Curriculum Vitae

Greg McShane

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Research Interests

Low dimensional topology, Kleinian groups, moduli space of Riemann surfaces, dynamics of the geodesic flow and interactions with physics and number theory.

Research Grants and Leadership

From 2015-2020 I was the director of the GDR des Tresses a research network in low dimensional topology in France `http://tresses.math.cnrs.fr/`. The GDR is a network of 700 researchers mainly in France but also in Italy, Spain, Canada working on problems related to the braid group and low dimensional topology. We organise a Winter School for young reserachers and two or three other conferences per year.

From 2021-2025 I was principal investigator for the ToFU project - Topologie Effective et Calcul in the University of Grenoble `https://persyval-lab.org/ToFu`. The goal of this project is to combine the knowledge of theoretical mathematicians and computer scientists in order to study questions in geometry which have a combinatorial and algorithmic nature.

Academic Positions

- Professor, Institut Fourier, Grenoble (2008 – present)

- Adjunct Professor, École Normale Supérieure Lyon (2014 – present)

- Lecturer, Université Paul Sabatier, Toulouse (1997 – 2008)

Education

- 2006: Habilitation diriger les recherches. Thesis: "Identités pour l'espace des représentations du groupe fondamental d'une surface"

- 1992: Ph.D., Advisor: Prof. David B.A. Epstein. Thesis: "A remarkable identity for lengths of curves on surfaces"

- 1988: M.Sc. (with distinction), University of Warwick. Thesis: "Some notes on hyperbolic groups after Gromov"

- 1987: B.Sc. (with honours, class I), University of Glasgow (Glasgow, Scotland)

Selected Publications

A full list of publications is available upon request.

- Convexity and Aigner's conjecture, to appear Advances in Math

- Isospectral configurations in Euclidean and Hyperbolic Geometry to appear Tohoku Journal of Math

- Geometry of Fermat's sum of squares, to appear in Essays on Topology, Springer

- Rank two free groups and integer points on real cubic surfaces, arXiv:2009. 09829

- with H. Masai, On systoles and ortho spectrum rigidity, Math Annalen, Vol 385, 2022

- Geodesic intersections and isoxial Fuchsian groups. Annales de la faculté des sciences de Toulouse Mathématiques Tome XXVIII, no 3 , p. 471-489 (2019)

- with William Goldman, George Stantchev, Ser Peow Tan. Automorphisms of two-generator free groups and spaces of isometric actions on the hyperbolic plane, Memoirs of the AMS, (Book 259), 78 pages, ISBN: 1470436140, (2019)

- with S. Kojima, Normalized entropy versus volume for pseudo-Anosovs, Geometry and Topology, 22(4) p. 2403-2426, (2018)

Visiting Positions

- Fall 2019: Brown University, Providence, USA

- Spring 2018: Tsing Hua University, Beijing, China

- Spring 2015: University of Texas Austin, USA

- Winter 2015: CalTech, CA, USA

- Spring 2012: Tokyo Tech, Japan

- January 2008: NUS, Singapore

- January 2007: NUS, Singapore

- Fall 2005: IHES, Paris

- Fall 2004: Princeton University

- Spring 2004: UIC, Chicago

Invitations to Speak at Conferences

- Geometry and Dynamics in Low Dimensions" workshop in Hanoi, Vietnam, January 2025

- Special session on Markoff Triples at the upcoming Joint Mathematics Meetings in San Francisco, January 2024

- Thin Groups, NUS Singapore, June 2024

- Characters and Moduli of Surfaces, RIMS Kyoto, Japan, July 2023

- Geometry of discrete groups and hyperbolic spaces, Tokyo, Japan, June 2021

- Topology and Geometry of Low-dimensional Manifolds 5/6 – 8/6, 2019, Kanazawa, Japan.

- Workshop on Geometry of Moduli, Suzhou Chine 20/4-22/4/2018 Workshop on Geometry of Moduli, Suzhou Chine 20/4-22/4/2019.

- Geometric Structures and Representation Varieties , NUS Singapour, mai, 2017.

- Geometric Analysis, Metric Geometry and Topology, UGA, Grenoble, France juillet 2016

- Workshop on Teichmüller Theory and Low-Dimensional Topology, TSIMF China, janvier, 2016.

- 3-dimensional Geometric Structures, Representations of Surface Groups and related topics. Luxembourg 13 au 15 juillet, 2015.

- Dynamics and Geometry in the Teichmller Space, CIRM juillet, 2015.

- Topology, Geometry and Algebra of Low-Dimensional Manifolds., Tokyo, Japan, mai 2015 .

- Identities in New York, CUNY Graduate Center, New York USA avril 2015

- Mapping Class Groups and Teichmller Theory, Nahsholim Israel mai, 2014.

- Complex Analysis and Topology of Discrete Groups and Hyperbolic Spaces” RIMS, Kyoto, Japon janvier 2014.