Gabriella Pinzari | vitae & studiorum (including publications)

✉ gabriella.pinzari@math.unipd.it
https://www.ercprojectpinzari.wordpress.com
Associate Professor, Department of Mathematics, University of Padova

Generalities

Date of Birth: Rome, May 21st, 1966

Citizenship: Italian

Research Interests

Hamiltonian Systems, Perturbative Techniques, Classical and Celestial Mechanics, Integrable Systems.

Abilitazione Scientifica Nazionale

2013: Professoressa Associata in Mathematical Physics (01/A4)

2020: Professoressa Ordinaria in Mathematical Physics (01/A4)

Academic Career

2017–today: Chiamata diretta as an Associate Professor in Mathematical Physics (01/A4–MAT/07) at the University of Padova.

2015–17: Assistant Professor (tenure-track) in Mathematical Physics at the University Federico II, Naples

2013–15: Assistant Professor (non tenure-track) in Mathematical Physics at the University Federico II, Naples

2011–13: Post-doc at the University Roma Tre

2009–11: Post-doc at the University Federico II, Naples

PhD Dissertation

Title: *On the Kolmogorov Set for Many–Body Problems*

University: Roma Tre

Year: 2009

Supervisor: Professor Luigi Chierchia

Report1: Professor Massimiliano Berti, SISSA, Trieste

Report2: Professor Jacques Féjoz, Céremade & IMCCE, Paris

Judging Committee: Professor Massimiliano Berti (SISSA, Trieste), Professor Alessandra Celletti

(Univ. Tor vergata, Rome), Professor Jacques Féjoz (Céremade & IMCCE, Paris), Professor Corrado Falcolini (Roma Tre)

arXiv source: *1309.7028*

Education

1986–1990: Degree in Physics. Sapienza, University of Rome. Supervisor: Professor G. Gallavotti

1992–1996: Degree in Mathematics. Sapienza, University of Rome. Supervisor: Professor C. Marchioro

2004–2009: PhD. Roma Tre University. Supervisor: Professor L. Chierchia

Honors

2023: Remote Reviewer for SNSF, Swiss

2022: Remote Reviewer for Fondo Italiano per la Scienza (FIS), Ministero dell'Università e della Ricerca, Italy

2021-22: Panelist of ERC Consolidator Grants 2022 (CoG22), European Commission

`https://erc.europa.eu/sites/default/files/2023-05/Panel_Members_ERC_Consolidator_Grant_2022.pdf`

2017-22: Principal Investigator of FARE project "Dynamics of gravitational systems", 91.080 €

2016-22: Principal Investigator of ERC Starting Grant project "Stable and Chaotic Motions in the Planetary Problem (677793 StableChaoticPlanetM), 900,000 €. https://ercprojectpinzari.wordpress.com

2014: Invited Speaker to the International Congress of Mathematicians, Seoul. Session no 9 Dynamical Systems

Editor activity

2022–23: Guest editor for Celestial Mechanics and Dynamical Astronomy, Springer

2015–today: Editor of Springer Monographs in Mathematics

Referée activity

2009–today: Annales Henri Poincaré, Annals of Applied Mathematics, Acta Applicandae Mathematicae, BUMI, Celestial Mechanics and Dynamical Astronomy, Communications in Mathematical Physics, Discrete and Continuous Dynamical Systems, European Journal of Pure and Applied Mathematics, International Journal of Bifurcation and Chaos, Inventiones Mathematcae, Journal of Mathematical Physics, Journal of the American Mathematical Society, Memoirs of the American Mathematical Society, Nonlinearity, Regular and Chaotic Dynamics.

PhD activity

2022: Member of the judging committee (referee) for the PhD thesis of Dr Matteo Veglianti, at the Department of Physics of the University Tor Vergata

2017-19: PhD Advisor of Dr Santiago Barbieri, at the Department of of Mathematics of the University of Padova

Teaching

2022–today: Rational Mechanics ("Meccanica Razionale"), University of Padua

2017–today: Calculus, ("Analisi I", "Analisi II"), University of Padua

2013–2017: Calculus, ("Analisi I", "Analisi II"), University Federico II, Naples

2010–today: Master for Space Science and Technology for graduated students ("master di II livello in scienza e tecnologia spaziale"), University Tor Vergata, Rome. Class: "classical orbit determination"

Invited Conferences

2022:

- Journées de dynamique 28-30 septembre 2022 (Title of the lecture: "Some studies concerning the three–body and the Euler problem"). Salle des thèses, bâtiment Halle aux Farines, UP site Grands Moulins. http://journees-de-dynamique.imj-prg.fr
- XLVII Summer School on Mathematical Physics (Ravello - September 12 - 24, 2022). (Title of the lectures (6): "Applications of normal form theory in Celestial Mechanics). Invited.
- GLADS 2022- Global and Local Aspects in Dynamical Systems. A conference in honor of the 60th birthday of Tere M-Seara. July 5-9, 2022 (Title of the lecture: Interactions between the three–body problem and the Euler problem. Slides.). Invited.
- JISD 2022 – 18th School on Interaction between Dynamical Systems and Partial Differential Equations. Cycle of lectures. June 27-July 1st 2022. (Title of the lectures: Perturbation theories versus canonical coordinates in celestial mechanics. Notes). Invited.
- BIRS-CMO Workshop (22w5175) Geometric and Variational Methods in Celestial Mechanics, Casa Matemática Oaxaca (CMO), June 19-24, 2022. (Title of the lecture: Interactions between the three-body problem and the Euler problem. Slides). Invited.
- Advances in Classical, Quantum and Statistical Mechanics. A celebration of the work and contributions of G. Gallavotti. In the occasion of his 80th birthday. May 11-13, 2022. (Title of the lecture: Interactions between the three-body problem and the Euler problem. Slides). Invited.

2021:

- Think Tank on Scientific Computing and Funding Opportunities. University of Camerino (Italy), June 18-19, 2021. (Title of the lecture: Stable and Chaotic Motions in the Planetary Problem. Slides). Invited.

2020:

- Assemblea GNFM Montecatini. March 26–28. Postponed due to Coronavirus outbreak.
- 18th School on Interaction between Dynamical Systems and Partial Differential Equations (JISD2019), June 29th–July 3rd.
- Geometric and Variational Methods in Celestial Mechanics. CMO Oaxaca (Mexico). October 4–9, 2020

2019:

- Dynamics, Equations and Applications (DEA 2019). AGH University of Science and Technology (Krakow, Poland). September 16–20.
- New Trends in Celestial Mechanics. Cogne. June 24–28
- Symplectic Dynamics. Lorentz Center, Leiden. April 8–12
- Leaning Tori. Centro di Ricerca Matematica Ennio de Giorgi of the Scuola Normale Superiore in Pisa. May 20–23.
- Journée des Systèmes Dynamiques communs aux groupes de Systèmes Dynamiques d'Avignon et

de Marseille, June 13.
- International Young Researcher Workshop on Geometry, Mechanics and Control. Georg–August–Universität Göttingen in Germany. December 16–18.

2018:
- Hamiltonian systems, from topology to applications through analysis. Mathematical Sciences Research Institute, Bekeley. September 8–October 12. Title of the lecture: Exponential Stability of Euler Integral in the three–body problem
- SPT 2018. Pula (Cagliari) June 3–10. Invited lecture. Title: "The two-centre problem vs the three–body problem"

2017:
- DinAmicI IV: Modern trends in the ergodic theory of dynamical system. Rome, June 5–9 (Organized by C. Bonanno). invited speaker.
- CELMEC. international conference on celestial mechanics. san martino al cimino, viterbo, roma.September 3-9. invited speaker.
- winter school in conservative dynamics. Engelberg, Switzerland, February 5–11. Organized by the ETH Institute for Theoretical Studies (Organizers: Marcel Giardia, Vadim Kaloshin, Alfonso Sorrentino). Invited lecture.

2016:
- The 11th AIMS Conference on Dynamical Systems, Differential Equations and Applications. orlando (florida), july 1–5. organizer of special session no 16 "hamiltonian systems and the planetary problem"

2015:
- minisymposium on "Celestial Mechanics". Equadiff conference. lyon, july 6-10, 2015.org: v. kaloshin and m. guardia. Invited lecture.
- Conference on Dynamical Systems at ICTP, Trieste, which will take place on July 27 - August 07, 2015.org: s. luzzatto, c. yoccoz, m. viana. Invited lecture.
- European Women in Mathematics. cortona. august, 31- sept., 4. Invited lecture.
- Convegno Umi. Siena, 1-6 Sett.Invited lecture.
- hamiltonian systems and celestial mechanics, Oaxaca, Mexico September 6-11, BIRS, workshops. org: e. pereze–chavela, f. diacu, j. libre.Invited lecture.

2014:
- Symposium on Mathematical Physics. University of Züric. nov. 10–11. Invited lecture.
- Symplectic Techniques in Topology and Dynamics. colonia, germany. september, 22– 26. Invited lecture.
- International Congress of Mathematicians. coex, seoul, south corea. august 13–21. Invited lecture.
- 10th AIMS conference on dynamical systems, differential equations and applications. madrid, spain. july, 7–11.
- spt 2014. cala gonone, sardegna, italy. may 26 – june, 1. Invited lecture.

2013:
- Planetary Motions, Satellite Dynamics and Spaceship Orbits. CRM, montreal. canada. july, 22–26. Invited lecture.
- New Perspectives on the N–body Problem. BIRS, banff, canada. january, 13–18. Invited lecture.

2012:
- Variational Methods in N–body and Vortex Dynamics. june 4–8, 2012. lecce, italy. Invited lecture.

2011:

- Dynamical Systems and Classical Mechanics: a Conference in Celebration of Vladimir Arnold 1937 -2010. edinburgh, great britain. october 3–7. Invited lecture.
- International Symposium on Orbit Propagation and Determination. lille, france. september, 26–28. Invited lecture.
- KAM and Cauchy Theories, napoli, may 21–18. Invited lecture.

2010:
- Conference on Celestial Mechanics and Hamiltonian Dynamics. university of maryland, college park (USA). april 15-18. Invited lecture.

2009:
- Observatoire de Paris. December 14–18. Invited lecture.

Organisation of conferences, workshops, schools

2023:
- New Frontiers of Celestial Mechanics: theory and applications. Univ. Padova, 15-17 February, 2023 (Organising Committee). https://events.math.unipd.it/nfcm2023/

2022:
- CELMEC VIII. University Tor Vergata, Rome, 5-9 September, 2022 (Scientific Committee). http://www.mat.uniroma2.it/ celmec/celmec8/index.html

2022:
- Theory, Models and Simulations in Celestial Mechanics. Univ. Pisa, 14-16 June, 2022 (Scientific Committee). https://arnold.dm.unipi.it/wp/tmscm

2022:
- H2020 in Hamiltonian dynamics. Venice, 25-29 July, 2022 (Scientific Committee). https://events.math.unipd.it/ercvenice2020/home

2021:
- Think Tank in Scientific Computing. University of Camerino, June 17-18, 2021 (Scientific Committee).

2019:
- "Leaning Tori. A Hamiltonian event under the tower". Centro di Ricerca matematica Ennio de Giorgi, Pisa. May 20-24, 2019 (Scientific Committee).

2018:
- Stable and Chaotic Motions in the Planetary Problem. Osservatorio di Asiago (Scientific Committee). June 10-15, 2018 https://events.math.unipd.it/ercschool/

2018:
- Perspectives in Hamiltonian Dynamics. Venice, 18-22 June 2018 (Scientific Committee). https://events.math.unipd.it/ercvenice/

2018:
- Recent Advances in Hamiltonian dynamics and symplectic topology. University of Padova, February 12-16, 2018 (Scientific Committee) https://events.math.unipd.it/hamschool2018/

2017:
- SDSM 2017 Satellite Dynamics and Space Missions. S Martino al Cimino, Viterbo. August 28-September 2, 2017 (Scientific Committee).

2016:

- The 11th AIMS Conference on Dynamical Systems, Differential Equations and Applications. July 1 – July 5, 2016, Orlando, Florida, USA. Special Session no 26 (Scientific Committee).

Visits

2019:
- University of Augsburg. January 20–23. Invited by Zaho Lei. With lecture.
- EPFL, May 8–11. Invited by Loris Buffoni. With lecture

2018:
- Invited as a Research Member and Speaker at MSRI, Berkeley, for the semester "Hamiltonian systems, from topology to applications through analysis" August–December 2018

2018:
- Centro de Giorgi, Scuola Normale Superiore, Pisa. Invited lecture: ''Applications of perturbation theories to the N-body problem '' held March 13, 2019

2016:
- university of barcelona. june. 5–10. invited by m. guardia. Invited lecture.

2014:
- university of zurich. nov. 10–11. invited by v. schroeder. Invited lecture.

2010:
- university of maryland. april. invited by v. kaloshin. three days. Invited lecture.

2009:
- observatoire de paris. december. invited by j. féjoz. one week. Invited lecture.

schools as a lecturer

2013:
- CIRM, luminy, marseille, france. lecturer. eight ours, Invited lecture.

schools as a participant

2013:
- st. etienne de tinée. winter school. one week. february, 3-9. (by l. stolovich)

2012:
- school on Variational Methods in N–body and Vortex Dynamics. Università del Salento, (by a. portaluri and s. terracini). may 28–june 1. Invited lecture.

2011:
- school Ciclo di Lezioni at milano bicocca university (by v. barurello and v. felli) . february 7–9. Milan, Italy;

2009:
- school New Connections Between Dynamical Systems and Hamiltonian PDEs. april–may (by m. berti et al.).

Participation in funded research projects

2016–2023: ERC StG 2015

Project: Stable and Chaotic Motions in the Planetary System

Funding: European Research Council (European Commission)

PI: Gabriella Pinzari, Università di Padova

2018–2022: FARE 2017
Project: Dynamics of Gravitational Systems
Funding: Ministero dell'Università e della Ricerca, Italy
PI: Gabriella Pinzari, Università di Padova

2018–2023: PRIN 2017
Project: New Frontiers of Celestial Mechanics: theory and applications
Funding: Ministero dell'Università e della Ricerca, Italy
PI: Alessandra Celletti, Università Tor Vergata (2017-2020), Massimiliano Guzzo, Università di Padova (2020-2023)

2014–2017: PRIN 2012
Project: Variational and perturbative aspects of nonlinear differential problems
Funding: MinisteUR
PI: Susanna Terracini, University of Torino

2013–2016: ERC ideas 2012
Project: Hamiltonian PDEs and small divisor problems: a dynamical system approach (306414)
Funding: European Research Council
PI: Michela Procesi, University Roma Tre

2009–2012: ERC starting grant
Project: Hamiltonian PDEs new connections between dynamical systems and Hamiltonian PDEs with small divisors phenomena (204979)
Funding: European Research Council (European Commission)
PI: Massimiliano Berti, SISSA, Trieste

2008–2012: PRIN 2009
Project: Critical Point Theory and Perturbative Methods for Nonlinear Differential Equations
Funding: Ministero dell'Università e della Ricerca, Italy
PI: Susanna Terracini, University of Torino

Students

2021-22: Dr Xiang Liu, undergraduate Student, University of Padua.
2020-22: Dr Dongchen Li. Post–Doc Student, University of Padua
2020-22: Dr Raoul Vetere. II level master Student, University Tor Vergata, Rome.
2019-20: Dr Qinbo Chen. Post–Doc Student, University of Padua

2018-20: Dr Jerome Daquin. Post–Doc Student, University of Padua

2018-19: Dr Rocio I. Paez. Post–Doc Student, University of Padua

2018-22: Dr Sara Di Ruzza. Post–Doc Student, University of Padua

2017-19: Dr Santiago Barbieri. PhD Student, University of Padua

2016-18: Dr Alexandre Pousse. Post–Doc Student, University of Padua

2017-18: Dr Edoardo Legnaro. Undergraduate Student, University of Padua

2011-12: Dr Andrea Chessa. II level master Student, University Tor Vergata, Rome.

Service

2023-today: Member of the Colloquia Committee at the Department of Mathematics of the University of Padova.

2018-2022: Member of the Evaluation Committee at the Department of Mathematics of the University of Padova.

Publications (including preprints)

[PL23]: Gabriella Pinzari, Xiang Liu. Quantitative KAM theory, with an application to celestial mechanics. Preprint 2023. https://arxiv.org/abs/2302.00279.

[P22b]: Gabriella Pinzari. Perturbation theory and canonical coordinates in celestial mechanics. Preprint 2022.https://arxiv.org/abs/2209.07457

[P22a]: Gabriella Pinzari. Proof of a conjecture by H. Dullin and R. Montgomery. Preprint 2022. https://arxiv.org/abs/2209.07097

[DDP22]: Daquin, J., Di Ruzza, S., Pinzari, G. (2022). A New Analysis of the Three-Body Problem. In: Baù, G., Di Ruzza, S., Páez, R.I., Penati, T., Sansottera, M. (eds) New Frontiers of Celestial Mechanics: Theory and Applications. I-CELMECH 2020. Springer Proceedings in Mathematics & Statistics, vol 399. Springer, Cham. https://doi.org/10.1007/978-3-031-13115-8_2

[DP22]: Sara Di Ruzza and Gabriella Pinzari. Euler integral as a source of chaos in the three-body problem. Commun. Nonlinear Sci. Numer. Simul. 110, Article ID 106372, 25 p. (2022). *arXiv:2202.12188*.

[CP21]: Qinbo Chen and Gabriella Pinzari. Exponential stability of fast driven systems, with an application to celestial mechanics. Nonlinear Anal., Theory Methods Appl., Ser. A, Theory Methods 208, Article ID 112306, 44 p. (2021). *arXiv:2009.12270* .

[DDP20]: Sara Di Ruzza, Jerome Daquin and Gabriella Pinzari. Symbolic dynamics in a binary asteroid system. Commun. Nonlinear Sci. Numer. Simul. 91, Article ID 105414, 16 p. (2020). *arXiv:2006.11057*.

[PTS]: Gabriella Pinzari, Alessio Troiani, Benedetto Scoppola. Lonely planets and light belts: the Statistical Mechanics of Gravitational Systems. Ann. Henri Poincaré 23, No. 3, 773-797 (2022). *arXiv:2006.07003*.

[P20b]: Gabriella Pinzari. Perihelion librations in the secular three–body problem. J. Nonlinear Sci. 30, No. 4, 1771-1808 (2020) *arXiv:2002.11358*.

[P20a]: Gabriella Pinzari. Euler integral and perihelion librations. Discrete Contin. Dyn. Syst. 40, No. 12, 6919-6943 (2020). *arXiv:2002.10756*.

[P19]: Gabriella Pinzari. A first integral to the partially averaged Newtonian potential of the three–body problem. Celest. Mech. Dyn. Astron. 131, No. 5, Paper No. 22, 30 p. (2019). *arXiv: 1607.03056*.

[P18b]: Gabriella Pinzari. On the co-existence of maximal and whiskered tori in the planetary three-body problem. J. Math. Phys. 59 (2018), no. 5, 052701, 37 pp.

[P18a]: Gabriella Pinzari. Perihelia Reduction and Global Kolmogorov Tori in the Planetary Problem. *Mem. Amer. Math. Soc.*, 255(1218), 2018.

[P15b]: Gabriella Pinzari. Global Kolmogorov Tori in the Planetary N-Body problem. Announcement of Result. Electron. Res. Announc. Math. Sci. 22 (2015), 55–75

[P15a]: Gabriella Pinzari. Canonical Coordinates for the Planetary Problem. 2014. Acta Appl Math (2015) 137:205–232

[CP14]: Luigi Chierchia and Gabriella Pinzari. Metric stability of the planetary N-body problem. Proceedings of the International Congress of Mathematicians, Coex, Seoul, 2014.

[P13]: Gabriella Pinzari. Aspects of the planetary Birkhoff normal form. Regul. Chaotic Dyn. 18 (2013), no. 6, 860–906.

[CP11c]: Luigi Chierchia and Gabriella Pinzari. Planetary Birkhoff normal forms. J. Mod. Dyn. 5 (2011), no. 4, 623–664.

[CP11b]: Luigi Chierchia and Gabriella Pinzari. The planetary N-body problem: symplectic foliation, reductions and invariant tori. Invent. Math. 186 (2011), no. 1, 1–77.

[CP11a]: Luigi Chierchia and Gabriella Pinzari. Deprit's reduction of the nodes revisited. Celestial Mech. Dynam. Astronom. 109 (2011), no. 3, 285–301.

[CP10]: Luigi Chierchia and Gabriella Pinzari. Properly-degenerate KAM theory (following V. I. Arnold). Discrete Contin. Dyn. Syst. Ser. S 3 (2010), no. 4, 545–578.

[CP06]: Alessandra Celletti and Gabriella Pinzari. Dependence on the observational time intervals and domain of convergence of orbital determination methods. Celestial Mech. Dynam. Astronom. 95 (2006), no. 1-4, 327–344.

[CP05]: Alessandra Celletti and Gabriella Pinzari. Four classical methods for determining planetary elliptic elements: a comparison. Celestial Mech. Dynam. Astronom. 93 (2005), no. 1-4, 1–52.

Languages

Italian: Mother Tongue

English: good (reading, writing, conversation)

Computer skills

Fortran, C++, Mathematica

Io sottoscritta Gabriella Pinzari, consapevole delle sanzioni previste dalle Leggi vigenti a carico di chi dichiara il falso, dichiaro sotto la mia personale responsabilità, che quanto dichiarato nel presente Curriculum Vitae corrisponde a verità.

Last revised: February 2023

Gabriella Pinzari