Davide Bolognini
CURRICULUM VITAE

Professional Positions

Sept 2021-present	**Assegno di Ricerca**, Dipartimento di Ingegneria Industriale e Scienze Matematiche, Universitá Politecnica delle Marche (Italy), with Prof. Mario Marietti
Research interests	Algebraic Combinatorics.
Dec 2019-Dec 2020	**Assegno di Ricerca INDAM**, Dipartimento di Matematica, Alma Mater Studiorum, Università di Bologna (Italy), with Prof. Luca Moci
Research interests	Algebraic Combinatorics.
March 2019-Nov 2019	**Assegno di Ricerca**, Dipartimento di Matematica, Alma Mater Studiorum, Università di Bologna (Italy), with Prof. Luca Moci
Research interests	Algebraic Combinatorics.
Oct 2018-Dec 2018	**SNF Postdoc**, Département de Mathématiques, Université de Fribourg (Switzerland), with Prof. Emanuele Delucchi
Research interests	Algebraic Combinatorics.
Sept 2017-Sept 2018	**Swiss Government Excellence Postdoctoral Scholarship**, Département de Mathématiques, Université de Fribourg (Switzerland), with Prof. Emanuele Delucchi
Research interests	Group actions on combinatorial structures, hyperplane and toric arrangements.
Spring 2017	**INDAM Research Grant**, Department of Mathematics, Osnabrück (Germany), with Prof. Martina Juhnke-Kubitzke and Prof. Tim Römer
Research interests	Algebraic Combinatorics.
Summer 2016	**Contratto di collaborazione autonoma per attivitá di studio e ricerca**, Università degli Studi di Genova (Italy)
Research interests	Algebraic and Topological Combinatorics.
2015	**Visiting**, supported by Fondazione CARIGE, Department of Mathematics and Computer Science of Philipps-Universität Marburg (Germany), with Prof. Volkmar Welker
Research interests	Poset topology, characteristic-dependence of powers ideals, binomial edge ideals.

Education

2012-2014	**PhD in Mathematics** (23 February 2015), Università degli Studi di Genova (Italy), *Betti splitting of monomial ideals and simplicial complexes*, advisors Prof. Maria Evelina Rossi, Prof. Leila De Floriani, Prof. Emanuela De Negri
Research interests	Algebraic Combinatorics, properties of simplicial complexes, minimal graded free resolutions, Discrete Morse Theory.
2011	**Research period**, with the supervision of Prof. Anthony Vito Geramita, Università degli Studi di Genova (Italy)
Research interests	Representation theory and plethysm problems with applications to Algebraic Geometry: schemes, secant varieties, resolution of defining ideals of Grassmannians.
2008−2010	**Master Degree in Mathematics**, Università degli Studi di Genova (Italy), final grade 110/110 cum laude, *Intersezioni complete insiemistiche in spazi affini e proiettivi* (*Set-theoretic complete intersections in affine and projective spaces*), advisor Prof. Giuseppe Valla.
2004−2007	**Bachelor Degree in Mathematics**, Università degli Studi di Genova (Italy), final grade 110/110, *Alcuni test di primalità, il problema della fattorizzazione nei numeri interi e crittografia* (*Some primality tests, the factorization problem on integers and cryptography*), advisor Prof. Maria Evelina Rossi.

Publications and Preprints

1. *Linear extensions and shelling orders*, (with Paolo Sentinelli), preprint.

2. *Cohen-Macaulay binomial edge of small graphs*, (with Antonio Macchia, Giancarlo Rinaldo, Francesco Strazzanti), preprint.

3. *Immanant varieties*, (with Paolo Sentinelli), preprint; arXiv:2211.11634.

4. *Powers of monomial ideals with characteristic-dependent Betti numbers*, (with Antonio Macchia, Francesco Strazzanti, Volkmar Welker), **Research in Mathematical Sciences**, Vol. 9(2), no. 26 (2022), arXiv:2201.00571.

5. *Cohen-Macaulay binomial edge ideals and accessible graphs*, (with Antonio Macchia, Francesco Strazzanti), **Journal of Algebraic Combinatorics**, Vol. 55 (2022), arXiv:2101.03619.

6. *P-flag spaces and incidence stratifications*, (with Paolo Sentinelli), **Selecta Mathematica**, Vol 27, no. 72 (2021); arXiv:1907.09047.

7. *Non-chordal complexes whose clique complex has shellable Alexander dual*, (with Bruno Benedetti), **Journal of Combinatorial Theory, Series A**, Vol. 180 (2021); arXiv:1910.06755.

8. *Betti splitting from a topological point of view*, (with Ulderico Fugacci), **Journal of Algebra and Its Applications**, Vol. 19, n. 6 (2020); arXiv:1704.01105.

9. *Binomial edge ideals of bipartite graphs*, (with Antonio Macchia, Francesco Strazzanti), **European Journal of Combinatorics**, Vol. 70, pp. 1-25 (2018); arXiv:1704.00152.

10. *The poset of proper divisibility*, (with Antonio Macchia, Emanuele Ventura, Volkmar Welker), **SIAM Journal on Discrete Mathematics**, Vol. 31 (3), pp. 2093-2109 (2017); arXiv:1511.04558.

11. *Recursive Betti numbers for Cohen-Macaulay d-partite clutters arising from posets*, **Journal of Pure and Applied Algebra**, Vol 220, pp. 3102-3118 (2016); arXiv:1411.5629v2.

12. *Betti splitting via componentwise linear ideals*, **Journal of Algebra**, Vol. 455, pp. 1-13 (2016); arXiv:1410.6511v2.

13. *Cohomological dimension and arithmetical rank of some determinantal ideals*, (with Alessio Caminata, Antonio Macchia, Maral Mostafazadehfard), **Le Matematiche**, Vol. 70, Fasc. 1, pp. 273-300 (2015); arXiv:1503.06184.

Teaching

2009 - 2014	**Teaching tutor** for the Courses of Analysis, Algebra and Linear Algebra at Dipartimento di Matematica, Università degli Studi di Genova (Italy).
Academic Year 2017-2018	**Assistant** for the course of Algebra und Geometrie I/II in University of Fribourg, covering topics on Commutative Algebra and Topology.
Fall 2018	**Assistant** for the course of Measure Theory in University of Fribourg.
Academic Year 2021-2022	**Professore a Contratto** di Algebra Lineare e Geometria per il Corso di Ingegneria Informatica e dell'Automazione presso l'Universitá Politecnica delle Marche (Ancona, Italia).
Academic Year 2022-2023	**Professore a Contratto** di Algebra Lineare e Geometria per il Corso di Ingegneria Informatica e dell'Automazione presso l'Universitá Politecnica delle Marche (Ancona, Italia).

Projects, Prizes and other scientific activities

2023	**Abilitazione scientifica nazionale a professore universitario di II fascia**-Settore concorsuale 01/A2 (ALGEBRA E GEOMETRIA)
2022	**Premio per Giovani Ricercatori 2022/Area Matematica**, DIISM-UNIVPM (Ancona)
2013-2016	**Member of PRIN 2010** "Geometria delle Varietá Algebriche" (Responsabile Scientifico: Aldo Conca)
May 2013-May 2015	**Member of the project** "Algebra Commutativa e applicazioni", finanziato dalla Fondazione CARIGE (Responsabile Scientifico: Emanuela De Negri)
9-13 Feb. 2015	**Local Organizer** of the HTCA School *Homology: Theoretical and Computational Aspects*, held in Genova (Italy), sponsored by University of Genova, Gruppo Italiano Ricercatori in Pattern Recognition and Fondazione Carige.

since 2016   **Referee** for Journal of Algebraic Combinatorics, Journal of Algebra and Its Applications, Journal of Combinatorial Theory (Series A), European Journal of Combinatorics, Research in Mathematical Sciences, Hokkaido Mathematical Journal.

Workshops, Schools, Conferences (selection)

Dec, 2019	Speaker in the **EINSTEIN Workshop**, FU Berlin (Germany)
Feb 19-23, 2018	Speaker in the School **Geometry, Algebra and Combinatorics of Moduli Spaces and Configurations II**, Toblach (Italy)
Oct 22-24, 2015	Speaker in the Workshop **Incontro di Algebra Commutativa**, Genova (Italy)
Oct 07-10, 2015	Participant in the Workshop **Combinatorial and Experimental Methods in Commutative Algebra and related fields**, Osnabrück (Germany)
Sep 08-12, 2014	Participant in the INdAM Conference **Mocca 2014, Meeting On Combinatorial Commutative Algebra**, Levico Terme (Italy)
Jun 23 - Jul 11, 2014	Participant in the **PRAGMATIC 2014, Local cohomology and syzygies of affine algebras**, Università di Catania (Italy)
Sep 09-13, 2013	Participant in the INdAM Conference **Combinatorial Methods in Topology and Algebra**, Palazzone of Cortona (Italy)
Jun 24-28, 2013	Participant in the **EACA's Second International School on Computer Algebra and Applications**, Valladolid (Spain)
Jul 18 - Aug 01, 2012	Participant in the summer school **Discrete Morse Theory and Commutative Algebra**, *Institut Mittag-Leffler*, Djursholm, Stockholm (Sweden)

Given Talks (selection)

January, 2023	Algebra/Geometry Seminar in DIMA, Unige, Genova (Italy). *Powers of monomial ideals with characteristic-dependent Betti numbers*
February, 2022	Algebra/Geometry Seminar in Unimore, Reggio Emilia (Italy). *Towards a proof of Simon's conjecture*
November, 2021	Algebra/Geometry Seminar in Politecnico di Milano, Milano (Italy). *Towards a proof of Simon's conjecture*
September, 2020	Algebra/Geometry Seminar in Dipartimento di Matematica, Bologna (Italy). *Simon's conjecture and chordality*
February 2020	Algebra/Geometry Seminar, Università degli Studi di Genova (Italy) *Simon's conjecture and chordality*
December 2, 2019	EINSTEIN Workshop, FU Berlin (Germany) *Simon's conjecture and chordality*
May 5, 2019	Discrete Geometry Seminar, FU Berlin (Germany) *Betti splitting from a topological point of view*
March 5, 2019	Algebra/Geometry Seminar, Bologna (Italy) *An Introduction to Algebraic Combinatorics*
December 19, 2018	Intercity Seminar, Bern (Switzerland) *Simon's conjecture and chordality*
February 22, 2018	Geometry, Algebra and Combinatorics of Moduli Spaces and Configurations II, Toblach (Italy) *Binomial edge ideals of bipartite graphs*
December 15, 2017	Intercity Seminar, Neuchatel (Switzerland) *Binomial edge ideals of bipartite graphs*
April 4, 2017	Algebra Seminar, Institüt Mathematik, Osnabrück (Germany) *Binomial edge ideals of bipartite graphs*
June 9, 2016	Algebra Seminar, Institüt Mathematik, Osnabrück (Germany) *Betti splitting of monomial ideals and simplicial complexes*
April 7, 2016	Combinatorics Seminar, Department of Mathematics, University of Fribourg (Switzerland) *Betti splitting of monomial ideals and simplicial complexes*
April 6, 2016	Seminar, Department of Mathematics, University of Neuchâtel (Switzerland) *Betti splitting of monomial ideals and simplicial complexes*
October 23, 2015	Incontro di Algebra Commutativa, Università degli Studi di Genova (Italy) *The poset of proper divisibility*

June 15, 2015	Discrete Math Seminar, Department of Mathematics, Philipps-Universität Marburg (Germany)
	On Betti splittings and related topics
October 20, 2014	GTM Seminar: Topics in Comm. Algebra and Algebraic Geometry, Politecnico di Torino (Italy)
	Betti splitting of componentwise linear ideals
June 23, 2013	Seminario di Algebra, Dipartimento di Matematica, Università degli Studi di Genova (Italy)
	Computational homology: an algebraic approach

Languages

Italian: Native. **English**: Advanced (C1). **German**: Beginner (A1).