new axioms in set theory
- 03/06/2016 CROSSING WORLDS: MATHEMATICAL LOGIC, PHILOSOPHY AND ART, Helsinki.
On the definitional character of axioms: revisiting Hilbert
- 14/01/2016 AIM WORKSHOP: HIGH AND LOW FORCING, San Jose, California
Delta-reflection and square
- 14/12/2015 PARIS-DAVIS WORKSHOP ON ONTOLOGICAL COMMITMENT IN MATH, Paris
On the definitional character of axioms
- 25/10/2015 YOUNG SET THEORY WORKSHOP, Jerusalem
Reflection and anti-reflection at the successor of a singular cardinal
- 3/08/2015 LOGIC COLLOQUIUM 2015, Helsinki
Reflection and anti-reflection at the successor of a singular cardinal
- 27 - 31 Jul 2015 SCANDINAVIAN SUMMER SCHOOL OF LOGIC, Helsinki. **Tutorial in set theory**.
Reflection principles and large cardinals
- 14/02/2015 ARCTIC SET THEORY WORKSHOP, Kilpisjärvi, Finland.
Compactness and reflection at small cardinals.
- 30/09/2014 XIII INTERNATIONAL WORKSHOP ON SET THEORY, CIRM, Marseille.
Reflection of stationary sets and the tree property at \aleph_{ω^2+1} .
- 15/07/2013 EUROPEAN SET THEORY CONFERENCE, Barcelona. **Plenary talk**.
From Large Cardinals to Large Combinatorial Properties (Plenary talk).
- 08/05/2013 2013 NORTH AMERICAN ANNUAL MEETING, Waterloo, Canada.
Strong Combinatorial Properties at Small Cardinals.
- 24/09/2012 XII INTERNATIONAL WORKSHOP ON SET THEORY, CIRM, Marseille.
Large Properties at Small Cardinals
- 19/01/2012 UNIVERSITY OF TURIN, Logic Seminars, Turin.
Strong Tree Properties for Two Successive Cardinals.

ORGANIZATION OF CONFERENCES AND OTHER RESPONSABILITIES

- Since 01/09/2020 I am in charge of the coordination of all the computer science courses at the DUT MMI
- Member of the organizing committee of the *Realisability workshop*, 18-20/09/2019, CIRM, Université Aix-Marseille, Marseille.
- Member of the organizing committee of the *Realisability workshop*, 12-13/06/2018, CIRM, Université Aix-Marseille, Marseille.
- Member of the organizing committee of MM^{+70} a conference in honour of M. Magidor's 70th birthday, 17-19 Feb. 2016, Jerusalem, Israel
- Reporter for the *Oberwolfach Workshop in Set Theory*, 13-17/01/2014, Oberwolfach, Germany (I was in charge of the composition of a report of the workshop with the abstracts of each talk).
- Collaboration in the organisation of the *KGRC conference in honour of S. D. Friedman's 60th birthday*, 08-12/07/2013 Vienna, Austria.
- Active participation in the *Fête de la Science 2011*, Paris, France.
- Collaboration in the organisation of the *Logic Colloquium 2010*, 25-31/07/2010, Paris, France.

REFeree ACTIVITIES

I served as referee for the following journals: *Bulletin of symbolic logic*, *Review of symbolic logic*, *Annals of pure and applied logic*, *Journal of symbolic logic*, *Journal of Mathematical Logic*, *Israel Journal of Mathematics*, *Houston Journal of Mathematics*, *Archive for Mathematical logic*, *Mathematical Logic Quarterly*, *Topoi*. I also reviewed an abstract for the conferences *Entia et Nomina* and *Logic Colloquium*.

TEACHING

Habilitations

I have two *Qualifications à la fonction de Maître de Conférence*, i.e. habilitations to teach as Maître de Conférence (equivalent Lecturer) in the following fields:

- Mathematics (Section 25) obtained in 2013.
- Epistemology, History of science (Section 72) obtained in 2015.

I also passed the CAPES of mathematics in 2019, i.e. habilitation to teach mathematics in college and high school.

Teaching experience

01/10/2020– TO DATE	MAÎTRE DE CONFÉRENCES at the University Paris Est Créteil DUT MMI - IUT Sénart Fontainebleau
01/10/2011 – 30/09/2012	ATER (researcher and teaching assistant) at the UNIVERSITY PARIS 7, Department of Mathematics
01/10/2008 – 30/09/2011	MONITORAT (teaching assistant) at the UNIVERSITY PARIS 7, Dep. of Math.

Courses given

Title	Level	Kind	Year	Univ.	Hrs
CULTURE SCIENTIFIQUE S3	DUT2	CM+TD	2020-2021	UPEC	?
SET THEORY	Master 1	TD	2011-2012	Univ. Paris 7	36
ALGEBRA AND ANALYSIS	Licence 2 [BSc.]	TD	2011-2012	Univ. Paris 7	54
MATHEMATICAL LOGIC	Licence 3 [BSc.]	TD	2010-2011	Univ. Paris 7	64
ALGEBRA AND ANALYSIS	Licence 1 [BSc.]	TD	2009-2010	Univ. Paris 7	64
INTRODUCTION TO MAPLE	Licence 1 [BSc.]	TP	2008-2009	Univ. Paris 7	64

(TD= tutorial, TP= practical class)