

# Curriculum Vitae

ROBERTO FEOLA

## EDUCATION.

1. **July 2009:** University of “Roma Tre”: Bachelor degree in Mathematics. Final mark: 110/110 *cum laude*. Date: 09/07/2009.
2. **May 2012:** University of “Roma Tre”: Master degree in Mathematics. Title of the thesis: “Resonant tori and one-dimensional systems with quasi-periodic forcing”. Advisor: Prof. G. Gentile. Final mark: 110/110 *cum laude*. Date: 17/05/2012.
3. **February 2016:** PHD at University of Roma “La Sapienza”: Advisor: M. Procesi Title of the thesis: “Quasi-periodic solutions for fully nonlinear NLS”. Date: 23/02/2016

## POSITIONS.

1. **November 2015/ October 2018:** Post-DOC at SISSA - Trieste.
2. **November 2018/ October 2020** Post-DOC at the “Laboratoire de Mathématiques Jean Leray, Université de Nantes.
3. **December 2020/ October 2021** Post-DOC, Dipartimento di Matematica “Federigo Enriques” Università degli Studi di Milano “La Statale”.
4. **Current:** November 2021-present, Ricercatore RTD-B, Dipartimento di Matematica e Fisica - Università degli Studi RomaTre.

## QUALIFICATIONS.

Holder of “Qualification a Maître de Conférence”

Holder of ASN in 01/A3- Analisi Matematica, Probabilità e Matematica Matematica, Seconda Fascia

**Research Interests:** Differential equations and dynamical systems, small divisor problems, periodic and quasi-periodic solutions, Hamiltonian Pde’s, KAM Theory, Nash-Moser Implicit Function Theorem. Para-differential calculus.

## PUBLICATIONS.

1. **L. Corsi, R. Feola, G. Gentile**  
*Lower-dimensional invariant tori for perturbations of a class of non-convex Hamiltonian functions,*  
Journal of Statistical Physics 150(1) : 156-180 (2013).  
DOI: 10.1007/s10955-012-0682-8

2. **L. Corsi, R. Feola, G. Gentile**  
*Domains of analyticity for response solutions in strongly dissipative forced systems,*  
 Journal of Mathematical Physics 54, 122701 (2013).  
 DOI: 10.1063/1.4836777
3. **L. Corsi, R. Feola, G. Gentile**  
*Convergent series for quasi-periodically forced strongly dissipative systems,*  
 Communications in Contemporary Mathematics 16(3), 1350022 (2014).  
 DOI: 10.1142/S0219199713500223
4. **R. Feola, M. Procesi**  
*Quasi-periodic solutions for fully nonlinear forced reversible Schrödinger equations,*  
 Journal of Differential equations, 259(7) : 3389–3447 (2015),  
 DOI: 10.1016/j.jde.2015.04.025
5. **L. Corsi, R. Feola, M. Procesi**  
*Finite dimensional invariant KAM tori for tame vector fields,*  
 Transactions of the Amer. Math. Soc. 372 : 1913–1983 (2019),  
 DOI: <https://doi.org/10.1090/tran/7699>
6. **R. Feola, F. Iandoli**  
*Local well-posedness for quasi-linear NLS with large Cauchy data on the circle,*  
 Annales de l’Institut Henri Poincaré C, Analyse non linéaire, 36(1) : 119–164 (2019),  
 DOI: 10.1016/j.anihpc.2018.04.003
7. **R. Feola, F. Giuliani, S. Pasquali**  
*On the integrability of Degasperis-Procesi equation: Birkhoff resonances and strong stability,*  
 Journal of differential Equations, 266(6) : 3390–3437 (2018),  
 DOI: 10.1016/j.jde.2018.09.003
8. **R. Feola, F. Giuliani, M. Procesi**  
*Reducibility for a class of weakly dispersive linear operators arising from the Degasperis Procesi equation,*  
 Dynamics of partial differential equations, 16(1) : 25–94 (2019),  
 DOI: 10.4310/DPDE.2019.v16.n1.a2
9. **R. Feola, F. Giuliani, R. Montalto, M. Procesi**  
*Reducibility of first order linear operators on tori via Moser’s theorem,*  
 Journal of Functional Analysis, 276(3) : 932–970 (2019),  
 DOI: 10.1016/j.jfa.2018.10.009
10. **R. Feola, F. Iandoli**  
*Long time existence for quasi-linear NLS with small Cauchy data on the circle,*  
 Ann. Sc. Norm. Super. Pisa Cl. Sci., 22(1): 109–182 (2021),  
 DOI: 10.2422/2036-2145.201811\_003
11. **R. Feola, B. Grebért**  
*Reducibility of Schrödinger equation on the Sphere,*  
 International Mathematics Research Notices 2021(19): 15082–15120 (2021),  
 DOI: <https://doi.org/10.1093/imrn/rnz344>,

12. **M. Berti, R. Feola, F. Pusateri**  
*Birkhoff normal form for Gravity Water Waves*,  
 Water Waves, 3 : 117–126 (2021),  
 DOI: 10.1007/s42286-020-00024-y
13. **M. Berti, R. Feola, L. Franzoi**  
*Quadratic life span of periodic gravity-capillary water waves*,  
 Water Waves, 3: 85–115 (2021),  
 DOI: <https://doi.org/10.1007/s42286-020-00036-8>
14. **R. Feola, F. Giuliani, M. Procesi**  
*Reducible KAM tori for Degasperis-Procesi equation*,  
 Comm. Math. Phys. 377: 1681– 1759 (2020),  
 DOI: <https://doi.org/10.1007/s00220-020-03788-z>
15. **R. Feola, B. Grebért, T. Nguyen**  
*Reducibility of Schrödinger equation on a Zoll manifold with unbounded potential*.  
 Journal of Mathematical Physics, 61, 071501 (2020),  
 DOI: 10.1063/5.0006536
16. **R. Feola, F. Giuliani**  
*Time quasi-periodic traveling gravity water waves in infinite depth*,  
 Rend. Lincei Mat. Appl. 31: 901–916 (2020),  
 DOI: 10.4171/RLM/919
17. **J. Bernier, R. Feola, B. Grebért, F. Iandoli**  
*Long-time existence for semi-linear beam equations on irrational tori*.  
 Journal of Dynamics and Differential Equations 33:1363–1398 (2021),  
<https://doi.org/10.1007/s10884-021-09959-3>
18. **M. Berti, R. Feola, F. Pusateri**  
*Birkhoff normal form and long time existence for pure gravity water waves in infinite depth*.  
 Accepted on CPAM (2022), DOI: 10.1002/cpa.22041
19. **R. Feola, F. Giuliani**  
*Quasi-periodic traveling waves on an infinitely deep fluid under gravity*.  
 Accepted on Memoires of the AMS, preprint arXiv:2005.08280.
20. **R. Feola, F. Iandoli, F. Murgante**  
*Long-time stability of the quantum hydrodynamic system on irrational tori*.  
 Mathematics in Engineering, 4(3): 1–24 (2021).  
 DOI:10.3934/mine.2022023
21. **R. Feola, F. Iandoli**  
*Local well-posedness for the quasi-linear Hamiltonian Schrödinger equation on tori*.  
 Journal de Mathématiques Pures et Appliquées, 157: 243–281 (2022).  
<https://doi.org/10.1016/j.matpur.2021.11.009>

22. **R. Feola, R. Montalto**  
*Quadratic lifespan and growth of Sobolev norms for derivative Schrödinger equations on generic tori.*  
 Journal of Differential Equations, 312: 276–316 (2022).  
<https://doi.org/10.1016/j.jde.2021.12.018>
23. **R. Feola, B. Grebért, F. Iandoli**  
*Long time solutions for quasi-linear Hamiltonian perturbations of Schrödinger and Klein-Gordon equations on tori.*  
 Accepted on Analysis & PDE, preprint arXiv:2009.07553.
24. **R. Feola, J.E. Massetti**  
*Sub-exponential stability for the Beam equation.*  
 Accepted on Journal of Differential Equations (2023), preprint arXiv:2207.09986.

PREPRINTS.

25. **R. Feola, M. Procesi**  
*KAM for quasi-linear autonomous NLS.*  
 preprint arXiv:1705.07287
26. **R. Feola, F. Iandoli**  
*A non-linear Egorov theorem and Poincaré-Birkhoff normal forms for quasi-linear Pdes on the circle.*  
 preprint arXiv:2002.12448.
27. **D. Bambusi, R. Feola, R. Montalto**  
*Almost global existence for some Hamiltonian PDEs with small Cauchy data on general tori.*  
 preprint arXiv:2208.00413.
28. **R. Feola, F. Giuliani**  
*Long time NLS approximation for the quasilinear Klein-Gordon equation on large domains under periodic boundary conditions.*  
 preprint arXiv:2206.11836.
29. **R. Feola, J.E. Massetti**  
*On the lifespan of solutions and control of high Sobolev norms for the completely resonant NLS on tori.*  
 preprint arXiv:2303.07459.

TEACHING.

1. **A.A. 2008-09:** Tutor for the course “Differential Equations and Mechanics” (Prof. G. Gentile), at the Mathematics department, University of “Roma Tre”.
2. **A.A. 2009-10:** Tutor for the course “Differential Equations and Mechanics” (Prof. G. Gentile), at the Mathematics department, University of “Roma Tre”.

3. **A.A. 2010-11:** Tutor for the courses “Differential Equations and Mechanics” (Prof. G. Gentile) and ”Preparation for the Final Exam” (Prof. G. Gentile and Prof. A. Bruno), at the Mathematics department, University of “Roma Tre”.
4. **A.A. 2011-12:** Tutor for the course “Differential Equations and Mechanics” (Prof. A. Giuliani), at the Mathematics department, University of “Roma Tre”.
5. **A.A. 2013/2014:** Assistant for the course “Partial Differential Equations” (Prof. A. Pellegrinotti), at the Mathematics department, University of ”Roma Tre”
6. **A.A. 2014/2015:** Assistant for the course “Istituzioni di Analisi Superiore” (Prof. U. Bessi), at the Mathematics department, University of ”Roma Tre”
7. **A.A. 2020/2021:** “Sobolev spaces”. at the Mathematics department, University of ”Roma Tre”
8. **A.A. 2021/2022:** “Analisi matematica I” at the department of engineering , University of ”Roma Tre”
9. **A.A. 2021/2022:** “Sobolev spaces”. at the Mathematics department, University of ”Roma Tre”
10. **A.A. 2022/2023:** “Sobolev spaces”. at the Mathematics department, University of ”Roma Tre”
11. **A.A. 2022/2023:** “Analisi matematica I” at the department of engineering , University of ”Roma Tre”

#### STUDENTS MENTORED.

1. **2015/2016** Alice Ambrosio (PhD).
2. **2016/2017** Filippo Giuliani (PhD).
3. **2018/2019** Trung Nguyen (PhD)

#### SUPERVISOR.

1. **2017/2018** PhD advisor for Felice Iandoli, with Prof. M. Berti.  
Title of the thesis: “*Local and almost global solutions for fully-nonlinear Schrödinger equations on the circle*”.

#### CONFERENCES AS INVITED SPEAKER.

1. **September 2013:** conference “Multiscale Methods in small divisors problem” Maiori. Talk: “Quasi-Periodic Solutions for quasi-linear forced NLS”;
2. **September 2014:** conference “KAM Theory and Dispersive PDE’s” in Rome; talk about “Quasi-Periodic solutions for quasilinear forced NLS”;

3. **December 2014:** Workshop “Metodi KAM e dispersivi in PDE Hamiltoniane” Milano. Talk: “ Quasi-Periodic Solutions for quasi-linear forced NLS.”
4. **September 2015:** Convegno UMI Siena 7-12 Sept. 2015. Talk: “KAM Theory for quasi-linear PDE’s ”.
5. **June 2019:** seminar at “Hamiltonian PDEs: KAM, Reducibility, Normal Forms and Applications” - Oaxaca 2019: “ Birkhoff normal form for periodic water waves”;
6. **September 2019:** conference ”New trends in propagation of linear and nonlinear wave phenomena”, Erice 2019. Talk: “Reducible KAM tori for Degasperis-Procesi equation”.
7. **June 2022:** conference: “Normal forms and splitting methods”, Pornichet.
8. **September 2022:** Talk: “Long time NLS approximation for a quasilinear Klein-gordon equation on large compact domains”.  
conference ”Hamiltonian and Dispersive PDEs”, Pisa. Talk: “Long time NLS approximation for a quasilinear Klein-gordon equation on large compact domains”.  
url: <https://sites.google.com/view/prin20hpdes/home>

INVITED SPEAKER.

1. **November 2015:** seminar at SISSA. Title: “Quasi-periodic solutions for fully nonlinear NLS”.
2. **November 2016:** invited speaker to Nantes by Prof. Benoit Grèbert. Talk: “KAM theory for quasi-linear NLS”;
3. **March 2017:** invited speaker to RomaTre by Prof. Michela Procesi. Talk about almost global existence for quasi-linear NLS on the circle;
4. **December 2017:** invited speaker to Naples by Prof. Pietro Baldi. Talk: “ Local well-posedness for quasi-linear NLS with large Cauchy data on the circle”;
5. **June 2018:** seminar at SISSA. Title: “On the Cauchy problem for a class of fully nonlinear Schrödinger equation”.
6. **July 2018:** invited speaker to RomaTre by Prof. Michela Procesi. Talk about long time existence for periodic gravity water waves;
7. **September 2018:** seminar at “XLIII Summer School On Mathematical Physics - Ravello 2018: “BNF for Water waves”;
8. **November 2018:** seminar at “University of Nantes”: Birkhoff normal form and long time existence for periodic gravity water waves;
9. **February 2019:** invited speaker at “Universitat Politècnica de Catalunya” by Prof. M. Guardia. Title: “Birkhoff Normal Form and long time existence for periodic gravity water waves”.

10. **July 2019:** invited speaker at “University of Toronto” by Prof. Fabio Pusateri. Title: “Reducible KAM tori for Degasperis-Procesi equation”;
11. **October 2019:** invited speaker at “University Paris13”-LAGA by Prof. Jean-Marc Delort. Title: “Birkhoff normal form for periodic water waves”;
12. **March 2020:** invited speaker for the series of seminars “Enrique-Lebesgue”, University of Nantes/University of Milano. Title: “A non-linear Egorov Theorem and Poincaré-Birkhoff Normal forms for quasi-linear PDEs on the circle”.
13. **March 2021:** invited speaker at “University of Lund” Title: “ Time quasi-periodic traveling gravity water waves in infinite depth”.
14. **October 2021:** invited speaker at “University of Nantes” Title: “Local and almost global solutions for quasi-linear Schrödinger equations on tori ”.
15. **July 2022:** invited speaker at “University of Stuttgart” Title: “Long time NLS approximation for a quasilinear Klein-gordon equation on large compact domains”.
16. **October 2022:** invited speaker at Università degli Studi di Roma ”Tor Vergata” Title: “Long time NLS approximation for a quasilinear Klein-gordon equation on large compact domains”.

ATTENDED CONFERENCES.

1. **September 2012:** conference “PDE’s in Rome: School and Conference” in Rome;
2. **February 2013:** winter School: “Dynamics and Pde’s” in Saint-Etienne de Tinnée
3. **June 2013:** HANDDY Conference: “Hamiltonians and Dispersive Equations: Dynamics”, CIRM-Marseille;
4. **January 2014:** conference in Toronto “Hamiltonian PDEs: Analysis Computations and Applications”;
5. **February 2014:** Winter school: Dynamics and PDEs, Saint- Etienne de Tinée;
6. **June 2014:** Workshop on interactions between Dynamical Systems and Partial Differential Equations in Barcellona;
7. **November 2014:** Workshop DYNPDE, Dynamics and PDE’s Cargese.
8. **July 2015:** Summer school “Normal forms and large time behavior for nonlinear PDE”, Nantes.
9. **July 2016:** summer schools “Nonlinear Waves 2016” in Paris ;
10. **September 2016:** conference “Hamiltonian Dynamics, PDEs and Waves on the Amalfi coast”;
11. **February 2017:** winter school “Dynamics and PDEs” in Saint-Etienne de Tinnée, France;

12. **May 2018:** School and Conference on Nonlinear Waves in Atlanta (US);
13. **July 2018:** EMS Lectures Summer School, Roma “Tor Vergata”;
14. **September 2018:** XLIII Summer School On Mathematical Physics in Ravello ;
15. **May 2019:** “Leaning tori” An Hamiltonian Event under the Tower, Pisa Centro “De Giorgi”;

RESEARCH MEETINGS.

1. **April 2013:** “Growth of Sobolev norms for NLS”, speaker: E. Haus.
2. **July 2013:** “An Abstract Nash-Moser theorem with applications to existence of quasi-periodic solutions for PDEs on compact homogeneous manifolds”, speaker: L. Corsi.
3. **February 2014:** “Nearly integrable systems with orbits accumulating to KAM tori”, speaker M. Guardia.
4. **June 2014:** “Energy cascades and wave turbulence for the cubic Schrödinger equation”, speaker Z. Hani.
5. **December 2015:** Mini Course: “Arnol’d Diffusion via Invariant Cylinders and Mather Variational Methods” speaker V. Kaloshin.
6. **April 2015:** Mini-course on “Weak Turbulence” by dott. A. Maiocchi.
7. **October 2015:** research meeting on “KAM for quasi-linear PDEs” with M. Procesi and D. Bambusi.
8. **November 2019:** scientific collaboration with dott. F. Giuliani and Prof. M. Guardia at “UPC” Barcelona.

LONG STUDY PERIODS.

1. **February 2015:** Invitation at the “Mc Master University” Hamilton, Canada 1-25 February 2015 Seminar: “Quasi-periodic solutions for fully non-linear NLS”, 13 Feb. 2015 Mc Master University, 23 Feb. 2015 University of Toronto. Scientific collaboration with Prof. W. Craig and Dott. L. Corsi.
2. **July 2019:** scientific collaboration with Prof. Fabio Pusateri. Seminar: “Reducible KAM tori for Degasperis-Procesi equation” at University of Toronto.

MEMBER OF THE ORGANIZING COMMITTEE.

1. “Roman Summer school and workshop: KAM theory and dispersive PDEs” (together with L. Biasco, P. Magrone, M. Procesi, L. Corsi, E. Haus),  
<http://ricerca.mat.uniroma3.it/users/procesi/RomanPDEs2014.html>  
 Roma 1-11 Sept. 2014



2. Hamiltonian dynamics, PDEs and Waves on the Amalfi coast (together with M. Procesi, P. Baldi, E. Haus, A. Maspero, V. Coti Zelati, L. Biasco),  
<http://ricerca.mat.uniroma3.it/users/procesi/maiori2016/home.html>  
Maiori, 5-10 Sept. 2016.
3. Hamiltonian and Dispersive PDEs, (together with L. Biasco, L. Corsi, E. Haus, J.E. Massetti, M. Procesi),  
<https://sites.google.com/view/prin20hpdes/workshops/second-school-workshop>  
Roma, 15 - 19 May 2023

MEMBER OF RESEARCH PROJECTS.

1. Member of the ERC project: “Hamiltonian PDEs and small divisor problems: a dynamical system approach” n. 306414 under FP7. (Principal investigator M. Procesi)
2. Member of Miur-PRIN 2015 “Variational methods, with applications to problems in mathematical physics and geometry” n. 2015KB9WPT-008.
3. Member of the ERC Project “FAnFARe” n. 637510. (Principal investigator Frederic Bernicot)
4. Supported by the Centre Henri Lebesgue ANR-11-LABX- 0020-01.
5. Member of the project ANR -15-CE40-0001-02 “BEKAM” of the Agence Nationale de la Recherche.
6. Member of Miur-PRIN 2020 “Hamiltonian and Dispersive PDEs” n. 2020B3EFL.

LANGUAGES SKILLS.

1. Italian: mother language
2. English: Upper intermediate (written and spoken)
3. French: Basic knowledge

“Autorizzo il trattamento dei miei dati personali ai sensi del Dlgs 196 del 30 giugno 2003”.

Dichiaro che le dichiarazioni rese all'interno del curriculum vitae sono corrispondenti al vero e sono rese ai sensi degli artt. 46 e 47 del DPR 445/2000.

Ai fini della pubblicazione.

Roberto Feola,

