

Margherita Maria Ferrari

EMPLOYMENT

Nov 2017 - present **Postdoctoral Scholar Research**

Research group: Discrete and Topological Models for DNA Assembly
University of South Florida (Tampa - FL (USA))

Supervisor: Prof. Nataša Jonoska and Prof. Masahico Saito

EDUCATION

2013 - 2016
(25 Jan 2017) **Ph.D. in Mathematical Models and Methods in Engineering**

Politecnico di Milano (Milano - Italy)

Thesis: *Integer compositions and DNA self-assembly strategies: a combinatorial and a geometric approach*

Supervisor: Prof. Norma Zagaglia

2011 - 2013
(29 Oct 2013) **M.S. in Mathematics** 110L/110

Università degli studi di Modena e Reggio Emilia (Modena - Italy)

Thesis: *Cayley graphs: complete rotations, spectrum and maximum cliques*

Supervisor: Prof. Arrigo Bonisoli

Co-supervisor: Dr. Mathieu Bogaerts (Université libre de Bruxelles)

2008 - 2011
(29 Sep 2011) **B.S. in Mathematics** 110L/110

Università degli studi di Modena e Reggio Emilia (Modena - Italy)

Thesis: *Grafi 1-fattorizzabili: condizioni sufficienti (Sufficient conditions for the 1-factorization of graphs)*

Supervisor: Prof. Arrigo Bonisoli

2003 - 2008 **Scientific High School Degree** 100/100

Liceo Scientifico Tecnologico F. Corni (Modena - Italy)

GRANTS AND SCHOLARSHIPS

Ph.D. scholarship provided by Politecnico di Milano

Awarded for excellent performance during undergraduate and graduate studies at Università degli studi di Modena e Reggio Emilia

RESEARCH INTERESTS

Graph Theory

Enumerative Combinatorics

Mathematical models for DNA rearrangement and DNA self-assembly

RESEARCH ACTIVITIES

Aug 2018 - present Reviewer for zbMATH

Jul 2017 - present Reviewer for Mathematical Reviews

May 2016 - Aug 2016 Participate in a research group with Prof. Joanna Ellis-Monaghan and Prof. Greta Pangborn investigating design strategies for self-assembly and related topics

During this experience I have also taught selected topics in Graph Theory to the students who joined the project as preliminary course.

Saint Michael's College (Colchester - VT (USA))

TEACHING EXPERIENCE

4-19 Sep 2017 *Introductory Course of Mathematics* for 1st year undergraduate students in Chemistry, Geological Science and Natural Science

Università degli studi di Modena e Reggio Emilia (Modena - Italy)

Oct 2016 - Feb 2017 Teaching assistant (exercise sessions) for the course *Discrete Mathematics* (course delivered in English)
Oct 2015 - Jan 2016
Oct 2014 - Jan 2015

Politecnico di Milano (Milano - Italy)

Oct 2016 - Mar 2017 Teaching assistant (exercise sessions) for the course *Geometria e Algebra Lineare (Geometry and Linear Algebra)*
Oct 2015 - Jan 2016
Mar 2015 - Jun 2015
May 2014 - Jun 2014

Politecnico di Milano (Milano - Italy)

Oct 2012 - Mar 2013 Tutor for 1st year undergraduate students for the course *Geometria e Algebra Lineare (Geometry and Linear Algebra)*

Università degli studi di Modena e Reggio Emilia (Modena - Italy)

RESEARCH PAPERS

M. M. Ferrari, N. Zagaglia Salvi *Cyclic compositions and cycles of the hypercube*, *Aequationes Mathematicae* **92**(4), 671-682 (2018)

M. M. Ferrari, A. Cook, A. Houlihan, R. Rouleau, N. C. Seeman, G. Pangborn, J. Ellis-Monaghan *Design formalism for DNA self-assembly of polyhedral skeletons using rigid tiles*, *Journal of Mathematical Chemistry* **56**(5), 1365-1392 (2018)

- S. Capparelli, M. M. Ferrari, E. Munarini, N. Zagaglia Salvi *A generalization of the “Problème des Rencontres”*, Journal of Integer Sequences **21**, Article 18.2.8 (2018)
- F. Beggas, M. M. Ferrari, N. Zagaglia Salvi *Combinatorial interpretations and enumeration of particular bijections*, Riv. Mat. Univ. Parma **8**, 161-169 (2017)
- M. M. Ferrari, N. Zagaglia Salvi *Aperiodic compositions and classical integer sequences*, Journal of Integer Sequences **20**, Article 17.8.8 (2017)
- M. M. Ferrari, N. Zagaglia Salvi *Recent results on the adjacent vertex distinguishing chromatic index of the direct product of graphs*, Selected topics in Graph Theory and its Applications, Lecture notes of Seminario Interdisciplinare di Matematica **14**, 57-69 (2017)
- M. M. Ferrari, N. Zagaglia Salvi *Minimal edge colorings of class 2 graphs and double graphs*, Le Matematiche **71**(2), 17-25 (2016)
- F. Beggas, M. M. Ferrari, H. Kheddouci, N. Zagaglia Salvi *On circular disarranged strings of sequences*, Advances and Applications in Discrete Mathematics **17**(3), 275-292 (2016)
- G. Cesari, M. M. Ferrari *On the position value for special classes of networks*, in Recent Advances in Game Theory and Applications (Birkhäuser/Springer, Cham, 2016), pp. 29-47

PARTICIPATION IN RESEARCH PROJECTS

Strutture Geometriche, Combinatoria e loro Applicazioni (Geometric Structures, Combinatorics and Applications) - PRIN 2012

CONFERENCES, SEMINARS AND SUMMER SCHOOLS

- 17-20 Jul 2018 **33rd Summer Conference on Topology and its Applications**
Western Kentucky University (Bowling Green - KY (USA))
- 3-9 Jun 2018 **COMBINATORICS 2018**
Arco (Italy)
Talk: MATHEMATICAL MODELS FOR DESCRIBING MOLECULAR SELF-ASSEMBLY
- 6-8 Apr 2018 **2018 Zassenhaus Group and Friends Conference**
University of South Florida (Tampa - FL (USA))
Talk: MATHEMATICAL MODELS FOR DESCRIBING MOLECULAR SELF-ASSEMBLY
- 26 Feb 2018 **Discrete Mathematics Seminar**
University of South Florida (Tampa - FL (USA))
Talk: DESIGN STRATEGIES FOR DNA TILE ASSEMBLY
- 27 Oct 2017 **La matematica che non ti aspetti 2017 (The math that you do not expect 2017) - conference cycle of “Progetto Lauree Scientifiche”**
Università degli studi di Modena e Reggio Emilia (Modena - Italy)
Talk (invited speaker): MODELLI MATEMATICI PER NANOSTRUTTURE DI DNA (MATHEMATICAL MODELS FOR DNA NANOSTRUCTURES)
- 26-27 Jan 2017 **Trends in Graph Theory and Combinatorics 2017**
Politecnico di Milano (Milano - Italy)
Talk (invited speaker): FORMALISM AND DESIGN STRATEGIES FOR DNA TILE ASSEMBLY

- 13-16 Sep 2016 **SIMAI 2016**
Politecnico di Milano (Milano - Italy)

- 12 Jul 2016 **Summer Combo 2016**
Saint Michael's College (Colchester - VT (USA))

- 3-4 Feb 2016 **Advances in Decision Making Workshop**
Politecnico di Milano (Milano - Italy)

- 14-16 Jul 2015 **Second International Symposium on Riordan Arrays and Related Topics**
Politecnico di Milano (Lecco - Italy)

- 6-10 Jul 2015 **25th British Combinatorial Conference**
University of Warwick (Warwick - England (UK))
Talk: ON THE PARTITION GRAPH OF A POSITIVE INTEGER

- 24-30 May 2015 **Chromatic and colored structures in geometry and statistical physics**
Cortona (Italy)
Talk: MINIMAL EDGE COLORING OF CLASS 2 GRAPHS AND DOUBLE GRAPHS

- 1-6 Jun 2014 **COMBINATORICS 2014**
Gaeta (Italy)

MEMBER OF ORGANIZING
COMMITTEE OF INTERNATIONAL
CONFERENCES

- 26-27 Jan 2017 **Trends in Graph Theory and Combinatorics 2017**
Politecnico di Milano (Milano - Italy)

LANGUAGE SKILLS

Mother tongue Italian

Other languages

| | UNDERSTANDING | | SPEAKING | | WRITING |
|---------|---------------|---------|--------------------|-------------------|---------|
| | Listening | Reading | Spoken interaction | Spoken production | |
| English | B2 | B2 | B2 | B2 | B2 |
| FCE-B | | | | | |

Levels: A1 and A2: Basic user – B1 and B2: Independent user – C1 and C2: Proficient user
[Common European Framework of Reference for Languages](http://www.cedefop.europa.eu/en/files/quest_doc/CEFR.pdf)

COMPUTER SKILLS

Digital competences

SELF-ASSESSMENT

| Information Processing | Communication | Content creation | Safety | Problem solving |
|------------------------|------------------|------------------|------------------|------------------|
| Independent user | Independent user | Independent user | Independent user | Independent user |

[Digital competences - Self-assessment grid](#)

Programming languages – Turbo Pascal
 – PHP
 – MatLab
 – C++
 – Java

Word processing applications – LaTeX
 – HTML
 – Word
 – Writer

Spreadsheets – Excel
 – Calc

CAD systems – AutoCAD
 – IPE

Other – Cabri
 – Geogebra

ADDITIONAL INFORMATION

Other activities – I collaborated in the project *Laboratorio di Macchine Matematiche* for high school students in Modena (2013).
 – I trained I.I.S. F.CORNI students in Modena for the competition *Olimpiadi della Matematica – Gara a squadre* (2008-2011).
 – I attended *Progetto Lauree Scientifiche : Gauss ieri e oggi* in 2006 and *Una vita tra massimi e minimi: convessità ed isoperimetria* in 2007.
 – I attended *Olimpiadi della Matematica – Gara a squadre* (2006-2008).

Personal interests – music, movies, TV series, reading manga, watching anime

PRIVACY

Privacy I authorize the use of my personal data according to the Decreto Legislativo 30 giugno 2003, n. 196 “Codice in materia di protezione dei dati personali” (Italy)