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<https://sites.google.com/site/davidebologninimath/>

About me: My research is at the crossroad between Commutative Algebra and Combinatorics. In particular, I focus on the strong connection between discrete combinatorial structures (simplicial complexes, posets, graphs, clutters...) and algebro-geometric objects (homogeneous ideals and varieties defined by them).

## ● WORK EXPERIENCE

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01/12/2019 – 30/11/2020 – Bologna, Italy  
**ASSEGNO DI RICERCA INDAM**

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01/03/2019 – 30/11/2019 – Bologna, Italy  
**ASSEGNO DI RICERCA**

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Dipartimento di Matematica, Alma Mater Studiorum, Università di Bologna (Italy),  
with Prof. Luca Moci  
working on Flag varieties, Matroid Theory and binomial edge ideals.

01/10/2018 – 31/12/2018 – Fribourg, Switzerland  
**SNF POSTDOC**

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01/09/2017 – 01/09/2018 – Fribourg, Switzerland  
**SWISS GOVERNMENT EXCELLENCE POSTDOCTORAL SCHOLARSHIP**

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Département de Mathématiques, Université de Fribourg (Switzerland),  
with Prof. Emanuele Delucchi,  
working on Matroid Theory, Group actions on combinatorial structures, hyperplane and toric arrangements.

2017 – Osnabrueck, Germany  
**ASSEGNO DI RICERCA INDAM**

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Department of Mathematics, Osnabrueck (Germany),  
with Prof. Martina Juhnke-Kubitzke and Prof. Tim Roemer,  
working on topics of Commutative Algebra

2016 – Genova, Italy  
**CONTRATTO DI COLLABORAZIONE AUTONOMA PER ATTIVITÀ DI STUDIO E DI RICERCA**

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2015 – Marburg, Germany  
**VISITING**

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Department of Mathematics and Computer Science of Philipps-Universität Marburg (Germany),  
with Prof. Volkmar Welker,  
working on Poset topology, characteristic-dependence of powers ideals, binomial edge ideals.

## ● EDUCATION AND TRAINING

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2012 – 2014  
**PH.D. IN MATHEMATICS AND APPLICATIONS** – Dipartimento di Matematica, Università degli Studi di Genova (Prof. M.E. Rossi, Prof. E. De Negri)

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2011  
**RESEARCH PERIOD** – Dipartimento di Matematica, Università degli Studi di Genova (Prof. A.V. Geramita)

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2008 – 2010

**LAUREA MAGISTRALE IN MATEMATICA** – Dipartimento di Matematica, Università degli Studi di Genova (Prof. G. Valla)

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2004 – 2007

**LAUREA TRIENNALE IN MATEMATICA** – Dipartimento di Matematica, Università degli Studi di Genova (Prof. M.E. Rossi)

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## ● **LANGUAGE SKILLS**

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**Mother tongue(s):** ITALIAN

**Other language(s):**

|                | UNDERSTANDING |         | SPEAKING          |                    | WRITING |
|----------------|---------------|---------|-------------------|--------------------|---------|
|                | Listening     | Reading | Spoken production | Spoken interaction |         |
| <b>ENGLISH</b> | B2            | C1      | C1                | C1                 | C1      |
| <b>GERMAN</b>  | A1            | A2      | A1                | A1                 | A1      |

Levels: A1 and A2: Basic user; B1 and B2: Independent user; C1 and C2: Proficient user

## ● **PUBLICATIONS**

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### **Cohen-Macaulay binomial edge ideals and accessible graphs**

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with A. Macchia, F. Strazzanti, preprint available on arXiv  
<https://arxiv.org/pdf/2101.03619.pdf>

### **P-flag spaces and incidence stratifications**

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with P. Sentinelli, to appear in Selecta Mathematica

### **Non-chordal complexes whose clique complex has shellable Alexander dual**

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with B. Benedetti, Journal of Combinatorial Theory, Series A, Vol. 180 (May 2021)

### **Betti splitting from a topological point of view**

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with U. Fugacci, Journal of Algebra and Its Applications, Vol. 19, no 6.  
2020

### **Binomial edge ideals of bipartite graphs**

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with A. Macchia, F. Strazzanti, European Journal of Combinatorics, Vol. 70, pp. 1-25  
2018

### **The poset of proper divisibility**

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with A. Macchia, E. Ventura, V. Welker, SIAM Journal on Discrete Math., Vol. 31(3), pp. 2093-2109  
2017

### **Recursive Betti numbers for Cohen-Macaulay d-partite clutters arising from posets**

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Journal of Pure and Applied Algebra, Vol 220, pp. 3102-3118  
2016

## **Betti splitting via componentwise linear ideals**

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Journal of Algebra, Vol. 455, pp. 1-13  
2016

## **Cohomological dimension and arithmetical rank of some determinantal ideals**

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with A. Caminata, A. Macchia, M. Mostafazadehfard, Le Matematiche, Vol. 70, Fasc. 1, pp. 273-300  
2015

## ● **CONFERENCES AND SEMINARS**

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12/2019 – FU Berlin (Germany)  
**Einstein Workshop**

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02/2018 – Toblach (Italy)  
**Geometry, Algebra and Combinatorics of Moduli Spaces and Configurations II**

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10/2015 – Osnabrueck (Germany)  
**Combinatorial and Experimental Methods in Commutative Algebra and related fields**

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09/2014 – Levico Terme (Italy)  
**INdAM Conference Mocca 2014, Meeting On Combinatorial Commutative Algebra**

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06/2014 – 07/2014 – Catania (Italy)  
**PRAGMATIC 2014, Local cohomology and syzygies of affine algebras**

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09/2013 – Cortona (Italy)  
**INdAM Conference Combinatorial Methods in Topology and Algebra**

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06/2013 – Valladolid (Spain)  
**EACA's Second International School on Computer Algebra and Applications**

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07/2012 – Institut Mittag-Leffler, Djursholm, Stockholm (Sweden)  
**Discrete Morse Theory and Commutative Algebra**

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