

Cristian Vay

Curriculum Vitae

Facultad de Matemática, Astronomía y Física
Universidad Nacional de Córdoba

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Current position

- 2017– **Adjunct Researcher**, CIEM–CONICET, Argentina.
Center of Research and Studies in Mathematics of Córdoba –
National Scientific and Technical Research Council
- 2015– **Adjunct Professor**, FaMAF–UNC, Argentina.
Faculty of Mathematics, Astronomy and Physics –
National University of Córdoba

Education

- 2012–2014 **Post-doctoral**, FaMAF – UNC, Argentina.
- 2007–2012 **PhD in Mathematics**, FaMAF – UNC, Argentina.
Advisor: Prof. PhD Nicolás Andruskiewitsch
Thesis: Contributions to the classification of Hopf algebras
- 2010–2011 **Sandwich PhD**, University of Antwerp, Belgium.
Advisor: Fred Van Oystaeyen
- 2002–2007 **Licenciado en Matemáticas**, FaMAF – UNC, Argentina.
Undergraduate degree in Mathematics
Average of qualifications: 9.56 (from 1 to 10, 1 being the lowest, 10 the highest)

Work experience

- 2014 – 2017 **Assistant Researcher**, CIEM–CONICET, Argentina.

Teaching experience

- 2015 – **Adjunct Professor**, FaMAF–UNC, Argentina.
- 2007 – 2014 **Assistant Professor**, FaMAF–UNC, Argentina.
- 2004 – 2007 **Student assistant in teaching**, FaMAF–UNC, Argentina.
Visitor Professor
- 2019 **Universidad Nacional de La Plata**, Argentina.
"Representations of algebras with triangular decomposition". 1 week.
- 2017 **U. F. de Rio Grande do Sul**, Brasil.
"An introduction to the category \mathcal{O} of representation of semisimple Lie algebra". Short course. 2 weeks.
- 2015 **U. F. do Santa Maria**, Brasil.
"Algebraic Number Theory". Short course. 2 weeks.

2013 **U. F. do Santa Maria**, Brasil.
"Braided Hopf algebras". Short course. 2 weeks.

Publications & preprints

- 18) **Simple modules of small quantum groups at dihedral groups**, arXiv:2012.09323.
G. A. García, C. Vay
- 17) **On the Hopf algebra structure of the Lusztig quantum divided power algebras**, *Annales Mathématiques Blaise Pascal*, 27 (2020), arXiv:2005.08342.
N. Andruskiewitsch, I. Angiono, C. Vay
- 16) **On Hopf algebras with triangular decomposition**, *Contemp. Math.* 728 (2019), arXiv:1808.03799.
C. Vay
- 15) **Mixed perverse sheaves on flag varieties of Coxeter groups**, *Canadian J. Math.* 72 (2020), no. 1, 1–55., arXiv:1802.07651.
P. Achar, S. Riche and C. Vay
- 14) **On the representation theory of the Drinfeld double of the Fomin-Kirillov algebra \mathcal{FK}_3** , *Algebr. Represent. Theory.* 22 (2019), no. 6, 1399–1426, arXiv:1707.02091.
B. Pogorelsky and C. Vay
- 13) **Copointed Hopf algebras over \mathbb{S}_4** , *J. Pure Appl. Algebra* 222 (2018), no. 9, 2784–2809, arXiv:1706.06624.
A. García I. and C. Vay
- 12) **On projective modules over finite quantum groups**, *Transf. Groups* 24 (2019), no. 1, 279–299, arXiv:1612.09220.
C. Vay
- 11) **Explicit coproduct formulas for quantum group of the type G_2** , *J. Algebra* 500 (2018), 103–116, arXiv:1510.02820.
V. Kharchenko and C. Vay
- 10) **Acerca de las álgebras de Fomin–Kirillov**, *Actas Congr. "Dr. Antonio A. R. Monteiro"* (2015), 43–54, Univ. Nac. del Sur, Bahía Blanca.
C. Vay
- 9) **The cohomology ring of the 12-dimensional Fomin-Kirillov algebra**, *Adv. Math.* 291 (2016) 584–620, arXiv:1404.5101.
D. Stefan and C. Vay
- 8) **Verma and simple modules for quantum groups at non-abelian groups**, *Adv. Math.* 301 (2016) 423–457, arXiv:1409.0438.
B. Pogorelsky and C. Vay
- 7) **Representations of copointed Hopf algebras arising from the tetrahedron rack**, *Ann. Univ. Ferrara Sez. VII Sci. Mat.* 60 (2014), no. 2, 407–427, arXiv:1309.4697.
B. Pogorelsky and C. Vay

- 6) **Finite-dimensional pointed or copointed Hopf algebras over affine racks**, *J. Algebra* 397 (2014), 379–406, arXiv:1204.5807.
A. García I. and C. Vay
- 5) **Lifting via cocycle deformation**, *J. Pure Appl. Algebra* 218 (2014), no. 4, 684–703, arXiv:1212.5279.
N. Andruskiewitsch, I. Angiono, A. García I., A. Masuoka and C. Vay
- 4) **From Hopf algebras to tensor categories**, *Conformal Field Theories and Tensor Categories* (2014), Yi-Zhu Huang et al. editors, *Mathematical Lectures from Peking University*, Springer, arXiv:1204.5807.
N. Andruskiewitsch, I. Angiono, A. García I., B. Torrecilla and C. Vay
- 3) **On a family of Hopf algebras of dimension 72**, *Bull. Belg. Math. Soc. Simon Stevin* 19 (2012), no. 3, 415–443, arXiv:1105.0394.
N. Andruskiewitsch and C. Vay
- 2) **Finite dimensional Hopf algebras over the dual group algebra of the symmetric group in three letters**, *Commun. Algebra* 39 (2011), no. 12, 4507–4517, arXiv:1010.5953.
N. Andruskiewitsch and C. Vay
- 1) **Hopf algebras of dimension 16**, *Algebr. Represent. Theory* 13 (2010), no. 4, 383–405, arXiv:0712.0405.
G. A. García and C. Vay

Fellowships

Study

- 2017 – 2018 **Research fellowship for young scientist**, CONICET, Argentina.
- 2012 – 2014 **Post-doctoral fellowship**, CONICET, Argentina.
- 2010 – 2011 **Erasmus Mundus PhD fellowship**, University of Antwerp, Belgium.
- 2007 – 2012 **PhD fellowship**, CONICET, Argentina.
- 2005 – 2006 **Academic Excellence Scholarship**, UNC, Argentina.

Research

- 2017 – 2018 **PICT-2016-3957**, FONCyT, MinCyT, Argentina.

Organizing congress

- 2019 **Encuentro Nacional de Álgebra (elENA)**, FONCYT.
- 2019 **Encuentro Nacional de Álgebra (elENA)**, SECYT, UNC.

Attend congress

- 2019 **Programa Viajes al exterior**, SECYT, UNC.
- 2018 **International Congress of Mathematicians**, Rio de Janeiro, Brasil.
- 2017 **Mathematical Congress of the Americas**, American Mathematical Society, USA.
- 2017 **Future Directions in Representation Theory**, University of Sydney, Australia.

Award

- 2007 **Diploma with "Honors's Mention"**, *University Prize*, UNC, Argentina.

Research stay

- 2019 **Instituto de Matemáticas de la Universidad de Sevilla**, Spain.
Prof. PhD. Luis Narváez. Partially supported by IMUS. 6 months.
- 2018 **University of Bucharest**, Romania.
Prof. PhD. Dragos Stefan. Supported by U. of B. 1 week.
- 2017 **Laboratoire de Mathématiques Blaise Pascal**, France.
Prof. PhD. Simon Riche. Supported by CONICET. 1 year.
- 2017 **U. F. de Rio Grande do Sul**, Brasil.
Prof. PhD. Barbara Pogorelsky. Supported by Programa ESCALA Docente de la Asociación de Universidades del Grupo Montevideo. 2 weeks.
- 2015 **University of Antwerp**, Belgium.
Prof. PhD. Dr. Fred Van Oystaeyen and Prof. PhD. Yinhua Zhang. Supported by Programme of Scientific-Technological Cooperation MINCYT–FWO. 1 month.
- 2014 **Universidad Nacional Autónoma de México**, México.
Prof. PhD. Vladislav Khartchenko. Supported by Programme Apoyo a Proyectos de Investigación e Innovación Tecnológica (UNAM). 2 weeks.
- 2014 **Universidade of São Paulo**, Brasil.
Prof. PhD. Vyacheslav Futorny. Supported by Programme MathAmSud. 2 weeks.
- 2012 **U. F. de Rio Grande do Sul**, Brasil.
Prof. PhD. Barbara Pogorelsky. Supported by UFRGS. 2 weeks.

Presentations in scientific meetings

Congresses

- 2021 **Mini-Workshop: Non-semisimple Tensor Categories and Their Semisimplification**, Oberwolfach, Alemania.
"Simple modules of small quantum groups at dihedral groups".
- 2020 **Workshop: Hopf Algebras and Tensor Categories**, Hamburg, Alemania.
"Symmetries on modules over Drinfeld doubles".
- 2019 **Workshop on Quantum Symmetries**, São Paulo, Brazil.
"Symmetries on modules over Drinfeld doubles".
- 2019 **Rings, modules and Hopf algebras**, Almeria, España.
"Mixed perverse sheaves on flag varieties of Coxeter groups".
- 2018 **International Congress of Mathematicians**, Rio de Janeiro, Brasil.
"Mixed perverse sheaves on flag varieties of Coxeter groups" (short communication).
- 2018 **Workshop Tensor categories, Hopf algebras and quantum groups**, Marburg, Germany.
"On the representation theory of a quantum group attached to the Fomin-Kirillov algebra \mathcal{FK}_3 ".

- 2017 **Mathematical Congress of the Americas**, Montréal, Canada.
"On projective modules over finite quantum groups".
- 2017 **Colloquium on Algebra and Representations – Quantum 2017**, Talca, Chile.
"On projective modules over finite quantum groups".
- 2016 **Workshop $q^{\frac{1}{2}}$** , Universidad de Chile, Santiago de Chile, Chile.
"2-Kac-Moody algebras".
- 2016 **Colloquium on Algebras and Representations – Quantum 2016**, Humboldt Kolleg, Córdoba, Argentina.
"Verma and simple modules for quantum groups at non-abelian groups".
- 2015 **XIII "Dr. Antonio A. R. Monteiro" Congress**, Bahía Blanca, Argentina.
"About the Fomin–Kirillov algebras". Invited speaker.
- 2014 **Colloquium on Algebra and Representations – Quantum 2014**, Santa Maria, Brasil.
"Cohomology ring of the smallest Nichols algebra over a non-abelian group".
- 2013 **LXII UMA**, Rosario, Argentina.
"Representations of copointed Hopf algebras". Annual Argentinean Mathematical Society scientific meeting
- 2013 **Colloquium on Algebra and Representations – Quantum 2013**, Tucumán, Argentina.
"Nichols algebras".
- 2012 **IV Congreso Latinoamericano de Matemáticos**, Córdoba, Argentina.
"Liftings of Nichols algebras over a group algebra or its dual".
- 2012 **Colloquium on Algebra and Representations – Quantum 2012**, Mendoza, Argentina.
"Representations of copointed Hopf algebras over \mathbb{S}_3 ".
- 2011 **XXI Encuentro Rioplatense de Álgebra y Geometría Algebráica**, Montevideo, Uruguay.
"Hopf algebras with coradical $k^{\mathbb{S}_3}$ ".
- 2011 **LX UMA**, Tucumán, Argentina.
"Hopf algebras with coradical $k^{\mathbb{S}_3}$ ".
- 2008 **LVII UMA**, Mendoza, Argentina.
"Hopf algebras of dimension 16".
- 2008 **Colloquium on Hopf Algebras and Applications**, Córdoba, Argentina.
"Hopf algebras of dimension 16".

Seminars

- 2020 **Seminario del grupo de Teoría de Lie**, FaMAF – UNC, Argentina.
"Fórmula de Weyl para módulos simples típicos de grupos cuánticos generalizados".
- 2019 **Seminario de Álgebra**, Universidad de Sevilla, España.
"Hopfological algebra".
- 2019 **Seminario de Álgebra**, Universidad de Sevilla, España.
"Acerca de la teoría de representaciones de las álgebras de Hopf (I,II)".

- 2019 **Instituto de Matemática de la Universidad de Sevilla**, Spain.
"Álgebras de Hopf para todas y todos".
- 2018 **Seminario del grupo de Teoría de Lie**, *FaMAF – UNC*, Argentina.
"Haces perversos en el lenguaje de categorías diagramáticas".
- 2017 **Séminaire GAAO**, *Laboratoire de Mathématiques Blaise Pascal*, France.
"On projective modules over finite quantum groups".
- 2017 **Seminario del grupo de Teoría de Lie**, *FaMAF – UNC*, Argentina.
"Acerca de la Reciprocidad BGG".
- 2015 **Antwerp Algebra Seminar**, *University of Antwerpen*, Belgium.
"Representations of non-pointed quantum groups".
- 2015 **Seminar of the Algebra group**, *University of Hasselt*, Belgium.
"The cohomology ring of the 12-dimensional Fomin-Kirillov algebra".
- 2014 **Seminar of Lie and Jordan Algebras and their Representations**, *Universidade de São Paulo*, Brasil.
"The cohomology of the smallest Nichols algebra over a nonabelian group".
- 2012 **Seminar of the Algebra group**, *U. F. do Porto Alegre*, Brasil.
"Nichols algebras attached to racks".
- 2010 **Antwerp Algebra Seminar**, *University of Antwerpen*, Belgium.
"Nichols algebras".

Posters

- 2019 **Aspects of Higher Representation Theory**, *Vrije Universiteit Brussel*, Bélgica.
"Mixed perverse sheaves on flag varieties of Coxeter groups".
- 2017 **Future Directions in Representation Theory**, *University of Sydney*, Australia.
"Mixed perverse sheaves on flag varieties of Coxeter groups".

Scientific meetings organized

Congresses

- 2020 **Colloquium on Algebra and Representations – Quantum 20**, *Córdoba*, Argentina.
- 2018 **Colloquium on Algebra and Representations – Quantum 60**, *Córdoba*, Argentina.
- 2015 **Colloquium on Algebra and Representations – Quantum 2015**, *Córdoba*, Argentina.

Seminars

- 2015 – 2016 **Seminar of the Lie Theory group**, *FaMAF – UNC*, Argentina.

Other

- 2019 **Session "Hopf Algebras and Tensor Categories"**, *CLA XXIII*, México.
- 2016 **Mathematics day**, *FaMAF – UNC*, Argentina.

Scientific meetings attended

- Colloquium on Algebra and Representation Theory, 2009, 2012-17.
- I Encuentro conjunto de SOMACHI–UMA, Valparaíso, Chile, 2016.
- II-IV National meeting of Algebra (elENA). Sierras de Córdoba. 2004, 2006, 2008.
- LIV-LVI, LVIII UMA, 2004-2006, 2008.
- VIII Congress Dr. Antonio Monteiro. Bahía Blanca. 2005.
- II Encuentro de Geometría Diferencial (EGEO). Sierras de Córdoba. 2005.
- CIMPA Research School 2006: Homological methods and representations of non-commutative algebras. Mar del Plata. 2006.
- Colloquium on Hopf Algebras and Applications. Córdoba. 2008.
- Homologie des algèbres: structures et applications (C.I.R.M.). France. 2008.
- Colloq. Hopf Algebras, Quantum Groups and Tensor Categories. Córdoba. 2009.

Referee/Reviewer

- J. Algebra (5)
- SIGMA (1)
- Israel J. Math. (1)
- Hacet. J. Math. Stat. (1)
- São Paulo J. Math. Sci. (1)
- Quantum Topology (1)
- J. Algebr. Comb. (1)
- J. Algebra Appl. (2)
- Acta Math. Sin. (1)
- MathSciNet (39)
- Revista de la UMA (2)
- Comm. Algebra (1)
- J. Math. Phys. (2)
- Korean J. Math. (1)
- J. of Taibah University for Science (1)
- J. Pure Appl. Algebra (1)
- Sel. Math. New Ser. (1)
- Internat. J. Algebra Comput. (1)
- Trans. Am. Math. Soc (1)
- zbMATH (4)

Languages

- Spanish
- English