Clément Cren

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Position

2023-Present: Hochschulassistent, Beamter (postdoc) at Georg-August Universität Göttingen Mathematisches Institut.

2020-2023: PhD Student at Université Paris-Est Créteil, Laboratoire d'Analyse et de Mathématiques Appliquées. Thesis *Pseudodifferential calculus on filtered manifolds and applications to geometry and harmonic analysis*, supervised by Jean-Marie Lescure.

Education

2019-2020: Master 2 in pure maths at Université de Paris-Cité (former Paris 7); Riemannian geometry, complex geometry, algebraic topology, operator theory, symmetric spaces and Lie groups theory, geometric quantization and geometric analysis (index theory).
Master thesis Deformation groupoids and inhomogeneous pseudodifferential calculus supervised by Georges Skandalis at Institut Mathématiques de Jussieu – Paris Rive Gauche (Paris)

July 2019: Successful candidate at Agrégation de Mathématiques, ranked 1st.

2018-2019: Master 2 FESUP (teaching degree) at ENS Cachan, preparation to Agrégation de Mathématiques competitive exam.

2017-2018: Master 1 at ENS Cachan; functional analysis, spectral theory, algebraic number theory, dynamical systems, optimisation, algebraic topology, differential geometry.
Master thesis *Klein metrics on real projective space* supervised by Charles Boubel at Institut de Recherche Mathématique Avancée (Strasbourg)

2016-2017: Bachelor at ENS Cachan; algebra, numerical analysis of ODE&PDE, differential calculus, Fourier analysis, probabilities.
Bachelor thesis *Matrix and tensor completion with applications* supervised by Nicolas Vayatis at Centre de Mathématiques et Leurs Applications (Cachan)

July 2016: Successful candidate at the Ecole Normale Supérieure of Cachan/Paris-Saclay entrance exam.

2014-2016: Classes Prépa in Lycée Chateaubriand Rennes, preparation for french « Grandes Ecoles » competitive entrance exams.

Publications

C, Cren, *A transverse index theorem in the calculus of filtered manifolds*, 2022,
https://arxiv.org/abs/2207.09112, submitted
C, Cren, *Filtered Calculus and crossed products by R-actions*, 2023,
https://arxiv.org/abs/2308.13532, submitted
C, Cren, *Transverse parabolic structures and transverse BGG sequences*, 2023,
https://arxiv.org/abs/2312.17509, submitted

Teaching Activities

2023-2024: 2023-2024 : Göttingen Universität. Assistant for *C*-algebras* (Master). Lecturer for *LaTeX Kurs*. Assistant for *Introduction to algebraic geometry* (Master). Organization of *Onbourding tutorial in Non-commutative Geometry* (Master).

2022-2023: Créteil University. Lecturer for *Introduction to Fourier analysis and wavelets* (Master 2, engineering students); assistant for *Euclidean spaces* (Bachelor, maths students, 2nd year).

2021-2022: Créteil University.Lecturer for *Arithmetic and basic set theory* (Bachelor, maths students, 1st year).

2020-2021: Créteil University. Assistant for *Multivariable calculus and linear algebra* (Bachelor, engineering students, 2nd year). Assistant for *Calculus II* (Bachelor, engineering students, 1st year).

2017-2019: CPGE Lycée Lakanal. Weekly oral examinations.

2016-2017: Tutoring for bachelor in science and technology students at Institut Villebon-Charpak (University Paris-Saclay)

Supervision

2021: Créteil University. Supervision of two Master 1 Thesis *Differential Forms and Poincaré Lemma*

Communications

Talks in conferences, workshops, seminars

April 2024: CIRM, *Group operator algebras and Non commutative geometry* conference, https://conferences.cirm-math.fr/2987.html

March 2024: Sichuan University Chengdu, *Algebraic, analytic, geometric structures emerging from quantum field theory* school and workshop, https://math.scu.edu.cn/info/1031/10971.htm

December 2023: Université de Lorraine Metz, GDR Géométrie Non-Commutative *Arbre de Noël* conference, https://iecl.univ-lorraine.fr/gnc2023/

June 2023: Université de Lorraine Metz, *Théorie de Lie, Géométrie et Analyse* seminar, https://iecl.univ-lorraine.fr/evenements/seminaires/seminaire-theorie-de-lie-geometrie-et-analyse/

March 2023: Athens, *Noncommutative Geometry and Representation Theory* conference, https://conferences.uoa.gr/event/56/

September 2022: Université Paris-Cité, Operator Algebras seminar, https://www.imj-prg.fr/gestion/evenement/affSeance/8831

June 2022: Cortona, *Dirac Operators in Topology, Geometry, and Representation Theory* conference, https://cortona2022.cbaer.eu/

June 2022: Caen, Géométrie Non-Commutative GDR Conference, https://conf.lmno.cnrs.fr/GNC2022/

May 2022: Dartmouth College, Functional Analysis Seminar

Other attended conferences and schools

September 2023: Angers, *High frequency analysis: from operator algebras to PDEs* workshop, https://indico.math.cnrs.fr/event/9728/

July 2023: Köln, *Quantization in geometry* conference, http://www.mi.uni-koeln.de/geometrische_analysis/QCONF_2023/Ohne-Titel.html

March 2023: Göttingen, *Interactions between Poisson geometry and quantization* spring school, https://www.uni-goettingen.de/en/672633.html

December 2022: IHES, GDR Géométrie Non-Commutative *Arbre de Noël* conference, https://indico.math.cnrs.fr/event/8849/

March 2022: CIRM, *Geometry and Analysis on non-compact manifolds* conference, https://conferences.cirm-math.fr/2548.html

June 2021: Oberwolfach Workshop *Analysis, Geometry and Topology of singular PDE,* *https://publications.mfo.de/handle/mfo/3883*

Science Outreach

2022-2023: Scientific advisor for the MATh.en.JEANS association in collège Janson de Sailly, https://www.mathenjeans.fr/content/College-Janson-de-Sailly-Paris-2022-2023

Languages

French: Native
English: Fluent (C1 Cambridge Advanced certified)
Spanish: Intermediate level
German: Beginner

Programming Languages

Latex: Fluent
Python: Intermediate level
Ocaml: basic level