Curriculum Vitae

Enrico Carlini

Personal Data

- Date of birth: June 19, 1974.
- Nationality: Italian
- Address:

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Monash University
1 Wellington rd, 3800 Monash University
Victoria

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- Web : http://users.monash.edu/~cenrico

Personal Data

- February 2004 PhD in Mathematics and Scientific Computing, University of Pavia, Italy.

Thesis: “Geometric aspects of some polynomial decompositions”.
Advisors: K. Ranestad (University of Oslo, Norway) and M. Cornalba (University of Pavia, Italy).

- 1999–2003, Doctoral School in Mathematics and Scientific Computing. University of Pavia, Italy
- 1999 Laurea in Matematica, University Of Genoa, Italy.

Thesis: “Hilbert Functions and points in P^n”, mark 110/110 cum laude.
Advisors: A.V. Geramita (Queen's University, Kingston, Canada) and. L. Robbiano (University of Genoa, Italy).

- 1994–1998, Undergraduate degree in Mathematics. University of Genoa, Italy.

Education

- February 2004 PhD in Mathematics and Scientific Computing, University of Pavia, Italy.
  Thesis: “Geometric aspects of some polynomial decompositions”.
  Advisors: K. Ranestad (University of Oslo, Norway) and M. Cornalba (University of Pavia, Italy).
- 1999-2003, Doctoral School in Mathematics and Scientific Computing. University of Pavia, Italy.
- 1999 Laurea in Matematica, University Of Genoa, Italy.
  Thesis: “Hilbert Functions and points in P^n”, mark 110/110 cum laude.
  Advisors: A.V. Geramita (Queen's University, Kingston, Canada) and. L. Robbiano (University of Genoa, Italy).
- 1994-1998, Undergraduate degree in Mathematics. University of Genoa, Italy.

Employment

- 2013 (August)–present: Senior Lecturer, School of Mathematical Sciences, Monash Univesrity.
- 2007 (October)–2013 (August): Assistant Professor, Department of Mathematics, Politecnico di Torino (Turin, Italy).
- 2004–2007 (September): Postdoctoral Fellow, Department of Mathematics, Politecnico di Torino (Turin, Italy).

Study Abroad

- 2001–2003, Universitet i Oslo (Oslo, Norway), Matematisk Institutt. Supervisor: K. Ranestad. Two years.

- 2001, Queen's University (Kingston, Ontario), Department of Mathematics and Statistics. Supervisor: J. Chipalkatti. One month.
- 1998, Queen's University (Kingston, Ontario), Department of Mathematics and Statistics. Supervisor: A. V. Geramita. One month.

Grants and funding

- Regular funding by INDAM (Istituto Nazionale di Alta Matematica, national institute for higher mathematics) to attend meetings and to support long stay visits: 2012(Regina-Saskatchewan), 2011(Lincoln-Nebraska, New Orleans-Louisiana, Coimbra-Portugal), 2010 (St. Petersburg-Russia, Lexington-Kentucky), 2009 (Kingston-Ontario), 2008 (San Diego-California, Chicago-Illinois), 2007 (Minneapolis-Minnesota).
- 2011,2009,2008, “Giovani ricercatori” research grant of the Politecnico di Torino awarded to the best 50 young researchers in the Politecnico. Amount: 3000 euros.
- 2007,2006, member of PRIN (national research program) “Spazi di Moduli e Teoria di Lie”. Amount: 100000 euros.
- 2005-2004, member of PRIN (national research program) “Spazi di Moduli e Teoria di Lie”. Amount: 182000 euros.

Visiting Positions

- 2009 (September-December), Department of Mathematics and Statistics, Queen's University, Kingston, Ontario,
- 2008 (September-December), Department of Mathematics and Statistics, Queen's University, Kingston, Ontario.
- 2007,(January-February) IMA (Institute for Mathematics and its Applications, University of Minnesota, Minneapolis, Minnesota) visitor for the thematic year “Algebraic Geometry and its applications”.
- 2006 (May), Universitet i Oslo (Oslo, Norway), Matematisk Institutt.

Scholarships and Honors

- 2006, IMA general membership (Institute for Mathematics and its Applications, University of Minnesota, Minneapolis, Minnesota).
- 2004(September)-2007(October), Postdoctoral Scholarship, Department of Mathematics Politecnico di Torino.
- 2001-2002, Marie Curie Scholarship, O.M.A.T.S.(Oslo Mathematics Training Site) Programme.
- 2000, S.A.F.I. award (Advanced School of Education). University of Pavia.
- 1999-2003, Doctoral Scholarship. University of Pavia.

Teaching Experience

- 2013 Fall Semester: Monash University. Lecturer MTH3110 (Differential Geometry) and MTH1030 (Techniques for modelling).
- 2013 Spring Semester: Politecnico di Torino.Iinstructor for the course: Geometry, a first year course on linear algebra and analytic geometry taught in Enghlish.
- 2012, Politecnico di Torino. Spring Semester, instructor for the course: Geometry, a first year course on linear algebra and analytic geometry taught in Enghlish.
- 2011, Politecnico di Torino. Fall semester, instructor for the exercise sections of the course: Analisi, a first year calculus course.
- 2010 Politecnico di Torino. Instructor for the exercise sections of the course: Geometria (linear algebra, analytic geometry, multivariate calculus). This course was aimed at students both on and off campus. The classes were recordered and delivered using a tablet pc.

- 2009, 2008, 2007, 2006 Politecnico di Torino. Teacher of the course: Geometria (I was completely responsible for one section of this multi-section first year course. The course covered linear algebra and analytic geometry.)
- 2005, 2004 (spring semester) Politecnico di Torino. Teaching Assistant for the course : Geometria 1. My duties included: preparing exercises for the students, tutoring students on these. The course covered linear algebra and analytic geometry.
- 2005, 2004 (fall semesters) University of Genoa. Faculty of Engineering. Teaching Assistant for the course: Geometria e Analisi. My duties included: preparing exercises for the students and tutoring students on these. The course covered linear algebra, analytic geometry and first year calculus.
- 2001, University of Pavia, Faculty of Engineering. Teaching Assistant for the course: Geometria (My duties included: preparing exercises for the students, tutoring students with these exercises. The course covered linear algebra and analytic geometry).

Teaching Evaluations

This data is collected at the end of the course by handing to the students two forms. One form contains suggestions directed to the teacher and is collected by the instructor. The other form is sent to the central administration which will take care of elaborating the data. Both forms are anonymous. No data available for 2011 as I was not the main instructor.

- 2012

Is the course well organized? 96,2% YES
Are the lessons and the practical sessions useful? 98% YES
Were you interested in the subject during the course? 83% YES
Are you satisfied of the course? 93% YES

- 2010

Is the course well organized? 96,2% YES
Are the lessons and the practical sessions useful? 77,3% YES
Were you interested in the subject during the course? 89,4% YES
Are you satisfied of the course? 89,3% YES

- 2009

Is the course well organized? 90% YES
Are the lessons and the practical sessions useful? 77,1% YES
Were you interested in the subject during the course? 88,4% YES
Are you satisfied of the course? 88,4% YES

- Teaching index: 3.54/4 Professor Index: 3.71/4

Students supervised

- 2012, Enrico Nablone, Bachelor Degree, Politecnico di Torino. Title:”Riduzione del numero di variabili in un polinomio (Reducing the number of variables in a polynomial)”.
- 2012, Alessandro Oneto, Master Theses, University of Genoa. Title:”On the defectiveness of projective varieties”.
- 2009, Silvio Valente, Theses for the second degree in Engineering (3+2 years). Title:”Analisi e sviluppo di metodologie per la gestione di nuvole di punti per applicazioni maxillo-facciali” (Analysis and development of methods to treat clouds of points in applications to maxillofacial surgery).

Advanced Teaching (teaching to highly qualified personnel)

- 2012, University of Regina, Workshop “Connections between Algebra and Geometry”, Teacher for the course: Secant Varieties. Four hours of lectures.
- 2009, Universitat Politècnica de Catalunya. International School on Computer Algebra: COCOA 2009, (Responsible for one of the two tutorial sessions).

- 2009 Politecnico di Torino. PhD course: Polynomial Models: from data to equations, from equations to solutions, held by L. Robbiano. (Responsible for the practice sessions. I also advised the students with their projects, which are part of the course requirement.)
- 2005, University of Turin. Teacher for the Short-Course on Computational Algebra for undergraduates (I was responsible for organizing a self–contained course on Groebner bases).

Research and Publications

Research interests: Algebraic Geometry, Commutative and Computational Algebra, Projective Geometry and Algebraic Statistics.

Papers in refereed journals

1. E. Carlini, M.V. Catalisano, A.V. Geramita, *The solution to the Waring problem for monomials and the sum of coprime monomials*, J Algebra 370 (2012) 5–14.

2. E. Carlini, M.V. Catalisano, A.V. Geramita, *Subspace arrangements, configurations of linear spaces and the quadrics containing them*, J Algebra 362 (2012) 70–83.

3. C. Bocci, E. Carlini, F. Rapallo, *Perturbation of matrices and non-negative rank with a view toward statistical models,* SIAM J Matrix Anal Appl 32 (2011) 1500–1512.

4. E. Carlini, M.V. Catalisano, A.V. Geramita, *3-dimensional sundials*, Cent Eur J Math 9 (2011) 5 949–971.

5. M. Boji, E. Carlini, A.V. Geramita, *Monomials as sums of powers: the Real binary case* Proc Amer Math Soc 139 (2011) 3039–3043.

6. A. Bernardi, E. Carlini, M.V. Catalisano, *Higher secant varieties of P^n x P^m embedded in bi-degree (1,d)*, J Pure Appl.Alg 215 (2011) 2853–2858.

7. E. Carlini, A. van Tuyl, *Star configuration points and plane curves* Proc Amer Math Soc 139 (2011) 12. 4181–4192.

8. E. Carlini, J. Kleppe, *Ranks derived from multilinear maps*, J Pure Appl Alg 215 (2011) 8 1999–2004 .

9. E. Carlini, F. Rapallo, *Probability matrices, non-negative rank, and parameterization of mixture models,* Linear Algebra Appl 433 (2010) 2 424–432.

10. E. Carlini, L. Chiantini, A. V. Geramita, *Complete intersection points on general surfaces in P^3*, Michigan Math J 59 (2010) 2 269–281.

11. E. Carlini, M. V. Catalisano, A. V. Geramita, *Bipolynomial Hilbert functions*, J of Algebra, 324 (2010) 4 758–781.

12. E. Carlini, F. Rapallo, *A class of statistical models to weaken independence in two-way contingency tables*, Metrika, 73 (2011) 1 1–22.

13. E. Carlini, M. V. Catalisano, *On rational normal curves in projective space*, J London Math Soc ,(2) 80 (2009) 1 1–17.

14. E. Carlini, L. Chiantini, A. V. Geramita, *Complete intersections on generic hypersurfaces in P^n*, Michigan Math J 57(2008) 121–136.

15. E. Carlini, G. Pistone, *Hilbert Bases for Orthogonal Arrays,* J. Stat. Theory Pract. 1 (2007) 3–4 299–309.

16. E. Carlini, M.V. Catalisano, *Existence results for rational normal curves*, J London Math Soc (2) 76 (2007) 1 76–86.

17. E. Carlini, *Binary decompositions and Variety of Sums of Binaries*, J Pure Appl Alg 204 (2006) 2 380–388.

18. E. Ballico, C. Bocci, E. Carlini, C. Fontanari, *Osculating spaces to secant varieties*, Rend. Circ. Mat. Palermo (2) 53 (2004) 3 429–436.

19. E. Carlini, J.V.Chipalkatti, *On Waring's problem for several algebraic forms*, Comment. Math. Helv. 78 (2003) 3 494–517.

20. E. Carlini, *Varieties of Simultaneous Sums of Powers for binary forms*, Le Matematiche 57 (2002) 1 83–97.

21. E. Carlini, T. Ha, A. van Tuyl, *Computing the spreading and covering numbers* Comm. Algebra 29 (2001) 12 5687–5699.

Book chapters

1. C. Bocci, E. Carlini, F. Rapallo, *Geometry of diagonal-effect models for contingency tables.* Algebraic methods in statistics and probability II, 61–73, Contemp. Math., 516, Amer. Math. Soc. Providence, RI, 2010.

2. E. Carlini, F. Rapallo, *Algebraic category distinguishability*, Algebraic and Geometric Methods in Statistics,111–122, Cambridge Univ. Press, Cambridge, 2010.

3. E. Carlini,*Reducing the number of variables of a polynomial*, Algebraic Geometry and Geometric Modelling, 237–247, Math. Vis., Springer, Berlin, 2006.

Papers in refereed conference proceedings

1. E. Carlini,*Codimension one decompositions and Chow Varieties*, Projective Varieties with Unexpected Properties, 67–79, editors C. Ciliberto, B. Harbourne, R. Mirò-Roig, K. Ranestad, A. Geramita, Walter de Gruyter GmbH & Co. KG, Berlin, 2005.

2. E. Carlini, F. Rapallo,*The Geometry of Statistical Models for Two-Way Contingency Tables with Fixed Odds Ratios*, Computational Algebra for Algebraic Geometry and Statistics, Rend. Ist. Mat. Univ. Trieste 37 (2005) 71–84.

Papers submitted for publication

1. E. Carlini, N. Grieve, L. Oeding, *Four lectures on secant varieties,* (2013).

2. E. Carlini, M. V. Catalisano, A. V. Geramita, *On the Hilbert functions og generic lines union one fat point*, (2013).

3. E. Carlini, E. Guardo, A. van Tuyl, *Plane curves containing a star configuration.* (2013)

4. E. Carlini, E. Guardo, A. van Tuyl, *Star configurations on generic hypersurfaces. (*2012)

Theses

1. E. Carlini, *Geometric aspects of some polynomial decompositions*, PhDThesis, University of Pavia (2004).

2. E. Carlini, *Hilbert Functions and points in P^n,* Tesi di laurea, University of Genoa (1999).

Didactic Publications

1. E. Carlini, 50 multiple choices in Geometry, CELID, Torino 2012.

2. E. Carlini, *50 quiz di geometria,*CELID, Torino, 2011.

3. E.Carlini, M. V. Catalisano, F. Odetti, A. Oneto, M. E. Serpico, GEOMETRIA PER INGEGNERIA - Raccolta di temi d'esame risolti, Esculapio, Bologna, 2008.

4. I wrote the text and exercises for the Mathematics and the Statistics sections of the undergraduate book series “Personal training io e ...Architettura-Urbanistica/Economia/Ingegneria-Informatica/Medicina e chirurgia/Psicologia”, edited by Sansoni in 2001, ISBN 88-383-(1897-2)/(1874-3)/(1875-1)/(1877-8)/(1876-X).

Invited Talks

- 2013, November 28–29, **31st Victorian Algebra Conference,** University of Melbourne. Title: “Waring problem: algebra and geometry in action”.
- 2013, September 30 –October 3, **57th annual meeting of the Australian mathematical society**, University of Sydney. Title for the algebra session:” Waring problems: an algebraic point of view”. Title for the differential geometry session: “Waring problems: a geometric point of view”.
- 2012, June 2, **CMS summer meeting**, University of Regina, Regina (Saskatewan). Invited speaker for the special session “Connections between Algebra and Geometry”. Title: “Waring rank: special cases”.
- 2011, October 14-16, **2011 Fall Central Section Meeting**, University of Nebraska Lincoln, Lincoln (Nebraska). Invited speaker for the special session “Algebraic Geometry and Graded Commutative Algebra”. Title: “The solution to the Waring's problem for monomial”.
- 2011, July 9-10, **Directions in Matrix Theory 2011**, University of Coimbra, Coimbra (Portugal). Invited speaker. Title: “Perturbation of matrices and the non-negative rank”.
- 2010, November 5-7, **AMS Fall Central Section Meeting**, University of Notre Dame, South Bend (Indiana). Invited speaker for the special session “Hilbert Functions in Commutative Algebra and Algebraic Combinatorics”. Title: “Star configuration points and hypersurfaces.”.
- 2010, June 19-24, **International Algebraic Conference,** Steklov Mathematics Institute, St. Petersburg (Russia). Title: “Hilbert functions and configuration of linear spaces”.
- 2010, March 27-28, **AMS Sectional Meeting at Lexington**, University of Lexington, Lexington (Kentucky). Invited Speaker for two special sessions. Special Session on Advances in Algebraic Statistics. Title: “Parameterization of mixture of independence models”. Special Session on Combinatorial Algebra. Title: “Bipolynomial Hilbert functions”.
- 2010, February 18-19, **Workshop After Carnival: An Algebraic Geometry Party at Turin,** University of Turin,Turin (Italy). Title: “Star configurations”.
- 2009, March, **G.T.M. Seminar Genoa, Torino, Milano Seminar: a Day on Commutative Algebra and Algebraic Geometry,** University of Genoa, Genoa (Italy). Title: “Configurations of linear spaces”.
- 2008, December 6-8, **CMS (Canadian Mathematical Society) Winter meeting,** Ottawa (Ontario). Title: “On Hilbert function for subspace arrangements”.
- 2008, October 18, **The 18th Route 81 annual conference**, Queen's University, Kingston (Ontario). Title: “Hilbert functions of subspace arrangements ”.
- 2008, April 11-13, **Algebraic Geometry and Commutative Algebra** (A conference to celebrate Robin Hartshorne's 70th birthday) University of Illinois at Chicago, Chicago (Ilinois). Title: “Intersection problems for rational normal curves”.
- 2008, January 6-9, **AMS Special Session on Secant Varieties and Related Topics,** San Diego (California). Title: “Rational normal curves in projective space”.
- 2007, April 11-13, **Linear systems and subschemes,** University of Ghent, Ghent (Belgium). Title: “On rational normal curves in projective space”.
- 2006, June 1-3, **Zero-dimensional Schemes and Applications,** Anacapri (Italy). Title: “Risultati di esistenza per curve razionali normali”.
- 2005, September 19– 25, **School (and workshop) on Cremona Transformations**, Politecnico di Torino, Turin (Italy). Title: “The Generalized Castelnuovo Theorem and special linear systems”.

- 2004, September 22-23. “**Waringshop**”**,** University of Ferrara, Ferrara (Italy).Title: “Scomposizioni in codimensione uno e Varietà di Chow”.
- 2004, September 27-29. **Workshop: Geometric Modelling and Algebraic Geometry,** University of Nice Sophia Antipolis, Nice (France). Title:“Polynomial Decompositions”.
- 2004, June 8-12. **Projective Varieties with unexpected geometric properties,** University of Siena, Siena (Italy). Title:“Varieties of Binary Forms”.
- 2003, September 15-20. **Workshop “Polynomial Interpolation and Projective Embeddings”**, Politecnico di Torino, Turin (Italy). Title: “Binary decompositions of forms in three variables and linear systems of surfaces in P^3”.
- 2003, February 13-14 . **Workshop: “Zero Dimensional Schemes”**, Politecnico di Torino, Turin (Italy). Title: “Decomposizione binaria di polinomi”.
- 2002, June 6-8. **Conference “Zero Dimensional Schemes and Related Topics”.** University of Catania, Catania (Italy). Title: “Varieties of Simultaneous Sums of Powers for Binary Forms”.

Invited Departmental Seminars

- 2012, University of Oslo. Seminar talk:”Waring rank of monomials”.
- 2011, University of Nebraska Lincoln, Lincoln (Nebraska). Seminar talk: “Perturbation of matrices and the non-negative rank”.
- 2010, University of Notre Dame, South Bend (Indiana). Seminar talk, title:”Star configuration points and plane curves ”. Colloquim talk, title:”Decomposition of polynomials and geometry”. University of Catania, Catania (Italy). Title: “Star configuration nel piano”. University of Kentucky, Lexington (Kentucky). Title:”Star configuration points”.
- 2009, Lakehead University, Thunderbay (Ontario). Title:“Polynomial decompositions and geometry”.
- 2008, MacMaster University, Hamilton (Ontario). Title:“Rational normal curves: from the twisted cubic curve on”.
- 2007, Universidad Complutense de Madrid, Madrid (Spain). Titles: “Complete intersection on generic hypersurfaces in P^n”, “On rational normal curves in projective space”.
- 2006, University of Florence, Florence (Italy). Title: “Varieta' delle secanti”.
- 2005, Politecnico di Torino, Torino (Italy). Seminars on Computational Algebra and its application to Algebraic Geometry and to Algebraic Statistic.
- 2004, University of Genoa, Pavia, Roma Tor Vergata, Roma Tre and Trieste, Politecnico di Milano and Politecnico di Torino (Italy). Title: “Decomposizioni Polinomiali e Varietà delle Secanti”.
- 2002, University of Oslo, Oslo (Norway). Seminars on VSSP (Varieties of Sums of Powers) and Binary Decompositions.

Other Professional Activities

- I co–organized: the 36th Autumn School in Algebraic Geometry, Power sum decompositions and apolarity, a geometric approach, September 1st-7th, 2013, Łukęcin, Poland. This has been a very successful event aimed to disseminate our research topics among PhD students and Postdoctoral fellows.
- F.Vaccarino and I are the organizers of the Algebraic Geometry seminar at the Politecnico di Torino (web page: http://calvino.polito.it/~geosem/).

- From 2008 to 2012 I have been a member of the Managing Committee of the journal “Rendiconti del seminario matematico, Universita' e Politecnico di Torino”. My duties include: scientific revision of the first draft of submitted manuscripts, and participating to the Committee meetings as secretary.
- Local organizer for the ESF-exploratory workshop “Multivariate Interpolation - Its Relation To Algebraic Statistics, Classical Algebraic Geometry And Computational Complexity Theory” (16-19 October 2007) held in Sestri Levante, Genoa, Italy.
- Referee for: Foundations of Computational Mathematics (2011),London Mathematical Society (2010), Journal of Pure and Applied Algebra(2007,2009); Plos ONE (2009); MEGA Conference proceedings (2009).
- Reviewer for AMS Mathematical Reviews (more than 20 reviews).
- 2000-2002, organizer of the junior seminar TO.P.M.A.G (Torino Pavia e Milano Algebra e Geometria).

Other Activities

- Since 2007 I have been an amateur euphoniumnc player.

Referees

1. Professor Bernd Sturmfels
   Professor of Mathematics Statistics and Computer Science
   925 Evans Hall
   Dept. of Mathematics University of California Berkeley
   CA 94720

   bernd@math.berkeley.edu

2. Professor Simon Salamon
   Professor in Geometry
   Department of Mathematics
   King's College London

   simon.salamon@kcl.ac.uk
3. Professor Juan C. Migliore
   Professor in Mathematics
   Department of Mathematics
   Room 236, Hayes-Healy Building
   University of Notre Dame
   Notre Dame, Indiana 46556-5641

   migliore.1@nd.edu