

Ludovic Patey

Doctor in Computer Science

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Academic Curriculum

- 2017 – now **CNRS Researcher (“Chargé de Recherche”)**, France.
- 2016 – 2017 **Postdoc (“Morrey Visiting Assistant Professor”)**,
University of California, Berkeley.
- 2013 – 2016 **PhD on “The reverse mathematics of Ramsey-type theorems”**,
Université Paris Diderot (Paris VII).
Advised by Laurent Bienvenu and Hugo Herbelin
- 2012 – 2013 **Mathematical Logic and Foundations of Computer Science**,
Université Paris Diderot (Paris VII), Master degree, Summa cum laude.
- 2010 – 2012 **Parisian Master of Research in Computer Science**,
École normale supérieure, Paris, Master degree. Summa cum laude.
- 2009 – 2010 **Licence in Computer Science**,
École normale supérieure, Paris, Magna cum laude.
- 2007 – 2009 **DEUG in Mathematics**,
Université Pierre et Marie Curie (Paris VI).
- 2006 – 2009 **Computer engineering studies**,
SUPINFO - The International Institute of Information Technology, Paris.

Research Interests

I am interested in the constructive content of mathematical reasoning. I mainly work within the framework of reverse mathematics under a computational perspective. My research primarily focuses on the reverse mathematics of combinatorial theorems, and in particular on Ramsey’s theorem and its consequences.

Experiences

- May 2012 – **Intern**, *Laboratoire Preuves, Programmes et Systèmes*, Paris, France.
Aug. 2013 Type theory and reverse mathematics.
- Mar. 2012 – **Intern**, *Laboratoire d’Informatique Algorithmique: Fondements et Applications*, Paris, France.
Aug. 2012 Definability of the Turing jump.
- Oct. 2011 – **Intern**, *ROSAEC Center*, Seoul, South Korea.
Feb. 2012 Verification framework of multi-staged programs. Also between Mar. 2011 and Aug. 2011
- Jun. 2010 – **Intern**, *Institut Fourier*, Grenoble, France.
Aug. 2010 Extensive study of the computational complexity of Eternity II and its variants.
- Aug. 2009 – **Casual labor**, *Institut National de Recherche en Agronomie*, Jouy-en-Josas, France.
Oct. 2009 Development of a web interface favouring search in semantic databases.
- Dec. 2009 – **Intern**, *TIMC-IMAG laboratory*, Grenoble, France.
Jun. 2009 Research and implementation of algorithms to search for partial subgraphs isomorphisms.
- Nov. 2007 – **Computer engineer**, *CLASIS SARL*, Paris, France, Permanent contract.
Jun. 2008 Development of a web application of direct marketing.

Teaching

- Spring 2017 **Teaching**, *Incompleteness and Undecidability*, University of California, Berkeley.
This class covers Gödel's incompleteness theorems, Turing machines, Rice theorem, recursively enumerable sets, among others.
- Fall 2016 **Teaching**, *Introduction to Abstract Algebra*, University of California, Berkeley.
This class covers group theory, commutative rings, ideals, fields, fields extensions, among others.
- Fall 2016 **Teaching**, *Introduction to Analysis*, University of California, Berkeley.
This class covers sequences, limits, continuous functions, uniform convergence, infinite series and the Riemann integral, among others.
- 2014 – 2015 **Lab sessions**, *Internet et Outils IO2*, Université Paris Diderot (Paris VII).
Course taught by Christophe Prieur. This class covers HTML, CSS, PHP and Javascript.
- 2013 – 2014 **Lab sessions**, *Language C*, Université Paris Diderot (Paris VII).
Course taught by Jean-Marie Rifflet. This class covers basic structures, pointers, libraries and related tools.
- 2013 – 2014 **Lab sessions**, *Initiation à la programmation IF1*, Université Paris Diderot (Paris VII).
Course taught by Matthieu Picantin. The aim of this class is to introduce the basics of procedural programming using Java.

Publications

Journal papers

- [DP16] **Coloring trees in reverse mathematics**
Damir Dzhafarov and Ludovic Patey — *Advances in Mathematics*, to appear.
- [Pat16a] **Dominating the Erdős-Moser theorem in reverse mathematics**
Ludovic Patey. — *Annals of Pure and Applied Logic*, to appear.
- [BPS15] **On the logical strengths of partial solutions to mathematical problems**
Laurent Bienvenu, Ludovic Patey and Paul Shafer.
— *Transactions of the London Mathematical Society*, to appear.
- [Pat16b] **The reverse mathematics of non-decreasing subsequences**
Ludovic Patey — *Archive for Mathematical Logic*, to appear.
- [Pat16c] **Partial orders and immunity in reverse mathematics**
Ludovic Patey — *Computability.*, to appear.
- [FP15] **Coloring the rationals in reverse mathematics**
Emanuele Frittaion and Ludovic Patey. — *Computability*, to appear.
- [MP16] **Pi01 encodability and omniscient reductions**
Benoit Monin and Ludovic Patey — *Notre Dame Journal of Formal Logic*, to appear.
- [DLSW] **Ramsey's theorem for singletons and strong computable reducibility**
Damir Dzhafarov, Ludovic Patey, Reed Solomon and Linda Brown Westrick
— *Proceedings of the American Mathematical Society*, 145 (2017), no. 3, 1343–1355.
- [Pat15j] **The weakness of being cohesive, thin or free in reverse mathematics**
Ludovic Patey. — *Israel Journal of Mathematics*, 216 (2016), no. 2, 905–955.
- [BP] **Diagonally non-computable functions and fireworks**
Laurent Bienvenu and Ludovic Patey. — *Information and Computation*, to appear.
- [Pat15b] **Controlling iterated jumps of solutions to combinatorial problems**
Ludovic Patey. — *Computability*, to appear.
- [Pat15i] **The strength of the tree theorem for pairs in reverse mathematics**
Ludovic Patey. — *Journal of Symbolic Logic*, 81 (2016), no. 4, 1481–1499.
- [Pat15k] **Iterative forcing and hyperimmunity in reverse mathematics**
Ludovic Patey. — *Computability*, to appear.
- [Pat15e] **Open questions about Ramsey-type statements in reverse mathematics**
Ludovic Patey. — *Bulletin of Symbolic Logic*, 22 (2016), no. 2, 151–169.
- [Pat15c] **Degrees bounding principles and universal instances in reverse mathematics**
Ludovic Patey. — *Annals of Pure and Applied Logic*, 166 (2015), no. 11, 1165–1185.

[Pat15f] **Ramsey-type graph coloring and diagonal non-computability**
Ludovic Patey. —*Archive for Mathematical Logic*, 54 (2015), no. 7-8, 899–914.

[Pat15h] **The complexity of satisfaction problems in reverse mathematics**
Ludovic Patey. —*Computability*, 4 (2015), no. 1, 69–84.

Conference papers

[Pat16] **Partial Orders and Immunity in Reverse Mathematics**
Ludovic Patey. —*Lecture Notes in Computer Science, Computability in Europe*, 353–363 (2016)

[Pat15d] **Iterative Forcing and Hyperimmunity in Reverse Mathematics**
Ludovic Patey. —*Lecture Notes in Computer Science, Computability in Europe*, 291–301 (2015)

[Pat14] **The Complexity of Satisfaction Problems in Reverse Mathematics**
Ludovic Patey. —*Lecture Notes in Computer Science, Computability in Europe*, 333–342 (2014)

Submitted papers

[PY] **The proof-theoretic strength of Ramsey’s theorem for pairs and two colors**
Ludovic Patey and Keita Yokoyama. —Submitted.

[CIPST] **The Rado path decomposition theorem**
Peter Cholak, Gregory Igusa, Ludovic Patey, Mariya Soskova and Dan Turetsky —Submitted.

Drafts

[Pat15a] **Combinatorial weaknesses of ramseyan principles**
Ludovic Patey. —In preparation.

Awards

2016 **Sacks prize**, *Association for Symbolic Logic*.

2016 **Accessit to the Gilles Kahn thesis prize**, *Société Informatique de France*.

2015 **Best student paper award**, *Computability in Europe*, Bucharest, Romania.
Paper: Iterative forcing and hyperimmunity in reverse mathematics

2014 **Best student paper award**, *Computability in Europe*, Budapest, Hungary.
Paper: The complexity of satisfaction problems in reverse mathematics

Invitations

Invited talks

Sep. 2017 **Plenary speaker**, *Computability Theory and Foundations of Mathematics*, Singapore.

Jul. 2017 **Plenary speaker**, *Computability, Complexity and Randomness*, Mysore, India.

Jun. 2017 **Plenary speaker**, *Computability in Europe*, Turku, Finland.

Mar. 2017 **Special session**, *Southeastern Logic Symposium*, Gainesville, FL, USA.
Talk: The strength of the thin set theorems

Jan. 2017 **Plenary speaker**, *Computability and Complexity Symposium*, Wellington, New-Zealand.
Talk: The reverse mathematics of non-decreasing sequences

Oct. 2016 **Plenary speaker**, *Midwest Computability Seminar, Special Meeting in Honor of Carl Jockusch’s 75th Birthday*, Chicago, IL, USA.
Talk: Coloring trees and rationals in reverse mathematics

Jul. 2016 **Plenary speaker**, *Workshop on Computability Theory*, Ghent, Belgium.
Talk: How randomly rainbows appear!

May. 2016 **Plenary speaker**, *The Foundational Impact of Recursion Theory, in honor of Steve Simpson’s 70th birthday*, Storrs, Connecticut.
Talk: The weakness of Ramsey’s theorem under omniscient reductions

Jun. 2015 **Special session**, *Computability in Europe*, Bucharest, Romania.
Talk: How colorings reduce when colors increase

Jul. 2014 **Plenary speaker**, *Workshop on Computability Theory*, Prague, Czech Republic.
Talk: On universal instances of principles in reverse mathematics

Invited participations

Jan. 2017 **Seminar**, *Computability Theory*, Oberwolfach, Germany.

Sep. 2017 **Conference**, *Aspects of Computation*, Singapore.

Jan. 2016 **Conference**, *New Challenges in Reverse Mathematics*, Singapore, Singapore.

Talk: Ramsey's theorem and compactness

Sep. 2015 **Seminar**, *Measuring the Complexity of Computational Content*, Dagstuhl, Germany.

Talk: Controlling iterated jumps of Ramsey-type theorems

Popular science press

May 2016 **Quanta Magazine**, *Mathematicians Bridge Finite-Infinite Divide*, by Natalie Wolchover.
<https://www.quantamagazine.org/20160524-mathematicians-bridge-finite-infinite-divide/>

Grants

Oct. 2016 **Grant**, *Research in pairs*, with Damir Dzhafarov and Denis Hirschfeldt, Oberwolfach, Germany.
Project: The computational strength of versions of Ramsey's Theorem

International conferences and seminars

Future events

Jan. 2018 **Computability Theory**, *Seminar*, Oberwolfach, Germany.

Sep. 2017 **Computability Theory and Foundations of Mathematics**, *Workshop*, Singapore.

Jul. 2017 **Computability, Complexity and Randomness**, *Conference*, Mysore, India.

Jun. 2017 **Computability in Europe**, *Conference*, Turku, Finland.

Past events

Mar. 2017 **Southeastern Logic Symposium**, *Conference*, Gainesville, FL, USA.

Jan. 2017 **Computability and Complexity Symposium**, *Conference*, Wellington, New-Zealand.

Oct. 2016 **Midwest Computability Seminar, Special Meeting
in Honor of Carl Jockusch's 75th Birthday**, *Seminar*, Chicago, IL, USA.

Jul. 2016 **Workshop on Computability Theory**, *Workshop*, Gand, Belgium.

Jun. 2016 **Computability in Europe**, *Conference*, Paris, France.

Jun. 2016 **Computability, Randomness and Applications**, *Conference*, Marseille, France.

May. 2016 **Annual North American Meeting**, *Conference*, Storrs, Connecticut.

May. 2016 **The Foundational Impact of Recursion Theory,
in honor of Steve Simpson's 70th birthday**, *Workshop*, Storrs, Connecticut.

Jan. 2016 **New Challenges in Reverse Mathematics**, *Conference*, Singapore, Singapore.

Sep. 2015 **Measuring the Complexity of Computational Content**, *Seminar*, Dagstuhl, Germany.

Jun. 2015 **Computability in Europe**, *Conference*, Bucharest, Romania.

Jun. 2015 **Computability, Complexity and Randomness**, *Conference*, Heidelberg, Germany.

Jun. 2015 **Varieties of Algorithmic Information**, *Conference*, Heidelberg, Germany.

Jul. 2014 **Workshop on Computability Theory**, *Workshop*, Prague, Czech Republic.

Jul. 2014 **Computability in Europe**, *Conference*, Budapest, Hungary.

May. 2014 **Types**, *Conference*, Paris, France.

Sep. 2013 **Computability, Complexity and Randomness**, *Conference*, Moscow, Russia.

Jul. 2013 **Logic Colloquium**, *Conference*, Evora, Portugal.

Jul. 2013 **Computability in Europe**, *Conference*, Milan, Italy.

Mar. 2013 **Reverse Mathematics and Type Theory**, *Workshop*, Seoul, South Korea.

Jun. 2012 **Computability in Europe**, *Conference*, Cambridge, United Kingdom.

Service

Referee Archive for Mathematical Logic
Referee Journal of Symbolic Logic
Referee Mathematical Review
Referee Mathematical Structures in Computer Science
Referee Computability in Europe 2014, 2017
Referee Symposium on Theoretical Aspects of Computer Science 2017
Referee Symposium on Logic in Computer Science 2017

Languages

French Mother tongue
English Fluent (110/120 at TOEFL)
German Advanced

Computer Skills

Languages	PHP, Java, Scala, C, C++, Ocaml, C#	Web	HTML5, CSS, Javascript
Platforms	Ubuntu, Windows, Mac OS	DB	MySQL, Oracle, CouchDB
Tools	LaTeX, Git, Subversion, Coq		

Interests and Hobbies

Dance Waltz, tap dancing
Sports Bicycling, Hiking, Running