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COLIN McSWIGGEN

- appointments** Postdoctoral Researcher, University of Tokyo, 2020–Present.
 Mentor: Yasuyuki Kawahigashi.
- education** Ph.D., Applied Mathematics, Brown University, 2020.
 Dissertation: *Theory and Applications of Harish-Chandra Integrals*.
 Advisor: Govind Menon.
- M.A.+M.Sc., Industrial Design Engineering, RCA/Imperial College London, 2013.
 S.B., Physics, MIT, 2011.
 S.B., Mathematics, MIT, 2011.
 Completed Mathematics Tripos Part II at Cambridge University, UK, 2009–2010.
- publications** *Accepted papers*
- C. McSwiggen, J. Novak (2021). “Majorization and spherical functions.” To appear in *Int. Math. Res. Not. IMRN*. [arXiv:2006.08541](https://arxiv.org/abs/2006.08541)
- C. McSwiggen (2021). “Box splines, tensor product multiplicities and the volume function.” To appear in *Algebr. Comb.* [arXiv:1909.12278](https://arxiv.org/abs/1909.12278)
- R. Coquereaux, C. McSwiggen, J.-B. Zuber (2020). “On Horn’s problem and its volume function.” *Comm. Math. Phys.* **376**: 2409–2439. [arXiv:1904.00752](https://arxiv.org/abs/1904.00752)
- R. Coquereaux, C. McSwiggen, J.-B. Zuber (2019). “Revisiting Horn’s problem.” *J. Stat. Mech.: Theory Exp* **2019**: 094018. [arXiv:1905.09662](https://arxiv.org/abs/1905.09662)
- C. McSwiggen (2019). “A new proof of Harish-Chandra’s integral formula.” *Comm. Math. Phys.* **365**: 239–253. [arXiv:1712.03995](https://arxiv.org/abs/1712.03995)
- Submitted papers*
- J. Leake, C. McSwiggen, N. Vishnoi (2020). “A polynomial-time algorithm and applications for matrix sampling from Harish-Chandra–Itzykson–Zuber densities.” [arXiv:2011.05417](https://arxiv.org/abs/2011.05417)
- I. Miers, C. McSwiggen, Y. Zhu, D. Lai, M. Green, S. He, A.S. Raja (2020). “A cryptographic framework for lotteries in medical triage: secure and transparent randomized allocation of scarce healthcare resources.”
- C. McSwiggen (2019). “The Harish-Chandra integral: An introduction with examples.” [arXiv:1806.11155](https://arxiv.org/abs/1806.11155)

- grants,
honors,
& awards
- Dunmu Ji Award, Brown University Division of Applied Mathematics, 2020.
Awarded “in recognition of a particularly original and independent thesis.”
- Chateaubriand Fellowship of the Embassy of France in the United States, 2018-2019.
Host institution: Laboratoire de Physique Théorique et Hautes Énergies, Sorbonne University.
Mentor: Jean-Bernard Zuber.
- Graduate Fellowship, Brown University, 2015–2016.
- conference
and seminar
presentations
- “Horn’s problem, polytope volumes and tensor product decompositions.” Operator Algebras Seminar, University of Tokyo, January 2020.
- Kyoto Operator Algebra Seminar, Kyoto University, January 2020.
- “From random matrices to multiplicities and back.” Combinatorics Seminar, Brown University, November 2019.
- “From random matrices to multiplicities and back.” *AMS Fall Western Sectional Meeting, Special Session on Random Matrices and Related Structures*, UC Riverside, November 2019.
- “Multiplicities from volumes.” *Integrability, Combinatorics, and Representations*, Giens, France, September 2019.
- “Large- N asymptotics of Harish-Chandra integrals.” *Randomness and Symmetry* (poster session), University College Dublin, June 2018.
- teaching
- Recitation leader*
- Introduction to Stochastic Differential Equations (APMA 1930U), Brown University, Fall 2019.
- Operations Research: Probabilistic Methods (APMA 1200), Brown University, Spring 2017.
- Monte-Carlo Simulation with Applications to Finance (APMA 1720), Brown University, Fall 2016.
- further
training
- Program on Dyson-Schwinger equations, topological expansions, and random matrices, Columbia University, 2017.
- Graduate Summer School on Random Matrices, Park City Mathematics Institute, 2017.
- Summer School in Analysis, University of Chicago, 2017.
- Brown-ICERM-Kobe High Performance Computing Summer School, Kobe University, 2015.
- service to the
profession
- Journal refereeing*
- Journal of the European Mathematical Society

International Mathematics Research Notices (IMRN)

SIAM Journal of Mathematical Analysis

Annals of Physics

Journal of Physics: Complexity

European Journal of Physics

Conference organization

Upcoming. “Random Theory 2021,” workshop on probability in computer science and physics, Estes Park, CO, August 2021.

“Random Theory 2017,” workshop on probability in computer science and physics, Estes Park, CO, August 2017.