

## CV of ADAMO, Maria Stella

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I am a Humboldt Research Fellow at the Department of Mathematics, Friedrich-Alexander-Universität (FAU) Erlangen-Nürnberg (Germany), host researcher: Prof. Karl-Hermann Neeb.

### *Professional experience*

- May 2024 - present **Humboldt Research Fellow**, funded by the Alexander von Humboldt Foundation, at Department of Mathematics, FAU Erlangen-Nürnberg (Germany). Project: “Representations of infinite-dimensional Lie groups in reflection positivity and AQFT”, host researcher: Prof. Karl-Hermann Neeb.
- April 2022 - April 2024 **JSPS International Research Fellow**, funded by the Japan Society for the Promotion of Science (JSPS), at the Graduate School of Mathematics, the University of Tokyo (Japan). Working on a project entitled “Analytical properties of standard subspaces and reflection positivity in AQFT”. host researcher: Prof. Yasuyuki Kawahigashi.
- June 2021 - April 2022 **Postdoctoral researcher** at the Department of Basic and Applied Sciences for Engineering (SBAI), University of Rome “La Sapienza” (Italy). Working on a project entitled “Cuntz-Pimsner algebras associated to complex vector bundles and standard subspaces in algebraic QFT”. Scientific director: Prof. Roberto Conti.
- May 2021 - July 2021 **Guest visiting researcher** at the Institute for Theoretical Physics, University of Leipzig (Germany). Working on a project regarding Entropy and QFT. Supported by the Deutsche Forschungsgemeinschaft (DFG) within the Emmy Noether grant “The quantum stress-energy tensor” CA1850/1-1PI, P.I. Dr. Daniela Cadamuro.
- January 2021 - April 2021 **Oberwolfach Leibniz Fellow** at the Mathematisches Forschungsinstitut Oberwolfach (Germany). Project title: Reflection positive representations and standard subspaces in algebraic QFT.
- September 2020 - December 2020 **Oberwolfach Leibniz Fellow** at the Mathematisches Forschungsinstitut Oberwolfach (Germany). Project title: Beurling–Lax type theorems and their connection with standard subspaces in Algebraic QFT.
- July 2019 - June 2020 **Postdoctoral researcher** at the Department of Mathematics, University of Rome “Tor Vergata” (Italy). Supported by European Research Council Advanced Grant no. 669240 QUEST - “Quantum Algebraic Structures and Models”, PI: Prof. Roberto Longo.

### *Education*

- 01.11.2015 - 30.01.2019 **Ph.D. in Mathematics and Computer Science** - XXXI ciclo - Joint Ph.D. program of Universities of Catania, Palermo and Messina (Italy)  
Thesis: Representable functionals and derivations on Banach quasi  $*$ -algebras.  
Advisor: prof. Camillo Trapani (University of Palermo)
- October 2013 - 22 July 2015 **Master degree in Mathematics with honors** - mentioned for career and E. Guigno prize - University of Palermo - Department of Mathematics and Computer Science  
Final project title: “On completions of a  $C^*$ -algebra with respect to a locally convex topology” (in Italian). Advisor: Prof. C. Trapani
- November 2010 - 26 July 2013 **Bachelor degree in Mathematics with honors** - University of Palermo - Department of Mathematics and Computer Science  
Final project title: “Orthogonal and hermitian spaces on finite cardinality fields” (in Italian). Advisor: Prof. C. Bartolone.

## Publications, preprints and conference proceedings

### Preprints:

- ★ M. S. Adamo, L. Giorgetti, Y. Tanimoto, *Representations of conformal nets associated with infinite-dimensional groups*, submitted for an invited contribution to Journal of Lie Theory.
- ★ M. S. Adamo, K.-H. Neeb, J. Schober, *Reflection positivity and its relation to disc, half plane and the strip*, arXiv link, to appear in Expositiones Mathematicae.
- ★ M. S. Adamo, Y. Moriwaki, Y. Tanimoto, *Osterwalder-Schrader axioms for unitary full vertex operator algebras*, arXiv link, preprint.

### Peer-reviewed:

- ★ M. S. Adamo, D. E. Archey, M. Forough, M. C. Georgescu, J. A. Jeong, K. R. Strung, M. G. Viola, *C\*-algebras associated to homeomorphisms twisted by vector bundles over finite dimensional spaces*, Trans. Amer. Math. Soc. 377, 1597-1640, 2024. arXiv link
- ★ M. S. Adamo, L. Giorgetti, Y. Tanimoto, *Wightman fields for two-dimensional conformal field theories with pointed representation category*, Commun. Math. Phys. 404, 1231-1273, 2023. arXiv link
- ★ M. S. Adamo, K.-H. Neeb, J. Schober, *Reflection positivity and Hankel operators—the multiplicity free case*, J. Funct. Anal. 283 2, 109493, 2022. arXiv link
- ★ M. S. Adamo, *On some applications of representable functionals of a Banach quasi \*-algebra*, In: Bastos, M.A., Castro, L., Karlovich, A.Y. (eds) Operator Theory, Functional Analysis and Applications. Operator Theory: Advances and Applications, vol 282. Birkhäuser, Cham, 2021.
- ★ M. S. Adamo, M. Fragoulopoulou, *Tensor products of normed and Banach quasi \*-algebras*. J. Math. Anal. Appl., vol. 490, no. 2, 124323, 2020. arXiv link
- ★ M. S. Adamo and C. Trapani, *Unbounded derivations and \*-automorphisms groups of Banach quasi \*-algebras*. Ann. Mat. Pura Appl. (4), vol. 198, no. 5, 1711-1729, 2019. arXiv link
- ★ M. S. Adamo, *The interplay between representable functionals and derivations on Banach quasi \*-algebras*, Proceedings of the International Conference on Topological Algebras and Their Applications-ICTAA 2018, 48-59, Math. Stud. (Tartu), 7, Est. Math. Soc., Tartu, 2018.
- ★ M. S. Adamo, C. Trapani, *Representable and continuous functionals on a Banach quasi \*- algebra*, Mediterr. J. Math. 14 (2017), no. 4, Paper No. 157, 25 pp. arXiv link
- ★ M. S. Adamo, C. Vetro, *Fixed point and homotopy results for mixed multi-valued mappings in 0- complete partial metric spaces*, Nonlinear Analysis: Modelling and Control, vol. 20, no. 2, 159-174, 2015.

### Not peer-reviewed:

- ★ M. S. Adamo, *About tensor products of Hilbert quasi \*-algebras and their representability properties*, Operator Theory 27 Conference Proceedings, 69-81, 2020.

### Reports:

- ★ M.S. Adamo, G. Lechner, R. Longo, K.-H. Neeb, *Mini-Workshop: Standard Subspaces in Quantum Field Theory and Representation Theory*, Oberwolfach Rep. 20, no. 4, pp. 2851-2901, 2023.

### PhD Thesis:

- ★ *Representable functionals and derivations on Banach quasi \*-algebras*, University of Catania (Italy) 2019.

## Fellowships and Awards

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| 2025 | Evaluation of a Marie Skłodowska-Curie Actions (MSCA) Global Postdoctoral Fellowship with a score of 91,40%, placed 1st in the reserve list for the panel GF-MAT at the call MSCA Postdoctoral Fellowships 2024. The proposals has been awarded the <i>Seal of Excellence</i> . |
| 2023 | Humboldt Research Fellowship for Postdocs to conduct my research for 24 months at the FAU Erlangen-Nürnberg, under prof. Karl-Hermann Neeb.   |
| 2021 | FY2021 JSPS Postdoctoral Fellowship for Research in Japan (Short Term) to conduct my research for 12 months at the University of Tokyo, under the leadership of Prof. Yasuyuki Kawahigashi. (Declined)  |

- 2021 FY2021 JSPS Postdoctoral Fellowship for Research in Japan (Standard) to conduct my research for 24 months at the University of Tokyo, under the leadership of Prof. Yasuyuki Kawahigashi. 115 fellowships awarded over 1125 applications (2nd round).
- 2021 Oberwolfach Leibniz Fellowship to spend 13 weeks at the MFO (Germany).
- 2020 Oberwolfach Leibniz Fellowship to spend 12 weeks at the MFO (Germany).
- 01.11.2015 to 31.10.2018 University of Palermo Ph.D. scholarship for the Ph.D. program in Mathematics and Computer Science XXXI ciclo.

### *Selected research projects and travel grants*

- ★ Grant-in-Aid for JSPS Research Fellow (KAKENHI) to be used by Fellows and their Hosts to carry out joint research during the period of the Fellow's tenure. 1.200.000¥(April 2022 - March 2023), 1.100.000¥(April 2023 - March 2024).
- ★ Member of "Beyond Borders" project - Department of Mathematics at the University of Rome Tor Vergata (Italy) entitled "Interaction of Operator Algebras with Quantum Physics and Non-commutative Structure" - from 1 December 2019 until 30 November 2021- 10.000€, PI: Prof. Yoh Tanimoto (extended to 2021 due to the Covid-19 pandemic).
- ★ Member of the projects INdAM-GNAMPA for 2016, 2017, 2018, 2020 (PI: prof. Camillo Trapani), 2022, 2024 (PI: Dr. Rosario Corso).
- ★ Support given by many conferences, workshop and schools attended.

### *Conference organization*

- ★ Member of the Organizing Committee for the Mini-Workshop "Standard Subspaces in Quantum Field Theory and Representation Theory", held at the Mathematisches Forschungsinstitut Oberwolfach (MFO), Germany, October 29 to November 3, 2023. [https://www.mfo.de/occasion/2344b/www\\_view](https://www.mfo.de/occasion/2344b/www_view).
- ★ Member of the Organizing Committee for the International Conference on Topological Algebras and Applications 2022, held online at the Department of Mathematics, University of Palermo, August 31 to September 2, 2022. <https://www.gtgconference.eu/ictaa2022.html>.

### *Selected invited contributions*

- ★ Speaker at the 9th edition of AQFT UK, 22 January 2025, Lancaster University (United Kingdom).
- ★ Plenary speaker at Banach and Operator Algebras 2024, from 8 to 13 July 2024, University of Waterloo (Canada).
- ★ Speaker at the Japan-Netherlands joint seminar: Index Theory and Operator Algebras in Topological Physics - from 1 to 3 March 2023, AIMR Main Building, Tohoku University, (Japan).
- ★ Speaker at the Recent Developments in Operator Algebra - from 5 to 7 September 2022, RIMS Kyoto (Japan).
- ★ Speaker at the Functional Analysis, Approximation Theory and Numerical Analysis Conference (FAATNA 20  $\geq$  22) in the section "Operator Algebras and Functional Analysis Methods for Applications" - from 5 to 8 July 2022, University of Basilicata, Campus in Matera (Matera, Italy).
- ★ Preregistered talk at the Special Section on Topological Algebras, 54th Congress of the Mexican Mathematical Society (online) - 18 October 2021.
- ★ Speaker at International Meet on Analysis - 24 November 2018, Department of Mathematics, University of Delhi (Delhi, India)
- ★ Speaker at International Conference on Banach Algebras, Harmonic Analysis and Operator Theory - from 20 to 22 November 2018, Department of Mathematics, Sardar Patel University (Vallabh Vidyanagar, Distr. of Anand - Gujarat, India)
- ★ Speaker at around 10 local seminars in universities of Europe and Asia.

## *Contributed talks and posters at international conferences*

I delivered around 25 contributions (talks, seminars, posters and more), some of them online, in more than 15 different countries. I mention the following contributed talks:

- ★ 16 January 2024: talk at the workshop “Quantum groups, tensor categories and quantum field theory”, University of Oslo (Norway).
- ★ 21 March 2023: talk at the workshop “Women at the Intersection of Mathematics and Theoretical Physics Meet in Okinawa”, Okinawa (Japan).
- ★ 28 May 2020: online talk at the 48th Canadian Operator Symposium, Toronto (Ontario, Canada).
- ★ 10 August 2019: talk at Young Mathematicians in  $C^*$ -algebras 2019, Copenhagen (Denmark)
- ★ 23 July 2019: talk at the International Workshop on Operator Theory and Applications 2019, Lisbon (Portugal).
- ★ 3 August 2018: poster at International Congress of Mathematicians 2018, Rio de Janeiro (Rio de Janeiro, Brazil).
- ★ 29 May 2018: talk at Great Plains Operator Theory Symposium 2018, Miami University (Oxford, Ohio, United States of America).
- ★ 22, 29 November 2017: seminar at National and Kapodistrian University of Athens (Greece).

## *Long stays*

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| 16 to 29 March 2025<br>(upcoming)                           | Invited to the thematic programme “Representation Theory and Noncommutative Geometry”, Institut Henri Poincaré, Paris (France).                           |
| 15 July to 12 September 2020                                | Institute for Mathematics - Czech Academy of Sciences (Czech Republic), invited by K. Strung and M. Forough.  |
| 23 May to 19 July 2018,<br>17 September to 20 December 2017 | Research period as a PhD student at the Department of Mathematics - National and Kapodistrian University of Athens (Greece), hosted by M. Fragoulopoulou. |
| 2 to 30 July 2017   | Research period as a PhD student at the Department of Mathematics - Autonomous University of Barcelona (Spain), hosted by P. Ara.                         |

## *Conferences, Workshops, etc.*

During my career, I have attended more than 50 events in around 20 different countries, some of them overseas and some online due to the covid-19 emergency. I mention my participation at the following events:

- ★ Workshop “Operator Algebras in High Energy Physics” - 30 September to 04 October 2024, Nordic Institute for Theoretical Physics (NORDITA) in Stockholm (Sweden).
- ★ Workshop “Women at the Intersection of Mathematics and Theoretical Physics Meet in Okinawa” - 20 to 24 March 2021, Okinawa Institute of Science and Technology (Japan).
- ★ International Workshop on Operator Theory and Applications 2021 - 16 to 20 August 2021, Lancaster University (United Kingdom), online.
- ★ 8th European Congress of Mathematics - 20 to 26 June 2021, hosted in Portorož (Slovenia), online.
- ★ International Workshop on Operator Theory and Applications 2019 - 22 to 26 July 2019, Instituto Superior Tecnico of Lisbon and University of Lisbon (Portugal).
- ★ International Congress of Mathematicians 2018 - 1 to 9 August 2018, Riocentro in Rio de Janeiro (Rio de Janeiro, Brazil).
- ★ ICM Operator Algebras Satellite Conference - 26 to 30 July 2018, Hotel Palace Praia in Florianopolis (Santa Caterina, Brazil).

## *Teaching* - Bachelor in Computer and System Engineering, University of Rome “La Sapienza” (Italy)

- ★ 30 hours for Mathematical Analysis 2 - taught together with Prof. Virginia De Cicco, A.Y. 2021/2022, 1st semester.
- ★ 30 hours for Mathematical Analysis 1 - taught together with Prof. Roberto Conti, A.Y. 2021/2022, 1st semester.

★ 60 hours for Mathematical Analysis 1 - taught together with Prof. Roberto Conti, A.Y. 2019/2020, 1st semester.

### *Teaching assistant* - Bachelor in Mathematics, University of Palermo (Italy)

★ 30 hours for Mathematical Analysis 1 - course taught by Prof. Camillo Trapani (1st Module) and by Prof. Giulio Cirraolo (2nd Module) A.Y. 2016/2017, 1st and 2nd semester.

★ 21 hours for Mathematical Analysis 1 - course taught by Prof. Camillo Trapani A.Y. 2015/2016, 1st semester.

★ 18 hours for Geometry 2 - course taught by Prof. Claudio Bartolone A.Y. 2014/2015, 1st semester.

★ 19 hours for Geometry 1 - course taught by Dr. Alfonso Di Bartolo, A.Y. 2013/2014, 1st and 2nd semester.

### *Science communication and networking*

★ November 20-24, 2024 - Network Meeting of the Alexander von Humboldt Foundation in collaboration with the Friedrich-Alexander-Universität Erlangen-Nürnberg.

★ November 2, 2024 - Junior Forum 2024, organized by the JSPS Bonn Office in Dortmund (Germany) aimed to gather JSPS funded scholarship holders who now carry on their research in Germany.

★ October 21, 2024 (online participation), invited panelist at the Round Table Panel “Women in Functional Analysis: Trends in Topological Algebras”, Special Session “Topological Algebra”, 57th National Congress of the Sociedad Matemática Mexicana.

★ Humboldt research fellowship and awards (Outstanding individual research) - short article at FAU Erlangen Nürnberg webpage where I explain my research for general public: <https://www.fau.eu/research/outstanding-individual-research/alexander-von-humboldt-professorship/humboldt-research-fellowships-and-awards/>

★ 14.09.2022 - JSPS Orientation, Comore Yotsuya building, Shinjuku, Tokyo, Japan - twitter release: <https://x.com/jspssns/status/1578201339099639808>

★ 21-22.09.2020, 13-18.08.2023 (online participation to both events) - 5-days Workshop Women on Mathematical Physics I & II- BIRS at Banff Center for Arts and Creativity in Alberta, Canada

★ 04-09.11.2018 (in person), 5-10.12.2021 (online participation) - 5-days Workshop Women on Operator Algebras I & II - BIRS at Banff Center for Arts and Creativity in Alberta, Canada.

★ December 17, 2022 - Lecture at Toshimagaoka Girls’ High School, Tokyo, as part of the JSPS Science Dialogue, which offers Fellows the opportunity to give lectures in English on their research work at Japanese high schools.

### *Training courses*

★ September 04, 2023 - e-Learning “Compliance and Legal Management Education” offered by the University of Tokyo (Japan) to foster compliance and legal management awareness.

★ April 27, 2022 - e-Learning Course on “Research Ethics” offered by the Japan Society for Promotion of Science (JSPS) while at the University of Tokyo (Japan).

★ April 2020 - Online course at the University of Rome “La Sapienza” (Italy) on “Privacy - regolamento Europeo” (in Italian) on the General Data Protection Regulation, EU 2016/679.

### *Languages*

Languages: Italian (Mother tongue), English (Upper intermediate), Catalan (Intermediate), Japanese (Lower intermediate), German (Basic), French (Basic).

★ Japanese Language Proficiency Test N3 - Score: Language Knowledge (Vocabulary and Grammar) 33/60, Reading 31/60, Listening 35/60 - Total score: 99/180, December 1, 2024.

★ Japanese Language Proficiency Test N4 - Score: Language Knowledge (Vocabulary and Grammar) and Reading 100/120, Listening 60/60 - Total score: 160/180, December 3, 2023.

★ Japanese Language Proficiency Test N5 - Score: Language Knowledge (Vocabulary and Grammar) and Reading 107/120, Listening 44/60 - Total score: 151/180, December 4, 2022.

- ★ Completion of the General Courses offered by the Center for Japanese Language Education at the University of Tokyo: Level 1 (summer semester 2022), Level 2 (autumn semester 2022), Level pre3 am (autumn semester 2023).
- ★ International English Language Testing System (IELTS Academic) - Score: Reading 7.0, Writing 6.0, Listening 7.0, Speaking 6.0, Overall score: 6.5 - April 2018
- ★ Certificate of Attendance - Course of German language - Level A1 - Goethe Zentrum - September 2013
- ★ Trinity College London - Graded Examination in Spoken English - Grade 10/12 - May 2010

*Associations of which I am a member*

- ★ From January 2016 member of Gruppo Nazionale per l'Analisi Matematica, la Probabilità e le loro Applicazioni - INdAM (National Group for Mathematical Analysis, Probability and their applications), section: Functional and Harmonic Analysis.
- ★ From February 2020 member of the European Women in Mathematics.
- ★ From April 2023 member of the International Association of Mathematical Physics.
- ★ From November 2024 member of the German JSPS Alumni Association.

March 16, 2025

Maria Stella Adamo