

# LAURA FONTANELLA

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**Profession :** Maîtresse de conférences (Senior Lecturer)

**Work Address:** LACL, Département d'Informatique

Faculté des Sciences et Technologie

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94010 Créteil Cedex

**E-mail :** laura.fontanella@u-pec.fr

**CNU :** 27 Computer Science

**LANGUAGES:** Italien (native), Français (fluent), Anglais (fluent)

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## RESEARCH INTERESTS

Logic and theoretical computer science:

- classical realizability
- set theory
- philosophy of mathematics

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## EMPLOYMENT HISTORY

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| SINCE 01/09/2020        | Maîtresse de conférences (Senior Lecturer) Université Paris Est Créteil<br>CNU 27 Computer Science<br>research team: LACL<br>(since 2023) teaching at the computer science departement (FST)<br>(2020-2023) teaching at DUT MMI of the IUT Senart Fontainebleau |
| 01/10/2017 - 30/09/2019 | POSTDOC, UNIVERSITÉ AIX-MARSEILLE<br>INSTITUT DE MATHÉMATIQUES DE MARSEILLE. team: Logique de la programmation<br><i>Funding: LabEx Archimède</i>   |
| 01/06/2014 – 31/05/2016 | POSTDOC, HEBREW UNIVERSITY OF JERUSALEM<br>EINSTEIN INSTITUTE OF MATHEMATICS<br><i>Funding: Marie Curie IEF</i>   |
| 23/08/2015 – 03/10/2015 | INVITED RESEARCHER, ISAAC NEWTON INSTITUTE (Cambridge, UK).<br>Project: <i>Mathematical, Foundational and Computational aspects of the Higher Infinite.</i>   |
| 01/01/2013 – 31/03/2014 | POSTDOC, UNIVERSITY OF VIENNA (Autriche)<br>KURT GÖDEL RESEARCH CENTER FOR MATHEMATICAL LOGIC<br><i>Funding: FWF</i>  |
| 01/10/2012 – 31/12/2012 | STAGE DE RECHERCHE, UNIVERSITY OF VIENNA (Autriche)<br>KURT GÖDEL RESEARCH CENTER FOR MATHEMATICAL LOGIC<br><i>Funding: ESF Exchange Grant and FWF</i>  |
| 01/10/2011 – 31/08/2012 | ATER, UNIVERSITÉ PARIS 7 (teaching assistant), Math. department   |
| 01/10/2008 – 12/12/2012 | PHD UNIVERSITÉ PARIS 7<br>INSTITUT DE MATHÉMATIQUES DE JUSSIEU, Équipe de Logique<br><i>Funding: Allocation de Recherche and Monitorat</i>  |

## EDUCATION

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| 2008 - 2012 | PHD, UNIVERSITÉ PARIS 7<br>Mathematics: <i>Logic</i> .<br>Advisor: B. Veličković. PhD defence: 12/12/2012 |
| 2007-2008   | MASTER 2, UNIVERSITÉ PARIS 7<br>Mathematics. <i>Logic and theoretical computer science</i> .              |
| 2006-2007   | MASTER 1, UNIVERSITÉ SORBONNE PARIS 1<br>Philosophy. <i>Logic and philosophy of science</i>               |
| 2003–2006   | LAUREA TRIENNALE [Bachelor], UNIVERSITÉ ROMA TRE, Rome<br>Philosophy. <i>Logic and computer science</i>   |

## PUBLICATIONS

### Submitted

1. L. Fontanella and R. Matthews *Realizing the totally unordered structure of ordinals*, submitted for publication in *Annals of Pure and Applied Logic*.
2. L. Fontanella *The evolution of the proofs-as-programs interpretation through realizability* **invited paper** for the proceedings of FILMAT that will be published by Springer.

### In Proceedings

1. L. Fontanella, G. Geoffroy, R. Matthews: *Realizability Models for Large Cardinals*. CSL 2024: 28:1-28:18
2. L. Fontanella et B. Veličković. *Oscillations and their applications in partition calculus* (survey). PROC. OF THE YOUNG SET THEORY WORKSHOP 2009, Centre de Recerca Matemàtica, eds. Asperó et al., p. 13-38 (2011).

### Journal papers

1. L. Fontanella and G. Geoffroy. *Preserving cardinals and weak forms of Zorn's lemma in realizability models*. MATHEMATICAL STRUCTURES IN COMPUTER SCIENCE, vol.30 (9), pp. 976-996 (2020).
2. L. Fontanella. *Axioms as definitions: revisiting Poincaré and Hilbert*. PHILOSOPHIA SCIENTIAE vol. 22/3 pp. 166 –183 (2019).
3. L. Fontanella and 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. L. Fontanella and Y. Hayut. *Square and Delta-reflection*. ANNALS OF PURE AND APPLIED LOGIC. Vol. 167 (8), pp. 663 - 683 (2016).
5. L. Fontanella and P. Matet. *Fragments of strong compactness, families of partitions and ideal extensions*, FUNDAMENTA MATHEMATICAE, vol. 234, pp. 171- 190 (2016).
6. L. Fontanella and S. D. Friedman. *The tree property at both  $\aleph_{\omega+1}$  and  $\aleph_{\omega+2}$* . FUNDAMENTA MATHEMATICAE, vol. 229, pp. 83-100 (2015)
7. L. Fontanella. *The strong tree property at successors of singular cardinals*, JOURNAL OF SYMBOLIC LOGIC, vol. 79 (1), pp. 193 - 207 (2014).

8. L. Fontanella. *Strong tree properties for small cardinals*. JOURNAL OF SYMBOLIC LOGIC, vol. 78 (1), pp. 317-333 (2013).
9. L. Fontanella. *Strong tree properties for two successive cardinals*. ARCHIVE FOR MATHEMATICAL LOGIC, vol. 51 (5-6), pp. 601-620 (2012).

## Book chapters

1. 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). Editeurs: S. Centrone, D. Kant et D. Sarikaya.

## PhD thesis

12. *Large properties for small cardinals*, Université Paris 7. Advisor: Boban Veličković.  
[https://www.imj-prg.fr/theses/pdf/2012/laura\\_fontanella.pdf](https://www.imj-prg.fr/theses/pdf/2012/laura_fontanella.pdf)

## Media reports

1. J. Cervelle, L. Fontanella, L. Maignan. *Kurt Gödel : ses théorèmes d'incomplétude ont ébranlé les mathématiques*. The Conversation France.  
<https://theconversation.com/kurt-godel-ses-theoremes-dincompletude-ont-ebbranle-les-mathematiques-227074>

## FUNDED PROJETS

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- 2022-2025 **Project leader** "COCONTENS", national funding **ANR JCJC** (budget 159k €)
- 2022-2023 **Project leader** "MDR" regional funding **DIM RFSI** (réseau francilien de sciences informatiques) (budget 74k €)
- 2014-2016 **Project leader** "LAPSCA", european funding **Marie Curie IEF** (individual european fellowship), budget 192.464 €

## PARTICIPANT IN OTHER NATIONAL AND INTERNATIONAL PROJECTS

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- fall 2024. QCOMICAL. EU-funding.
- 2023-date. ApCORE funded by South-American agency STIC-AmSud.
- 2023-date. CHOICE, funded by the national agency ANR.
- 2023-date. CHOCOLA as part of a project coordinated by the ENS Lyon (monthly meeting on Curry Howard correspondence).

## PHD SUPERVISION

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- Ada Picano Nacci - start 13/10/2023. Co-supervisor (50%) with Julien Cervelle (Université Paris Est Créteil, LACL)
- Jacopo Furlan - start 01/10/2023, Co-supervisor (50%) with Damiano Mazza (Université Sorbonne Paris Nord, laboratoire LIPN)

## MASTER RESEARCH SUPERVISION

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- Ada Picano Nacci (2023) student at Master2 LMFI Université Paris Cité
- Anita Moyassari (2023) student at Master2 LMFI Université Paris Cité
- Jacopo Furlan (2023) student at Master2 international de Logique, Université Aix Marseille et Università di Roma 3. Co-supervision with Giulio Manzonetto, Université Sorbonne Paris Nord, laboratoire LIPN)

## INVITED TALKS (LAST 5 YEARS)

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| 27/05/2024 | AXIOMS AND IMPLICIT DEFINITIONS, Université Aix Marseille<br><i>On the computational content of axioms</i>                |
| 22/02/2024 | CSL2024, Napoli<br><i>Realizability models for large cardinals</i>  |
| 29/11/2023 | SCALP, Orléans<br><i>Realizability models for large cardinals</i>   |
| 29/09/2022 | FILMAT 2022, Pavia<br><i>The evolution of the concept of proofs through realizability</i>                                 |
| 29/08/2022 | EUROPEAN SET THEORY WORKSHOP 2022, Torino<br><i>Realizability models for large cardinals</i>                              |
| 28/06/2022 | GREEK SUMMER SCHOOL Greece (online)<br><i>The evolution of the concept of proofs through realizability</i>                |
| 18/05/2022 | ICREA LOGIC SEMINARS, Barcelona (online)<br><i>Representing ordinals in classical realizability</i>                       |
| 15/05/2022 | UNIVERSITÉ PARIS CITÉ, séminaires de l'IRIF<br><i>Representing ordinals in classical realizability</i>                    |
| 24/03/2021 | UNIV. DE PARIS ET UNIV. LYON 1, Séminaires de logique Lyon-Paris (online)<br><i>Realizability and the Axiom of Choice</i> |
| 11/11/2020 | UNIVERSITY OF LEEDS, UK (online)<br><i>Realizability and the Axiom of Choice</i>  |

## SCIENTIFIC DISSEMINATION

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- Media report: J. Cervelle, L. Fontanella, L. Maignan *Kurt Gödel : ses théorèmes d'incomplétude ont ébranlé les mathématiques*. The Conversation France.  
<https://theconversation.com/kurt-godel-ses-theoremes-dincompletude-ont-ebbranle-les-mathematiques-227074>
- *women and science meetings* at l'UPEC (2023 et 2024) to promote sciences for female high school students
- *La nuit des chercheurs* à l'UPEC (2024) meetings the students of UPEC to present Research Career
- *Fête de la Science 2011*, scientific dissemination for scholars Université Paris 7, Paris.

# TEACHING EXPERIENCE

## TEACHING QUALIFICATIONS

- CAPES *Mathematics* 2019.
- QUALIFICATION SECTION 25 *Mathématiques*, obtained in 2013
- QUALIFICATION SECTION 72 *Epistemology, History of Science and Technology* obtained in 2015.

## TEACHING POSITIONS

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|-------------------------|---|
| DEPUIS 01/09/2020       | MAÎTRESSE DE CONFÉRENCES (Senior Lecturer), UNIVERSITÉ PARIS EST CRÉTEIL<br>Section 27 Computer Science<br>(since 01/09/2023) teaching at Faculté des Sciences et Technologie - Computer Science department<br>(01/09/2020–31/08/2023) teaching at IUT Sénart Fontainebleau - DUT MMI |
| 01/10/2011 – 31/08/2012 | ATER (teaching assistant), UNIVERSITÉ PARIS 7 Mathematics department  |
| 01/10/2008 – 30/09/2011 | MONITORAT (teaching assistant), UNIVERSITÉ PARIS 7, Mathematics department  |

## TEACHING

| Year      | Level                             | Department       | Title                             | Hours |
|-----------|-----------------------------------|------------------|-----------------------------------|-------|
| 2023-2024 | Bachelor                          | Computer science | Web development Back-end          | 55.5H |
| 2023-2024 | Bachelor                          | Computer science | Web development project           | 30H   |
| 2023-2024 | Bachelor                          | CS and Math      | Data Encoding                     | 23.5H |
| 2023-2024 | Bachelor                          | CS and Math      | Functional programming            | 24H   |
| 2023-2024 | Bachelor                          | Computer science | Functional programming project    | 20H   |
| 2023-2024 | Bachelor                          | Computer science | Object oriented programming       | 21H   |
| 2023-2024 | Bachelor                          | CS and Math      | Web pages                         | 30H   |
| 2023-2024 | Bachelor                          | Computer science | Introduction to database          | 16H   |
| 2023-2024 | Bachelor                          | CS and Math      | Représentation de données         | 23.5H |
| 2023-2024 | University Bachelor of Technology | Computer science | Multimedia development            | 12H   |
| 2022-2023 | University Bachelor of Technology | Multimedia       | VR development                    | 25H   |
| 2022-2023 | University Bachelor of Technology | Multimedia       | Computer Networks                 | 96H   |
| 2022-2023 | University Bachelor of Technology | Multimedia       | Web development Front-end         | 48H   |
| 2022-2023 | University Bachelor of Technology | Multimedia       | Data Encoding and signal theory   | 51H   |
| 2022-2023 | University Bachelor of Technology | Multimedia       | Data Encoding and signal theory   | 49H   |
| 2021-2022 | University Bachelor of Technology | Multimedia       | Computer Networks                 | 48H   |
| 2021-2022 | University Bachelor of Technology | Multimedia       | Object oriented programming       | 86H   |
| 2021-2022 | University Bachelor of Technology | Multimedia       | Data Encoding and signal theory   | 98H   |
| 2021-2022 | University Bachelor of Technology | Multimedia       | Multimedia development – projects | 52H   |
| 2020-2021 | University Bachelor of Technology | Multimedia       | Data Encoding and signal theory   | 85H   |
| 2020-2021 | University Bachelor of Technology | Multimedia       | Data Encoding and signal theory   | 67H   |
| 2020-2021 | University Bachelor of Technology | Multimedia       | Multimedia development – projects | 14H   |

# ADMINISTRATIVE RESPONSABILITIES

## ADMINISTRATIVE RESPONSABILITIES

- Since June 2024 Elected member of the Laboratory Council. Research unit: LACL, UPEC)
- Since October 2023 SAPS contact: contact person for projects around 'Science with and for society'. Research unit : LACL , 'Université Paris Est Créteil
- 2020-2025 Elected member of the Department Council. Department MMI, IUTSF UPEC
- 2021-2022 Director of studies of DUT2 MMI (103 students), IUTSF UPEC
- 2020-2021 Teachers Coordinator for the courses in Computer Science at the DUT MMI, IUTSF
- 13-17/01/2014 Proceedings editor for the *Oberwolfach workshop in set theory*,

- Reviewer for *Handbook of intuition*, *Bulletin of Symbolic Logic*, *Review of Symbolic Logic*; *Journal of symbolic logic*; *Annals of Pure and Applied Logic*; *Journal of Mathematical Logic*; *Israel Journal of Mathematics*; *Houston Journal of Mathematics*; *Archive for Mathematical Logic*; *Mathematical Logic Quarterly*; *Topoi*; *Logic Colloquium*; *Entia et Nomina*.

## COMMITEES

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- 2024 position: MCF (Senior Lecturer) in Computer Science, Université Paris Est Créteil, IUT de Vitry
- 2024 position: MCF (Senior Lecturer) in Computer Science, Université Sorbonne Paris Nord, IUT GEA
- 2023 position: MCF (Senior Lecturer) in Computer Science, Université Gustave Eiffel, IUT MMI
- 2023 position: MCF (Senior Lecturer) in Computer Science, Université de Renne, IUT de Lannion, departement:MMI
- 2022 position: MCF (Senior Lecturer) in Computer Science, Université Paris Est Créteil, EPISEN
- 2022 position: PRAG in Mathematics and Computer Science, Université Paris Est Créteil, Faculté de Lettre
- 2022 poste de PRAG in Mathematics and Computer Science, IUT Sénart Fontainebleau, MMI, UPEC
- 2021 poste de PRAG in Mathematics and Computer Science, IUT Sénart Fontainebleau, MMI, UPEC

## ORGANISATION OF WORKSHOPS

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- *Realisability workshop 2022* (with G. Geoffroy), 25-27 October 2022, Université Paris Cité
- *Scalp 2021* (with D. Mazza, L. Pellissier and A. Saurin) 3-5 November 2021, IUTSF UPEC, Fontainebleau
- *Realisability workshop 2019* (with G. Geoffroy), 18-20/09/2019, CIRM, Université Aix-Marseille, Marseille.
- *Realisability workshop 2018* (with G. Geoffroy), 12-13/06/2018, CIRM, Université Aix-Marseille, Marseille.
- Workshop  $MM^{+70}$  in honor of Menachem Magidor (with A. Karagila and A. Rinot), 17-19/02/2016, Hebrew University of Jerusalem, Israël