Curriculum Vitae

Riccardo Montalto

1 Personal data

Name: Riccardo

Surname: Montalto

Place and date of birth: Villaricca (Napoli) - Italy, 2 January 1987.

Current position: (November 2014 - present) Post-doc at Institut für Mathematik, Universität Zürich, under the supervision of the Professor Thomas Kappeler (renewal until July 2019).

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2 Education

- 1.**October 2008:** University Federico II of Naples, Naples, Italy : Bachelor degree in Mathematics. Title of the thesis: *"Rappresentazione di ordinali numerabili in $\mathbb{Q}$"*. Advisor: Prof. R. Tortora. Final mark: 110/110 *cum laude*.

- 2. **October 2010:** University Federico II of Naples, Naples, Italy : Master of degree in Mathematics. Title of the thesis: *"KAM Theory for quasi-integrable hamiltonian systems "*. Advisor: Prof. M. Berti. Final mark: 110/110 *cum laude*.

- 3. **November 2010 − 31 October 2014:** PhD at *International school of advanced studies* SISSA, Via Bonomea 265, 34136, Trieste. PhD in Mathematical analysis (*cum laude*)
  supervisor: Prof. Massimiliano Berti.

  date of defense: *31 October 2014*

  Title of the PhD thesis: *KAM for quasi-linear and fully nonlinear perturbations of Airy and KdV equations*

3 Research periods

- 1. **September 2013 – December 2013:** visiting student at *Ecole Normale Supérieure, Paris (France)*, under the supervision of the Professor *Thomas Alazard*.

- 2. **November 2014 – present:** Post-doc at University of Zürich under the supervision of the Professor Thomas Kappeler (renewal until July 2019)

4   Publications

Research topics: KAM theory for PDEs (existence of quasi-periodic solutions for partial differential equations), Microlocal analysis (pseudo-differential operators theory), Integrable systems, Control theory for PDEs.

1. P. Baldi, M. Berti, R. Montalto, *A note on KAM theory for quasi-linear and fully nonlinear KdV.* Rend. Lincei Mat. Appl. 24, 437-450, 2013

2. P. Baldi , M. Berti, R. Montalto, *KAM for quasi-linear and fully nonlinear forced perturbations of Airy equation.* Math. Annalen, 359, 1-2, 471-536, 2014.

3. P. Baldi , M. Berti, R. Montalto, *KAM for quasi-linear KdV.* C. R. Acad. Sci. Paris, Ser. I 352, 603-607, 2014

4. P. Baldi , M. Berti, R. Montalto,*KAM for autonomous quasi-linear perturbations of KdV.* Ann. I. H. Poincaré (C) Anal. Non Linéaire 33, 1589-1638, 2016.

5. P. Baldi , M. Berti, R. Montalto, *KAM for autonomous quasi-linear perturbations of mKdV.* Boll. Unione Mat. Ital, 9, 143-188, 2016.

6. M. Berti, T. Kappeler, R. Montalto, *Large KAM tori for perturbations of the dNLS equation.* Accepted on Asterisque. Preprint arXiv:1603.09252v1, 2016.

7. T. Kappeler, R. Montalto, *Canonical coordinates with tame estimates for the Defocusing NLS Equation on the Circle*, Int. Math. Res. Notices, doi: 10.1093/imrn/rnw233, 2016

8. R. Montalto, *A note on KAM for gravity-capillary water waves.* Journées équations aux dérivées partielles, Exp. No. 7, 18 p., doi: 10.5802/jedp.648, 2016. (Proceeding for the conference "Journées des équations aux dérivées partielles' in Roscoff, 30 May- 3 June, 2016)

9. M. Berti, R. Montalto, *Quasi-periodic water waves.* J. Fixed Point Theory Appl., 19(1), 129-156, 2017.

10. M. Berti, R. Montalto, *Quasi-periodic standing wave solutions for gravity-capillary water waves.* To appear on Memoirs of the American Math. Society, MEMO 891 (preprint arXiv:1602.02411v1, 2016).

11. P. Baldi, E. Haus, R. Montalto, *Controllability of quasi-linear Hamiltonian NLS equations.* Accepted on Journal of Differential Equations. Preprint arXiv:1610.09196v1, 2016.

12. R. Montalto, *Quasi-periodic solutions of forced Kirchhoff equation.* Nonlinear Differ. Equ. Appl. NoDEA, 24(1), 9, 2017.

13. R. Montalto, *A reducibility result for a class of linear wave equations on $\mathbb{T}^d$.* Int. Math. Res. Notices, doi: 10.1093/imrn/rnx167, 2017.

14. R. Montalto, *On the growth of Sobolev norms for a class of linear Schrödinger equations on the torus with superlinear dispersion.* Preprint arXiv:1706.09704, 2017.

15. P. Baldi, M. Berti, E. Haus, R. Montalto, *Time quasi-periodic gravity water waves in finite depth.* Preprint arXiv:1708.01517, 2017.

5   Research projects

- *Hamiltonian systems of infinite dimension*, project number: 200020–165537.

  Supported by the *Swiss National Science Foundation*.

  Scientific coordinator: Thomas Kappeler

- *Aspetti variazionali e perturbativi nei problemi differenziali nonlineari*, PRIN 2012, protocollo: 201274FYK7–004.

  Coordinatore scientifico: Susanna Terracini

  Responsabile scientifico: Massimiliano Berti

6   Invited talks

1. **February 2012**. Mathematics department, University Federico II of Naples, Naples, Italy.
   Title: *Pseudo-differential operators and applications to the PDEs.*

2. **December 2012**. Mathematics department, University of "Roma Tre", Rome, Italy.
   Title: *Kam Theory for quasi-linear and fully nonlinear forced perturbations of the airy KdV equation.*

3. **September 2013**. Maiori (NA), Italy, workshop "Hamiltonian PDEs".
   Title: *Kam Theory for quasi-linear and fully nonlinear forced perturbations of the airy KdV equation.*

4. **26 November 2013**. Paris, France, ENS (Ecole Normale Supérieure) "Journeé d'analyse'.
   Title: *Kam Theory for quasi-linear and fully nonlinear forced perturbations of the airy KdV equation.*

5. **September 2014**. Rome, Italy, "School and worshop on KAM and dispersive PDEs'.
   Title: *Kam for quasi-linear autonomous Hamiltonian perturbations of KdV.*

6. **December 2014**. University of Milan (Statale di Milano), Milan, Italy, workshop "KAM and dispersive PDEs'.
   Title: *Kam for quasi-linear autonomous Hamiltonian perturbations of KdV.*

7. **December 2014**. Venice, Italy, "Conference in honour of Antonio Ambrosetti'.
   Title: *Kam for gravity-capillary water waves.*

8. **June 2015**. Euler International Mathematical Institute, St. Petersburg, Russia, "Conference on Hamiltonian systems and their applications'.
   Title: *Kam for gravity-capillary water waves.*

9. **October-November 2015**. GSSI, Gran Sasso Science Institute, L'Aquila, Italy "IperGSSI2015 16th Italian Meeting on Hyperbolic Equations'.
   Title: *Quasi-periodic standing wave solutions for gravity-capillary water waves.*

10. **December 2015**. University of Milan (Statale di Milano), Milan, Italy, "Localization and reducibility in Hamiltonian PDEs and quantum mechanics'.
    Title: *Quasi-periodic standing wave solutions for gravity-capillary water waves.*

11. **May-June 2016**. Roscoff, France, "Journées des équations aux dérivées partielles'
    Title: *Quasi-periodic standing wave solutions for gravity-capillary water waves.*

12. **September 2016**. Maiori (NA), Italy, "Hamiltonian Dynamics, PDEs and waves on the Amalfi coast'
    Title: *On the exact controllability for quasi-linear Hamiltonian NLS equation.*

13. **April 2017**. ETH Zürich, Institute for theoretical studies, Zürich, Switzerland, "Dynamical systems seminar' invited by Vadim Kaloshin
Title: *Quasi-periodic solutions of water waves.*

7 Selection of other schools and workshops

1. **May 2011**. Naples, Italy, "School and Conference on KAM and Cauchy theory for PDEs".

2. **January-February 2012**. Saint-Etienne de Tinée, France, "Dynamics and PDEs".

3. **June 2012**. Capri (NA), Italy, "Hamiltonian PDEs".

4. **July 2012**. Ascona, Switzerland, "Nonlinear Hamiltonian PDEs".

5. **September 2012**. Rome, Italy, "School and Conference: Nonlinear PDEs".

6. **November 2012**. Marseille, France, "Dynamique et EDP"

7. **February 2014**. Saint-Etienne de Tinée, France, "Dynamics and PDEs"

8. **June-July 2015**. Lebesgue center, Nantes, France, "Normal forms and large time behavior for nonlinear PDEs'.

8 Teaching activity

1. **Academic year 2012–2013** Teaching assistant, for the Master's degree course in Mathematics, **Foundations of advanced analysis** (Measure theory and Functional Analysis), held by Prof. Massimiliano Berti at university Federico II of Naples, in the academic year $2012 - 2013$.

2. **February 2015 – June 2015**, course : **Introduction to KAM theory**, University of Zürich. In this course I presented an introduction of the theory of quasi-periodic solutions of Hamiltonian perturbations of finite-dimensional integrable systems. It is referred to the literature as the KAM theory (Kolmogorov-Arnold-Moser Theory). The syllabus of the course was the following:

   - **Hamiltonian formalism in finite dimension:** Hamiltonian equations of the motion, examples of Hamiltonian systems, symplectic form, Poisson brackets, symplectic matrices, canonical transformations, action-angle variables.
   - **Integrable Hamiltonian systems:** definition of integrable system, the Arnold-Liouville Theorem, definition of quasi-periodic motions, diophantine frequencies, properties of linear flows on the n-dimensional torus.
   - **Nash-Moser implicit function theorem:** differential calculus on Banach spaces, introduction to small divisors problems, some examples in which the classical implicit function Theorem fails. Nash-Moser implicit function Theorem in analytic setup and its refinement using the *approximate inverse* introduced by *Zehnder.*

- **KAM Theorem:** Proof of the KAM Theorem for analytic Hamiltonian perturbations of an integrable system.

3. **September 2015–December 2015.** Organizer of the student's seminar **Topics in Nonlinear Analysis**.

   Topics: Differential calculus in Banach spaces, implicit function theorem, local and global inversion theorems in Banach spaces, bifurcation theory of periodic solutions for Ordinary differential equations.

4. **February 2016–June 2016.** Teaching assistant for the Bachelor's degree course **Linear Algebra for natural scientists**, University of Zürich, held by the Professor Thomas Kappeler.

5. **September 2016 – December 2016**. Teaching assistant for the Master's degree course in Mathematics **Functional Analysis**, University of Zürich, held by the Professor Thomas Kappeler.

6. **February 2017– present**. Teaching assistant for Bachelor's degree course in Chemistry **Analysis for Chemistry**, University of Zürich, held by the Professor Thomas Kappeler.

9   Referee activity

I have reviewed some papers for the following journals:

- Journal of Functional Analysis.
- Transaction of the American Mathematical Society
- Discrete and continuous dynamical systems, series A.
- Nonlinear Analysis, theory methods and applications.
- Journal of mathematical Analysis.
- Journal of Dynamics and Differential Equations