

# Guillermo Sanmarco

Iowa State University  
Ames, Iowa, USA  
✉ [sanmarco@iastate.edu](mailto:sanmarco@iastate.edu)  
🌐 [www.gsanmarco.com](http://www.gsanmarco.com)

## Education

- 2015–2020 **Doctor en matemática**, Ph.D in Math. equivalent, National University of Córdoba, Argentina. Thesis: “Contributions to the classification of pointed Hopf algebras with finite Gelfand-Kirillov dimension”  
Advisor: Nicolás Andruskiewitsch.
- 2010–2015 **Licenciado en matemática**, M. Sc. in Math equivalent, National University of Córdoba, Argentina. Thesis: “Invariants of finite groups”  
Advisor: Nicolás Andruskiewitsch.

## Scholarships and employment

- Aug 2021– **Postdoctoral Research Scholar at Iowa State University, Department of Mathematics**  
Advisor: Shlomo Gelaki.
- April 2020 - **Postdoctoral scholarship**  
Aug 2021 Granted by National Scientific and Technical Research Council, Argentina. Advisor: Iván Angiono.
- 2015–2020 **Doctoral scholarship**  
Granted by National Scientific and Technical Research Council, Argentina. Advisor Nicolás Andruskiewitsch.
- 2014 **Initiation to research scholarship**  
Granted by "Consejo Interuniversitario Nacional", Argentina. Advisor: Nicolás Andruskiewitsch.
- 2013 **Exchange scholarship**  
Granted by National University of Córdoba to study a semester abroad at University of Texas, Austin.

## Publications and preprints

6. **Finite-dimensional quantum groups of type super A and non-semisimple modular categories**, joint with Robert Laugwitz, submitted. Available at [arXiv:2301.10685](https://arxiv.org/abs/2301.10685).
5. **Pointed Hopf algebras over non-abelian groups with non-simple standard braidings**, joint with Iván Angiono and Simon Lentner, submitted. Available at [arXiv:2206.10726](https://arxiv.org/abs/2206.10726).
4. **Finite GK-dimensional pre-Nichols algebras of (super)modular and unidentified type**, joint with Iván Angiono and Emiliano Campagnolo, *J. Noncommut. Geom.*, to appear. Available at [arXiv:2110.11217](https://arxiv.org/abs/2110.11217).
3. **Finite GK-dimensional pre-Nichols algebras of super and standard type**, joint with Iván Angiono and Emiliano Campagnolo, submitted. Available at [arXiv:2009.04863](https://arxiv.org/abs/2009.04863).
2. **Finite GK-dimensional pre-Nichols algebras of quantum linear spaces and of Cartan type**, joint with Nicolás Andruskiewitsch, *Trans. Amer. Math. Soc. Ser. B* **8** (2021), 296–329.
1. **Pointed Hopf algebras over non abelian groups with decomposable braidings, I**, joint with Iván Angiono, *J. Algebra* **549** (2020), 78–111.

## Research interests

Hopf algebras, specially quantum groups and Nichols algebras. Non-semisimple modular categories and topological invariants built from them. Representation theory of group schemes and tensor categories in positive characteristic.

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## Selected talks

- 2023 **Small quantum groups of type super A and knot invariants**  
Online Homological Algebra Seminar, University of Buenos Aires.
- 2022 **Finite-dimensional quantum groups of type super A and invariants of framed knots**  
AMS Fall Western Sectional Meeting, University of Utah.
- 2022 **Pointed Hopf algebras over non-abelian groups**  
University of Nottingham.
- 2021 **Some nonsemisimple modular categories constructed from super quantum groups**  
Mathematical Congress of the Americas, Online.
- 2020 **Pre-Nichols algebras with finite Gelfand-Kirillov dimension**  
Indiana University Algebra Seminar, Online.
- 2020 **An invitation to Nichols algebras**  
Quantum Symmetries Students Seminar, Online.
- 2020 **Pre-Nichols algebras with finite Gelfand-Kirillov dimension**  
University Quantum Symmetries Lectures, Online seminar.
- 2020 **Pre-Nichols algebras of diagonal type with finite Gelfand-Kirillov dimension**  
Online Homological Algebra Seminar, University of Buenos Aires.
- 2020 **On the classification of pre-Nichols algebras of diagonal type with finite Gelfand-Kirillov dimension**  
Virtual Workshop: Hopf Algebras and Tensor Categories.
- 2019 **On solvability of semisimple Hopf algebras**  
Lie Theory seminar, Universidad Nacional de Córdoba.
- 2019 **On finite GK-dimensional pre-Nichols algebras of Cartan type**  
Lie Theory seminar, Universidad Nacional de Córdoba.
- 2019 **On pointed Hopf algebras over non-abelian groups with decomposable braiding**  
Posters session, CIMPA Research School on Quantum Symmetries, Bogotá.
- 2019 **Examples of finite dimensional pointed Hopf algebras over non abelian groups**  
Colloquium on algebras and representations, Montevideo.
- 2018 **Examples of Hopf algebras over non abelian groups**  
Algebra seminar, Philipps-Universität Marburg.
- 2017 **Categorification of quantum  $sl_2$ , after Khovanov, Lauda, Roquier**  
2 hours long talk. Workshop Categorical methods on Hopf algebras, Punta del Este.

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## Research visits

- July 2022 **University of Nottingham, UK**  
Invited and founded by Robert Laugwitz, 2 weeks.
- Nov. 2018 **Philipps-Universität Marburg, Germany**  
Founded by Alexander von Humboldt Foundation, 2 weeks.
- Nov. 2018 **Universität Hamburg, Germany**  
Invited and founded by Simon Lentner, 1 week.

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## Teaching experience

- Spring 2023 **Instructor**, *Iowa State University*, Graph theory.
- Fall 2022 **Discussion sessions leader**, *Iowa State University*, Multivariable Calculus.
- Spring 2022 **Instructor**, *Iowa State University*, Linear Algebra and Matrices.
- Fall 2021 **Discussion sessions leader**, *Iowa State University*, Differential Equations and Laplace Transform.

- 2017-2021 **Discussion sessions leader**, *National University of Córdoba*, Calculus 1, Discrete Math, Linear Algebra.
- 2012-2014 **Undergraduate Teaching Assistant**, *National University of Córdoba*, Calculus 1 & 2, Discrete Math, Linear Algebra.

## Undergraduate Advisees

- Spring 2023 **Matthew Dorang, Alec/Alice Kessler and Henrik Penney**, *Iowa State University*, ISMaRT project. Topic: Infinitesimal symmetries and their representations.
- Spring 2022 **Jensen Petros and Slater Williams**, *Iowa State University*, ISMaRT project. Topic: Groups and quantum groups.

## Grants and funding

- 2022–2023 **Simons Travel Grant**, in the amount of 5000 USD.
- 2022 **Centre de recherches mathématiques Travel Grant**, in the amount of 1500 USD.
- 2019 **MSRI travel funding**, in the amount of 2400 USD.
- 2019 **CIMPA travel funding**, in the amount of 2000 USD.
- 2018 **Oberwolfach travel funding**, in the amount of 350 USD.

## Service

- Referee**, Journal of Algebra, Communications in Algebra, SIGMA, Journal of Pure and Applied Algebra, Communications in Algebra.
- 2024 **Organization**, Workshop: Symmetric tensor categories in positive characteristic at Institute for Pure & Applied Mathematics (UCLA) . Co-organized with I. Angiono, P. Etingof, C. Negron and J. Plavnik. Jan 8-12, 2024 expected.
- 2022 **Organization**, AMS Special Session on Categorical Structures in Hopf Algebras and Representation Theory at the AMS Spring Southeastern Sectional Meeting in University of Virginia. Co-organized with A. Czenky and J. Plavnik. Cancelled due to Covid.
- 2020, 2021 **Co-organizer of the Lie theory seminar**, National University of Córdoba.
- 2018 **Co-organizer of the Math graduate students seminar**, National University of Córdoba.