Davide Ravotti

Personal Data

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Scientific Interests

My research focuses on the ergodic theory of smooth parabolic flows, including locally Hamiltonian flows on surfaces, unipotent flows on quotients of semisimple Lie groups, nil-flows on nilmanifolds, and their smooth perturbations. I am also interested in the following topics:

- Distributional limit theorems for dynamical systems.
- Infinite ergodic theory.
- Rigidity phenomena in homogeneous dynamics.

Education

2018	Ph.D. degree at the University of Bristol (Bristol, UK). Supervisor: prof. Corinna Ulcigrai. Thesis title: *Mixing via shearing in some parabolic flows*. This thesis received a *Faculty of Science Commendation*.
2014	Diploma di Licenza of the Scuola Superiore of the University of Udine (Udine, Italy). Final mark: 110/110 *cum laude*.
2013	Master degree in Mathematics, University of Udine (Udine, Italy). Final mark: 110/110 *cum laude*.
2011	Bachelor degree in Mathematics, University of Udine (Udine, Italy). Final mark: 110/110 *cum laude*.

Academic Positions

Jun. 2021-present	Postdoctoral Assistant, University of Vienna (Vienna, Austria).
Mar. 2019-May 2021	Research Fellow, Monash University (Melbourne, Australia).
Sep. 2018-Mar. 2019	Postdoctoral Assistant, University of Zürich (Zürich, Switzerland).
Apr. 2018-Aug. 2018	Research Associate, University of Bristol (Bristol, UK).

Funded research projects as PI

Azrieli Fellowship	2021-2023 (declined).
ESI Research in Teams	2023 (together with H. Bruin, D. Terhesiu, and C. Fougeron).

Publications and Preprints

Preprints:

[13] M. Artigiani, L. Flaminio, D. Ravotti. On rigidity properties of time-changes of unipotent flows. Preprint, 2022 (*arxiv:2209.01253*).

[12] E. Corso, D. Ravotti. Large hyperbolic circles. Preprint, 2022 (*arxiv:2208.07771*).

[11] L. Flaminio, D. Ravotti. Abelian covers of hyperbolic surfaces: equidistribution of spectra and infinite mixing asymptotics for horocycle flows. Preprint, 2022 (*arxiv:2207.08263*).

[10] D. Ravotti. Asymptotics and limit theorems for horocycle ergodic integrals à la Ratner (with an appendix by Emilio Corso). Preprint, 2021 (*arxiv:2107.02090*).

Published/accepted:

[9] P. Giulietti, A. Hammerlindl, D. Ravotti. Quantitative global-local mixing for accessible skew products. *Ann. Henri Poincaré*, 23(3):923–971, 2022.

[8] D. Ravotti. Polynomial mixing for time-changes of unipotent flows. *Ann. Sc. Norm. Super. Pisa Cl. Sci. (5)*, vol. XXIII(3):1491–1506, 2022.

[7] A. Avila, G. Forni, D. Ravotti, C. Ulcigrai. Mixing for smooth time-changes of general nilflows. *Adv. Math.*, 385, 107759, 2021.

[6] D. Ravotti. Quantitative equidistribution of horocycle push-forwards of transverse arcs. *Enseign. Math.*, 66(1-2):135–150, 2020.

[5] A. Kanigowski, D. Ravotti. Polynomial 3-mixing for smooth time-changes of horocycle flows. *Discrete Contin. Dyn. Syst.*, 40(9):5347–5371, 2020.

[4] D. Ravotti. Parabolic perturbations of unipotent flows on compact quotients of $\mathrm{SL}(3,\mathbb{R})$. *Comm. Math. Phys.*, 371(1):331–351, 2019.

[3] D. Ravotti. Mixing for suspension flows over skew-translations and time-changes of quasi-abelian filiform nilflows. *Ergod. Theory Dyn. Syst.*, 39(12):3407–3436, 2019.

[2] D. Ravotti. Quantitative mixing for locally Hamiltonian flows with saddle loops on compact surfaces. *Ann. Henri Poincaré*, 18(12):3815–3861, 2017.

[1] G. Panti, D. Ravotti. Measures induced by units. *J. Symb. Log.*, 78(3):886–910, 2013.

Other writings:

[a] D. Ravotti. Introduction to Homogeneous Dynamics. Lecture notes for the course given at the University of Vienna, 2022.

[b] D. Ravotti. Mixing via shearing in some parabolic flows. Ph.D. thesis (*Faculty of Science Commendation*), University of Bristol, 2018.

Seminars

16 Nov. 2022 Tsinghua University (online seminar).
06 Oct. 2022 KTH (online seminar).
18 Jul. 2022 Conference "Summer Topology Conference" (Vienna, Austria).
29 Jun. 2022 Workshop "Ruelle Resonances in Parabolic Dynamics" (Zürich, Switzerland).
13 May 2022 Jagiellonian University in Krakow (online seminar).
29 Apr. 2022 Université de Lille (Lille, France).
25 Apr. 2022 IST Austria (Klosteneuburg, Austria).
04 Feb. 2022 Workshop "Dynamics, Foliations, and Geometry II" (Regensburg, Germany).
30 Jan. 2022 Budapest-Wien Seminar (Wien, Austria).

04 Oct. 2021	University of Zürich (Zürich, Switzerland).
09 Mar. 2021	UNSW Pure Math Seminar (online seminar).
08 Oct. 2020	Vienna Ergodic Seminar (online seminar).
02 Jul. 2020	Sydney Dynamics Group (online seminar).
23 Apr. 2020	University of Maryland (online seminar).
22 Apr. 2020	Monash University (online seminar).
05 Dec. 2019	Conference "AustMS 2019" (Melbourne, Australia).
23 Sep. 2019	Conference "Smooth and Homogeneous Dynamics" (Bangalore, India).
01 Jul. 2019	Conference "Dynamics of Parabolic Flows" (Zürich, Switzerland).
27 Mar. 2019	Monash University (Melbourne, Australia).
05 Dec. 2018	Scuola Normale Superiore (Pisa, Italy).
03 Sep. 2018	Conference "Dynamics Days Europe" (Loughborough, UK).
16 Jan. 2018	Queen Mary University (London, UK).
02 Nov. 2017	Scuola Normale Superiore (Pisa, Italy).
17 Oct. 2017	University of Warwick (Coventry, UK).
12 Oct. 2017	University of Manchester (Manchester, UK).
24 Aug. 2017	Conference "Dynamics in Number Theory and Geometry" (Kingston, Canada).
06 Jun. 2017	Workshop "Modern Trends in the Ergodic Theory of Dynamical Systems" (Rome, Italy).
23 Mar. 2017	University of Bristol (Bristol, UK).
11 Jan. 2017	One-day Workshop on Dynamical Systems, ICTP (Trieste, Italy).
10 Jan. 2017	University of Udine (Udine, Italy).

Teaching and Other Activities

Student supervision:

University of Vienna	Bachelor Thesis of Gibeom Kim Thesis title: *Discrete time Markov chains and applications* Expected graduation in 2023.

Lecturer:

University of Vienna	*Measure and Integration Theory* (together with H. Bruin), 2022. *Homogeneous Dynamics*, 2022.
Monash University	*Metric spaces, Banach spaces, Hilbert spaces* (together with J. Clutterbuck), 2020.
ICTP Summer School	*Ergodic theory minicourse* (together with O. Butterley, I. Pasquinelli, S. Luzzatto, and L. Simonelli), July 2019. Lecture recording is available at https://www.youtube.com/watch?v=PjFpuDiVL1U.

Tutor (problem classes):

University of Vienna	*Basic concepts of Topology*, 2021.
Monash University	*Metric spaces, Banach spaces, Hilbert spaces*, 2020. *Mathematics Learning Center*, 2019-2020.
Univeristy of Zürich	*Dynamical Systems and Ergodic Theory*, 2019.
Univeristy of Bristol	*Analysis 1* and *Foundations and Proof*, 2018. *Analysis 1*, *Foundations and Proof*, and *Introduction to Geometry*, 2017. *Analysis 1* and *Linear Algebra and Geometry*, 2016.

Service to the Community

Referee for: Inventiones Mathematicae, Journal of Modern Dynamics, Ergodic Theory and Dynamical Systems, Monatshefte für Mathematik, Discrete and Continuous Dynamical Systems.

Reviewer for MathSciNet.

Language Skills

Italian (native language).
English (full professional proficiency).
French (basic).
German (basic).
Spanish (basic).
Japanese (basic).