Jean Lagacé

Contact Information

Department of Mathematics
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Research Interests

Asymptotic analysis, spectral theory of elliptic operators, shape optimisation, minimal surfaces, homogenisation theory, Steklov problem, periodic, quasi-periodic and almost-periodic problems, lattice point counting, pseudodifferential operators.

Employment

King's College London
 Lecturer in Pure Mathematics, 2022–

University of Bristol
 Postdoctoral research associate, 2021
  Mentor: Asma Hassannezhad

University College London
 Postdoctoral research fellow, 2018–2021
  Mentors: Leonid Parnovski and Alexander Sobolev

Education

Université de Montréal
 Ph.D., Pure Mathematics, 2018
  Dissertation Topic: Asymptotiques spectrales et géométrie des nombres
  Advisor: Iosif Polterovich

 B. Sc., Pure and Applied Mathematics, 2014
  Dissertation Topic : Pseudodifferential operators and application to spectral geometry
  Advisors : Paschalis Karageorgis and John Stalker (Trinity College Dublin)

Publications

12. Mikhail Karpukhin and Jean Lagacé, Flexibility of Steklov eigenvalues via boundary homogenisation. Annales mathématiques du Québev (2022) 12 pp.

11. Mikhail Karpukhin, Jean Lagacé and Iosif Polterovich, Weyl's law for the Steklov problem on surfaces with rough boundary. Preprint, arXiv:2204.05294 (2022), 17 pp.

10. Jean Lagacé, Sergey Morozov, Leonid Parnovski, Bernhard Pfirsch and Roman Shterenberg, The almost periodic gauge transform — An abstract scheme with applications to Dirac operators, Preprint, arXiv:2106.01888 (2021) 86 pp.

9. Alexandre Girouard, Mikhail Karpukhin and Jean Lagacé, Continuity of eigenvalues and shape optimisation for Laplace and Steklov problems. Geometric and Functional Analysis 31:3 (2021), pp. 513–561

8. Alexandre Girouard and Jean Lagacé, Large Steklov eigenvalues via homogenisation on manifolds. Inventiones Mathematicae 226 (2021), pp.1011–1056.

7. Jean Lagacé and Simon St-Amant, Spectral invariants of Dirichlet-to-Neumann operators on surfaces, arXiv:2003.02143. To appear in Journal of Spectral Theory (2021) 35 pp.

6. Pedro Freitas, Jean Lagacé and Jordan Payette, Optimal unions of scaled copies of domains and Pólya's conjecture. Arkiv för Mathematik 59 (2021) pp. 11–51.

5. Alexandre Girouard, Antoine Henrot and Jean Lagacé, From Steklov to Neumann via homogenisation. Archive for Rational Mechanics and Analysis 239 (2021) pp. 981–1023.

4. Jean Lagacé, Eigenvalue optimisation on flat tori and lattice points in anisotropically expanding domains, Canadian Journal of Mathematics, 72:4 (2020) pp. 967–987.

3. Francesco Ferrulli and Jean Lagacé, appendix of Asma Hassannezhad and Ari Laptev, Eigenvalue bounds for mixed Steklov problems, Communications in Contemporary Mathematics, (2020) 22:2, pp. 18–22.

2. Alexandre Girouard, Jean Lagacé, Iosif Polterovich and Alessandro Savo, The Steklov spectrum of cuboids, Mathematika, 65:2 (2019) pp. 272–310.

1. Jean Lagacé and Leonid Parnovski, A generalised Gauss circle problem and integrated density of states, Journal of Spectral Theory, 6:4 (2016) pp. 859–879.

Grants and Scholarships	2019–2021	Postdoctoral Fellowship (PDF) National Science and Engineering Research Council of Canada
	2016–2018	Alexander Graham Bell Canada Graduate Scholarship – Doctorate (D3) National Science and Engineering Research Council of Canada
	2016	Doctoral Scholarship (B2) (Classed first on the competition – declined) Fonds de recherche du Québec - Nature et Technologie
	2014–2016	Masters Scholarship (B1) (Classed second on the competition) Fonds de recherche du Québec - Nature et Technologie
	2014–2015	Canada Graduate Scholarship - Masters National Science and Engineering Research Council of Canada

Prizes	2018	First place at Three minute thesis, represented Université de Montréal at the Eastern Canada final.
		Génie du mois (FAÉCUM) for the article A generalised Gauss circle problem and integrated density of states
	2017	Bourse Serge-Bissonnette (Université de Montréal)

Student Supervision

Chia-Chun Lo, PhD Student, KCL (2022–),
    Project title: Singular Perturbations in Spectral Geometry

Julia Lévesque (jointly with Iosif Polterovich), ISM Undergraduate Summer Scholarships
    Project title : The Steklov problem in spectral geometry

Service	Organisation	2023 Summer school on "Periodic and ergodic spectral problems" in Montréal
		2023 Conference "Waves by the Thames", KCL
		London Analysis seminar, 2022–
		KCL Analysis seminar, 2022–
		CMS 2020 Winter meeting "Geometric and Computational spectral theory" session
		Spectral geometry in the clouds, Joint KCL/Bristol/Laval online seminar
		Pint of Science 2019 Atoms to Galaxies event, UCL
		CMS 2018 Summer Meetings's student session, Fredericton
		CMS 2017 Winter Meeting's student session, Waterloo
		Spectral geometry seminar, U. Montréal
		2013 Canadian Undergraduate Mathematical Conference, Montréal

Referee	Duke, GAFA, Analysis and PDEs, Canadian journal of mathematics, Annales mathématiques du Québec, Portugaliae Mathematica, Arkiv för Mathematik, CRM-AMS series, Inverse problems and imaging,
Committees	Co-chair, student committee of the Canadian Mathematical Society President, Mathematics graduate students association, U. Montréal Grant attribution committee, U. Montreal Student Federation Advisory committee on libraries, U. Montréal

Outreach   Editor for mathematics communication journal "Chalkdust"

Columnist in mathematics for the science outreach radio show "Le lab" on CISM 89.3

Various presentations at the "club mathématiques", a series of seminars aimed at undergraduate students.

Languages   French, English