Aleks Jevnikar

Curriculum Vitae

Personal Information

Born	Trieste, Italy, 30/12/1987
Marital status	Married, one child
E-mail	aleks.jevnikar@uniud.it
Web page	https://sites.google.com/site/ajevnika/

Current Position

Since 2022 **Associate Professor**, *University of Udine*, Italy.

Previous Positions

2019-22 **Assistant Professor (RTD-B)**, *University of Udine*, Italy.

2019 **Postdoc**, *Scuola Normale Superiore*, Pisa, Italy.
Group of Prof. Andrea Malchiodi

2018-19 **Postdoc**, *University of Pisa*, Italy.
Group of Prof. Matteo Novaga

2015-18 **Postdoc**, *University of Rome Tor Vergata*, Italy.
Group of Prof. Gabriella Tarantello

Education

2015 **Ph.D. in Mathematics**, *SISSA*, Italy.
Advisor: Prof. Andrea Malchiodi
Mark: cum laude

2011 **M.Sc. in Mathematics**, *University of Trieste and SISSA*.
Advisor: Prof. Andrea Malchiodi
Mark: 110/110 cum laude

2009 **B.Sc. in Mathematics**, *University of Trieste*, Italy.
Advisor: Prof. Martino Prizzi
Mark: 110/110

Research Interests

Elliptic PDEs in mathematical physics and geometry: Liouville and super-Liouville equation, Gelfand equation, Toda system, Sinh-Gordon equation, Moser-Trudinger inequality, free boundary problems.

Publications

[1] A. Jevnikar, *An existence result for the mean-field equation on compact surfaces in a doubly supercritical regime*, **Proc. Royal Soc. Edinburgh A 143** (2013), no. 5, 1021-1045.

[2] L. Battaglia, A. Jevnikar, A. Malchiodi, D. Ruiz, *A general existence result for the Toda system on compact surfaces*, **Adv. Math. 285** (2015), 937-979.

[3] A. Jevnikar, S. Kallel, A. Malchiodi, *A topological join construction and the Toda system on compact surfaces of arbitrary genus*, **Anal. PDE 8** (2015), no. 8, 1963-2027.

[4] A. Jevnikar, *New existence results for the mean field equation on compact surfaces via degree theory*, **Rend. Semin. Mat. Univ. Padova 136** (2016), 11-17.

[5] A. Jevnikar, *A note on a multiplicity result for the mean field equation on compact surfaces*, **Adv. Nonlinear Stud. 16** (2016), no. 2, 221-229.

[6] A. Jevnikar, W. Yang, *Analytic aspects of the Tzitzéica equation: blow-up analysis and existence results*, **Calc. Var. and PDEs 56** (2017), no. 2, 56:43.

[7] A. Jevnikar, *Blow-up analysis and existence results in the supercritical case for an asymmetric mean field equation with variable intensities*, **J. Diff. Eq. 263** (2017), no. 2, 972-1008.

[8] A. Jevnikar, J. Wei, W. Yang, *Classification of blow-up limits for the Sinh-Gordon equation*, **Differential and Integral Equations 31** (2018), no. 9-10, 657-684.

[9] A. Jevnikar, J. Wei, W. Yang, *On the topological degree of the mean field equation with two parameters*, **Indiana Univ. Math. J. 67** (2018), no. 1, 29-88.

[10] C. Gui, A. Jevnikar, A. Moradifam, *Symmetry and uniqueness of solutions to some Liouville-type equations and systems*, **Comm. PDEs 43** (2018), no. 3, 428-447.

[11] D. Bartolucci, A. Jevnikar, Y. Lee, W. Yang, *Non degeneracy, Mean Field Equations and the Onsager theory of 2D turbulence*, **Arch. Ration. Mech. Anal. 230** (2018), no. 1, 397-426.

[12] D. Bartolucci, C. Gui, A. Jevnikar, A. Moradifam, *A singular Sphere Covering Inequality: uniqueness and symmetry of solutions to singular Liouville-type equations*, **Math. Ann. 374** (2019), no. 3-4, 1883-1922.

[13] A. Jevnikar, W. Yang, *A mean field equation involving positively supported probability measures: blow-up phenomena and variational aspects*, **Proc. Royal Soc. Edinburgh A 149** (2019), no. 2, 325-352.

[14] D. Bartolucci, A. Jevnikar, Y. Lee, W. Yang, *Uniqueness of bubbling solutions of mean field equations*, **J. Math. Pures Appl. 123** (2019), 78-126.

[15] D. Bartolucci, A. Jevnikar, C.S. Lin, *Non-degeneracy and uniqueness of solutions to singular mean field equations on bounded domains*, **J. Diff. Eq. 266** (2019), no. 1, 716-741.

[16] D. Bartolucci, A. Jevnikar, Y. Lee, W. Yang, *Local uniqueness of m-bubbling sequences for the Gel'fand equation*, **Comm. PDEs 44** (2019), no. 6, 447-466.

[17] D. Bartolucci, C. Gui, Y. Hu, A. Jevnikar, W. Yang, *Mean field equation on torus: existence and uniqueness of evenly symmetric blow-up solutions*, **Discrete Contin. Dyn. Syst. - A 40** (2020), no. 6, 3093-3116.
[Special issue to honor Wei-Ming Ni's 70th birthday.]

[18] D. Bartolucci, A. Jevnikar, Y. Lee, W. Yang, *Local uniqueness and non-degeneracy of blow up solutions of mean field equations with singular data*, **J. Diff. Eq. 269** (2020), no. 3, 2057-2090.

[19] A. Jevnikar, A. Malchiodi, R. Wu, *Existence results for a super-Liouville equation on compact surfaces*, **Trans. Amer. Math. Soc. 373** (2020), no. 12, 8837-8859.

[20] W. Ao, A. Jevnikar, W. Yang, *On the boundary behavior for the blow up solutions of the sinh-Gordon equation and rank N Toda systems in bounded domains*, **Int. Math. Res. Not. (IMRN)** (2020), no. 23, 9386-9419.

[21] W. Ao, A. Jevnikar, W. Yang, *Wave equations associated with Liouville-type problems: global existence in time and blow up criteria*, **Ann. Mat. Pura Appl. 200** (2021), 1175-1194.

[22] D. Bartolucci, A. Jevnikar, *On the global bifurcation diagram of the Gel'fand problem*, **Anal. PDE 14-8** (2021), 2409-2426.

[23] A. Jevnikar, A. Malchiodi, R. Wu, *Existence results for super-Liouville equations on the sphere via bifurcation theory*, **J. Math. Study 54** (2021), no. 1, 89-122.
[Special issue to honor Alice Chang's and Paul Yang's 70th birthday.]

[24] A. Jevnikar, A. Malchiodi, R. Wu, *Min-max solutions for super sinh-Gordon equations on compact surfaces*, **J. Diff. Eq. 289** (2021), 128-158.

[25] A. Jevnikar, R. López-Soriano, M. Medina, D. Ruiz, *Blow-up analysis of conformal metrics of the disk with prescribed Gaussian and geodesic curvatures*, **Anal. PDE 15** (2022), no. 8, 1897-1931.

[26] D. Bartolucci, A. Jevnikar, *On the uniqueness and monotonicity of solutions of free boundary problems*, **J. Diff. Eq. 306** (2022), 152-188.

[27] D. Bartolucci, A. Jevnikar, *New universal estimates for free boundary problems arising in plasma physics*, **Proc. Amer. Math. Soc. 150** (2022), 673-686.

[28] D. Bartolucci, Y. Hu, A. Jevnikar, W. Yang, *Generic properties of free boundary problems in plasma physics*, **Nonlinearity 35** (2022), 411-444.

[29] Y. Hu, A. Jevnikar, W. Xie, *Infinitely many solutions for Schrödinger-Newton equations*, **Commun. Contemp. Math.** (2021), to appear.

[30] W. Ao, A. Jevnikar, W. Yang, *Blow up solutions for Sinh-Gordon equation with residual mass*, **Calc. Var. and PDEs 61** (2022), 209.

[31] L. Battaglia, A. Jevnikar, Z.A. Wang, W. Yang, *Prescribing Gaussian curvature on surfaces with conical singularities and geodesic boundary*, **Ann. Mat. Pura Appl.** (2022), to appear.

[32] D. Bartolucci, A. Jevnikar, J.Jin, C.S. Lin, S. Liu, *Non-degeneracy and uniqueness of solutions to general singular Toda systems on bounded domains*, **J. Math. Anal. Appl. 525** (2023), 127132.

[33] A. Jevnikar, R. Wu, *Existence results for a super Toda system*, **Ann. Glob. Anal. Geom.** (2023), to appear (https://arxiv.org/abs/2203.14951).

[34] D. Bartolucci, Y. Hu, A. Jevnikar, W. Yang, *Generic properties of the Rabinowitz unbounded continuum*, **Adv. Nonlinear Stud.** (2023), to appear (https://arxiv.org/abs/2207.07952).

[35] A. Jevnikar, J. Wang, W. Yang, *Liouville type theorems and periodic solutions for $\chi^{(2)}$ type systems with non-homogeneous nonlinearities*, Preprint (2020) (https://arxiv.org/abs/2008.13190).

[36] A. Jevnikar, Y. Sire, W. Yang, *Prescribing Q-curvature on even-dimensional manifolds with conical singularities*, Preprint (2022) (https://arxiv.org/abs/2206.06006).

[37] D. Bartolucci, A. Jevnikar, R. Wu, *A Courant nodal domain theorem for linearized mean field type equations*, Preprint (2023) (https://arxiv.org/abs/2301.09128).

Invited lectures

2021 Mini-course (6h) on *Variational analysis of Liouville type equations: existence results* as part of a PhD Course, University of Rome Tor Vergata, Italy

2018 Mini-course (6h) on *Variational analysis of Mean field equations and system: existence and uniqueness results* at the International Workshop on Mean Field Equations and Systems, Central South University, China

Invited conference talks

2023 *PDEs in Cogne: a friendly meeting in the snow*, Cogne, Italy

2022 *Geometric Analysis: Past, Present and Future – online workshop*, Jeonbuk National University, Korea

2021 *Analytical Methods in Quantum and Continuum Mechanics – Winter School*, Politecnico di Torino, Italy

2019 *Differential Equations Group Of North-East – Christmas Meeting*, University of Udine, Italy

PDE Workshop, Wuhan Institute of Physics and Mathematics, Chinese Academy of Sciences, China

BIRS Workshop - Nonlinear Geometric PDEs, Banff, Canada

2018 *Bicocca-Urbino Days in Nonlinear Analysis*, University of Milano Bicocca, Italy

BIRS Workshop - Physical, Geometrical and Analytical Aspects of Mean Field Systems of Liouville Type, Banff, Canada

Young in PDE's @ Roma, Sapienza - University of Rome, Italy

Variational Methods in Analysis, Geometry and Physics, Scuola Normale Superiore, Pisa, Italy

2017 *From students to mathematicians: an excellence master program in Trieste*, SISSA, Italy

2016 *EWM-EMS Summer School: Geometric and Physical aspects of Trudinger-Moser type inequalities*, Institut Mittag-Leffler, Sweden

2015 *Workshop – Giornata di Dipartimento*, University of Rome Tor Vergata, Italy

2014 *Thematic Program on Nonlinear PDEs in Geometry and Physics*, University of Notre Dame, USA

6th South West Regional PDE Winter School, University of Oxford, UK

Conference on variational methods in elliptic equations and systems, University of Lisbon, Portugal

Invited seminar talks

2023 Central South University, China, online

Henan University, China, online

2022 Differential Equations Group Of North-East Italy, online

2021 Henan University, China, online

University of Rome Tor Vergata, Italy, online

Central South University, China, online

PDE's: Italia vs Espana, online

Differential Equations Group Of North-East Italy, online

2018 University of Milano, Italy

University of Rome Tor Vergata, Italy

University of Pisa, Italy

2017 University of Padua, Italy

University of Pisa, Italy

University of Giessen, Germany

University of Texas San Antonio, USA

2016 University of Basel, Switzerland

Sapienza - University of Rome, Italy

2015 University of Rome Tor Vergata, Italy

SISSA, Italy

2014 SISSA, Italy

2013 University of Warwick, UK

2012 University of Granada, Spain

Visits

2021-22 Covid break, visits canceled: Italy, Germany, China, Korea

2019 Wuhan Institute of Physics and Mathematics, Chinese Academy of Sciences, China (invited by Prof. W. Yang, 2 weeks)

University of Rome Tor Vergata, Italy (invited by Prof. D. Bartolucci, 1 week)

2018 Oberwolfach, Germany (invited by Dr. R. López-Soriano, 1 week)

National Taiwan University, Taiwan (invited by Prof. C.S. Lin, 2 weeks)

University of Rome Tor Vergata, Italy (invited by Prof. D. Bartolucci, 1 week)

2017 University of Giessen, Germany (invited by Prof. M. Ahmedou, 1 week)

University of Texas San Antonio, USA (invited by Prof. C. Gui, 2 weeks)

2015-16 Scuola Normale Superiore, Pisa, Italy (invited by Prof. A. Malchiodi, 3 weeks)

2015 University of British Columbia, Canada (invited by Prof. J. Wei, 1 month)

2013 University of Warwick, UK (invited by Prof. A. Malchiodi, 4 months)

2012-13 University of Granada, Spain (invited by Prof. D. Ruiz, 3 weeks)

2012 Institut Henri Poincaré, Paris, France (thematic program: Conformal and Kähler Geometry, 2 months)

Organized activities

2022 *Nonlinear afternoon – workshop*, (organized with G. Feltrin) University of Udine, Italy

Honors and awards

2019 Habilitation for Associate Professor in Mathematical Analysis

2019 Junior Visiting Position, on a qualifications based international selection, Scuola Normale Superiore, Pisa, Italy

2011-15 Fellowship for Ph.D. studies, based on international exams, SISSA, Italy

2014 Best M.Sc. thesis in Mathematics, University of Trieste, Italy

2011 Joint Study Programme of the M.Sc. in Mathematics, based on the achievement of the established training objectives, SISSA and University of Trieste, Italy

Grants and research projects

2020 GNAMPA project 'Variational aspects of some PDEs in conformal geometry'
PI W. Borrelli

Oberwolfach Research in Pairs program
Members: A. Jevnikar, Y. Lee, W. Yang

Since 2019 Member of Differential Equations Group Of North-East Italy

2019 NSF 'Qualitative Study of the Mean Field Equation and Allen-Cahn Equation'
PI C. Gui

2018 Project S.E.E.A. (University of Rome Tor Vergata)
PI D. Bartolucci

Oberwolfach Leibniz program
PI R. López-Soriano

2015 PRIN 'Variational Methods and Nonlinear PDEs'
PI A. Malchiodi

Consolidate the Foundations (University of Rome Tor Vergata) 'Nonlinear Differential Problems and Their Applications'
PI G. Tarantello

Since 2013 Member of Italian Mathematical Analysis Group GNAMPA

2012 PRIN 'Variational and perturbative aspects of nonlinear differential problems'
PI S. Terracini

2008 FIRB 'Analysis and Beyond'
PI A. Malchiodi

Mentoring

PhD students

2022-25 Luca Di Beo, coadvised with R. Musina, D. Papini
2022-23 Qiang Fei, visiting from Central South University, China (1 year)
2021-22 Senli Liu, visiting from Central South University, China (1 year)
Jiaming Jin, visiting from Hunan University, China (1 year)

Postdocs

2022-23 Sang-Hyuck Moon (6 months)
2022-23 Giuliano Klun (1 year)

Institutional responsibilities

Since 2022 Contact person for the agreement between the Department of Engineering at University of Udine and high school for Basic Mathematics courses

Since 2021 Member of the Ph.D. scientific board (Collegio dottorale) in Mathematics and Physics, University of Udine, Italy

Teaching

Lecturer

University of Udine:

Mathematical Analysis I, Mathematics in 2022

Mathematical Analysis I, Engineering in 2020-22

Mathematical Analysis II, Engineering in 2019-20

Phd courses

University of Pisa: *Variational analysis of Liouville-type equations* (30h) in 2018

Assistant

University of Rome Tor Vergata:

Calculus, Economics (taught in English) in 2017

Math pre-courses, Economics (taught in English) in 2017

Mathematical Analysis I, Engineering in 2015-17

Mathematical Analysis I, Engineering (taught in English) in 2015-17

Referee activity

Referee for the journals: Adv. Math., Calc. Var., IMRN, JFA, Proc. Royal Soc. Edinburgh A., AMPA, Nonlinear Analysis, J. Geom. Anal., Adv. Nonlinear Analysis, Pacific J. Math., CPAA, J. Geom. Phys., Archiv der Mathematik, J. Math. Phys., Bull. Malays. Math. Sci. Soc.

Reviewer for research proposals: National Science Centre of Poland, National science agency FONDECYT of Chile, research grants of Sharjah American University Research Grant of United Arab Emirates, NSERC of Canada.

Reviewer for A.M.S.