

# Curriculum Vitae of Professor Magdalena Musat

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**Personal data:** Born May 16, 1970, Romania. Citizen of Romania and Italy.

**Mathematical interests:** Functional Analysis and Operator algebras, and their interplay with analytic, geometric and probabilistic aspects of group theory, noncommutative probability theory, analysis in quantum information theory.

## Education:

2002	Ph. D. University of Illinois, Urbana-Champaign (advisors: D. Burkholder, M. Junge).
1997	M. Sc. University of Illinois, Urbana-Champaign.

## Positions:

2020–	Professor	University of Copenhagen.
2017 Fall	CNRS Associate Professor	Institut Henri Poincaré, Paris.
2009–2020	Lektor (Associate Professor)	University of Copenhagen.
2008–2009	Lektor (Associate Professor)	University of Southern Denmark.
2005–2009	Assistant Professor	University of Memphis, on leave 08–09.
2004–2005	Visiting Assistant Professor	University of California, San Diego.
2002–2004	S. E. Warschawski Visiting Assist. Professor	University of California, San Diego.

## Selected offices, Academic Service, Professional activities:

2020–	Study leader for the Masters Program in Mathematics, University of Copenhagen.
2017–	Editor of the Mathematical Proceedings of the Royal Irish Academy.
2014–	Organizer of the Distinguished Harald Bohr Lecture series in Mathematics, and of the Department Colloquium at the Mathematics Department, University of Copenhagen.
2010–	Organizer of 13 international conferences and workshops, incl. 5 Ph.D. Masterclasses at the University of Copenhagen.
•	Member of habilitation committee: Université Paris-Sud (2019).
•	Member of international Ph.D. committees: K. U. Leuven (2018), Univ. de Caen (2019).
•	Member of NSF Grant evaluation Panel.
•	Member of faculty hiring committees: Aalborg Univ. (2013), Syddansk Univ. (2018).

## Academic awards and honors:

2016	Fifty-Second Annual DeLong Lecturer, University of Colorado, Boulder. Lecture series: <i>Operator Algebras, Quantum Information Theory and the Grothendieck Program</i> .
2009–2011	Freja Stipend, University of Copenhagen.

## Selected research grants:

2021–2025	co-PI on FP2 FNU grant <i>Operator algebras, Groups and Quantum Spaces</i> , amount: DKK 5,145,331.
2019	co-PI on Carlsberg Foundation Grant in support of the conference “Richard Kadison and his mathematical legacy — A memorial conference”. Amount: DKK 60,000.
2018 Spring	PI on Carlsberg Foundation Grant for two-month research stay at IPAM (UCLA). Project: <i>The Connes embedding problem, Tsirelson’s conjecture and factorizable quantum channels</i> , amount: DKK 75,000.
2016–2019	co-PI on FNU grant <i>Groups, actions and <math>C^*</math>-algebras</i> , amount: DKK 2,242,175.
2013–2016	co-PI on FNU grant <i>Operator Algebras, Dynamical systems and Quantum Information</i> .
2010–2019	co-PI on grant <i>Symmetry and Deformation</i> , the Danish National Research Foundation.
2009–2011	co-PI on FNU grant <i>Operator algebras and applications</i> .
2007–2010	PI on NSF Grant DMS-0703869 <i>Noncommutative probability, operator spaces and von Neumann algebras</i> , amount: USD 93,178.

## Students and postdocs:

- 5 Ph.D. students: Tim de Laat (2013), joint with U. Haagerup, currently Juniorprofessor für Theoretische Mathematik, Universität Münster, Kristian Knudsen Olesen (2016), joint with U. Haagerup, Rasmus Sylvester Bryder (2017), joint with M. Rørdam, Clemens Borys (2020), joint with M. Rørdam, and Rasmus Kløvgaard Stavenhagen (current).
- Theses supervised: 9 M.Sc. theses (specialer), 11 M.Sc. Projects (Fagprojekter), 9 B.Sc. theses (Bachelor projekt) of which one current, and 2 PUK (projects).
- Postdoc: Christopher Cave (2015–2018).

**Selected invited addresses at conferences and workshops:** *Over 70 invited talks at international conferences and workshops since 2000, including the following:*

- 2021 Seminar talk, UCLA.
- 2021 “Quantum Probability and Noncommutative Harmonic Analysis”, Lorentz Center, Leiden.
- 2021 Seminar talk, Seoul National University.
- 2021 International Workshop on Operator Theory and Applications, Lancaster, Semi-Plenary speaker.
- 2021 “Groups meet  $C^*$ -algebras” celebrating Siegfried Echterhoff’s 60th birthday, Münster.
- 2021 Summer School on Operator Algebras, University of Ottawa. Lecture series ( $4 \times 60$  min).
- 2021 “Special Week on Operator Algebras”, Research Center for Operator Algebras, East China Normal University, Shanghai, China.
- 2021 “Non-local games in quantum information theory”, AIM workshop.
- 2020 Workshop on “Number Theory and Operator Algebras” at the Chinese Academy of Sciences, Beijing. *Cancelled because of Corona.*
- 2020  $C^*$ -algebras,  $K$ -theory and Noncommutative Geometry of Correlated Condensed Matter Systems, Simons Center for Geometry and Physics, Stony Brook. *Cancelled because of Corona.*
- 2020 NCGOA at Vanderbilt University. Lecture series ( $3 \times 60$  min). *Cancelled because of Corona.*
- 2019 Workshop on  $C^*$ -algebras, Mathematisches Forschungsinstitut Oberwolfach.
- 2019 Workshop on the Many Faceted Connes Embedding Problem at BIRS, Banff, Canada.
- 2019 Advanced course on Geometry, Topology and Algebra at CRM, Barcelona ( $2 \times 60$  min).
- 2019 Thematic Research Program: Operator algebras, groups and applications to quantum information theory, ICMAT, Madrid, Lecture series ( $5 \times 90$  min).
- 2019 Seminar, Harvard University, Cambridge, MA.
- 2019 Operator Algebras in the Twenty-First Century, University of Pennsylvania, Philadelphia.
- 2019 Subfactors in Sydney: Operator algebras, representation theory, quantum field theory, UNSW Sydney.
- 2019 The Connes embedding problem and quantum information theory, Winter school, University of Oslo, Lecture series ( $4 \times 60$  min).
- 2018 International Workshop on Operator Theory and Applications, Shanghai, Semi-Plenary speaker.
- 2018 Seminar, UC Berkeley.
- 2018 Colloquium, Lund University.
- 2017 Thematic Program on Analysis in Quantum Information Theory, IHP Paris, Lecture series ( $2 \times 90$  min).
- 2017 Young Women in  $C^*$ -algebras (YMC $^*$ A), University of Copenhagen, Main lecturer.
- 2016 Colloquium, Purdue University.
- 2016 Mathematical Aspects in Current Quantum Information Theory, Daejeon, Korea.
- 2015 George Boole Mathematical Sciences Conference, Cork.
- 2015 Canadian Operator Algebras Symposium, Waterloo, Plenary Speaker.
- 2014 Canadian Operator Algebras Symposium, Toronto, Plenary Speaker.
- 2013 Banach Algebras and Applications, Chalmers University, Gothenburg, Plenary Speaker.
- 2013 Workshop on Operator Spaces, Harmonic Analysis and Quantum Probability, Madrid.
- 2012 North British Functional Analysis Seminar, Oxford, UK, Lecture series ( $3 \times 60$  min).
- 2012 Operator structures in quantum information theory, BIRS, Banff.
- 2011 EMS-RSME Joint Mathematical Weekend, Bilbao.
- 2011 Conference on  $C^*$ -algebras and related topics, RIMS, Kyoto.
- 2011 Great Plains Operator Theory Symposium, Tempe, AZ, Plenary Speaker.

## Articles in journals:

- *Extreme Points and Factorizability for New Classes of Unital Quantum Channels* with U. Haagerup and M.B. Ruskai, *Annales H. Poincaré*, to appear.
- *Factorizable maps and traces on the universal free product of matrix algebras*, with M. Rørdam, *Int. Math. Res. Not., IMRN.*, to appear.
- *Non-closure of quantum correlation matrices and factorizable channels that require infinite dimensional ancilla*, with M. Rørdam, *Comm. Math. Phys.*, **375** (2020), no. 3, 1761–1776.
- *Just-infinite  $C^*$ -algebras*, with R. Grigorchuk and M. Rørdam, *Commentarii Math. Helv.* **93** (2018), no. 1, 157–201.
- *An asymptotic property of factorizable completely positive maps and the Connes embedding problem*, with U. Haagerup, *Comm. Math. Phys.* **338** (2015), 721–752.
- *Factorization and dilation problems for completely positive maps on von Neumann algebras*, with U. Haagerup, *Comm. Math. Phys.* **303** (2011), 555–594.
- *Classification of hyperfinite factors up to completely bounded isomorphism of their preduals*, with U. Haagerup, *J. Reine Angew. Math.* **630** (2009), 141–176.
- *The Effros-Ruan conjecture for bilinear maps on  $C^*$ -algebras*, with U. Haagerup, *Invent. Math.* **174** (2008), 139–163.
- *On the best constants in noncommutative Khintchine-type inequalities*, with U. Haagerup, *J. Funct. Analysis* **250**, no. 2, (2007), 588–624.
- *A noncommutative version of the John–Nirenberg theorem*, with M. Junge, *Trans. Amer. Math. Soc.* **359**, no. 1 (2007), 115–142.
- *On the operator space UMD property for noncommutative  $L_p$ -spaces*, *Indiana Univ. Math. J.* **55**, no. 6 (2006), 1857–1892.
- *The condenser problem*, with J. Bliedtner, *Potential Analysis* **21** (2004), 177–192.
- *Interpolation between non-commutative BMO and non-commutative  $L_p$ -spaces*, *J. Funct. Analysis* **202** (2003) 195–225.
- *On strong Darboux property*, *Stud. Cerc. Mat.* **44** (1992), no. 4, 305–307.

## Oberwolfach reports:

- *Infinite dimensional aspects of the analysis of quantum information theory*, with M. Rørdam, *Oberwolfach Reports* (2019), to appear.
- *Factorization and dilation problems for completely positive maps on von Neumann algebras*, with U. Haagerup, *Oberwolfach Reports* **7**, issue 1 (2010), 718–719.
- *The Effros-Ruan conjecture for bilinear maps on  $C^*$ -algebras*, with U. Haagerup, *Oberwolfach Reports* **5**, issue 3 (2008), 2157–2159.

## In preparation:

- *Infinite dimensional phenomena in quantum information theory and the Connes Embedding Problem*. Survey paper for the Proceedings of the IWOTA 2021, Lancaster.
- *On factorizable quantum channels with finite dimensional ancillas*.
- *Finite dimensional approximations of hyperfinite martingales*.