

Contact Information

Department of Mathematics
King's College London,
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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 Québec* (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 Matematik* 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 Parnowski, 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 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
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Referee	Duke, GAFA, Analysis and PDEs, Canadian journal of mathematics, Annales mathématiques du Québec, Portugaliae Mathematica, Arkiv för Matematik, 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