

# CURRICULUM VITAE

YAIZA CANZANI

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Last revised: 10-19-2022

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## EDUCATION

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DEGREE	Ph.D. in Mathematics	September 2008 – April 2013
INSTITUTION	McGill University	Montreal, Canada
DEGREE	Bachelor in Mathematics	March 2005 – July 2008
INSTITUTION	Universidad de la República	Montevideo, Uruguay

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## ACADEMIC EMPLOYMENT

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JOB TITLE	Associate Professor	July 2021 – Present
INSTITUTION	University of North Carolina at Chapel Hill	Chapel Hill, NC
JOB TITLE	Assistant Professor	July 2016 – July 2021
INSTITUTION	University of North Carolina at Chapel Hill	Chapel Hill, NC
JOB TITLE	Benjamin Peirce Fellow	July 2013 – June 2016
INSTITUTION	Harvard University	Cambridge, MA
JOB TITLE	Member	July 2014 – June 2015
INSTITUTION	Institute for Advanced Study	Princeton, NJ

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## GRANTS & FELLOWSHIPS

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- NSF RTG Grant DMS-2135998 (co-PI with H. Christianson (PI), J. Marzuola (PI), J. Metcalfe (Lead PI)) 2022–2027
- NSF CAREER Grant DMS-2045494 (split evenly between the Analysis Program and the Geometric Analysis Programs) 2021–2026
- NSF Grant DMS-1900519 (funded by the Analysis Program) 2019–2023
- Sloan Research Fellowship 2018–2022
- NSERC Postdoctoral Fellowship 2014–2016
- Benjamin Peirce Fellowship 2013–2016
- Graduate Excellence Fellowship 2012–2013
- ISM Scholarship 2012–2013

- Schulich Graduate Fellowship 2010–2012
- Trottier Accelerator Fellowship 2008–2009

## HONORS & AWARDS

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- AWM Sadosky Prize in Analysis 2022
- Sue Goodman and Karl Petersen Teaching Excellence Award 2021
- Selected by UNC for nomination for a Packard Fellowship Award 2019
- Sloan Research Fellowship 2018
- UNC Junior Faculty Award 2018
- Research Associate of Sistema Nacional de Investigadores de Uruguay 2013–present
- Alexis D. and W. Charles Pelletier prize in Mathematics 2013

## PUBLICATIONS

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### SUBMITTED FOR PUBLICATION

1. Y. Canzani and J. Toth. Lower bounds for eigenfunction restrictions in lacunary regions. (2022). Preprint arXiv:2207.05607
2. Y. Canzani and J. Galkowski. Logarithmic improvements in the Weyl law and exponential bounds on the number of closed geodesics are predominant. (2022). Preprint arXiv:2204.11921.
3. Y. Canzani and J. Galkowski. Weyl remainders: an application of geodesic beams. (2020). Preprint arXiv:2010.03969.

### REFEREED PUBLICATIONS

4. G. Berkolaiko, Y. Canzani, G. Cox, and J. Marzuola. Spectral minimal partitions, nodal deficiency and the Dirichlet-to-Neumann map: the generic case. (2022). To appear in *Calculus of Variations and Partial Differential Equations*. Preprint arXiv:2201.00773
5. T. Beck, Y. Canzani, and J. Marzuola. Quantitative bounds on impedance-to-impedance operators with applications to fast direct solvers for pdes. To appear in *Pure and Applied Analysis*. (2021) Preprint arXiv:2103.14700.
6. G. Berkolaiko, Y. Canzani, G. Cox, and J. Marzuola. A local test for global extrema in the dispersion relation of a periodic graph. To appear in *Pure and Applied Analysis*. (2020). Preprint arXiv:2004.12931.
7. Y. Canzani and J. Galkowski. Growth of high  $L^p$  norms for eigenfunctions: an application of geodesic beams. To appear in *Analysis and PDEs*. (2020). Preprint arXiv:2003.04597.
8. Y. Canzani and J. Galkowski. Improvements for Eigenfunction Averages: An application of geodesic beams". To appear in *Journal of Differential Geometry*. (2021). Preprint arXiv:1809.06296.
9. T. Beck, Y. Canzani and J. Marzuola. Nodal line estimates for the second Dirichlet eigenfunction. *Journal of Spectral Theory*. 11(1):323–353 (2021).
10. Y. Canzani and J. Galkowski. Eigenfunction concentration via geodesic beams. *Journal für die reine und angewandte Mathematik (Crelles Journal)*. 2021(775):197–257 (2021).
11. Y. Canzani and B. Hanin. Local Universality for zeros and critical points of monochromatic random waves. *Communications in Mathematical Physics*. 378(3):1677–1712 (2020).
12. Y. Canzani and J. Galkowski. On the growth of eigenfunction averages: microlocalization and geometry. *Duke Journal of Mathematics*. 168(16):2991–3055 (2019).

13. Y. Canzani and P. Sarnak. Topology and nesting of the zero set components of monochromatic random waves. *Communications on Pure and Applied Mathematics*. 72(2):343–374 (2019).
14. Y. Canzani. Monochromatic Random Waves for General Riemannian Manifolds. In: N. Anantharaman, A. Nikeghbali M.T. Rassias (Eds.). *Frontiers in Analysis and Probability*. Springer. (2020).
15. Y. Canzani, L. Chen, D. Jakobson (Eds.). *Probabilistic Methods in Geometry, Topology and Spectral Theory*. Contemporary Mathematics (Vol. 739). American Mathematical Society. (2019).
16. Y. Canzani and J.Toth. Intersection Bounds for Nodal Sets of Laplace Eigenfunctions. In: M. Hitrik, D. Tamarkin, B. Tsygan, S. Zelditch (Eds.). *Algebraic and Analytic Microlocal Analysis. AAMA 2013*. Springer Proceedings in Mathematics & Statistics (Vol. 269, pp. 421–436). Springer. (2018).
17. Y. Canzani. Spectral geometry. In: A. Girouard (Ed.). *Spectral Theory and Applications*. Contemporary Mathematics (Vol. 720, pp. 153–186). American Mathematical Society. (2018).
18. Y. Canzani and B. Hanin.  $C^\infty$ - Scaling asymptotics for the spectral function of the laplacian. *Journal of Geometric Analysis*. 28(1):111–122 (2018).
19. Y. Canzani, J. Galkowski and J. Toth. Averages of eigenfunctions over hypersurfaces. *Communications in Mathematical Physics*. 360(2):619–637 (2018).
20. Y. Canzani and J. Toth. Nodal sets of Schrödinger eigenfunctions in forbidden regions. *Annales Henri Poincaré*. 17(11):3063–3087 (2016).
21. Y. Canzani and B. Hanin. Scaling limit for the kernel of the spectral projector and remainder estimates in the pointwise Weyl Law. *Analysis and Partial Differential Equations*. 8(7):1707–1731 (2015).
22. Y. Canzani and B. Hanin. High frequency eigenfunction immersions and supremum norms of random waves. *Electronic Research Announcements in Mathematical Sciences*. 22:76–86 (2015).
23. Y. Canzani, D. Jakobson and L. Silberman. Appendix of: Gaussian measures on the of space of Riemannian metrics. *Annales mathématiques du Québec*. 39:129–145 (2015).
24. Y. Canzani, D. Jakobson, J. Toth. On the distribution of perturbations of propagated Schrödinger eigenfunctions. *Journal of Spectral Theory*. 4(2):307–328 (2014).
25. Y. Canzani. On the multiplicity of eigenvalues of conformally covariant operators. *Annales de L'Institut Fourier*. 64(3):947–970 (2014).
26. Y. Canzani, D. Jakobson, R. Gover and R. Ponge. Conformal invariants from nodal sets I. Negative eigenvalues and curvature prescription. *International Mathematical Research Notices*. 2014(9):2356-2400 (2014).
27. Y. Canzani, D. Jakobson and I. Wigman. Scalar curvature and Q-curvature of random metrics. *The Journal of Geometric Analysis*. 24(4):1982–2019 (2014).
28. Y. Canzani, D. Jakobson, R. Gover and R. Ponge. Nullspaces of conformally invariant operators. Applications to  $Q_k$ -curvature. *Electronic Research Announcements in Mathematical Sciences*. 20:43–50 (2013).

## INVITED TALKS

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|--|--------------------|
| • München-Aahrus-Santiago Seminar in Mathematical Physics (virtual)      | Dec 5, 2022        |
| • <b>Dartmouth University Mathematics Colloquium</b> (Dartmouth, USA)    | Oct 20, 2022       |
| • UNC Analysis and PDE seminar (Chapel Hill, USA)                        | Oct 14, 2022       |
| • Riviere-Fabes Symposium (Chicago, USA)                                 | Oct 7-9, 2022      |
| • <b>Northwestern University Mathematics Colloquium</b> (Evanston, USA)  | Oct 5, 2022        |
| • Workshop on Microlocal Analysis and PDEs (London, UK)                  | July 20–22, 2022   |
| • <b>Plenary speaker: 2022 Riviere-Fabes Symposium</b> (Minneapolis, MN) | Apr 29–May 1, 2022 |
| • MIT Analysis seminar (virtual)   | Apr 19, 2022       |

- Cirbercoloquio Latinoamericano de Matemáticas (virtual) Mar 25, 2022
- Plenary speaker: Triangle Area Graduate Mathematics Conference 2021. Nov 13, 2021  
Duke University (Durham, NC)
- Conference on Harmonic Analysis and Symmetric Spaces (virtual). Oct 27–29, 2021
- 33rd. Brazilian Colloquium of Mathematics (virtual). Aug 4, 2021
- Analysis Seminar at Institute for Advanced Study (virtual). May 17, 2021
- Analysis on Singular Spaces, BIRS workshop (virtual). May 7, 2021
- **Invited Address: Southeastern Sectional Meeting of the AMS.** (Atlanta, GA) Mar 13–14, 2021
- Analysis Seminar at Princeton University (virtual). Mar 8, 2021
- Analysis Seminar at Notre Dame University (virtual). Mar 11, 2021
- Analysis Seminar at Stanford University (virtual). Mar 12, 2021
- **Colloquium at Brown University** (virtual). Oct 28, 2020
- Conference on Random Nodal Domains. (Rennes, France) Sep 7–11, 2020  
(cancelled due to pandemic)
- Dima Jakobson’s 50th birthday at CRM (virtual). Aug 24, 2020
- **Latinoamerican Congress of Mathematicians (CLAM).** Jul 20–24, 2020  
*Invited to teach a mini-course* (cancelled due to pandemic)
- Monza Seminar. MIT. (virtual). May 20, 2020
- Spectral geometry in the clouds (virtual). May 18, 2020  
Université Laval and University College London.
- Conference on Microlocal analysis and PDEs. (London, England) Apr 29–May 1, 2020  
(cancelled due to pandemic)
- **Microlocal Analysis and Spectral Theory: A Conference in Honor of Richard Melrose** (Berkeley, CA) Oct 19–20, 2019
- **Summer school on semiclassical analysis.** (Chicago, IL) Jul 29–Aug 16, 2019  
*Taught a mini-course titled “Eigenfunction asymptotics”.*
- Conference on Microlocal Analysis and Applications. (Shanghai, China) Jun 17–21, 2019
- Conference on Microlocal Methods in Analysis and Geometry. (Luminy, France) May 6–10, 2019
- **Colloquium at University of Michigan at Ann Arbor.** (Ann Arbor, MI) Mar 26, 2019
- Differential Geometry Seminar at Harvard University. (Cambridge, MA) Mar 12, 2019
- Differential Geometry Seminar at University of Chicago. (Chicago, IL) Mar 5, 2019
- Analysis Seminar at North Carolina State University. (Raleigh, NC) Nov 7, 2018
- **Main speaker: Texas Analysis and Mathematical Physics Symposium.** Oct 26–28, 2018  
(Waco, TX)
- Workshop on “Groups, Geometry and Dynamics” (Montevideo, Uruguay) Jul 23–27, 2018
- Workshop “Around Quantum chaos”. (Banff, Canada) Jul 15–20, 2018
- Workshop on “Spectral Geometry: Theory, Numerical Analysis, and Applications” (Banff, Canada) Jul 1–6, 2018
- Workshop “Random Waves in Oxford”. (Oxford, England) Jun 18–22, 2018
- Workshop on “Microlocal Analysis and its Applications in Spectral Theory, Dynamical Systems, Inverse Problems and PDE” (Batemans Bay, Australia) Mar 18–23, 2018
- Analysis Seminar at Texas A&M. (College Station, TX) Feb 9, 2018
- Spectral geometry, graphs and semiclassical analysis. (Aussois, France) Dec 11–15, 2017
- **Riemannian Geometry Past, Present and Future: an homage to Marcel Berger** (Paris, France) Dec 6–9, 2017
- Workshop on Random geometries / Random topologies at ETH. Dec 4–5, 2017  
(Zurich, Switzerland)
- AMS Fall Southeastern Sectional Meeting. (Orlando, FL) Sep 23–24, 2017

- Symposium on Scattering and Spectral Theory. (Florianopolis, Brasil) Jul 17–28, 2017
- AMS Spring Western Sectional Meeting. (Pullman, WA) Apr 21–23, 2017
- **Colloquium at Princeton University.** (Princeton, NJ) Apr 12, 2017
- Workshop on Random Polynomials. (Montevideo, Uruguay) Feb, 2017
- BIRS. Conference on Geometric and Spectral Methods in Partial Differential Equations. (Oaxaca, Mexico) Dec 11–16, 2016
- AMS Fall Southeastern Sectional Meeting. (Raleigh, NC) Nov 12–13, 2016
- **CRM summer school of mathematics.** (Quebec City, Canada) Jul 4–14, 2016  
*Taught a mini-course titled “Introduction to Spectral Geometry”.*
- BIRS Conference on Dirichlet-to-Neumann Maps: Spectral Theory, Inverse Problems and Applications. (Oaxaca, Mexico) May 29–Jun 3, 2016
- Conference on Random Waves. Kings College University. (London, England) May 3–5, 2016
- **Colloquium at Tufts University.** (Medford, MA) Apr 22, 2016
- **Colloquium at University of Illinois at Urbana-Champaign.** (Champaign, IL) Apr 14, 2016
- CMS Winter meeting. (Montreal, Canada) Dec, 2015
- CRM Summer School on Geometric and computational Spectral Theory. (Montreal, Canada) Jun 15–26, 2015
- Simons Center Conference on Quantum Geometry, Stochastic Geometry, Random Geometry, you name it. (Stony Brook, NY) . Jun 15–19, 2015
- May Midwestern Microlocal Meeting at Northwestern University. (Evanston, IL) May 16, 2015
- Geometry Seminar at Indiana University. (Bloomington, IN) Apr 16, 2015
- Analysis and PDE seminar at University of California at Berkeley. (Berkeley, CA) Mar, 2015
- Analysis seminar at Temple University. (Philadelphia, PA) Mar, 2015
- **Colloquium at Drexel University.** (Philadelphia, PA) Feb 9, 2015
- Analysis seminar at McGill University Dec, 2014
- Faculty Colloquium at Harvard University March 10, 2014
- Analysis Seminar at Northwestern University Feb 25, 2014
- PDE Seminar at University of North Carolina at Chapel Hill. Nov, 2013
- Conference on Spectral Theory of Laplace and Schrödinger Operators. Banff, Canada . Aug, 2013
- Conference on Quantum chaos, resonances and Semiclassical measures. Roscoff, France June 2013
- Workshop on Analytic Microlocal Analysis. Evanston, United States May 20-24, 2013
- CMS Winter meeting. Montreal, Canada Dec, 2012
- Analysis seminar at University of Toronto. Toronto, Canada Nov, 2012
- Workshop on manifolds of metrics and probabilistic methods in geometry and analysis. Montreal, Canada. July 2-6, 2012
- Workshop on geometry of eigenvalues and eigenfunctions. Montreal, Canada June 4-8, 2012
- Dartmouth Geometry and Topology Research seminar. Hanover, USA May 31, 2011
- CMS Winter meeting. Vancouver, Canada Dec 4-6, 2010

## RESEARCH SUPERVISION

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- Doctoral dissertation advising of Andrew Lyons. Jan 2022–present
- Doctoral dissertation advising of Madelyne Brown. Jan 2020–present
- Doctoral dissertation advising of Blake Keeler. Aug 2017–Apr 2021

- Supervised research (w/J. Marzuola) of a working group with graduate students Dmitro Golovanich and Blake Keeler. Jan 2018–Apr 2019
- Co-supervisor of Matthew de Courcy-Ireland’s undergraduate summer project. May–Aug 2012
- Co-supervisor of Steven Pollack’s undergraduate summer project. May–Aug 2012

## TEACHING EXPERIENCE

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### INSTRUCTOR AT UNC

- Math 521– Introductory Analysis Spring 2023
- Math 653– Introductory Analysis Fall 2022
- Math 782– Differential Geometry Spring 2022
- Math 653– Introductory Analysis Fall 2021
- Math 233– Multivariable Calculus Spring 2021
- Math 680– Geometry of curves and surfaces Fall 2020
- Math 680– Geometry of curves and surfaces Fall 2019
- Math 550 – Undergraduate Topology
- Math 233H– Multivariable Calculus-Honors Spring 2019
- Math 782– Differential Geometry Spring 2018
- Math 233H– Multivariable Calculus-Honors (Course coordinator) Fall 2017
- Math 233– Multivariable Calculus (Course coordinator) Spring 2017
- Math 680– Geometry of curves and surfaces Fall 2016

### INSTRUCTOR AT HARVARD UNIVERSITY

- Math 1B– Calculus, series, odes Winter 2015
- Math 1A– Introduction to Calculus Fall 2015
- Math 118– Dynamical systems Winter 2014
- Math 112– Introductory Real Analysis Winter 2014
- Math 253– Analysis on manifolds via the Laplacian Fall 2014

### INSTRUCTOR AT MCGILL UNIVERSITY

- Math 222– Calculus 3 Winter 2013
- Math 140– Calculus 1 Summer 2012

## PROFESSIONAL SERVICE

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### CONFERENCE ORGANIZATION

- Session “Spectral geometry”. 2019–2021  
Mathematical Congress of the Americas. Moved to July 2021 due to pandemic.
- Session “ Geometry in Spectral and Scattering Theory”. 2019–2021  
CMS Ottawa 75th Anniversary Meeting. Session canceled due to pandemic.
- Summer School “Summer School in Semiclassical Analysis”. 2018–2019  
July 29–August 16, 2019. Evanston, USA.
- Workshop “Microlocal Analysis and its Applications 2017–2018  
in Spectral Theory, Dynamical Systems, Inverse Problems and PDE”.  
March 18–23, 2018. Batemans Bay, Australia.

- Session “Spectrum and dynamics” for the Mathematical Congress of the Americas. Held in July 24–28, 2017. Montreal, Canada. 2017
- Thematic semester on probabilistic methods in geometry, topology and spectral theory. Summer&Fall of 2016. 2015

#### OUTREACH AND PROMOTION OF SCIENCE

- Panelist for “Exploring a research landscape”. GROW. Duke University. Oct 2022
- Invited speaker: UNC’s Mathematics Department Anti-Racism Community Feb 2022
- Biographic interview for book “La ciencia es cosa de mujeres” by Margarita Michelini (editorial Penguin) Dec 2021
- Plenary speaker: Graduate Research Opportunities for Women 2021 University of Illinois East Campus. Oct 2021
- Panelist for “Working in the Mathematical Sciences Panel”. GROW. University of Illinois East Campus. Oct 2021
- Panelist for the Graduate Student Panel “Launch Point: NC Conference for Student Mathematicians” Apr 2021
- Featured in *Notices of the American Mathematical Society*. ISSN 0002-9920. Mar 2021
- Interviewed in radio show *En Perspectiva: Mesa de científicos*. <https://www.enperspectiva.net/tag/mesa-de-cientificos/> Jun 2020
- Organized and ran the booth “Sound and Waves” at the UNC Science Expo. Apr 2019
- Featured in *Semanario Búsqueda* <https://www.busqueda.com.uy/nota/talentos-en-la-mira> Feb 2019
- Panelist for the “Carolina seminar on gender and STEM”. Nov 2018
- Biographic interview, Chapter 6 in book *Ganadas y Perdidas* by Alexis Jano Ros. Nov 2018
- Panelist for the “Academic Career Panel” for the Carolina Women in STEM program. Sep 2018
- Honoree of *Lathisms’ 2019 edition*. <http://lathisms.org/wednesday-september-19th-2018.html> Sep 2018
- Interviewed in radio show *No Toquen Nada*. <https://delsol.uy/notoquennada/entrevistas/la-matematica-uruguaya-que-es-una-de-las-mentes-mas-brillantes-de-norteamerica> Jul 2018
- Featured in *Scientists of North Carolina* on June 20, 2018. Jun 2018
- Mentor for a professional development activity of the WinSpire program. Jun 2018
- Interviewed by *Fundación Julio Ricaldoni*. <http://www.ricaldoni.org.uy/noticias/267-un-paso-adelante-en-matematica> Apr 2018
- Organizer of the booth “Sound and Waves” at the UNC Science Expo. Apr 2018
- Featured in *Women in Science, CAS* <https://college.unc.edu/2017/11/canzani/> Nov 2017
- Reviewer for the Distinguished Dissertation Award in the doctoral programs in the areas of Mathematics, Physical Sciences and Engineering. Nov 2016
- Invited panelist in the AWM sponsored Mathematics Academic Job Search Panel. Oct 2016
- Co-organizer of a group on Gender Inclusiveness in Mathematics which aimed to promote gender inclusivity among undergraduate students within Harvard University’s mathematics department. 2015–2016

## ACADEMIC SERVICE

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### ADMINISTRATIVE POSITIONS

- Associate Chair. January 2022–present

### COMMITTEE MEMBER

- Chair’s Advisory Committee (elected). Fall 2019–present
- Graduate Committee. Fall 2020–present
- Comprehensive Exam committee member (Analysis). Fall 2022 – present
- Goodman Petersen Award Committee. Spring 2022
- Comprehensive Exam committee member (Geometry and Topology). Spring 2019 -Spring 2022
- Hiring Committee member for departmental job search. Fall 2021
- Budget Committee. Spring 2021
- Hiring Committee member for departmental postdoc search. Fall 2020
- Undergraduate Advising Committee. Spring 2019–2021
- Hiring Committee member for departmental job search. Fall 2017
- Comprehensive Exam committee member (Geometry and Topology). Fall 2017 -Spring 2018
- Assistant Director of Graduate Studies at Harvard University. 2015–2016
- Member of the Junior Advising Committee at Harvard University. 2013–2014

### GENERAL DEPARTMENTAL SERVICE

- Redesign of the Calculus sequence working platform. 2022–present
- Faculty Mentor for the Directed Reading Program. 2018–present
- Leading project to improve the appearance of UNC’s math department. 2018–present
- Member of the planning committee to create an institutional proposal for the NIH Common Fund Program: “Faculty Institutional Recruitment for Sustainable Transformation (FIRST) Program”. 2020–2021
- Redesign of the Geometry and Topology first year courses. 2019–2021
- Co-organizer of the “Analysis and PDEs seminar”. 2017–2021
- Grant reviewer for the Israel Science Foundation (ISF). March 2019
- Organizer of the “PDEs Student seminar”. 2017–2019
- Math major advisor for eight undergraduate students. March 2018
- Course coordinator for Math 233 (nine sections). Spring 2017
- Participant of the Calculus Working Group led by Prof. Christopher Jones. Spring 2017
- Reviewer for the Distinguished Dissertation Award in the doctoral programs in the areas of Mathematics, Physical Sciences and Engineering. UNC Chapel Hill. November 2016
- Organizer of the Differential Geometry Seminar at Harvard University. 2015–2016
- Organizer of a reading seminar on Semiclassical Analysis at McGill University. Fall 2011