

# Curriculum Vitae et Studiorum

Maria Infusino

## 1 Personal information

**First and Last Name:** Maria Infusino

**Date and place of birth:** July 13th, 1983 - Cosenza, Italy

**Nationality:** Italian

**Work Address:** Department of Mathematics, Sapienza University of Rome,  
5, Piazzale Aldo Moro, 00185, Rome, Italy

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## 2 Current position

Marie Curie fellow of INdAM (Istituto Nazionale di Alta Matematica, i.e. Italian National Institute of Higher Mathematics) at La Sapienza–University of Rome, working full-time on the project: “Realizability and Quantum Representability Problem”.

## 3 Main research interests

Functional analysis, probability, mathematical physics and measure theory. In particular:

- Moment problem and its applications.
- Realizability of correlation functions and quantum representability problem.
- Uniform distribution theory of points and partitions.
- Random sequences of Steiner symmetrizations (Blaschke, Minkowski and Schwarz symm.)

## 4 Education and academic achievements

- 18/02/2011 – *PhD in Mathematics and Computer Science* from University of Calabria.  
Evaluation degree: Excellent (highest possible).  
PhD thesis: “Uniform distribution of sequences of points and partitions”.  
Supervisor: Prof. Aljosa Volčič. PhD duration: 3 years.
- 02/10/2007 – *Master degree in Mathematics* from University of Calabria.  
Evaluation degree: 110 out of 110 cum laude.  
Master thesis: “Uniformly distributed sequences on fractal sets”.  
Supervisor: Prof. Aljosa Volčič. Master course duration: 2 years.
- 05/10/2005 – *Bachelor degree in Mathematics* from University of Calabria.  
Evaluation degree: 110 out of 110 cum laude.  
Bachelor thesis: “Newton-Kantorovich method for non-linear operators in Banach space”.  
Supervisor: Prof. Espedito De Pascale. Bachelor course duration: 3 years.
- 07/2002 – *Maturità scientifica* (general qualification for university entrance) from “Liceo Scientifico Pitagora” in Rende. Evaluation degree: 100 out of 100. High-school course duration: 5 years.

## 5 Post-doctoral experience

- 05/11/2012 to 04/05/2014 – *Marie Curie Fellow of INdAM at University of Reading, UK.*  
Project: “Realizability and Quantum Representability Problem”.  
Principal investigator: M. Infusino.
- 01/09/2012 to 04/11/2012 – *Postdoctoral Research Fellow at University of Reading, UK.*  
• 21/06/2011 to 30/07/2012  
Project: “Classical Realizability and Quantum Representability: Truncated Moment Problems in Statistical Physics and Quantum Chemistry”.  
Principal investigator: T. Kuna.

## 6 Teaching activity

- 2013/2014 – Teaching Assistant, Functional analysis I, University of Reading, UK, (13/01/2014–21/03/2014, 10 hours).
- 2013/2014 – Teaching Assistant, Foundations of Mathematics, University of Reading, UK, (07/10/2013–13/12/2013, 10 hours).
- 2013/2014, – Teaching Assistant, Real Analysis, University of Reading, UK, (13/01/2014–21/03/2014, 10 hours).
- 2012/2013, – Teaching Assistant, Real Analysis, University of Reading, UK, (08/10/2012–14/12/2012 and 14/01/2013–22/03/2013, 20 hours).
- 2011/2012, – Teaching Assistant, Real Analysis, University of Reading, UK, (10/10/2011–16/12/2011, 16/01/2012–23/03/2012, 23/04/2012–07/06/2012, 48 hours).
- 2008/2009 – Teaching Assistant, Linear Algebra, University of Calabria, Italy, (21/04/2009–30/09/2009, 24 hours).
- 2008/2009 – Teaching Assistant, Biostatistics II, University of Calabria, Italy, (26/11/2008–30/09/2009, 8 hours).
- 2008/2009– Tutor, Geometry and Linear Algebra, University of Calabria, Italy, (05/05/2009–30/09/2009, 10 hours).
- 2007/2008– Tutor, Geometry and Linear Algebra, University of Calabria, Italy, (14/01/2008–30/09/2008, 45 hours).
- 2006/2007 – Tutor, Geometry and Linear Algebra, University of Calabria, Italy, (25/01/2007–30/09/2007, 45 hours).
- 2005/2006 – Tutor, Geometry and Linear Algebra, University of Calabria, Italy, (20/01/2006–30/09/2006, 45 hours).

## 7 Supervision activity

- Aldo Rota (Phd student in Mathematics, University of Reading, UK):  
*Moment problem for point random fields and its applications*, April 2010–February 2014.
- Hasina Uddin (Bachelor student in Mathematics, University of Reading, UK):  
*Approximation of irrational numbers via continued fractions*, October 2013–March 2014.
- Harry Eaton (Bachelor student in Mathematics, University of Reading, UK):  
*Archimedes’ cattle problem and Pell’s equation*, October 2013–March 2014.
- Colm Teeluck (Bachelor student in Mathematics, University of Reading, UK):  
*Continued fractions and Farey diagram*, October 2013–March 2014.

## 8 Publications and preprints

### Peer-reviewed publications

- I. M. Infusino and A. Volčič, *Uniform distribution on fractals*, Uniform Distribution Theory, **4** (no.2): 47-58, 2009.
- II. M. Drmota and M. Infusino, *On the discrepancy of some generalized Kakutani's sequences of partitions*, Uniform Distribution Theory, **7** (no.1): 75–104, 2012.
- III. M. Infusino, T. Kuna, and A. Rota, *The full infinite dimensional moment problem on semi-algebraic sets of generalized functions*, Journal of Functional Analysis, **267**:1382-1418, 2014.
- IV. M. Infusino, *Quasi-analyticity and determinacy of the full moment problem from finite to infinite dimensions*, to appear in Trends in Mathematics.

### Extended Abstracts

- V. M. Infusino, *The moment problem on infinite dimensional basic semi-algebraic sets*, to appear in Oberwolfach Report 17/2014, Real algebraic geometry with a view toward systems control and free positivity, DOI: 10.4171/OWR/2014/17.

### In Preparation

- VI. M. Infusino, T. Kuna, J. L. Lebowitz, and E. R. Speer, *Truncated moment problem on  $\mathbb{N}_0$  as a special case of realizability*, in preparation.
- VII. M. Infusino and T. Kuna, *The full moment problem on subsets of configurations*, in preparation.
- VIII. M. Ghasemi, M. Infusino, S. Kuhlmann and M. Marshall, *A continuous moment problem for locally convex spaces*, in preparation.

## 9 Research projects

- **Marie Curie–INdAM project: “Realizability and Quantum Representability”**  
Duration: 05/11/2012 to 04/11/2014.  
Principal investigator: M. Infusino.  
Host Institutions: University of Reading, UK and University of Rome “La Sapienza”, Italy.
- **EPSRC project: “Classical Realizability and Quantum Representability: Truncated moment problems in Statistical Physics and Quantum Chemistry”**  
Duration: 21/06/2011 to 31/07/2012.  
Principal investigator: T. Kuna.  
Host Institution: University of Reading, UK.
- **“Progetto Giovani Ricercatori” (Young Researchers Project): “Probabilistic and Geometric Aspects of Steiner Symmetrizations”.**  
Duration: 10/2010 to 10/2011.  
Principal investigator: M. Infusino.  
Host institution: University of Calabria, Italy.

## 10 Grants, fellowships, prizes and awards

- *LMS Research in Pairs grant* awarded by the London Mathematical Society to support the research visit of Jean Bernard Lasserre at University of Reading in April 2014.
- Travel and accommodation grant for the participation in the “*Program on inverse moment problems: the crossroads of Analysis, Algebra, Discrete Geometry and Combinatorics*”, Institute for Mathematical Sciences, Singapore, (6-19/01/2014).

- Travel grant for the participation in “*Young women in Discrete Mathematics*”, Research Institute for Discrete Mathematics, Bonn, Germany (7-9/06/2013).
- 05/11/2012 to 04/11/2014 – “*Marie Curie-Indam Outgoing fellowship*”.  
This competitive two-year fellowship is aimed at early career researchers who obtained a PhD in an Italian university and wish to work abroad, and required the preparation of a substantial research proposal. My proposed project scored 4.925 out of 5 points (the second highest score) and was awarded one of the five fellowships offered in the call.
- 08/07/2012 – Prize for “*The best research poster*” at the 6th European Congress of Mathematics (6ECM), Jagiellonian University, Kraków, Poland.  
My poster was first selected among the 300 abstracts submitted to be showed at the congress and then awarded one of the 11 prizes for the best posters out of the 180 presented. I was awarded a grant covering all my expenses for participating in this congress.
- Travel grant for the participation in the “*Courses for Phd students: Random trees and coalescents*” at CIRM, Marseille, France (20-25/09/2010).
- 19/07/2008 – Award for “*The best graduate in 2007*” from the Faculty of Mathematics, Physics and Natural Sciences of University of Calabria.
- 10/2002 to 09/2007 – Fellowship from “*Fondazione Calabria Scienze Oggi*”.  
This fellowship was established with the goal of providing a more advanced quality education and training in the sciences to particularly outstanding students. I was selected through a process assessing the grades and the high school accomplishments and the results of three entrance exams. I successfully passed all the exams and I was among the five students who have been awarded this fellowship for the first time since its establishment.

## 11 International research stays

- 01/08/2014 to 13/08/2014 – *Research visitor at CCM of University of Madeira, Portugal.*  
Participation in the XLII Madeira Math Encounter organized by J. L. da Silva on the subject: “PDEs and particle systems dynamics”.  
17/03/2014 to 03/04/2014
- 26/03/2013 to 26/04/2013 – *Research visitor at Rutgers University, USA.*  
16/04/2012 to 10/05/2012  
Collaboration with J. Lebowitz and E. R. Speer on the subject: “Connections between realizability and moment problem”.  
22/07/2013 to 26/07/2013
- 17/12/2013 to 21/12/2013 – *Research visitor at Roma La Sapienza, Italy.*  
Collaboration with E. Caglioti on the subject: “Realizability problem on the lattice”.
- 01/09/ 2012 to 14/10/2012 – *Research visitor at University of Reading, UK.*  
Collaboration with T. Kuna about topics related to the realizability problem.  
30/04/2010 to 01/06/2010
- 01/10/2009 to 30/11/2009 – *Visiting PhD student at the Institute of Discrete Mathematics and Geometry of TU-Wien, Austria.*  
28/03/2009 to 03/04/2009  
Collaboration with M. Drmota on the subject: “Discrepancy of some generalized Kakutani’s sequences of partitions and uniform distribution on fractals”.

## 12 Invited/Contributed talks

### 12.1 Invited talks

#### Invited talks at conferences

- 4/08/2014 – “*XLII Madeira Math Encounter*”, CCM of University of Madeira, Portugal. Invited speaker with the talk: “The moment problem on infinite dimensional basic semi-algebraic sets”.
- 14-18/07/2014 – Special session “Linear operator theory, function theory, and linear systems” in the workshop “*TWOTA–International Workshop on Operator Theory and its Applications*”, VU-University, Amsterdam, Netherlands. Invited speaker with the talk: “The infinite dimensional moment problem on semi-algebraic sets”.
- 6-12/04/2014 – “*Real algebraic Geometry with a view toward systems control and free positivity*”, Mathematisches Forschungsinstitut Oberwolfach, Germany. Invited speaker with the talk: “The moment problem on infinite dimensional basic semi-algebraic sets”.
- 7-16/01/2014 – “*Polyhedra, Lattices, Algebra, and Moments*”, Institute of Mathematical Science, Singapore. Invited speaker with the talk: “The realizability problem as an infinite dimensional moment problem”.
- 24-28/06/2013 – “*Stochastic and Infinite Dimensional Analysis*”, ZIF, Bielefeld, Germany. Invited speaker with the talk: “The full Infinite Dimensional Moment Problem for Semi-Algebraic Sets of Generalized Functions”.

#### Invited research seminars

- 13/11/2013 – “*Women in Mathematics in Konstanz*”, University of Konstanz, Germany. Invited seminar talk: “A journey through the moment theory on semi-algebraic sets”.
- 19/10/2012 – *Analysis day at the University of Reading*, UK. Invited seminar talk: “Realizability Problem for moment measures”.
- 09/12/2011– *Analysis seminars at the University of Reading*, UK. Invited seminar talk: “Uniform distribution of sequences of points and partitions”.
- 31/10/2009 – *AG Diskrete Mathematik at TU Wien*, Austria. Invited seminar talk: “Uniform distribution on fractals”.

### 12.2 Contributed presentations at conferences

#### Contributed talks at conferences

- 17-19/07/2013 – “*Polynomial Optimisation - Workshop*”, INI, Cambridge, UK. Talk: “Concrete conditions for realizability of moment functions via quadratic modules”.
- 7-9/06/2013 – “*Young women in Discrete Mathematics*”, Research Institute for Discrete Mathematics, Bonn, Germany. Talk: “On the discrepancy of some sequences of partitions”.
- 6-8/05/2012 – “*107th Statistical Mechanics Conference*”, Rutgers University, New Brunswick, USA. Talk: “Uniform distribution on fractals”.
- 12-17/09/2011 – “*XIX Conference of Italian Mathematical Society (UMI)*”, University of Bologna, Italy. Talk: “Discrepancy of generalized Kakutani’s sequences”.
- 4-15/04/2011 – “*Spring School in Discrete Probability, Ergodic Theory and Combinatorics*”, TU-Graz, Austria. Talk: “Discrepancy of Kakutani’s sequences”.
- 5-9/07/2010 – “*II International Conference on Uniform Distribution Theory*”, Strobl, Austria. Talk: “Uniform distribution on fractals and Khodak’s algorithm”.

#### Poster presentations at conferences

- 1-8/07/2012 – “*6th European Congress of Mathematics*”, Jagiellonian University, Cracow, Poland. Poster: “On the discrepancy of some generalized Kakutani’s sequences of partitions”.

## 13 Participation in other conferences and workshops

- 11/06/2014 – “*INdAM’s day*”, SISSA, Trieste, Italy.
- 14–18/10/2013 – “*Uniform distribution and quasi-Monte Carlo methods*”, RICAM, Linz, Austria.
- 25–30/06/2012 – “*III International Conference on Uniform Distribution Theory*”, Congress Center of the Slovak Academy of Sciences, Smolenice, Slovakia.
- 21–25/05/2012 – “*Stochastic Dynamics in Action*”, ZIF, Bielefeld, Germany.
- 15–22/07/2011– “*Stochastic and Real World Models*”, University of Bielefeld, Germany.
- 18/02/2011– “*Minicolloquium on Convex Geometry and its connections with other Mathematical fields*”, University of Calabria, Italy.
- 13–17/07/2009 – “*Conference on Convex and Discrete Geometry (with a Minisymposium on the History of Convex Geometry)*”, TU-Wien, Austria.

## 14 Participation in schools

- 15–17/07/2013 – “*Summer school in Polynomial Optimisation*”, INI, Cambridge, UK.
- 04–15/04/2011– “*Spring School in Discrete Probability, Ergodic theory and Combinatorics*”, Technical University of Graz, Austria.
- 20–25/09/2010 – “*Courses for Phd students: Random trees and coalescents*”, Centre de Rencontre Mathématiques de Luminy (CIRM), Marseille, France.
- 27/07/2008 to 29/08/2008 – “*Interuniversity Mathematical School*” (Scuola Matematica Interuniversitaria, S.M.I.) in Perugia, Italy.

## 15 Memberships and Reviewing activity

Member of Italian Mathematical Society (UMI) and National Group of Mathematical Analysis, Probability and their Applications (GNAMPA) since 2009. Reviewer for MathSciNet and Zentralblatt.

## 16 Languages

Italian (mother tongue), English (Level C1), German (Level A2), Spanish (Level A2)

### Language certificates:

- German A2 certificate, Institution Wide Language Program of University of Reading – May 2014.
- Goethe-Zertifikat A1– July 2011.
- IELTS, International English Language Testing System – December 2010.
- FCE, First Certificate in English – December 2009.
- Certificado Inicial de Espanol – July 2002.

## 17 Computer skills

Windows, Word, Excel, Power Point, Latex, Cabri, Maple, MatLab, C++

**Place and Date**

Rome, 4/09/2014

**Signature**

