

Elía Saini

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Personal data

Born in Sondrio, Italy, on August 15, 1988.

Citizenship: Italian.

Current position

University of Fribourg

PhD in Mathematics

– Advisor: SNSF-Prof. Emanuele Delucchi

Fribourg, Switzerland

September 2014 - present

Research interests

- *Combinatorics*: Matroids, Oriented Matroids, Phased Matroids, Matroids over Hyperfields.
- *Topology*: Hyperplane Arrangements, Toric Arrangements, Poset Topology.

Education

- **ALTA Institute, University of Bremen** Bremen, Germany
Study Grant *February 2014 - July 2014.*
- **International School for Advanced Studies SISSA-ISAS** Trieste, Italy
Diploma in Mathematics *October 2011 - October 2013*
- **University of Trieste** Trieste, Italy
Master of Science in Mathematics *October 2011 - October 2013*
 - Thesis title: Approximate Hermitian-Yang-Mills structures on semistable Higgs bundles
 - Advisor: Prof. Ugo Bruzzo (International School for Advanced Studies SISSA-ISAS)
 - Assessment: 110/110 *cum laude*
- **University of Pisa** Pisa, Italy
Bachelor degree in Mathematics *October 2007 - July 2011*
 - Thesis title: Reflection groups, Coxeter groups, Chevellay-Shephard-Todd theorem
 - Advisor: Prof. Giovanni Gaiffi (University of Pisa)
 - Assessment: 110/110 *cum laude*
- **Liceo Scientifico Statale Carlo Donegani** Sondrio (SO), Italy
High School Diploma *July 2007*
 - Assessment: 100/100

Honors and awards

- Won the “Franco Tricerri” prize for master degree thesis in differential geometry, sponsored by the Italian Mathematical Union UMI, September 2015.
- Won the “Arturo Schena” prize for master degree thesis, sponsored by the Bank “Credito Valtellinese”, April 2014.
- Won a full scholarship at the International School for Advanced Studies SISSA-ISAS in Trieste after a selective admission contest, September 2011.
- Won the “Mario Papa” study grant, sponsored by the Liceo Scientifico Statale Carlo Donegani, November 2004.

Papers

- E. Saini, *A new presentation for the inner Tutte group of a matroid*, preprint [arXiv:1605.07773], 10pp.
- M. Gallet, E. Saini, *The diffeomorphism type of small hyperplane arrangements is combinatorially determined*, preprint [arXiv:1601.05705], 12pp.
- E. Delucchi, E. Saini, *Phasing spaces of weak phased matroids*, preprint [arXiv:1504.07109], 44pp.

Organized events

- CUSO graduate colloquium, Fribourg, Switzerland, September 2016.

Talks

- *Combinatorics and topology of small arrangements*, Geometry, Algebra and Combinatorics of Moduli Spaces and Configurations, Dobbiaco, Italy, February 2017.
- *Rescaling classes of matroids over hyperfields*, Combinatorics seminar, SUNY, Binghamton, Unites States, December 2016.
- *Non realizability of uniform phased matroids*, ALTA oberseminar, Bremen, Germany, April 2016.
- *Small hyperplane arrangements are isotopic*, CUSO graduate colloquium, Neuchâtel, Switzerland, February 2016.
- *Arrangements with up to 7 hyperplanes*, Arrangements: topology, combinatorics and stability, Pisa, Italy, February 2016.
- *Uniform hyperplane arrangements*, CUSO graduate colloquium, Bern, Switzerland, Septmeber 2015.
- *Non realizable uniform phased matroids*, Perspectives in Lie theory, Pisa, Italy, February 2015.
- *Realizable phased matroids*, Combinatoric oberseminar, Fribourg, Switzerland, November 2014.
- *Phasing classes of matroids*, ALTA oberseminar, Bremen, Germany, July 2014.
- *Canonical decomposition of 3-manifolds: the Kneser-Milnor theorem*, Trieste, Italy, May 2013.

Posters

- *Phasing spaces of matroids*, Topology and geometry in a discrete setting, Providence, United States, November 20 - December 2, 2016.
- *Diffeomorphism type of small hyperplane arrangements*, Pisa-Hokkaido summer school on mathematics and its applications, Pisa, Italy, August 30 - September 2, 2016.
- *Phasing classes of matroids*, Configuration spaces, Cortona, Italy, August 31 - September 6, 2014.

Attended conferences

- Enumerative, algebraic and geometric aspects of arrangements, Bremen, Germany, August 25, 2016.
- Topology and geometry of arrangements, Fribourg, Switzerland, June 6 - June 8, 2016.
- Seminar on matroids in algebra, representation theory and topology, Les Diablerets, Switzerland, January 24 - January 29, 2016.
- Characters of finite groups of Lie type, Les Diablerets, Switzerland, August 24 - August 28, 2015.
- Hyperplane arrangements and reflection groups, Hannover, Germany, August 10 - August 12, 2015.
- Non-crossing partitions in representation theory, Bielefeld, Germany, June 12 - June 14, 2014.

Teaching

- Teaching assistant of Combinatorial Methods in Topology, University of Fribourg, Switzerland, Spring 2017.
- Teaching assistant of Propedeutic Analysis I, University of Fribourg, Switzerland, Fall 2016.
- Teaching assistant of Analysis II for Mathematics, University of Fribourg, Switzerland, Spring 2016.
- Teaching assistant of Analysis I for Mathematics, University of Fribourg, Switzerland, Fall 2015.
- Teaching assistant of Analysis IV for Mathematics, University of Fribourg, Switzerland, Spring 2015.
- Teaching assistant of Analysis III for Mathematics, University of Fribourg, Switzerland, Fall 2014.
- Tutor student of Analysis I for Mathematics and Physics, University of Trieste, Italy, Fall 2012.

Educational activities

- Leonhard Euler e il problema dei ponti, Giornalino degli Open Days di Matematica, Pisa, Italy, February 2017.
- Matematica Olimpica, Tec Day at Liceo Cantonale of Bellinzona, Bellinzona, Switzerland, November 2016.
- Un séjour à l'hôtel Cosmos, Mathematikòn Educational Talk, Fribourg, Switzerland, March 2016.
- Variétés exotiques, Mathematikòn Educational Talk, Fribourg, Switzerland, October 2015.
- Euler et la découverte de la topologie, Mathematikòn Educational Talk, Fribourg, Switzerland, April 2015.

Language skills

- Italian (mother tongue)
- English (first certificate in English of University of Cambridge ESOL examinations)
- French (council of Europe level B1)
- German (council of Europe level A2)

Other activities

- Sectional participant at the contest "Ma Thèse en 180 Secondes" for the outreach of PhD thesis, April 2016.
- Selected contestant at the Sectional Olympiads of Mathematics, February 2007.
- Selected contestant at the Sectional Olympiads of Chemistry, April 2005.
- Selected contestant at the Sectional Olympiads of Mathematics, February 2004.