Curriculum Vitae

LIVIA CORSI
(Apr 11, 2024)

PERSONAL DATA.

Place and date of birth: Rome, September 2, 1983
Current position: (since June 2022) Associate Professor at University of "Roma Tre"
Address: Largo S. Leonardo Murialdo 1, 00146 Roma, Italy
e-mail: livia.corsi@uniroma3.it

EDUCATION.

1. **October 2005:** University of "Roma Tre": Bachelor degree in Mathematics. Final mark: 110/110 .

2. **May 2008:** University of "Roma Tre": Master degree in Mathematics. Title of the thesis: *"Melnikov theory to all orders and Puiseux series for subharmonic solutions"*. Advisor: Prof. G. Gentile. Final mark: 110/110 *cum laude*.

3. **November 2008 – October 2011:** University of "Roma Tre". PhD in Mathematics. Advisor: Prof. G. Gentile. External examinators: Prof. A. Kupiainen and Prof. M. Berti. Date of defense: January 27, 2012. Title of the thesis: *"Resonant solutions in the presence of degeneracies for quasi-periodically perturbed systems"*.

SCIENTIFIC INTERESTS.
   Dynamical systems, recurrent motions, small divisors problems, resonances, Hamiltonian PDEs

FORMER POSITIONS.

1. **May 2012 – November 2013** Postdoc at University of Naples "Federico II" (FORGIARE fellowship)

2. **December 2013 – August 2014** Postdoc at University of Rome "La Sapienza" (within the ERC project "HamPDEs")

3. **September 2014 – July 2016** Canada Research Chairs Postdoctoral Fellow at McMaster University

4. **August 2016 – July 2018** Visiting Assistant Professor at Georgia Institute of Technology

5. **August 2018 – May 2019** Visiting Assistant Professor at Emory University

6. **June 2019 – May 2022** RTDb (TT Assistant Professor) at University of "Roma Tre"

COMMITTEES.

- **From 2023** Member of the PhD committee for the PhD program at the University of "Roma Tre".

PUBLICATIONS.

1. **L. Corsi, G. Gentile**
   Melnikov theory to all orders and Puiseux series for subharmonic solutions.
   J. Math. Phys. **49** (2008), no.11.

2. **L. Corsi, G. Gentile, M. Procesi**
   KAM theory in configuration space and cancellations in the Lindstedt series.
   Comm. Math. Phys. **302** (2011), no.2, 359–402.

3. **L. Corsi, G. Gentile**
   Oscilator synchronisation under arbitrary quasi-periodic forcing.
   (previously: *Response solutions for arbitrary quasi-periodic perturbations with Bryuno frequency vector*)
   Comm. Math. Phys. **316** (2012), no.2, 489–529.

4. **L. Corsi, R. Feola, G. Gentile**
   Lower-dimensional invariant tori for perturbations of a class of non-convex Hamiltonian functions.
   J. Stat. Phys. **150** (2013), no.1, 156–180

5. **L. Corsi, R. Feola, G. Gentile**
   Domains of analyticity for response solutions in strongly dissipative forced systems.
   J. Math. Phys. **54** (2013), no.12

6. **L. Corsi, R. Feola, G. Gentile**
   Convergent series for quasi-periodically forced strongly dissipative systems.
   Commun. Contemp. Math. **16** (2014), no.3

7. **M. Berti, L. Corsi, M. Procesi**
   An abstract Nash-Moser theorem and quasi-periodic solutions for NLW and NLS on compact Lie groups and homogeneous spaces.
   Comm. Math. Phys. **334** (2015), no.3, 1413–1454.

8. **L. Corsi, G. Gentile**
   Resonant solutions in the presence of degeneracies for quasi-periodically perturbed systems.
   Erg. Th. Dynam. Sys. **35** (2015), no.4, 1079–1140.

9. **L. Corsi, G. Gentile**
   Resonant tori of arbitrary codimension for quasi-periodically forced systems.
   NoDEA, **24** (2017), no.1.

10. **L. Corsi, G. Genovese**
    Periodic Driving of an Impurity in the Isotropic XY Chain.
    Comm. Math. Phys. **354** (2017), no.3, 1173–1203.

11. **R. Calleja, A. Celletti, L. Corsi, R. de la Llave**
    Response solutions for quasi-periodically forced, dissipative wave equations.
    SIAM J. Math. Anal., **49** (2017), no.4, 3161–3207

12. **L. Corsi, R. Montalto**
    Quasi-periodic solutions for the forced Kirchhoff equation on $\mathbb{T}^d$.
    Nonlinearity, **31** (2018), 5075–5109

13. **L. Corsi, R. Feola, M. Procesi**
    Finite dimensional invariant KAM tori for tame vector fields.
    Transactions of the AMS, **372** (2019), no.3 1913–1983

14. **A. Casal, L. Corsi, R. de la Llave**
    Expansions in the delay of quasi-periodic solutions for state dependent delay equations
    J. Phys. A, **53** (2020), no. 23

15. **L. Corsi, R, Montalto, M. Procesi**
Almost-periodic Response Solutions for a forced quasi-linear Airy equation
J. Dynam. Diff. Eq. **33** (2021), 1231–1267

16. **D. Borthwick, L. Corsi, K. Jones**
Sharp diameter bound for the Spectral Gap for Quantum Graphs
Proc. Am. Math. Soc. **149** (2021), 2879–2890

17. **L. Corsi, G. Genovese**
Long time behaviour of a local perturbation in the isotropic XY chain under periodic forcing.
Ann. Henri Poincaré **23** (2022), 1555–1581

PROCEEDINGS.

1. **L. Corsi, E. Haus, M. Procesi**
A KAM result on compact Lie groups.
Acta Appl. Math. special issue, SPT - Symmetry and perturbation theory (2014).
Contains original research

PREPRINT.

1. **L. Corsi, V. Kaloshin**
A locally integrable non-Liouville analytic geodesic flow
preprint, 2018, https://arxiv.org/abs/1803.01222

2. **G. M. Marin, F. Bonetto, L. Corsi**
Analiticity of the Lyapunov exponent of perturbed toral automorphisms
preprint, 2023, https://arxiv.org/abs/2308.04957

3. **L. Corsi, G. Gentile, M. Procesi**
Almost-periodic solutions to the NLS equation with smooth convolution potentials
preprint, 2023

4. **L. Corsi, G. Gentile, M. Procesi**
Maximal tori in infnite-dimensional Hamiltonian systems: a Renormalization Group approach
preprint, 2024

5. **F. Argentieri, L. Corsi**
On the linearization of analytic diffeomorphisms of the torus
preprint, 2024, https://arxiv.org/abs/2404.04410

SHORT VISITS.

1. **November 2010**. Mathematics department, University of Naples "Federico II"

2. **October 2012**: Mathematics department, University of Milan

3. **March 2013**: School of Mathematics, Georgia Institute of Thecnology

4. **February 2014**: Mathematics department, University of Padua

5. **May 2014**: SISSA - International School for Advanced Studies, Trieste

6. **June 2014**: Mathematics department, University of Milan

7. **December 2014**: Mathematics department, University of Milan

8. **December 2014**: Institute of Mathematics, University of Zurich

9. **June 2015**: Mathematics department, Sapienza, University of Rome

10. **December 2015**: Mathematics and Physics department, University of "Roma Tre"

11. **February 2015**: Mathematics and Physics department, University of "Roma Tre"

12. **April 2016**: Department of Mathematics, University of Maryland

13. **September 2016**: Mathematics and Physics department, University of "Roma Tre"

14. **December 2016–January 2017**: Mathematics and Physics department, University of "Roma Tre"

15. **April 2017**: Department of Mathematics and Statistics, University of Southern Alabama

16. **June 2017**: Institute of Mathematics, University of Zurich

17. **November 2017**: Institute of Mathematics, University of Zurich

18. **November 2017**: Departemento de Matemàticas y Mecànica, UNAM

19. **April 2018**: CIMAT - Centro de Investigación en Matemàticas

20. **April 2018**: Departemento Académico de Matemàticas, ITAM

21. **May 2018**: Mathematics and Physics department, University of "Roma Tre"

22. **June 2018**: SISSA - International School for Advanced Studies, Trieste

23. **February 2022**: SISSA - International School for Advanced Studies, Trieste

24. **April 2022**: SISSA - International School for Advanced Studies, Trieste

25. **February 2023**: ISTA - Institute of Science and Technology of Austria, Klosteneneuburg

26. **March 2023**: School of Mathematics, Georgia Institute of Thecnology

LONG VISITS.

1. **July to December 2019**: School of Mathematics, Georgia Institute of Thecnology & Department of Mathematics, Emory University (Atlanta, GA)

SCHOOLS AND WORKSHOPS AS INVITED SPEAKER:

1. **June 2012**. "Hamiltonian PDEs"
Capri, 4 – 7 June 2012
Talk: *Resonant motions in the presence of degeneracies for quasi-periodically perturbed systems.*

2. **July 2013**. "Planetary motion, satellite dynamics and Spaceship Orbits"
Montréal, 20 – 27 July 2013
Talk: *Degenerate lower-dimensional invariant tori for non-convex Hamiltonian systems*

3. **September 2013**. "Multiscale analysis and small divisors"
   Maiori, 16 – 20 Semptember 2013
   Talk: *An abstract implicit function theorem*

4. **August 2014**. "Summer School on Dynamical Systems"
   Washington DC, 17 – 25 August 2014
   Talk: *Resonant tori of arbitrary codimension for quasi-periodically forced systems*

5. **December 2014**. "KAM and dispersive methods in Hamiltonian PDEs"
   Milan, 1 – 5 December 2014
   Talk: *Degenerate resonant tori*

6. **September 2016**. "Hamiltonian Dynamics, PDEs and Waves on the Amalfi coast"
   Maiori, 5 – 10 September 2016
   Talk: *Locally integrable non-Liouville analytic geodesic flows on $\mathbb{T}^2$*

7. **July 2017**. "Mathematical Congress of the Americas"
   Montréal, 24 – 28 July 2017
   Talk: *Periodic Driving of an Impurity in the Isotropic XY Chain*

8. **January 2018**. "Introduction to Dynamical Systems Methods for Space Mission Design"
   Atlanta, 16 – 19 January 2018
   Talk: *Lindstedt series - Everything you always wanted to know about them (but were afraid to ask)*

9. **May 2022** "Assemblea Scientifica GNFM"
   Montecatini, 5–7 May 2022
   Talk: *Almost-periodic Solutions for the NLS*

10. **May 2022** "Advances in Classical, Quantum and Statistical Mechanics"
    Rome, 11–13 May 2022
    Talk: *Infinite dimensional invariant tori for the 1d NLS Equation.*

11. **December 2023** "Quantum and Dynamical Christmas"
    Milan, 19–22 December 2023
    Talk: *Almost-periodic Solutions to the NLS equation with smooth convolution potential*

TEACHING:

1. **From 2020:** Instructor/assistant for various courses in Analysis and Mathematical Physics at the Mathematics and Physics Department, University of "Roma Tre".

2. **From 2018 to 2019:** Instructor for the courses "Calculus 1", "Calculus 2" and "Ordinary Differential Equations" at the Department of Mathematics, Emory University.

3. **From 2016 to 2018:** Instructor for the courses "Calculus 1", "Introduction to Linear Algebra", "Linear Algebra" and "Ordinary Differential Equations" at the School of Mathematics, Georgia Institute of Technology.
   Coordinator of the Undergraduate Research Course "Analytical Mechanics" at the School of Mathematics, Georgia Institute of Technology, during Summer 2018.

4. **From 2014 to 2016:** Instructor for the courses "Engineering Mathematics III - ODEs" and "Engineering Mathematics IV - vector calculus and linear PDEs" at the Department of Mathematics and Statistics, McMaster University

5. **From 2012 to 2014:** Teaching assistant for the course "Dynamical systems" (Prof. V. Coti Zelati), at the Mathematics department, University of Naples "Federico II".

6. **From 2008 to 2012:** Teaching assistant for the courses "FM1 - Dynamical systems" (Prof. G. Gentile) and "FM2 - Linear PDEs" (Prof. A. Pellegrinotti), at the Mathematics department, University of "Roma Tre".

7. **From 2004 to 2008:** Tutor for the courses "FM1 - Dynamical systems" (Prof. G. Gentile), "GE2 - Euclidean, affine and projective geometry" (Prof. A. Verra) and "GE4 - Curves and surfaces in the euclidean space" (Prof. M. Pontecorvo) at the Mathematics department, University of "Roma Tre".

PHD COURSES

1. **February-April 2022** (20h). "A diagrammatic approach to Perturbation Theroy"
   SISSA, Trieste

THESIS SUPERVISION

1. Emanuele Calò, Laurea Triennale in Fisica (Bachelor degree in physics) 2020, Title of the thesis: *Chaotic Behaviors in Continuous and Discrete Dynamical Systems.*

2. Michela Policella, Laurea Triennale in Matematica (Bachelor degree in mathematics) 2021, Title of the thesis: *Local Bifurcation Theory.*

3. Gian Marco Marin, Laurea Triennale in Fisica (Bachelor degree in physics) 2021, Title of the thesis: *Approccio perturbativo ai sistemi dinamici iperbolici.*

4. Elisa Menechini, Laurea Triennale in Matematica (Bachelor degree in mathematics) 2022, Title of the thesis: *Modelli matematici per l'epidemiologia.*

5. Alessia Di Giovanni, Laurea Triennale in Matematica (Bachelor degree in mathematics) 2022, Title of the thesis: *Modelli matematici per la cinetica enzimatica.*

6. Laura Fagotto, Laurea Triennale in Matematica (Bachelor degree in mathematics) 2022, Title of the thesis: *Soluzioni periodiche in sistemi Hamiltoniani.*

7. Carlotta Calevi, Laurea Triennale in Matematica (Bachelor degree in mathematics) 2022, Title of the thesis: *Analisi storica dello sviluppo della meccanica celeste.*

8. Riccardo Sabbatini, Laurea Triennale in Fisica (Bachelor degree in physics) 2022, Title of the thesis: *Linearizzazione di funzioni olomorfe.*

9. Michela Policella, Laurea Magistrale in Matematica (MSc in mathematics) 2023, co-supervised with R. Feola. Title of the thesis: *Reducibility for a class of linear Schrodinger equations.*

10. Ruben Bottini, Laurea Triennale in Fisica (Bachelor degree in physics) 2023, Title of the thesis: *Diagrammatic approach to KAM theorem.*

STUDENTS MENTORED

1. Roberto Feola (Master and PhD)

2. Giuseppe Genovese (PhD)

3. Bobby Wilson (PhD)

4. Nikolay Hristov (Master)

5. Alice Ambrosio (PhD)

6. Kenny Jones (PhD)

ORGANIZATION OF CONFERENCES.

1. Multiscale methods in Small Divisor problems
   (together with A. Ambrosio, M. Berti, P. Baldi, P. Bolle, V. Coti Zelati, M. Procesi)
   http://ricerca.mat.uniroma3.it/users/procesi/maiori.html
   Maiori, 16–20 September 2013

2. Roman Summer School and Workshop: KAM Theory and Dispersive PDEs
   (together with P. d'Ancona, M. Berti, L. Biasco, L. Fanelli, R. Feola, E. Haus, P. Magrone, C. Procesi, M. Procesi)
   http://ricerca.mat.uniroma3.it/users/procesi/RomanPDEs2014.html
   Rome, 1–11 September 2014

3. Introduction to Dynamical Systems Methods for Space Mission Design
   (together with R. Anderson, M. Gidea and R. de la Llave)
   http://people.math.gatech.edu/∼rll6/JPL/jpl.html
   Atlanta, 16–19 January 2018

4. Hamiltonian and Dispersive PDEs
   (together with L. Biasco, P. DAncona, R. Feola, E. Haus, J. E. Massetti and M. Procesi)
   https://sites.google.com/view/prin20hpdes/workshops/second-school-workshop
   Rome, 15– 19 May 2023

ORGANIZATION OF SEMINARS SERIES.

1. **From 2015 to 2016:** Organizer of the Dynamical Systems seminar at McMaster University

2. **From 2017 to 2018:** Organizer of the CDSNS Colloquium at Georgia Institute of Technology

3. **Since 2020:** Organizer of the Dynamical Systems Informal Meetings at University of "Roma Tre"

RESEARCH PROGRAMS.

1. Participant to the program *Sistemi dinamici, equazioni alle derivate parziali e meccanica statistica*, PRIN announcement 2008 (scientific coordinator - Giovanni Gallavotti). 2008-2011.

2. Participant to the ERC project *Hamiltonian PDEs and small divisor problems: a dynamical systems approach*, under FP7 (principal investigator - Michela Procesi). 2013-2014.

3. Participant to the project *Invariant objects in dynamical systems: Analysis and numerics*, NSF grant DMS-1500943 (principal investigator - Rafael de la Llave). 2016-2018.

4. Participant to the program *Hamiltonian and dispersive PDEs*, PRIN announcement 2020 (principal investigator - Massimiliano Berti, local coordinator - Michela Procesi). 2021-present.

5. Participant to the program *Turbulent Effects vs Stability in Equations from Oceanography*, PRIN announcement 2022 (principal investigator - Stefano Scrobogna, local coordinator - Emanuele Haus). 2023-present.