Bérénice Delcroix-Oger

CIMI Postdoctoral researcher

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▬▬▬ Research interest

My research interests lay on the edge of combinatorics, rewriting theories, algebraic topology and algebra. They are organized in two themes around the notion of operad and combinatorics of tree-like structure and partitions : the study of posets and their combinatorial and topological invariants and the study of generalised bialgebras and structure theorems.

▬▬▬ Positions held

Since September 2015	**CIMI postdoctoral researcher**, *Institut de Mathématiques de Toulouse (IMT)*, Toulouse, France.
From 2012 to 2015	**Allocataire-moniteur normalien**, *Institut Camille Jordan (ICJ)*, Lyon, France.
From 2008 to 2012	**Élève normalienne**, *ENS de Lyon*, Lyon, France.

▬▬▬ Diplomas

2015	**Qualification**, Allows to take part to the competitive examination for academic positions (maître de conférence). Sections 25 (mathematics) and 27 (computer science).
2014	**PhD thesis**, *Université Lyon 1*, Lyon, France. Under the supervision of Frédéric Chapoton, at the Institut Camille Jordan, defended on November 21st 2014. **Titre** : Hypertrees and semi-pointed Partitions : Combinatorial, algebraic and homological aspects.
2011	**Agrégation**, *ENS de Lyon*, Lyon, France.
2011	**Master degree in Mathematics**, *ENS de Lyon & Université Lyon 1*, Lyon, France. with honours.
2009	**Licence (equivalent to Bachelor degree) in Mathematics**, *ENS de Lyon & Université Lyon 1*, Lyon, France.

▬▬▬ Scientific publications and communications

Articles published in an international journal with reading committee

4. **Semi-pointed partition posets and Species**, *J. Algebraic Combin. (2016)*. doi :10.1007/s10801-016-0727-1
3. **Incidence Hopf Algebra of the Hypertree Posets**, *Sém. Loth. de Combin. (2015)*, no.72.
2. **Decorated hypertrees**, *J. Combin. Theory Ser. A 120 (2013)*, no.7, 1871-1905.
1. **Action of the symmetric groups on the homology of the hypertree posets**, *J. Algebraic Combin. 38 (2013)*, no. 4, 915-945.

International conference proceedings, with reading committee

3. **Non-ambiguous trees : new results and generalisation**, *accepted to FPSAC 2016*, joint with J.-C. Aval (LaBRI), A. Boussicault (LaBRI), F. Hivert (LRI) and P. Laborde-Zubieta (LaBRI), 2015. ArXiv :1511.09455.
2. **Semi-pointed partition posets**, *proceedings of FPSAC 2015*, 2015.
1. **PreLie-decorated hypertrees**, *proceedings of FPSAC 2013 in DMTCS*, 2013.

Proceedings of national conference

Hyperarbres décorés et code de Prüfer, 2013. *Forum des jeunes Mathématicien-ne-s.*

Submitted articles and preprints

– **Generalised mixed distributive laws and Hopf-Borel type theorem for operads**, with E. Burgunder (IMT), ArXiv : 1701.01323.
– **An operad is never free as a pre-Lie algebra**, with E. Burgunder (IMT) and D. Manchon (LMBP), ArXiv : 1702.01949.

– **Rigidity theorem, freeness of algebras and applications**, with E. Burgunder.

Articles in preparation

1. **Non-ambiguous trees : New results and generalisation**, joint with J.-C. Aval (LaBRI), A. Boussicault (LaBRI), F. Hivert (LRI) and P. Laborde-Zubieta (LaBRI) *(coming soon)*, 22 pages.
2. **Rigidity theorem for dendriform and tridendriform algebras**, with E. Burgunder (IMT), 35 pages.
3. **An operad is never free as a Pre-Lie algebra**, with E. Burgunder (IMT) and D. Manchon (LMBP, UMR 6620)

Other publications

PhD thesis under the supervision od F. Chapoton, *Institut Camille Jordan*, Lyon, France, 2014.
Title : Hypertrees and semi-pointed Partitions : Combinatorial, algebraic and homological aspects.

Master thesis under the supervision of F. Chapoton,*Institut Camille Jordan*, Lyon, France, 2010.
Title : An analogue of logarithm in the ring of formal series indexed by rooted trees.

Bachelor thesis under the supervision of P. Dehornoy, *Institut Nicolas Oresme*, Caen, France, 2009.
Title : Braids and word reversing.

Talks in international conferences

April 2016	**Talk at SLC 76**, Ottrott, France.
July 2015	**Poster at FPSAC 2015**, Daejeon, South Corea.
July 2014	**Talk at the "Journées Champinatoires" (ANR ACORT)**, *LMR*, Reims, France.
March 2014	**Talk at SLC 72**, *ICJ*, Lyon, France.
January 2014	**Talk at the seminar of the ANR HOGT**, *Laboratoire Paul Painlevé*, Lille, France.
June 2013	**Poster at FPSAC 2013**, Paris, France.
April 2013	**Poster at the Sao Paulo-Lyon meeting**, *ICJ*, Lyon, France.

Talks in national conferences

November 2016	**Talk at GT LAC-Géocal days**, Paris, France.
October 2016	**Talk at ANR CATHRE days**, Fontainebleau, France.
October 2016	**Talk at ANR CARMA days**, Besse, France.
September 2016	**Talk at GT CombAlg days**, *ICJ*, Lyon, France.
June 2016	**Talk at the workshop "Topology and Languages"**, *IMT*, Toulouse, France.
January 2016	**Talk at ANR CATHRE days**, *IMT*, Toulouse, France.
January 2016	**Poster at the GDR IM days**, Villetaneuse, France.
Sept. 2015	**Talk at the GT CombAlg days**, Palaiseau, France.
February 2015	**Talk at the combinatorial days of Bordeaux**, Bordeaux, France.
January 2014	**Talk at GDR IM days**, Paris, France.
November 2013	**Talk at the "Forum des jeunes Mathématicien-ne-s"**, Lyon, France.
Sept. 2013	**Talk at the "Trees and Graphs" meeting**, *LAGA/LIPN*, Paris, France.

Séminaires

Talks at seminars in the following institutes : LAGA, Villetaneuse (april 2016), LIPN, Villetaneuse (march 2016), LaBRI, Bordeaux (october 2015), ICJ, Lyon (april 2015), LMJL, Nantes (april 2015), LPP, Lille (april 2015), IMT, Toulouse (april 2015), TU, Vienne (march 2015), IRMA, Strasbourg (february 2015), KTH, Stockholm (february 2015), LMPA, Calais (december 2014), LITIS, Rouen (december 2014), LIX, Massy-Palaiseau (june 2014), LACIM, Montreal (august 2013), LIAFA, Paris 7 (february 2013)

Invitations

October 2015	**Invitation at LaBRI**, *two weeks*, Bordeaux, France.
March 2015	**Invitation at Vienna University (Universität Wien)**, *Three weeks funded by ICJ and Universität Wien*, Vienna, Austria.
August 2013	**Invitation at LACIM**, *Two weeks funded by LIRCO*, Montreal, Canada.

May 2013 **Stay at LIGM**, *A week funded by GDR IM*, Marne-la-Vallée, France.

Spring 2010 **Master courses**, *Tokyo University*, Tokyo, Japan.

▬▬ Teaching experiences

2016-2017 **Courses, tutorials and practical work in Information theory**, *Université Paul Sabatier*, Toulouse, France.
42 hours. Practical work in Python.

2015-2016 **Courses, tutorials and practical work in MathInfos2**, *Université Paul Sabatier*, Toulouse, France.
26 hours. Practical work in Ada.

Monitorat (teaching responsibilities) 2012-2015 (*192h*) , *UCBL*, Lyon, France.

Major	Level	Module	Tutorial	Practical work	Oral examina
Computer science	1st year	Recursive and functional programming (scheme)	22h	2x28h 27h	
Physic	2nd year	Math 3 (Linear algebras, series PDE)	36h		
Preparatory classes	1st and 2nd year	Algebra and analysis			49h

2011-2012 **Colles (Oral examination) in CPGE (preparatory classes)**, *Lycée du Parc*, Lyon, France.
in PCSI. *2hours/week.*

▬▬ Administrative and pedagogical activities

2015-2016 **Co-supervision of two highschool students for a one week internship**, *IMT*, Toulouse, France.

2015 **Crochet mathematical surfaces**, *ICJ*, Lyon, France.
in collaboration with MMI (Maison des Mathématiques et de l'Informatique)

2013-2014 **Organizer of a conference for PhD students Inter'actions 2014**, *ICJ*, Lyon, France.

2012-2013 **Organizer of the PhD students' seminar**, Lyon, France.

2012-2015 **Scientific popularization with Math@Lyon and at the "fête de la science"**, *ICJ*, Lyon, France.

▬▬ Programming skills

– Daily used : Python, Sage

– Taught : Lisp (Scheme), Ada, Python

– Learnt : Pascal

▬▬ Other contributions

– Contribution to **SAGE** software (with A. Boussicault and P. Laborde-Zubieta, ticket # 19446)

– Hyperbolic crochet for ICJ (Lyon) in link with MMI (Maison des Mathématiques et de l'Informatique, House of Mathematics and Computer science in french).