

Curriculum Vitae et Studiorum

ALESSANDRO CONFLITTI

Personal

Date of birth: May 13, 1975
Place of birth: Roma, Italy
Citizenship: Italian.



Address

CMUC
Centre for Mathematics
University of Coimbra
Apartado 3008,
3001-454 Coimbra,
Portugal.

Phone: ++351 - 239 791 169
Fax: ++351 - 239 793 069
E-mail: conflitt@mat.uc.pt
<http://www.mat.uc.pt/~conflitt/>

Education

- 1994: High School Diploma in Ragioneria (Accounting) with top marks.
- 2000: Laurea degree (equivalent to Master) in Mathematics at Università degli Studi “Roma Tre”, magna cum laude (full marks and honour). Final dissertation: ‘Some results in the theory of Finite Fields’, supervisors: Prof. Francesco Pappalardi (Roma Tre) and Prof. Igor E. Shparlinski (Macquarie University, Sydney).
- 2004: Dottorato di Ricerca (equivalent to Ph. D.) in Mathematics at Università degli Studi di Roma “Tor Vergata”. Final dissertation: ‘Enumeration on Coxeter systems by associated reflections’, advisor Prof. Francesco Brenti.
- November 20, 2006: TOEFL iBT (Internet Based Test); final score: 103, equivalent to 257 for TOEFL CBT (Computer based Test) and to 613 for TOEFL PBT (Paper Based Test).

Professional Experience

- September 1, 2004–August 31, 2005: Post Doc at Fakultät für Mathematik, Universität Wien, Austria, supported by European Research Training Net-

work “Algebraic Combinatorics in Europe”, grant
HPRN-CT-2001-00272.

- September 1, 2005–August 31, 2006: Post Doc at Fakultät für Mathematik, Universität Wien, Austria, supported by FWF Austrian Science Fund grant P17563-N13.
- September 1, 2006–2009: Post Doc at CMUC, Centre for Mathematics, University of Coimbra, Portugal.
- Present: faculty research fellow at CMUC, Centre for Mathematics, University of Coimbra, Portugal.

Visiting Appointments

- 1999: visitor for 10 weeks of Prof. Igor E. Shparlinski at Department of Computing, Macquarie University, Sydney, Australia.
- Since September 2, 2001 until December 2, 2001, visitor of Prof. Igor E. Shparlinski at Department of Computing, Macquarie University, Sydney, Australia.
- Since April 7, 2005 until April 30, 2005, visitor of Institut Mittag-Leffler, The Royal Swedish Academy of Sciences, Djursholm, Sweden, during the program “Algebraic Combinatorics”.

Scholarships and Grants

- 1994–1999: Roma Tre Scholarship of partial exemption from fees for special merits.
- 1995: IDISU scholarship.
- 1998: ADISU scholarship.
- November 1, 2000–October 31, 2004: Ph. D. Grant by Italian Research and University Ministry.
- 2003: Israeli Travel and Lodging Grant by The Institute for Advanced Studies, The Hebrew University of Jerusalem, Israel.
- 2005: Travel and Lodging Grant by the Institute of Applied and Computational Mathematics of the Foundation for Research and Technology–Hellas and Department of Mathematics of the University of Crete.
- 2006: Travel and Lodging Grant by University of Liège, Belgium, and European Commission, contract MSCF-CT-2005-029473.
- 2007: Lodging Grant by Centre de Recerca Matemàtica, Bellaterra, Barcelona, Spain.
- 2007: Boarding and Lodging Grant by Mathematisches Forschungsinstitut Oberwolfach, Germany.

Publications and Preprints

1. A. Conflitti, 'On Elements of High Order in Finite Fields', in *Cryptography and Computational Number Theory*, Progress in Computer Science and Applied Logic vol. 20, Birkhauser, Basel 2001, 11–14. MR1944714 (2003i:11181). Available online at <http://ur1.ca/5iwol>
2. W. D. Banks, A. Conflitti and I. E. Shparlinski, 'Character Sums over Integers with Restricted g -ary Digits', *Illinois J. Math.* **46** (2002), 819–836. MR1951242 (2003k:11133). Available online at <http://projecteuclid.org/euclid.ijm/1258130986>
3. A. Conflitti, 'On Computation of the Greatest Common Divisor of Several Polynomials Over a Finite Field', *Finite Fields Appl.* **9** (2003), 423–431. MR2007461 (2004h:11102). Available online at [http://dx.doi.org/10.1016/S1071-5797\(03\)00022-4](http://dx.doi.org/10.1016/S1071-5797(03)00022-4)
4. W. D. Banks, A. Conflitti, J. B. Friedlander and I. E. Shparlinski, 'Exponential Sums over Mersenne Numbers', *Compositio Math.* **140** (2004), 15–30. MR2004121 (2004j:11091). Available online at http://journals.cambridge.org/abstract_S0010437X03000022
5. W. D. Banks, A. Conflitti and I. E. Shparlinski, 'Number Theoretic Designs for Directed Regular Graphs of Small Diameter', *SIAM J. Discrete Math.* **17** (2004), 377–383. MR2050680 (2005e:05064). Available online at <http://dx.doi.org/10.1137/S0895480101396676>
6. A. Conflitti and I. E. Shparlinski, 'On the Multidimensional Distribution of the Subset Sum Generator of Pseudorandom Numbers', *Math. Comp.* **73** (2004), 1005–1011. MR2031421 (2005d:11112). Available online at <http://dx.doi.org/10.1090/S0025-5718-03-01563-1>
7. A. Conflitti, 'Zeros of Real Symmetric Polynomials', *Appl. Math. E-Notes* **6** (2006), 219–224. MR2231747 (2007c:12001). Available online at <http://www.math.nthu.edu.tw/~amen/2006/051014-3.pdf>
8. A. Conflitti, 'The size of Bruhat intervals between nested involutions in S_n ', *Adv. in Appl. Math.* **39** (2007), 76–85. MR2319564 (2008d:05162). Available online at <http://dx.doi.org/10.1016/j.aam.2006.03.003>
9. A. Conflitti, 'Enumeration by associated reflections on Coxeter systems', *J. Algebra* **320** (2008), 1083–1098. MR2427630 (2009e:05320). Available online at <http://dx.doi.org/10.1016/j.jalgebra.2008.04.005>
10. A. Conflitti, 'Boolean Algebras and Spectrum', *Carpathian J. Math.* **24** (2008), no. 2, 20–25. MR2484400 (2009j:05247). Available online at http://carpathian.ubm.ro/issues/Carpathian_2008_24_No_2_20_25.pdf
11. A. Conflitti, 'On Whitney Numbers of the Order Ideals of Generalized Fences', *Discrete Math.* **309** (2009), 615–621. MR2502171 (2010g:05019). Available online at <http://dx.doi.org/10.1016/j.disc.2007.12.077>

12. A. Conflitti, ‘Enumerating S_n by associated Transpositions and Linear Extensions of Finite Posets’, *Discrete Math.* **309** (2009), 2020–2041. MR2510329 (2010j:05421). Available online at <http://dx.doi.org/10.1016/j.disc.2008.04.014>
13. O. Azenhas, A. Conflitti and R. Mamede, ‘Linear time equivalence of Littlewood–Richardson coefficient symmetry maps’, *Discrete Math. Theor. Comput. Sci. Proceedings*, 21st International Conference on Formal Power Series and Algebraic Combinatorics (FPSAC 2009), (2009), 127–144. MR2721507 (2011m:68200). Available online at <http://www.dmtcs.org/dmtcs-ojs/index.php/proceedings/article/view/dmAK0111>
14. A. Conflitti, ‘On the Rank Polynomial and Whitney Numbers of Order Ideals of a Garland’, *Ars Combin.* **95** (2010), 321–331. MR2656271 (2011d:06004).
15. A. Conflitti and M. J. Schlosser, ‘Noncommutative hypergeometric and basic hypergeometric equations’, *J. Nonlinear Math. Phys.* **17** (2010), 429–443. MR2771184. Available online at <http://dx.doi.org/10.1142/S1402925110000982>
16. O. Azenhas, A. Conflitti and R. Mamede, ‘Números (coeficientes) de Littlewood–Richardson e simetrias’, *Bol. Soc. Port. Mat.* Número Especial, Actas do Encontro Nacional da SPM, Leiria 2010, 5–14. MR2839739.
17. A. Conflitti and R. Mamede, ‘Bijeções entre partições que não cruzam e partições que não encaixam’, *Bol. Soc. Port. Mat.* Número Especial, Actas do Encontro Nacional da SPM, Leiria 2010, 20–27. MR2839741.
18. A. Conflitti and R. Mamede, ‘On Noncrossing and Nonnesting Partitions of Type D ’, *Ann. Comb.* **15** (2011), 637–654. Available online at <http://dx.doi.org/10.1007/s00026-011-0114-5>
19. A. Conflitti, C. M. da Fonseca and R. Mamede, ‘The maximal length of a chain in the Bruhat order for a class of binary matrices’, *Linear Algebra Appl.* **436** (2012), 753–757. Available online at <http://dx.doi.org/10.1016/j.laa.2011.07.043>
20. A. Conflitti, C. M. da Fonseca and R. Mamede, ‘On the largest size of an antichain in the Bruhat order for $\mathcal{A}(2k, k)$ ’, *Order* (to appear). Available online at <http://dx.doi.org/10.1007/s11083-011-9241-1>
21. O. Azenhas, A. Conflitti and R. Mamede, ‘On an index two subgroup of puzzle and Littlewood–Richardson tableau $\mathbb{Z}_2 \times \mathbb{S}_3$ -symmetries’, *CMUC preprint* **09–51** (2009), available at <http://www.mat.uc.pt/preprints/2009.html>
22. O. Azenhas, A. Conflitti and R. Mamede, ‘(Multiplicity-free) Skew Schur functions with interval support’, *submitted preprint* (2011), available at <http://front.math.ucdavis.edu/1009.4170>

Refereeing and Organizing Activities

- Referee for *The 5th International Workshop on Practice and Theory in Public Key Cryptography, PKC 2002*, which took place at Maison de la Chimie, Paris, France, 12–14 February 2002. Proceedings published in *Public Key Cryptography*, Lecture Notes in Computer Science 2274, Springer–Verlag, Berlin 2002, editors: D. Naccache and P. Paillier.
- Referee for the following journals:
 - *Analele Științifice ale Universității “Ovidius” Constanța. Seria Matematică*,
 - *Annals of Combinatorics*,
 - *Applied Mathematics and Computation*,
 - *Applied Mathematics E-Notes*,
 - *Ars Combinatoria*,
 - *Discrete Mathematics*,
 - *Discrete Applied Mathematics*,
 - *European Journal of Combinatorics*,
 - *Involve. A Journal of Mathematics*,
 - *Journal of Algebraic Combinatorics*,
 - *Journal of Automata, Languages and Combinatorics*,
 - *Journal of Combinatorial Theory. Series A*,
 - *Journal of Mathematical Cryptology*,
 - *Monatshefte für Mathematik*,
 - *Revista Colombiana de Matemáticas*,
 - *Rocky Mountain Journal of Mathematics*,
 - *Séminaire Lotharingien de Combinatoire*,
 - *Theoretical Informatics and Applications*.
- Reviewer for *Mathematical Reviews (MR)*.
- Member of the Organizing Committee for *Coimbra Meeting on 0–1 Matrix Theory and Related Topics*, which will be held on June 17–19, 2010, at Department of Mathematics, University of Coimbra, Portugal, web page <http://www.mat.uc.pt/~cmf/01MatrixTheory>
- Member for the year 2012 of the *Combinatorial Mathematics Society of Australasia (CMSA)*.

Talks and Seminars

- “Some results in the theory of finite fields”, Oberseminar Algorithmische Mathematik, Paderborn University, Germany, July 5, 2000.

- “Combinatorics of symmetric and finite Coxeter groups”, 52nd Séminaire Lotharingien de Combinatoire, Domaine Saint Jacques, Ottrott, France, March 29, 2004.
- “On the multidimensional discrepancy of the knapsack generator of pseudorandom numbers”, Technische Universität Graz, Austria, January 13, 2006.
- “Enumeration of Bruhat intervals between nested involutions in S_n ”, poster, 18th International Conference on ‘Formal Power Series & Algebraic Combinatorics’ (FPSAC), June 19–23, 2006, San Diego, California, USA.
- “Enumeration on finite Coxeter systems through associated reflections”, Dipartimento di Matematica, Università degli Studi di Genova, Italy, December 15, 2006.
- “Whitney Numbers of Order Ideals of Fences, Crowns and Garlands”, XIII Incontro Italiano di Combinatoria Algebrica, Rome, Italy, December 20, 2006.
- “Enumerating Bruhat intervals between nested involutions in S_n ”, CELC, Centro de Estruturas Lineares e Combinatórias, Universidade de Lisboa, Portugal, March 19, 2007.
- “Enumeration on finite Coxeter systems by means of associated reflections”, Middle East Technical University, Ankara, Turkey, June 19, 2007.
- “Noncommutative hypergeometric and basic hypergeometric differential equations”, Summer School on Algebra and Combinatorics, Lisbon, Portugal, June 26, 2007.
- “Noncommutative hypergeometric and basic hypergeometric differential equations”, 21st British Combinatorial Conference, University of Reading, U.K., July 11, 2007.
- “Some algorithms over finite fields”, CAUL, Centro de Álgebra da Universidade de Lisboa, Portugal, October 8, 2007.
- “Bruhat graph of the symmetric group and size of special intervals”, CAUL, Centro de Álgebra da Universidade de Lisboa, Portugal, October 11, 2007.
- “Highly generalized Eulerian calculus on Coxeter systems”, Mathematics Department, Tulane University, New Orleans, USA, January 24, 2008.
- “Massive Eulerian Calculus on Coxeter Systems”, Mini-Workshop Diskrete Mathematik, Institut für Algebra, Zahlentheorie und Diskrete Mathematik, Leibniz Universität Hannover, Germany, February 13, 2008.
- “Noncommutative hypergeometric and basic hypergeometric differential equations over an abstract unital Banach algebra”, 60th Séminaire Lotharingien de Combinatoire, Strobl, Austria, March 31, 2008.
- “Whitney Numbers of Order Ideals of Generalized Fences, Crowns and Garlands”, Joint Meeting of the 61st British Mathematical Colloquium and the 22nd Annual Meeting of the Irish Mathematical Society, Galway, Ireland, April 8, 2009.

- “Bijections between noncrossing and nonnesting partitions of classical Weyl groups”, CELC, Centro de Estruturas Lineares e Combinatórias, Universidade de Lisboa, Portugal, March 1, 2010. Talk given in Portuguese.
- “Noncrossing and nonnesting partitions for all classical Weyl groups and associated bijections”, Universidade de Aveiro, Portugal, April 22, 2010. Talk given in Portuguese.
- “Noncommutative differential equations for hypergeometric and basic hypergeometric functions over abstract Banach algebras”, Department of Mathematics, University of Crete, Greece, January 17, 2011.
- “Chains and antichains in the Bruhat order for a class of binary matrices”, The 35th Australasian Conference on Combinatorial Mathematics & Combinatorial Computing, Monash University, Melbourne, Australia, December 8, 2011.
- “Poset structure and enumerative results for a class of binary matrices equipped with a generalization of the Bruhat order”, Centro de Matemática da Universidade do Porto, Portugal, January 19, 2012.

Furthermore I gave different talks and seminars at the following Universities:

- Arbeitsgemeinschaft Diskrete Mathematik, Institute for Discrete Mathematics and Geometry, Technische Universität Wien (Vienna University of Technology), on Fall 2004, Winter 2005 and Fall 2005,
- Analytische Zahlentheorie Forschung Gruppe (Number Theory Research Group), Universität für Bodenkultur (BOKU Universität) Wien, on Spring 2005,
- Fakultät für Mathematik der Universität Wien, on Spring 2005,
- CMUC, Centre for Mathematics, University of Coimbra (Portugal), on Fall 2006, Winter 2007, Fall 2007, Spring 2009, Spring 2010 and Spring 2011.
- Dipartimento di Matematica, Università degli Studi di Roma “Tor Vergata”, Italy, on Spring 2010.

Teaching Experience

Since 1996 until 2001 I was teaching assistant for Algebra, Geometry and Analysis courses for Bachelor degree in Mathematics at Università degli Studi “Roma Tre”.

More specifically my experiences in classrooms were the following:

- Academic year 1996/1997: 48 hours (4 hours per week, 12 weeks) of recitation for *Algebra* course, second semester freshman, main professor Florida Girolami.
- Academic year 1997/1998: 48 hours (4 hours per week, 12 weeks) of recitation for *Algebra* course, second semester freshman, main professor Florida Girolami.

- Academic year 1998/1999: 30 hours (3 hours per week, 10 weeks) of recitation for *Geometry* course, first semester freshman, main professor Giulio Campanella.
- Academic year 1998/1999: 30 hours (3 hours per week, 10 weeks) of recitation for *Introductory Number Theory* course, second semester sophomore, main professor Marco Fontana.
- Academic year 1999/2000: 30 hours (3 hours per week, 10 weeks) of recitation for *Introductory Number Theory* course, first semester sophomore, main professor Marco Fontana.
- Academic year 1999/2000: 30 hours (3 hours per week, 10 weeks) of recitation for *Analysis II* course, second semester sophomore, main professor Ugo Bessi.
- Academic year 2000/2001: 30 hours (3 hours per week, 10 weeks) of recitation for *Introductory Number Theory* course, first semester sophomore, main professor Marco Fontana.

Since October 2000 until January 2001 I was a teacher of Mathematics and Physics at Scientific High School “Primo Levi”, Roma, Italy. High School in Italy is a five years program: I taught in three classes, at third, fourth and fifth year.

During my stay at Università degli Studi di Roma “Tor Vergata” as Ph.D. student in Mathematics, I gave recitation in some Bachelor and Master degree courses given by my Advisor Prof. Francesco Brenti.

On March 2004 I gave one lecture on *Cassels’ Theorem* for the workshop on *Catalan’s Conjecture*, which took place at INDAM (Istituto Nazionale di Alta Matematica), Università degli Studi di Roma “La Sapienza”. This workshop was made of 10 lectures, each one given by a different speaker, and it was valid as Ph. D. course for students of all of three Universities in Rome.

The main organizer was Prof. René Schoof.

Web page of the workshop:

<http://www.mat.uniroma2.it/~schoof/catacorso.html>

One monographic lesson (2 hours) about *Algorithm over Finite Fields* for the *Analytic Number theory* course, Sommersemester (Spring–Summer term) 2005, Fakultät für Mathematik der Universität Wien, Austria, main professor Johannes Schoissengeier.

One monographic lesson entitled *Finite fields and cryptography in a nutshell* given at Mathematics Department, Tulane University, New Orleans, USA, on January 23, 2008.

Since April 2010, faculty member of the Ph. D. program in Mathematics jointly organized by the Department of Mathematics of the University of Coimbra and the Department of Pure Mathematics of the University of Porto, Portugal, and I can officially be a Ph. D. advisor. During Spring 2011 I gave one monographic lesson about Coxeter systems.

Others Professional Activities

In the academic year 1997–1998 I worked for the Mathematics Department of Università degli Studi “Roma Tre” in the Advanced Computer Laboratory and

I managed the web site of the Department.

Since March 2001 until December 2004 I have been the web master of the ‘Ph. D. in Mathematics at Università degli Studi di Roma “Tor Vergata”’ web site.

Meetings, Workshops and Schools

- **45th Annual Meeting of The Australian Mathematical Society**, September 22–26, 2001, Australian National University, Canberra.
- **49th Séminaire Lotharingien de Combinatoire**, October 20–23, 2002, Haus Schönenberg, Ellwangen, Germany.
- *Midrasha Mathematicae* Spring School **Combinatorics, Topology and Convexity: Their Meeting Points**, April 27–May 5, 2003, The Institute for Advanced Studies, The Hebrew University of Jerusalem, Israel.
- Summer School **Enumerative Combinatorics**, June 30–July 10, 2003, Linköping University, Sweden.
- **52nd Séminaire Lotharingien de Combinatoire and LascouxFest**, March 28–31, 2004, Domaine Saint Jacques, Ottrott, France.
- **International conference Trends in Geometry in memory of Beniamino Segre**, June 7–9, 2004, Roma, Italy.
- Summer School **Combinatorics of Groups and Algebras**, July 5–16, 2004, CIRM (Centre International de Rencontres Mathématiques), Luminy, France.
- **53rd Séminaire Lotharingien de Combinatoire**, October 10–13, 2004, Haus Schönenberg, Ellwangen, Germany.
- **54th Séminaire Lotharingien de Combinatoire and ViennotFest**, April 3–6, 2005, Lucelle, France.
- Spring School **Enumerative Combinatorics**, June 1–4, 2005, Netzeband, Germany.
- 17th Annual International Conference on **Formal Power Series and Algebraic Combinatorics (FPSAC)**, June 20–25, 2005, Taormina, Italy.
- Summer School **Geometric Combinatorics**, July 18–29, 2005, Vienna, Austria.
- Euroconference on **Algebraic and Geometric Combinatorics**, August 20–26, 2005, Anogia, Crete, Greece.
- **55th Séminaire Lotharingien de Combinatoire**, joint session with **XII Incontro Italiano di Combinatoria Algebrica**, September 26–28, 2005, Bertinoro, Italy.
- **CANT 2006: International school and conference on Combinatorics, Automata and Number Theory**, May 8–19, 2006, University of Liège, Belgium.

- *18th International Conference on Formal Power Series & Algebraic Combinatorics (FPSAC)*, June 19–23, 2006, San Diego, California, USA.
- **XIII Incontro Italiano di Combinatoria Algebrica**, December 18–20, 2006, Istituto Matematico “G. Castelnuovo”, Università di Roma La Sapienza, Roma, Italy.
- *Advanced Course on Analytic and Probabilistic Techniques in Combinatorics*, January 15–26, 2007, Centre de Recerca Matemàtica, Bellaterra, Barcelona, Spain.
- **Summer School on Algebra and Combinatorics**, June 25–29, 2007, Lisbon, Portugal.
- **21st British Combinatorial Conference**, July 8–13, 2007, University of Reading, U.K.
- *Oberwolfach–Seminar: Enumerative Combinatorics and Integrable Models of Statistical Mechanics*, November 18–24, 2007, Mathematisches Forschungsinstitut Oberwolfach, Germany.
- **60th Séminaire Lotharingien de Combinatoire**, March 30–April 2, 2008, Strobl, Austria.
- **61st Séminaire Lotharingien de Combinatoire**, September 21–25, 2008, Curia, Portugal.
- **Joint Meeting of the 61st British Mathematical Colloquium and the 22nd Annual Meeting of the Irish Mathematical Society**, April 6–9, 2009, Galway, Ireland.
- *21st International Conference on Formal Power Series & Algebraic Combinatorics (FPSAC)*, July 20–24, 2009, Hagenberg, Austria.
- **Three Short Courses on Combinatorics and Representation Theory**, February 1–5, 2010, Coimbra, Portugal.
- **64th Séminaire Lotharingien de Combinatoire**, March 28–31, 2010, Lyon, France.
- **Directions in Matrix Theory 2011**, July 9–10, 2011, Coimbra, Portugal.
- **The 35th Australasian Conference on Combinatorial Mathematics & Combinatorial Computing**, December 5–9, 2011, Monash University, Melbourne, Australia.

Research Interests

- **Number Theory**
 - Finite Fields (*MSC*: 11T06, 11T30)
 - Computational Number Theory (*MSC*: 11Y16, 68Q25)
 - Exponential Sums and Character Sums (*MSC*: 11L07, 11L40)

- **Enumerative and Algebraic Combinatorics**

- Enumerative Combinatorics of Posets (*MSC*: 05A15, 06A07)
- Combinatorics of Coxeter Groups (*MSC*: 05E15, 20F55)

Computer Skills

Professional knowledge and experience in

Programming languages: Pascal, Ansi C, HTML, Cobol, DB III Plus, SQL+

Operating systems: DOS, Win 3.x/95/98/NT 4.0/XP, Unix (Digital and Sun workstations), Linux Red Hat and Fedora, MacOS 9

Symbolic computations packages and computer algebra systems: Pari/GP, Maple

Typesetting systems: L^AT_EX 2_ε.

Languages

ITALIAN: mother tongue.

ENGLISH: fluent. TOEFL iBT taken on November 20, 2006; final score: 103, equivalent to 257 for TOEFL CBT (Computer based Test) and to 613 for TOEFL PBT (Paper Based Test).

PORTUGUESE: very good.

GERMAN: intermediate level. Completed Grundstufe Deutsch at *DeutschAkademie*, Wien, Austria, equivalent to a level in between A2 and B1 in Common European Framework of Reference for Languages.

FRENCH: reading.

Other

Italian driving licence, category B, not endorsed, valid in any European Union country.

Blood donor.

References

Available upon request.