

Philippe Moustrou

University curriculum & Employments

- Jun 2018 – present **PostDoc**, *UiT - The Arctic University of Norway*.
Project "Symmetry in Quantitative and Algorithmic Real Algebraic Geometry" funded by Tromsø Research Foundation.
- Feb 2018 – May 2018 **PostDoc**, *ICERM, Brown University*.
Semester Program: *Point Configurations in Geometry, Physics and Computer Science*.
- Sep 2017 – Jan 2018 **Temporary lecturer and research assistant**, *Institut de Mathématiques de Bordeaux*.
- 2014 – 2017 **Ph.D student**, *Institut de Mathématiques de Bordeaux*.
Thesis: *Geometric Distance Graphs, Lattices and Polytopes*.
Supervised by Christine Bachoc and Arnaud Pêcher.
- 2013 – 2014 **Master 2 "Mathématiques Approfondies, Parcours spécialisé"**, *University of Bordeaux*.
Master thesis on Network Coding supervised by Christine Bachoc.
Courses taken : Number theory, Algebraic Geometry, Algorithmic Number Theory, Heights, Elliptic curves.
With highest honour.
- 2012 – 2013 **Master 2 "Parcours spécialisé métiers de l'enseignement des mathématiques (Agrégation)"**, *University of Bordeaux*.
Agrégation rank 29th
Master thesis on Gaussian Sums supervised by Ahmed Sebbar.
With highest honour.
- 2011 – 2012 **Master 1 "Spécialité Mathématiques Approfondies"**, *University of Bordeaux*.
Project on the Zeros of Holomorphic Functions supervised by Philippe Charpentier.
With highest honour.
- 2008 – 2011 **Bachelor "Mathématiques Fondamentales"**, *University of Bordeaux*.
With highest honour.

Preprints & Publications

Submitted

- [5] **Exact semidefinite programming bounds for packing problems.**
Maria Distert, David de Laat and Philippe Moustrou, (2020).
- [4] **Symmetric ideals, Specht polynomials and solutions to symmetric systems of equations.**
Philippe Moustrou, Cordian Riener and Hugues Verdure, (2019).
- [3] **Coloring the Voronoi tessellation of lattices.**
Mathieu Dutour Sikirić, David Madore, Philippe Moustrou and Frank Vallentin, (2019).

Published

- [2] **On the Density of Sets Avoiding Polytope Distance 1.**
Christine Bachoc, Thomas Bellitto, Philippe Moustrou and Arnaud Pêcher.
Discrete & Computational Geometry, 62(3), (2019) 497–524.
- [1] **On the Density of Cyclotomic Lattices Constructed from Codes.**
Philippe Moustrou
International Journal of Number Theory, Vol. 13, No. 5 (2017) 1261–1274

Presentations

- January 2020 **Conference *Mørketidens MatteMøte*, Tromsø.**
Exact semidefinite programming bounds for packing problems
- December 2019 ***Optimization Seminar*, Erlangen.**
Exact semidefinite programming bounds for packing problems
- October 2019 **Summer School *Sphere Packings and Optimal Configurations*, Kopp.**
Lattices with exponentially large kissing numbers (after Serge Vlăduț)
- July 2019 **Conference *SIAM AG*, Bern.**
Computing spectral bounds for geometric graphs via polynomial optimization
- July 2019 ***Groups, Arithmetic & Algebraic Geometry Seminar*, EPFL, Lausanne.**
Exact semidefinite programming bounds for packing problems
- December 2018 ***Optimization Seminar*, Cologne.**
On Sets Avoiding Polytope Distance 1
- October 2018 ***Algebra Seminar*, Tromsø.**
Lattices and Sphere Packings from Low to High Dimensions
- July 2018 **Symposium *ISMP 2018*, Bordeaux.**
The upper density of sets avoiding norm one in the real space of dimension n
- May 2018 ***Discrete Mathematics Seminar*, Delaware.**
On sets avoiding distance 1
- May 2018 ***Computational Challenges in the Theory of Lattices*, Providence.**
On the density of sets avoiding parallelohedron distance 1
- February 2018 ***ICERM Graduate Students and PostDocs Seminar*, Providence.**
On sets avoiding distance 1
- January 2018 ***LFANT Seminar*, Bordeaux.**
On the density of sets avoiding parallelohedron distance 1
- July 2017 ***Journées Arithmétiques*, Caen .**
On the density of sets avoiding parallelohedron distance 1
- April 2017 ***Lambda Seminar*, Bordeaux.**
À propos des ensembles évitant la distance 1
- March 2017 ***GT Graphes et Optimisation*, Bordeaux.**
On the density of sets avoiding parallelohedron distance 1
- April 2016 **Conference *Network Coding and Designs*, Dubrovnik.**
On the Density of Cyclotomic Lattices Constructed from Codes
- January 2016 **Oberwolfach workshop *Lattices and Applications in Number Theory*, Oberwolfach.**
On the Density of Cyclotomic Lattices Constructed from Codes
- October 2015 ***Journées Codage et Cryptographie*, la-Londe-les-Maures.**
Sur la Densité de Réseaux Obtenus par Construction A sur des Corps Cyclotomiques
- September 2015 ***Scientific evaluation of the cluster CPU*, Bordeaux.**
Sur l'Utilisation des Réseaux Euclidiens pour la Transmission d'Information

Teaching

- 2019 – 2020 ○ *Algebra 2*, full responsibility, Master of Mathematics and Statistics, Tromsø.
- 2017 – 2018 ○ *Information Theory*, exercise sessions, first year Master students, Master "Cryptologie & Sécurité Informatique".
○ *Linear Algebra for Engineering Sciences*, lectures and exercise sessions, second year Bachelor students.
- 2016 – 2017 ○ *Linear Algebra*, exercise sessions, first year Bachelor students.
○ *Linear Algebra for Engineering Sciences*, lectures and exercise sessions, second year Bachelor students.
- 2015 – 2016 ○ *Mathematics for Environment Sciences (Analysis and Algebra)*, lectures and exercise sessions, first year Bachelor students.
○ *Linear Algebra for Engineering Sciences*, lectures and exercise sessions, second year Bachelor students.
- 2010 – 2014 Tutor for PreBachelor and Bachelor students at the University of Bordeaux.
2013 – 2014 "Khôlleur".

Popularization

Animation of popularization activities in Tromsø (Forskningsdagene, skolelaboratoriet) about various topics, like Rubik's cube, Black Jack...

Member of the association *Maths à Modeler*, whose aim is popularization of mathematics, in particular for pupils in middle school.

Administration

Member of the department council, Tromsø (2020).

Vice-president of *Lambda*, the Bordeaux association of Ph.D. students in mathematics.

Organization of scientific events

June 2020 **Mathematics and Data.**

January 2020 **Mørketidens MatteMøte 2020.**

April 2019 **Arctic Applied Algebra.**

January 2019 **Mørketidens MatteMøte 2019.**

November 2016 **Bordeaux Graph Workshop 2016.**

November 2014 **Bordeaux Graph Workshop 2014.**

Research projects and networks

Through the Algebra group of UiT, I am involved in the following projects and networks:

- SymRAG - Symmetry in Quantitative and Algorithmic Real Algebraic Geometry
- POEMA - Polynomial Optimization, Efficiency through Moments and Algebra
- \mathbb{N}^3 - Nordic Number theory Network
- RAGO - Real Algebraic Geometry and Optimization

Grants

2014 – 2017 Ph.D. Scholarship awarded by the Cluster of Excellence CPU-Idex Bordeaux.

2008 – 2013 "Bourse au mérite", scholarship awarded on merit by the French State.

Languages

French	Native Speaker
English	Fluent
Italian	Intermediate
Spanish	Notions