

Nicolas M. THIÉRY



Born the 28th of May 1973, at Paris XV^e (Age : 37)

French nationality

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Note : not everything below is translated in English ; sorry for the language mixture

— Synthèse

Doctorat info-maths (1999), **habilitation** (2008), qualifié 25^e et 27^e sections, PES

Encadrement de thèses : Nicolas Borie et coencadrement de Tom Denton (2008-2011)

Publications internationales avec comité : journaux : **12** (p. likesubsection6), actes : **7** (p. likesubsection7)

Thématique de recherche : combinatoire algébrique et énumérative (p. ??)

Mots clés : structures combinatoires (monoïdes, permutations, graphes, treillis, ...) combinatoire et représentations des algèbres (de Hopf, de Hecke, de Kac, de Steenrod, ...)

Fondateur, coordinateur et développeur du projet logiciel Sage-Combinat (p. ??)

Points forts : exploration informatique, contacts internationaux, animation d'équipe

Enseignement : 2050 heures en informatique et mathématiques (p. likesubsection13)

— Positions and studies

2004-2012 : **Associate professor with tenure** in mathematics ;

Institut Universitaire de Technologie d'Orsay, département d'informatique ;

Laboratoire de Mathématiques d'Orsay, Université Paris Sud ;

2008 : **Habilitation à diriger des recherches**, defended on December 10-th in Orsay ;

Algèbre combinatoire et effective : des graphes aux algèbres de Kac via l'exploration informatique ;

Reviewers : François Bergeron, Peter Cameron, Bernard Leclerc ;

Jury : Jean-Benoît Bost, Mireille Bousquet-Mélou, Alain Lascoux (président),

Jean-Yves Thibon, Léonid Vainerman, Paul Zimmermann ;

01/2001-08/2004 : **Associate professor with tenure**, Univ. Claude Bernard Lyon I ;

1999 : **PhD thesis of mathematics and computer science**, defended June 15th :

Algebraic Invariants of Graphs and Reconstruction ; a computer aided study ;

Advisor : Maurice Pouzet ; Reviewers : Adriano Garsia, William Kocay ;

Jury : Adrian Bondy, Marc Giusti, Michel Habib, Daniel Kroh ;

1997 : Agrégation de Mathématiques, with rank 135

(French yearly national competition for hiring teachers for high schools and universities).

1996-1999 : Lecturer at the UCBL (France).

1992-1996 : Student at the École Normale Supérieure, Paris (France).

— Mobilité

09/2008-02/2009 : **Researcher** (funded by CNRS),

Institut d'Electronique et d'Informatique Gaspard Monge, Marne-la-vallée ;

2007-2008 and 02/2009-08/2009 : dix-huit mois **Researcher** at the Department of Mathematics of the University of California at Davis (funded by the NSF) ;

2006 : One month at UCSD (San Diego, USA), with A. Garsia ;

2004 : Quatre mois **Senior architect and developer** at the Software Security Department of IDEALX ;

1999-2000 : Seize mois Département de Maths et Informatique, Colorado School of Mines (USA). Adjunct faculty, Colorado School of Mines.

— Synergistic activities

- **Coorganisateur et chercheur résident** du semestre «*Multiple Dirichlet series and related combinatorics*», à l'*Institute for Computational and Experimental Research in Mathematics*, Brown, Rhodes Island, USA, printemps 2013 ;
- Member of the NSF «*Focused Research Group : Affine Schubert Calculus*» 500 k\$, 2007-2010 ; Besides my participation to the research, I play the role of consultant on the algorithmic and computational aspects, and am in charge of the coordination of the software development. In particular, I wrote the related section in the project application file (4 pages out of 23) ;
- Coorganisateur du Groupe d'Utilisateurs de Sage en région parisienne
- Coorganizer of seven ***-Combinat** meetings : June 2004 (Rouen), June (Orsay) and September 2007 (Banff), January (Orsay) and July 2009 (RISC), June 2010 (Orsay), January 2011 (Orsay) ;
- Coorganiser of *Sage Days 20*, March 2010 (CIRM, 110 participants) ;
- Local organizer of the *Workshop on Open Source Computer Algebra* (Lyon, 21-23 mai 2002, 50 participants) ;

— Languages

French : mother tongue, *english* : fluent, *german* : read and written.

— Research supervision

- PhD advisor of Nicolas Borie (2008-2011) ;
- PhD coadvisor of Tom Denton (joint with Anne Schilling, 2008-2011) ;
- Reviewer of one PhD thesis (Rahmany, 2009) ; member of five PhD committees (Flori 2012, Rahmany, Buchwalder, 2009, Descouens, 2007, Molinero 2005) ;
- Examinateur pour les thèses de Xavier Molinero (2005, **Barcelone**), François Descouens (2007, Univ. Marne-la-Vallée), Xavier Buchwalder (2009, Univ. Lyon I), Jean-Pierre Flori (2011, Télécom ParisTech) ;
- Coordination of ***-Combinat** software development (see below), including the training of multiple PhD students : Borie, Boussicault, Denton, Descouens, Molinero, Pon, Pons, Wang, etc.

— Invited speaker

1. *École d'été CIMPA : «Mathématiques discrètes : aspects combinatoires, dynamiques et algorithmiques»*, Bobo-Dioulasso (Burkina Faso), automne 2012 (mini-course) ;
2. *4-th SCIENCE Workshop*, École Polytechnique, Décembre 2011 ;
3. *Congrès SMAI*, Mini-symposium Sage, Guidel May 2011 ;
4. *Sage Days 30*, Acadia University, Canada, May 2011 ;
5. *Affine Schubert Calculus Summer School*, Toronto, Canada, July 2010 (lecturer) ;
6. *Sage Days 20.5*, Fields Institute, Toronto, Canada, May 2010 ;
7. *Sage Days 20*, CIRM, Luminy, France, February 2010 (mini-course) ;
8. *Journée PLUME - Groupe Calcul : «Les alternatives libres aux outils propriétaires de mathématiques»*, Paris, France, February 2010 (opening lecture) ;
9. *Sage Days 15*, Seattle, USA, May 2009 ;
10. *Sage Days 10*, Nancy, France, October 2008, (chair of session on combinatorics) ;
11. *AMS special session on Algebraic Combinatorics*, Claremont, USA, May 2008 ;
12. *Sage Days 7*, Los Angeles, USA, February 2008 ;
13. *AMS Joint Mathematics Meeting, Special Session on Applications of Computer Algebra in Enumerative and Algebraic Combinatorics*, San Diego, USA, January 2008 ;
14. *Axiom Workshop 2007*, RISC, Linz, Austria, June 2007 ;
15. *Axiom Workshop 2006*, RISC, Linz, Austria, April 2006 ;
16. *Modular Invariants and Representations of Finite Groups : Theory and Computation*, Canterbury, UK, September 2003 ;
17. *Workshop on Invariant Theory*, Kingston, Canada, Avril 2002.

— Recent seminars

UC Davis, USA (10/2007, 06/2009) ; MSRI, Berkeley, USA (04/2008) ; Orsay (12/2008) ; LMNO, Caen (01/2009), Tulane, New-Orleans, USA (03/2009) ; INRIA, Rocquencourt ; LIPN, Villetaneuse (11/2009) ; LIAFA, Paris (02/2010) ; LACL, Créteil (06/2010) ; Aix-la-Chapelle (12/2010) ; Orsay (01/2011) ; Rabat, Maroc (02/2011) ; LRI, Orsay (03/2011), Montréal, Canada (04/2011) ; LMNO, Caen (05/2011) ; Bar Ilan University, Israël (05/2011).

Quelques titres récents :

- «*Théorie des représentations effective des monoïdes*»
- «*Algèbres et monoïdes de tris des groupes de Coxeter*»
- «*Développement collaboratif libre d'applications métier ; Étude de cas : Sage pour les Mathématiques*»
- «*Une introduction à Sage et Sage-Combinat*»

– «*Categories for the working mathematical programmer*»
Voir aussi : <http://Nicolas.Thiery.Name/Talks/>.

— Publications —

Note : mes publications sont presque toutes disponibles sur arXiv :

http://arxiv.org/find/all/1/au:+Thiery_N/0/1/0/all/0/1 et référencées sur HAL :

<http://hal.archives-ouvertes.fr/aut/Nicolas+M.+Thi%C3%A9ry/>

International journals

- [1] Tom Denton, Florent Hivert, Anne Schilling, and Nicolas M. Thiéry. On the representation theory of finite J -trivial monoids. *Sém. Lothar. Combin.*, 64 :Art. B64d, 44, 2010/11. 40 pages, arXiv :1010.3455 [math.RT].
- [2] Marie-Claude David and Nicolas M. Thiéry. Exploration of finite dimensional kac algebras and lattices of irreducible intermediate subfactors. *Journal of Algebra and its Applications*, November 2010. Accepted, 94 pages, arXiv :0812.3044 [math.QA].
- [3] Jason Bandlow, Anne Schilling, and Nicolas M. Thiéry. On the uniqueness of promotion operators on tensor products of type a crystals. *Journal of Algebraic Combinatorics*, 31, Mai 2010. arXiv :0806.3131 [math.CO].
- [4] Florent Hivert, Anne Schilling, and Nicolas M. Thiéry. Hecke group algebras as quotients of affine Hecke algebras at level 0. *J. Combin. Theory Ser. A*, 116(4) :844–863, 2009. arXiv :0804.3781v3 [math.RT].
- [5] Florent Hivert and Nicolas M. Thiéry. The Hecke group algebra of a Coxeter group and its representation theory. *J. Algebra*, 321(8) :2230–2258, 2009. arXiv :0711.1561 [math.RT].
- [6] Pierrick Gaudry, Éric Schost, and Nicolas M. Thiéry. Evaluation properties of symmetric polynomials. *Internat. J. Algebra Comput.*, 16(3) :505–523, 2006. <http://hal.inria.fr/inria-00000629>.
- [7] Florent Hivert and Nicolas M. Thiéry. MuPAD-Combinat, an open-source package for research in algebraic combinatorics. *Sém. Lothar. Combin.*, 51 :Art. B51z, 70 pp. (electronic), 2004. <http://igd.univ-lyon1.fr/~slc/wpapers/s51thiery.html>. <http://mupad-combinat.sf.net/>.
- [8] Jean-Christophe Novelli, Jean-Yves Thibon, and Nicolas M. Thiéry. Algèbres de Hopf de graphes. *C. R. Math. Acad. Sci. Paris*, 339(9) :607–610, 2004. doi :10.1016/j.crma.2004.09.012, arXiv :0812.3407v1 [math.CO].
- [9] Nicolas M. Thiéry and Stéphan Thomassé. Convex cones and SAGBI bases of permutation invariants. In *Invariant theory in all characteristics*, volume 35 of *CRM Proc. Lecture Notes*, pages 259–263. Amer. Math. Soc., Providence, RI, 2004. arXiv :0607380 [math.AC].
- [10] Florent Hivert and Nicolas M. Thiéry. Deformation of symmetric functions and the rational Steenrod algebra. In *Invariant theory in all characteristics*, volume 35 of *CRM Proc. Lecture Notes*, pages 91–125. Amer. Math. Soc., Providence, RI, 2004. arXiv :0812.3056v1 [math.CO].
- [11] Maurice Pouzet and Nicolas M. Thiéry. Invariants algébriques de graphes et reconstruction. *C. R. Acad. Sci. Paris Sér. I Math.*, 333(9) :821–826, 2001. arXiv :0812.3079v1 [math.CO].
- [12] Nicolas M. Thiéry. Algebraic invariants of graphs : a study based on computer exploration. *SIGSAM Bulletin (ACM Special Interest Group on Symbolic and Algebraic Manipulation)*, 34(3) :9–20, September 2000. arXiv :0812.3082v1 [math.CO].

International conference with refereed proceedings

- [1] Nicolas Borie and Nicolas M. Thiéry. An evaluation approach to computing invariants rings of permutation groups. In *MEGA 2011*, Mai 2011. 8 pages.
- [2] François Bergeron, Nicolas Borie, and Nicolas M. Thiéry. Deformed diagonal harmonic polynomials for complex reflection groups. *DMTCS Proceedings*, 0(01), 2011. <http://www.dmtcs.org/dmtcs-ojs/index.php/proceedings/article/view/dmA00113>. FPSAC'11, arXiv :1011.3654 [math.CO].
- [3] Florent Hivert, Anne Schilling, and Nicolas M. Thiéry. The biHecke monoid of a finite Coxeter group. *DMTCS proc.*, AN(01) :307–318, 2010. <http://www.dmtcs.org/dmtcs-ojs/index.php/proceedings/article/view/dmAN0116>. arXiv :0912.2212 [math.CO].
- [4] Florent Hivert, Anne Schilling, and Nicolas M. Thiéry. Hecke group algebras as degenerate affine Hecke algebras. In *20th Annual International Conference on Formal Power Series and Algebraic Combinatorics (FPSAC 2008)*, pages 611–624, September 2008. <http://www.dmtcs.org/dmtcs-ojs/index.php/proceedings/article/view/dmAJ0153>.
- [5] Florent Hivert and Nicolas M. Thiéry. Representation theories of some towers of algebras related to the symmetric groups and their Hecke algebras. In *Proceedings of FPSAC'06 San Diego*, 2006. arXiv :0607391v2 [math.RT].
- [6] Maurice Pouzet and Nicolas M. Thiéry. Some relational structures with polynomial growth and their associated algebras. In *Proceedings of FPSAC'05 Taormina*, 2005. arXiv :0601256 [math.CO].
- [7] Nicolas M. Thiéry. Computing minimal generating sets of invariant rings of permutation groups with SAGBI-Gröbner basis. In *Discrete models : combinatorics, computation, and geometry (Paris, 2001)*, Discrete Math. Theor. Comput. Sci. Proc., AA, pages 315–328 (electronic). Maison Inform. Math. Discrèt., Paris, 2001. <http://www.dmtcs.org/pdfpapers/dmAA0123.pdf>.

Submitted

- [1] Nicolas M. Thiéry. Cartan invariant matrices for finite monoids : description and computation using characters. Submitted, 12 pages, December 2011.
- [2] Nicolas Borie and Nicolas M. Thiéry. An evaluation approach to computing invariants rings of permutation groups. Submitted, 18 pages, arXiv :1110.3849v1 [math.CO], October 2011.
- [3] Florent Hivert, Anne Schilling, and Nicolas M. Thiéry. The biHecke monoid of a Coxeter group and its representation theory. Submitted, 57 pages, arXiv :1012.1361 [math.CO], December 2010.

PhD and Habilitation thesis, book chapters

- [1] Alexandre Casamayou, Nathann Cohen, Guillaume Connan, Thierry Dumont, Laurent Fousse, François Maltey, Matthias Meulien, Marc Mezzarobba, Clément Pernet, Nicolas M. Thiéry, and Paul Zimmermann. *Calcul Mathématique avec Sage*. 2011. <http://sagebook.gforge.inria.fr/>. 415 pages.
- [2] Nicolas M. Thiéry. Algèbre Combinatoire et Effective; des graphes aux algèbres de Kac *via* l'exploration informatique. Mémoire d'Habilitation à Diriger des Re-

cherches, December 2008. Laboratoire de Mathématiques d'Orsay, Université Paris Sud, arXiv :0912.2619v1 [math.CO].

- [3] Nicolas M. Thiéry. *Invariants algébriques de graphes et reconstruction; une étude expérimentale*. PhD thesis, Université Lyon I, June 1999. <http://nicolas.thiery.name/Preprints/Thiery.IAGR/Thiery.IAGR.pdf>. 300 pages, N° d'ordre : 167-99.

Communications

- [1] Nicolas M. Thiéry. Sage-combinat, free and practical software for algebraic combinatorics. Software demonstration, FPSAC'09, Hagenberg, Austria, 2009. <http://wiki.sagemath.org/combinat?action=AttachFile&do=get&target=2009-07-20-FPSAC.pdf>.
- [2] Conrado Martínez, Xavier Molinero, and Nicolas M. Thiéry. Generació ordenada de classes d'estructures combinatòries (ordered generation of combinatorial structures). In *In Jornada de Recerca EPSEM 2006*, pages 83–84. EPSEM (Technical College of Manresa <<http://www.eupm.upc.es/>>), Remsa S.L. Manresa, April 2006. <http://www.epsem.upc.edu/recerca/jornada-de-recerca-epsem-20-d-abril-de-2006/DossierJornadadeRecerca.pdf>. ISBN : 84-86784-05-0. ISBN : 978-84-86784-05-8.
- [3] Nicolas M. Thiéry. PerMuVAR, a library for computing in invariant rings of permutation groups. Software demonstration, MEGA 2000, Bath, UK, 2000. <http://permuvar.sourceforge.net/>.
- [4] Nicolas M. Thiéry. Algebraic invariants of graphs; an experimental study. Poster, ISSAC'99, Vancouver, CANADA, 1999. **Awarded best poster prize.**

— **Teaching experience (\approx 2050 hours since 1996)** —————

Informatique

- L1** : C++ (TP, 20h, 2003, Filière Ingénieur 2000, Université de Marne-la-Vallée),
TA of Computer Science (Turbo-Pascal), first year of DEUG (32h, 1996),
- L2** : *Programmation Objet en Java* (Cours, TD, TP, 4×50h),
Algo et Langage C++ (TD, TP), Instructor of two 3-credit hours courses : MACS 261c :
"Programing concepts, in C++". Recitations of discrete maths, (32h + 20h, 1998-
1999).
- L3** : *Optimisation discrète* (TD, 2×27h),
- M1** : *Operational research*, M1 Maths et Ingénierie Mathématique (Course and recita-
tions, 3×80h)
- M2** : **Montage et responsabilité** de la thématique informatique du DESS Statistiques,
Informatique et Techniques Numériques :
Programmation Java et outils de développement, Systèmes et réseaux informatiques,
Remise à niveau informatique fondamentale (Cours, TD, TP, 3×90h).
- Intervenant chez Orsys** : *Linux, Mise en Œuvre* (3×4 jours, 2005-2006).
- Sage Days** : *Python, Sage, Programmation objet, Génie logiciel, Tests, Systèmes de*
gestion de version (CVS, Subversion, Mercurial) (30h).

Mathématiques

- L1** : *Mathématiques générales* (Amphi, TP, TD, 3×100h),
Calcul formel pour les Mathématiques (Amphi, TP, 10h),
TA of Mathematics, algebra and combinatorics (Calculus II) (100h, 1996-1998).
- L2** : *Algèbre, statistiques, graphes, codage* (Cours, TD, 3×130h, 2004-2007),
Recherche Opérationnelle (Cours, TD, 30h, 1999),
Instructor of two 3-credit hours courses : MACS 261c : "Programing concepts, in
C++" and MACS 368 : "Algebraic structures and discrete math".
- L3** : Introduction to Maple, first year of the ENS Lyon (16h, 1996),
- M1** : **Montage et responsabilité** de l'option *Algèbre et Calcul Formel* de la prépara-
tion à l'agrégation d'Orsay (2×50h, 2005-2007);

Doctorat : Informal graduate courses in combinatorics (20h);

Divers

- *Projet Professionnel Personnalisé*;
- Encadrement de sept projets tutorés, L1, IUT d'Orsay;
- Encadrement de quatre TER (Orsay, Lyon);

Références