

Alessandro Carotenuto

About Me I am a researcher in mathematics. My research experience is in quantum groups, noncommutative geometry and algebra with some emphasis on physical applications. My current work focuses on differential noncommutative geometry of quantum homogeneous spaces.

Jobs

01/01/2024 - today, Bologna

Postdoctoral fellowship (Assegno di Ricerca) at Università di Bologna

Supervisor: Rita Fioresi

As part of MSCA doctoral network CaLiForNIA.

01/02/2023 - 31/10/2023, Brno

Postdoctoral fellowship at Masaryk University

Supervisor: Jan Slovák

As part of the GACR EXPO project "Homotopické a homologické metody a nástroje úzce související s matematickou fyzikou".

01/12/2021 - 31/11/2022, Prague

Postdoctoral fellowship at Charles University

Supervisor: Réamonn Ó Buachalla

As part of the PRIMUS grant "Spectral Noncommutative Geometry of Quantum Flag Manifolds".

01/09/2020 - 01/11/2021, Prague

Postdoctoral fellowship at Institute of Mathematics of the Czech Academy of Sciences

Supervisor: Karen Strung

As part of the grant "Applications of C*-algebra classification: dynamics, geometry, and their quantum analogues".

Education

2015-2019, SISSA

PhD cum Laude in Geometry and Mathematical Physics awarded on 02/10/2019.

Supervisor: Prof. Ludwik Dąbrowski

Title of the thesis: *Differential calculus for Jordan algebras and connections for Jordan Modules.*

2012 - 2015, Università degli studi di Napoli Federico II

Master degree in Physics.

Supervisor: Prof. Giuseppe Marmo

Title of the thesis: *Boundary conditions and topology change in quantum mechanics.*

Grade: 110/110

2009 - 2012, Università degli studi di Napoli Federico II

Bachelor degree in Physics.

Supervisor: Prof. Gennaro Miele

Title of the thesis: *Effetto Aharonov-Bohm* (English title: *The Aharonov-Bohm effect*).

Grade: 110/110

Works

Published papers

- A. C., C. Mrozinski, Réamonn Ó Buachalla "A Borel-Weil Theorem for the Quantum Grassmannians " in Documenta Mathematica, August 2023
- A.C., R. Ó Buachalla "Bimodule connections for relative line modules over the irreducible quantum flag manifolds" in SIGMA, October 2022.
- A.C., R. Ó Buachalla, Fredy Diaz-Garcia "A Borel-Weil theorem for the irreducible quantum flag manifolds" in International Mathematics Research Notices, July 2022.
- A.C., F. Lizzi, M. Manfredonia, F. Mercati "The Weyl-Mellin quantization map for κ -Minkowski Noncommutative spacetime " in International Journal of Geometric Methods in Modern Physics November 2021.
- A.C., L. Dąbrowski "Spin geometry of the rational noncommutative torus" in Journal of Geometry and Physics May 2019
- A.C., L. Dąbrowski, M. Dubois-Violette, "Differential calculus for Jordan algebras and Jordan modules" in Letters in Mathematical Physics, May 2018.

Conference papers

- A. C. "Connections on Jordan modules and particle physics" for the conference for School and Workshops on Elementary Particle Physics and Gravity, Corfù, September 2018.

Preprints

- A.C., R. Ó Buachalla "Principal Pairs of Quantum Homogeneous Spaces" arXiv:2111.11284, November 2021.

Conferences, seminars and workshop attended as a speaker

- Training school on Cartan Geometry, September 2023, Brno.
- Emergent Geometries from Strings and Quantum Fields, July 2023, Firenze.
- CaLISTA Kick-off meeting June 2023, Bologna.
- The 43th Winter School GEOMETRY AND PHYSICS, January 2022, Srni.
- Noncommutative Geometry: Spectral and metric aspects, September 2022, Krakow.
- Differential geometry and applications, July 2022, Hradec Kralice
- North atlantic Noncommutative Geometry seminar, March 2022.
- NCG&T in Prague, March 2022.
- The 42th Winter School GEOMETRY AND PHYSICS, January 2022, Srni.
- Geometry and Analysis of Quantum groups, December 2021, Oslo.
- NCG&T in Prague, October 2020, Prague.
- Nonassociative Algebras and Applications, September 2018, Tashkent.
- Information geometry, Quantum mechanics and applications, June 2018, Policeta.
- Symmetries, Geometry and Quantum Gravity, June 2018, Primosten.
- Noncommutative geometry seminars in SISSA, February 2018, Trieste
- School and Workshops on Elementary Particle Physics and Gravity, 19 September 2017, Corfù.

Organization of conferences

- "Quantum Flag manifolds in Prague" 09/2023, Prague.
- "Quantum and Super afternoon in Bologna" 09/2022, Bologna.
- "Recent development in theoretical physics" 01/2020, Napoli.
- "Recent development in theoretical physics" 12/2018, Napoli.
- "Topological and geometrical aspects of quantum spaces field theory and causal structure" 03/2017, Trieste.

Memberships and affiliations

- From 2024: Affiliated to INFN - Iniziativa specifica GAST.
- From 2024: Affiliated to INDAM - Research group GNSAGA.
- From 2023: Member of the MSCA doctoral network CaLiFoRNIA led by Rita Fioresi.
- From 2022: Member of the RISE project CALIGOLA led by Rita Fioresi.
- From 2022: Member of the COST project CALISTA led by Rita Fioresi.

Administrative duties

- From 01/2024: Project manager of the MSCA doctoral network CaLiFoRNIA led by Rita Fioresi.

Languages

Italian

Mother language

Neapolitan

Mother language

English

Fluent

Czech

Basic

Computer Skills

Programming

- C++ (basic)
- Mathematica (basic)
- HTML (basic)
- GAP System for computational discrete Algebra (basic)

Writing softwares

- Keynote and Office (intermediate)
- Latex (intermediate)

17/07/2024