



Nicolas Berkouk

Birth date : 14/03/1994

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Education

- Expected 2020** *Persistence and Sheaves, Ph.D. in preparation*
Ph.D under the supervision of Steve Oudot at INRIA Saclay
Defense expected date : September 2020
- 2015 - 2016** **M.Sc. of Pure Mathematics, Imperial College, London, U.K.**
Master thesis under the direction of Ambrus Pál : *Is the property of being formal axiomatisable in the first order theory of A_∞ -algebras ?*
- 2012 - 2016** **École Polytechnique, Palaiseau, France**
Major in pure mathematics
- 2010 - 2012** **Classe Préparatoire MP*, Lycée Saint-Louis, Paris, France**

Professional experience

- 2019 - 2020** **Data Scientist at the French Ministry of Finances**
I have joined the highly selective program « Entrepreneurs d'intérêt général » (Entrepreneurs for general interest) during my gap year, which aims at developing high impact IT projects in the French Administration. NLP and graph analysis in Python.

Published Paper

- May 2020** ***Ephemeral persistence modules and distance comparison, with François Petit***
To appear in *Algebraic and Geometric Topology*. arXiv preprint available at : <https://arxiv.org/abs/1902.09933>
- Aug 2018** ***Are competitive entrance exams neutral? Competition and sponsorship in access to the École polytechnique, with Pierre François published in Sociologie, 2018/2 Vol. 9***
Paper that I published from my first master thesis with École polytechnique

Papers under review

- Jul. 2019** ***Level-sets persistence and sheaf theory, with Grégory Ginot and Steve Oudot***
arXiv preprint available at : <https://arxiv.org/abs/1907.09759>
- Jan 2019** ***Stable resolutions of multi-parameter persistence modules***
arXiv preprint available at : <https://arxiv.org/abs/1901.09824>
- May 2018** ***A derived a isometry theorem for constructible sheaves over \mathbb{R} , with Grégory Ginot***
arXiv preprint available at : <https://arxiv.org/abs/1805.09694>

Visiting positions

- June 2018** **Politecnico di Torino, Torino Italy**
Short-term visitor in Francesco Vaccarino's research group
- March 2018** **Luxembourg University, Luxembourg**
Short-term visitor in François Petit's research group
I gave a 10 hours course for the doctoral school of mathematics together with Steve Oudot : « Theoretical foundations of persistence theory »
- Sept. 2017** **Hausdorff Research Institute for Mathematics , Bonn, Germany**
Special Hausdorff Program on « Applied and Computational Algebraic Topology »

Presentations at workshops and seminars

- Jun. 2020** ***ATMCS conference, Ohio State University, USA***
Contributed online talk : « Sheaves as computable and stable descriptors of data »
- Jun. 2020** ***Representation theory seminar, Bielefeld, Germany***
Invited online talk : « Derived methods for persistence »
- Jan. 2019** ***Workshop on Applied Topology 2019, Kyoto, Japan***
Contributed talk : « A derived isometry theorem for constructible sheaves over \mathbb{R} »
- May 2018** ***Bridging statistics and sheaves, IMA, Minneapolis, USA***
Joint talk with Anthea Monod : « Connecting measures with sheaves »
Poster : « A derived isometry theorem for constructible sheaves over \mathbb{R} »
- March 2018** **Luxembourg University, Luxembourg**
10 hours course for the doctoral school of mathematics together with Steve Oudot : « Theoretical foundations of persistence theory »
- Feb. 2018** ***Linking Topology to Algebraic Geometry and Statistics, MPI Leipzig, Germany***
Poster : « Computing the convolution distance for constructible sheaves over \mathbb{R} »
- Dec. 2017** ***Journées de Géométrie Algorithmique, Aussois, France***
Talk : « Stable resolutions of multi-parameter persistence modules »
- Aug. 2017** ***Developing abstract foundations for TDA, Banff Center, Canada***
Talk : « Stable resolutions of multi-parameter persistence modules »
- March 2017** ***Persistent homology working group, IHP, Paris, France***
Talk : « Stable resolutions of multi-parameter persistence modules »

Teaching

- 2018 - 2019** **Teaching assistant at École polytechnique's bachelor**
I gave the exercise sessions for the course « linear algebra 2 » of Damian Brotbeck
- 2017 - 2018** **Teaching assistant at École polytechnique's bachelor**
I gave the exercise sessions for the course « linear algebra 1 » of Stéphane Bijakowski
- 2016 - 2017** **Oral examiner in « classe préparatoire » at Lycée Saint-Louis, Paris**
MPSI Lycée Saint-Louis