

# Alexis Langlois-Rémillard

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Krijgslaan 281, S9  
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## Research interests

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Algebra, mathematical physics, representation theory of algebras, diagrammatic algebras, cellular algebras, Lie (super)algebras, Dunkl operators and Temperley-Lieb algebras.

## Education

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- 2019- **Ph. D. in Mathematics**, Universiteit Gent  
exp. Thesis subject: *Algebraic realization of Dunkl operators*  
2023 Advisors: Profs Joris Van der Jeugt and Hendrik De Bie
- 2017- **M. Sc. in Mathematics**, Université de Montréal  
2019 Thesis: *Sur la structure cellulaire et la théorie de la représentation des algèbres de Temperley-Lieb à couture*  
Advisor: Prof. Yvan Saint-Aubin
- 2014- **B.Sc in Mathematics**, Université de Montréal  
2017 *Excellence mention*

## Scholarships

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- 2019-2023 **FRQNT<sup>1</sup>** Doctoral Research Scholarship (\$ 84 000)  
2019-2022 **FWO<sup>2</sup>** EOS PRIMA PhD scholarship (€ 96 000)  
2017-2018 Alexander-Graham-Bell **NSERC<sup>3</sup>** Master's award (\$ 17 500)  
2017-2019 **FRQNT** Master's award (\$ 30 000)  
Summer 2016 Undergraduate Research Award, **NSERC** and **FRQNT** (\$ 7 625)  
Summer 2015 Undergraduate Research Award, **NSERC** (\$ 5 625)

## Academic work experience

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- 2016-2018 **Teaching Assistant** at Université de Montréal  
*Discrete Mathematics, Analysis 1 and Fundamental Mathematics*  
Animation of exercises sessions for 20-60 students classrooms, office hours for students, invigilated and corrected exams.
- Summer 2016 **NSERC Research internship** with Prof. Yvan Saint-Aubin at UdeM  
Summer 2015 **NSERC Research internship** with Prof. Matilde Lalín at UdeM

## Publications and preprints

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### Articles

(preprint) De Bie, H., Langlois-Rémillard, A., Oste, R., and Van der Jeugt, Joris (2020) Finite-dimensional representations of the symmetry algebra of the dihedral Dunkl-Dirac operator. 46p. [arxiv:2010.03381](https://arxiv.org/abs/2010.03381)

Langlois-Rémillard, A., Saint-Aubin, Y. (2020) The representation theory of seam algebras. SciPost Physics 8, 019. 34p. <https://doi.org/10.21468/SciPostPhys.8.2.019>

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<sup>1</sup>Fonds de Recherche du Québec – Nature et Technologies (Québec Research Funds on Natural sciences)

<sup>2</sup>Fonds Wetenschappelijk Onderzoek – Vlaanderen (The Research Foundations – Flanders)

<sup>3</sup>National Science and Engineering Research Council of Canada

## Proceedings

(preprint) Langlois-Rémillard, A. (2020) Deforming algebras with anti-involution via twisted associativity. *Submitted as contribution for the proceedings of International Conference on Stochastic Processes and Algebraic Structures*, Västerås 2019, 21p.

Langlois-Rémillard, A. and Oste, R. (2020) An Exceptional Symmetry Algebra for the 3D Dirac-Dunkl Operator. In: Dobrev V. (ed) *Lie Theory and its Applications in Physics*. LT Varna 2019. Springer Proceedings in Mathematics & Statistics, vol 335. Springer Singapore. pp 399-405 [doi:10.1007/978-981-15-7775-8\\_30](https://doi.org/10.1007/978-981-15-7775-8_30) [arXiv:2009.13904](https://arxiv.org/abs/2009.13904)

## Popularization work

Boutet, V., Godin, J. and Langlois-Rémillard, A. (2017) Excursion typographique : La matrice des fontes. *Accromath*, 12, pp. 26-29. <http://accromath.uqam.ca/archives/>

## Talks and Workshop

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### Invited seminar talks:

- November 2018 **Seminar: representation theory of algebras**, Université de Sherbrooke  
*Idempotence, cellularité et algèbres diagrammatiques* (invited by Prof. Ibrahim Assem)
- October 2018 **Mathematical physics seminar**, Université de Montréal  
*Roots of unity and the representation theory of boundary seam algebras*  
(Invited by Prof. Yvan Saint-Aubin)

### Workshop:

- June 2018 **Canadian Mathematical Society Summer Meeting**, Fredericton  
*Atelier d'enseignement actif* (with Marie-Andrée B. Langlois)

### Contributed seminar and conference talks:

- December 2020 **CMS Winter meeting**, Canada, online  
*The symmetry algebra of the Dunkl-Dirac operator: the dihedral cases*
- March 2020 **Clifford research seminar**, Universiteit Gent  
*The symmetry algebra of the 3D dihedral Dunkl-Dirac equation.*
- November 2019 **International Conference on Stochastic Processes and Algebraic Structures**, Västerås  
*Cellular structure of seam algebras and avenues for deformations*
- June 2019 **Clifford research seminar**, Universiteit Gent  
*Representation theory and cellular structure of seam algebras*
- December 2018 **Séminaire étudiant en mathématique**, Université de Montréal  
*Colorier une carte, une approche par dessin*
- September 2018 **XXX<sup>th</sup> Meeting on representation theory of algebras**, Sherbrooke  
*Cellular structure of boundary seam Temperley-Lieb algebras*
- June 2018 **Canadian Mathematical Society Summer Meeting**, Fredericton  
*Bratteli and the morphisms of boundary seam algebras*
- May 2018 **XXI<sup>e</sup> Colloque ISM**, Université Sherbrooke  
*Bratteli et les morphismes (semi-)simples de Temperley-Lieb*

### Popularization talks:

- September 2020 **Club mathématique**, Université de Montréal  
*Des pentagones aux heptagones, une infinité de différences*
- November 2018 **Club mathématique**, Université de Montréal  
*Huit dames pour un échiquier*
- July 2018 **Camp mathématique de l'AMQ**, Dawson College, Montréal  
*Le carrérousel du géomètre*
- November 2017 **Club mathématique**, Université de Montréal  
*Excursion typographique*

## Leadership and implication

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### Conference organizer

- 2019 **SAMARI**. One day conference on possibilities after graduation in mathematics. *Co-initiator and co-organizer*
- 2016-2018 **Seminars in Undergraduate Mathematics in Montréal**. Annual provincial undergraduate weekend conference. *President for 2016–2017 and member of the organizing committee in 2018*
- 2018 **SAPHARI**. One day conference on possibilities after graduation in physics. *Organizer of the mathematics session*
- 2017 **Canadian Undergraduate Mathematics Conference** Annual national undergraduate week conference. *President for the Montréal 2017 edition*

### Session and seminars organizer

- 2017-2018 **AARMS-STUDC student poster session**. Co-organizer for 2018 CMS Summer Meeting, University of New-Brunswick, Fredericton and 2017 CMS Winter Meeting, University of Waterloo, Waterloo.
- 2017-2018 **Séminaire étudiant en mathématique**, Université de Montréal
- 2015-2017 **Club mathématique**, Université de Montréal

### Community service

- 2016-2019 **Student committee** of the Canadian Mathematical Society. *Committee member*: involved in the French translation of general activities and in the edition of French articles in the annual publication *Notes from the Margin*.
- 2017-2019 **AECSSMS**: Graduate mathematics and statistic students association in Université de Montréal. *President* (2018-2019) and *Treasurer* (2017-2018).
- 2014-2019 Students representative on the **mathematics and statistic departmental assembly** at Université de Montréal: 2014-2016 for undergraduate and 2018-2019 for graduate students.

### Popularization

- 2016-2018 **Institut des sciences mathématiques**. I created an activity on tatami tiling in 2016 for the *MathFest* and co-created the activity *Le carréousel du géomètre* for the festival *Eureka!* 2018 at the Science center of Montréal.
- 2018-2019 **L'Axiomatique**. *Corrector-in-chief and writer* for a mathematics student journal at Université de Montréal.
- 2015-2017 **JÉMUM**. *Co-created and co-edited* a student mathematical journal to showcase summer research by undergraduate students.

## Languages

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- Français** : Native language
- English**: Fluent
- Nederlands**: Good (B1 CEFRL 2020-12)

## Other Interests and Activities

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- Chess** I am a Canadian and Québécois expert and play with the KGSRL chess club.
- Lifeguard** I taught swimming lessons and was a lifeguard and a swimming teacher from 2011 to 2016 and a lifeguard instructor from 2013 to 2016. I received a Commonwealth service citation for my volunteer work in 2015 and 2014.