

## **ALLEGATO B**

UNIVERSITÀ DEGLI STUDI DI MILANO

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## **[Filippo Giuliani] CURRICULUM VITAE**

### **INFORMAZIONI PERSONALI (NON INSERIRE INDIRIZZO PRIVATO E TELEFONO FISSO O CELLULARE)**

COGNOME	GIULIANI
NOME	FILIPPO
DATA DI NASCITA	[ 12, 12, 1987]

### **ACADEMIC CARRIER**

2018-Present: Postdoctoral Fellow at UPC, Barcelona.

Postdoctoral Fellow for the ERC project HAMINSTAB: Instabilities and homoclinic phenomena in Hamiltonian systems, with Principal Investigator Prof. M. Guardia.

2017-2018: Postdoctoral Fellow at Università di Roma Tre, Roma.

Postdoctoral Fellow for the ERC project HAMPDES: Hamiltonian PDEs and small divisor problems: a dynamical systems approach , with Principal Investigator Prof. M. Procesi.

### **EDUCATION**

2013-2017: PhD at SISSA, Trieste.

PhD (cum laude) in Mathematical Analysis, Modeling and Applications at SISSA International School of Advanced Studies under the supervision of Prof. M. Berti.

Thesis title: KAM for quasi-linear PDEs.

2011-2013: Laurea Magistrale at Università degli studi di Pisa, Pisa.

Master Degree in Mathematics at University of Pisa, Curriculum Analysis and Probability, 110/110 cum laude.

Advisor: Prof. P. Acquistapace, co-advisor: Prof V. Georgiev.

Thesis Title: Controllo lineare quadratico per problemi ai limiti parabolici e iperbolici.

### **AWARDED SCHOLARSHIPS AND FELLOWSHIPS**

2018: Postdoctoral Fellowship for the ERC project HAMINSTAB.

2017: Postdoctoral Fellowship for the ERC project HAMPDES.

2013: PhD scholarship at SISSA (Trieste).

## RESEARCH INTERESTS

My research interests are focused on the analysis of the Dynamics of Partial Differential Equations. In particular I am interested in both stability and instability phenomena for nonlinear Hamiltonian PDEs on compact manifolds.

-KAM for PDEs: results of existence and stability of time quasi-periodic solutions for PDEs on tori.

-Study of long-time dynamics of nonlinear PDEs through normal form methods.

-Reducibility of quasi-periodically time-dependent unbounded linear operators on tori.

-Growth of Sobolev norms and transfers of energy for PDEs on compact manifolds.

-Arnold diffusion for infinite dimensional dynamical systems.

## PUBLICATIONS AND PREPRINTS

- (1) F. Giuliani, Transfers of energy through fast diffusion channels in some resonant PDEs on the circle, accepted on 10.03.2021 in Discrete and Continuous Dynamical Systems, (2021).
- (2) F. Giuliani, M. Guardia, P. Martin and S. Pasquali, Chaotic-like transfers of energy in Hamiltonian PDEs, Communications in Mathematical Physics, published online at <https://link.springer.com/article/10.1007/s00220-021-03956-9> (2021).
- (3) R. Feola and F. Giuliani, Quasi-periodic traveling waves on an infinitely deep perfect fluid under gravity, Preprint Arxiv, <https://arxiv.org/abs/2005.08280>, 102 pages (2020).
- (4) R. Feola and F. Giuliani, Time quasi-periodic traveling gravity water waves in infinite depth, Rendiconti Lincei. Matematica e Applicazioni, 31, 901–916 (2020).
- (5) F. Giuliani, M. Guardia, P. Martin and S. Pasquali, Chaotic resonant dynamics and exchanges of energy in Hamiltonian PDEs, accepted on 23.11.2020 in Rendiconti Lincei. Matematica e Applicazioni, (2020).
- (6) R. Feola, F. Giuliani and M. Procesi, Reducible KAM tori for Degasperis-Procesi equation, Communications in Mathematical Physics, 377, 1681–1759 (2020).
- (7) R. Feola, F. Giuliani and 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).
- (8) R. Feola, F. Giuliani, R. Montalto and M. Procesi, Reducibility of first order operators on tori via Moser theorem, Journal of Functional Analysis 276(3) : 932-970 (2019).
- (9) R. Feola, F. Giuliani and S. Pasquali, On the integrability of the Degasperis-Procesi equation: control of Sobolev norms and Birkhoff resonances, Journal of Differential Equations 266 (6), 3390-3437 (2018).

(10) F. Giuliani, Quasi-periodic solutions for quasi-linear generalized KdV equations, Journal of Differential Equations, 262, 5052-5132 (2017).

## **TEACHING**

2018-2021: Course of Calculus 2 for 3 consecutive years at School of Industrial Ingeenering, UPC, Barcelona.

2018: Tutorial activity for the exam of Mathematics at the faculty of Biology, University of Roma Tre, Rome.

## **INVITED SPEAKER AT**

Oct. 2020: Dynamical Systems session of the Barcelona Mathematical Days, online conference. Title: Chaotic resonant dynamics and exchanges of energy in Hamiltonian PDEs.

Feb, 2020: Winter school Implicit function theorems in Geometry and Dynamics, at Schloss Rauschholzhausen. Title: Proof of the KAM theorem by a Nash-Moser approach.

Jun. 2019: Second BMS-BGSMath Junior Meeting, at Berlin. Title: KAM theory for quasi-linear PDEs.

May 2018: MINI - Workshop PDE postdoc students working on PDE in MATH Physics at Pisa. Title: Integrability and quasi-periodic solutions for the Degasperis-Procesi equation.

## **INVITED SEMINARS**

2019: Universite' de Nantes, 21 March 2019, title: "Reducible KAM tori for Degasperis-Procesi equation".

2019: Universita' di Roma Tre, 18 October 2019, title: "Chaotic resonant dynamics for some PDEs".

2018: Universita' di Tor Vergata, 22 May 2018, title: "Integrability and KAM theory for the Degasperis-Procesi equation".

2018: Seminari de sistemes dinamics UB-UPC, 14 November 2018 at UPC Barcelona, title: "KAM for quasi-linear PDE's".

2017: Universita' di Napoli Federico II, 30 November 2017, title: "Quasi- periodic solutions for Hamiltonian perturbations of the Degasperis-Procesi equation".

2016: Universita' di Roma Tre, 18 October 2016, title: "Quasi-periodic solutions for quasi-linear generalized KdV equations".

## **TALKS IN CONFERENCES**

2018: Perspectives in Hamiltonian dynamics, conference 18-22 June 2018, Venice, seminar title: "Integrability and quasi-periodic dynamics for the Degasperis-Procesi equation".

2018: Symmetry and Perturbation Theory, conference 3-10 June 2018 S. Margherita di Pula (Sardegna), seminar title: "On the integrability of the Degasperis-Procesi equation: control of Sobolev norms and Birkhoff resonances".

## **ORGANIZER OF INTERNATIONAL CONFERENCES**

2021: Organizer of the 19-th School on interactions between dynamical systems and Partial Differential Equations (JISD2021). Postponed to 2023 due to Covid19-pendemic.

2020: Organizer of the 18-th School on interactions between dynamical systems and Partial Differential Equations (JISD2020). Postponed to 2022 due to Covid19-pendemic.

## **RESEARCH VISITS**

2020: Università di Roma Tre, invited by prof. Procesi and prof. Biasco, 20-23 Jan.

2020: SISSA (Trieste), invited by prof. M. Berti, 15-17 Jan.

2019: Université de Nantes, invited by Dr. R. Feola, 19-23 March.

2019: Università di Roma Tre, invited by prof. M. Procesi, 13-20 Oct.

2017: Università di Napoli Federico II, invited by prof P. Baldi, Nov.

2016: Università di Roma Tre, invited by prof. Procesi, Oct.

## **PROJECT MEMBER**

2018-Present: ERC grant, Haminstab: Instabilities and homoclinic phenomena in Hamiltonian systems, P.I: M. Guardia (UPC, Barcelona) .

2017-2018: ERC grant, Hamiltonian PDEs and small divisor problems: a dynamical systems approach, P.I: M. Procesi (Università degli studi di Roma Tre).

2015-2017: PRIN 2015, Variational methods, with applications to problems in mathematical physics and geometry, P.I: M. Berti (SISSA, Trieste).

2013-2015: PRIN 2012, Variational and perturbative aspects of nonlinear differential problems, P.I: M. Berti (SISSA, Trieste).

## **MEMBERSHIP**

2019-Present: Member of Barcelona Graduate School Math community.

## **REFeree ACTIVITY FOR**

Journal of Differential Equations. Nonlinearity. Journal of Nonlinear Science. Journal of Mathematical Physics. Nonlinear analysis. Analysis and Mathematical Physics. Applicable Analysis.

## **PARTICIPATION TO CONFERENCES AND SCHOOLS**

2019: 17-th School on interactions between dynamical systems and Partial Differential Equations, Barcelona.

2019: "Leaning tori, An Hamiltonian event under the tower", Centro Ennio De Giorgi, Pisa.

2018: 16-th School on interactions between dynamical systems and Partial Differential Equations, Barcelona.

2018: Perspectives in Hamiltonian dynamics, Venezia.

2018: Symmetry and Perturbation Theory, S. Margherita di Pula.

2016: Hamiltonian Dynamics, PDEs and Waves on the Amalfi Coast, Maiori.

2016: Nonlinear Waves 2016: Summer School, IHES, Paris.

2015: Normal Forms and Large Time Behavior for Nonlinear PDE, Centre Henri Lebesgue, Nantes.

2015: Sixth Itinerant Meeting in PDEs, SISSA, Trieste.

2014: KAM and Dispersive Methods in PDEs, Università di Milano, Milano.

2014: Roman Summer School and Workshop on KAM Theory and Dispersive PDEs, Università Roma Sapienza, Roma.

## **PHD COURSES AND EXAMS**

2013-2014: Nonlinear analysis and bifurcation theory, prof. Malchiodi (with exam, final mark: 30 cum laude).

2013-2014: Nonlinear analysis and dynamical systems, prof. Berti (with exam, final mark: 30 cum laude).

2013-2014: Introduction to elliptic PDE's, prof. Dal Maso (with exam, final mark: 30 cum laude).

2013-2014: Topics in computational Fluid Dynamics, prof. Rozza (with exam, final mark: 30 cum laude).

2014-2015: An introduction to KAM theory, prof. Bolle.

2014-2015: Global solutions of Klein-Gordon type equations and semi-classical microlocal normal forms, prof. Delort.

2015-2016: Variational methods for linear and nonlinear Dirac equations, prof. Sere.

2015-2016: KAM theory for PDE's, prof. Berti.

2015-2016: Dynamics of Hamiltonian PDE's, prof. Procesi.

2016-2017: Dynamics of nonlinear PDE's, prof. Berti.

2016-2017: Reducibility and KAM theory for PDE's, prof. Bambusi.

## **LANGUAGES**

Italian: Mother-tongue.

English: Fluent.

Spanish: Fluent.

Data

12.03.2021

Luogo

Barcellona