

UNIVERSITÀ DEGLI STUDI DI MILANO

selezione pubblica per n.1 posto di Ricercatore a tempo determinato in tenure track (RTT) per il settore concorsuale 01/A2 - Geometria e Algebra,

settore scientifico-disciplinare MAT/03 – Geometria

presso il Dipartimento di "MATEMATICA FEDERIGO ENRIQUES",

Codice concorso 5467

Celeste Damiani

Curriculum Vitae

PERSONAL DATA

Surname: Damiani
Name: Celeste
Birth: 11/01/1987, Trieste, Italy
Title: Doctor in Mathematics and its Interactions (Université de Caen Normandie)
Academic Qualifications: Abilitazione Scientifica Nazionale 01/A2 - Geometria e Algebra, 2a Fascia (expiration: 01/06/2033)
Fellow of the Higher Education Academy (UK, reference: PR268272)
Memberships: Aderente INDAM - GNSAGA

Research interests

I am interested in geometric topology and geometric group theory, more specifically in the fields of braid groups and braid groups generalisations, and knot theory.

Since 2020 I've also been working in AI and machine learning for healthcare.

At the interface between the two areas above, I am interested in harnessing the advantages of Topological Data Analysis tools in machine learning pipelines.

EMPLOYMENT HISTORY

Nov 2022 – pres. **Postdoc**, *Istituto Italiano di Tecnologia, Genova*
MISE project in machine learning for clinical and omics data

Nov 2022 – Jan 2024 **Honorary Research Fellow**, *WIPH, Queen Mary University of London*

Apr 2021 – May 2023 **Visiting Research Fellow at WMG**, *University of Warwick*

Apr 2020 – Nov 2022 **Postdoctoral Data Scientist**, *WIPH, Queen Mary University of London*
CRUK EDx project "An Artificial Intelligence System for Real-time Risk Assessment at Mammography Screening (Mammo AI)" (reference C49757/A28689)

Sep 2018 – Mar 20 **Research Fellow**, *University of Leeds*
Leverhulme funded project "Emergent Physics From Lattice Models of Higher Gauge Theory"

May – Jul 2018 **Visiting researcher**, *Universität Regensburg*
Independent research on knotted surfaces in a 4-dimensional space-time

Nov 2016 – Apr 18 **JSPS Postdoctoral Fellow**, *OCAMI, Osaka City University*
Collaborative and individual research as part of the Knot Theory Research Team of the OCAMI.

Oct 2014 – Sep 16 **Teaching assistant and Science Communicator**, *Université de Caen Normandie*

EDUCATION

- Jan 2021 – Jan 23 **Postgraduate Certificate in Academic Practice (PGCAP)**, *Queen Mary University of London*, Leading to Fellowship of the HE Academy with reference: PR268272
- Oct 2013 – Sep 16 **Ph.D. in Mathematics**, *Université de Caen Normandie*
title *The topology of loop braid groups: applications and remarkable quotients*
defended on September 20, 2016
advisor: Paolo Bellingeri; supervisor (*encadrant scientifique*): Emmanuel Wagner
mention Très honorable
- 2010 – 13 **Master of Science in Mathematics**, *Università degli Studi di Trieste*
- 2006 – 10 **Bachelor of Science in Mathematics**, *Università degli Studi di Trieste*

MISCELLANEOUS

- Nov 2023 **Participant at the workshop: “Introduction to MATLAB on HPC systems at Cineca”**, *Cineca, Casalecchio di Reno*
- Sept 2021 **Facilitator and participant of the Data Study Group project “Using machine learning to improve sleep habits in Dementia patients”**, *The Alan Turing Institute*

PUBLICATIONS AND PREPRINTS

Journals' Impact Factors (IF) from Web of Science - Journal Citation Reports at year of publication (or previous year for publications from 2023)

- Are better AI algorithms for breast cancer detection also better at predicting risk? A paired case-control study**, *Preprint, submitted*.
R. Santeramo, C. Damiani, J. Wei, G. Montana, A. R. Brentnall
- IF(2022): 15.2 **An optimization framework to guide the choice of thresholds for risk-based cancer screening**, *npj Digit. Med.* 6, 223, 2023. doi:10.1038/s41746-023-00967-9.
A. R. Brentnall, E. Atakpa, H. Hill, R. Santeramo, C. Damiani, J. Cuzick, G. Montana, S. Duffy
- IF(2022): 19.7 **Evaluation of an AI model to assess future breast cancer risk**, *Radiology*, 307(5):e222679, 2023. doi:10.1148/radiol.222679.
C. Damiani, G. Kalliatakis, M. Sreenivas, M. Al-Attar, J. Rose, C. Pudney, E. F. Lane, J. Cuzick, G. Montana, and A. R. Brentnall
- IF(2022): 0.6 **Generalisations of Hecke algebras from loop braid groups**, *Pac. J. Math.*, 323(1):31–65, 2023. doi:10.2140/pjm.2023.323.31.
C. Damiani, P. P. Martin, and E. C. Rowell
- IF: 0.83 **On a canonical lift of Artin's representation to loop braid groups**, *J. Pure Appl. Algebra*, 225(12):22, 2021. Id/No 106760. doi:10.1016/j.jpaa.2021.106760.
C. Damiani, J. Faria Martins, and P. P. Martin
- IF: 0.53 **On the group of ring motions of an h-trivial link**, *Topology and its Applications*, 264:51 – 65, 2019. doi:https://doi.org/10.1016/j.topol.2019.06.004.
C. Damiani and S. Kamada
- IF: 0.47 **A Markov's theorem for extended welded braids and links**, *Osaka J. Math.*, 56(2):255–268, 2019. URL: https://projecteuclid.org/euclid.ojm/1554278423.
C. Damiani
- (Chapter in book) **Towards a version of Markov's theorem for ribbon torus-links in \mathbb{R}^4** , In *Knots, low-dimensional topology and applications. Knots in Hellas, International Olympic Academy, Greece, July 2016. Papers of the international conference, Ancient Olympia, Greece, July 17–23, 2016, pages 309–328. Cham: Springer, 2019.*
C. Damiani

- IF: 0.50 **Alexander invariants of ribbon tangles and planar algebras**, *J. Math. Soc. Japan*, 70(3):1063–1084, 2018. doi:10.2969/jmsj/75267526.
C. Damiani and V. Florens
- IF: 0.74 **A journey through loop braid groups**, *Expo. Math.*, 35(3):252–285, 2017. doi:10.1016/j.exmath.2016.12.003.
C. Damiani
- IF: 0.48 **Unrestricted virtual braids, fused links and other quotients of virtual braid groups**, *J. Knot Theory Ramifications*, 24(12):1550063, 23, 2015. doi:10.1142/S0218216515500637.
V. G. Bardakov, P. Bellingeri, and C. Damiani

SEMINARS

- 2023 **Generalizzazioni delle algebre di Hecke dai gruppi di trecce di cerchi**, *Seminario di algebra e geometria del DMG*, Università di Trieste
Trecce, trecce di cerchi, e altri motion groups, *Seminario di Geometria*, Università di Camerino
Loop Braid Groups and generalisations of Hecke Algebras, *Seminario di Algebra e Geometria*, Università di Bologna
- 2022 **An AI System for Risk Assessment at Mammography Screening**, *Statistics and Data Science Seminar*, Queen Mary University of London
An AI System for Risk Assessment at Mammography Screening, *Human Technopole - Centre of Computational Biology*, Milan
Generalisations of Hecke Algebras from Loop Braid Groups, *Glasgow G&T seminar*
- 2021 **Généralisations des algèbres de Hecke à partir des groupes de tresses de cercles + Un système de IA pour la détection précoce du cancer du sein**, *Séminaire Teich Marseille*
An AI System for assessing breast density, *Statistics and Data Science (SDS) seminar*, Queen Mary University of London
Generalisations of Hecke Algebras from Loop Braid Groups, *CUNY Representation Theory Seminar*
- 2020 **Generalisations of Hecke Algebras from Loop Braid Groups**, *[K-OS] Knot online seminar*
Towards a breast density age predictor, *Centre for Cancer Prevention statistics meeting*, Queen Mary University of London
Alexander invariants of ribbon tangles, *Algebra seminar*, University of Leeds
- 2019 **Loop braid groups and a new lift of Artin's representation**, *Pure Maths Seminar*, University of Leicester
Loop braid groups and a new lift of Artin's representation, *BLOC meeting*, City, University of London
The ring motion group of an H-trivial link, *Topology seminar*, University of Sheffield
Le groupe de mouvements d'un entrelacs H-trivial, *Séminaire Géométrie, Dynamique et Topologie*, Aix-Marseille Université
- 2018 **A journey through loop braid groups**, *Geometry and Topology seminar*, Luxembourg
Some remarkable quotients of virtual braid groups, *Algebra seminar*, University of Leeds

- A journey through loop braid groups**, *Geometry and Topology seminar*, Regensburg
- 2017 **A journey through loop braid groups**, *Maths - String Theory seminar*, Kavli IPMU, Tokyo
- A journey through loop braid groups**, *Topology working seminar*, Osaka University
- Vers un théorème de Markov pour entrelacs dans \mathbb{R}^4** , *Séminaire d'algèbre et géométrie*, Université de Caen Normandie
- Invariants d'Alexander pour enchevêtrements ruban**, *Séminaire de Topologie*, Paris - Jussieu
- Braid groups, Hecke Algebras, and welded braid groups**, *Working Seminar*, Osaka City University
- 2016 **Invariants d'Alexander pour enchevêtrements ruban**, *Séminaire topologies*, Montpellier
- Invariants d'Alexander pour enchevêtrements ruban**, *Séminaires géométrie et systèmes dynamiques*, Dijon
- Alexander invariants of ribbon tangles**, *Topology seminar*, Glasgow
- Alexander invariants of ribbon tangles**, *Barcelona Algebraic Topology Group*, U. A. Barcelona
- 2014 **The Multivariable Alexander Polynomial for virtual tangles**, *Séminaire de topologie*, Université de Pau et des Pays de l'Adour

TALKS AND POSTERS (CONFERENCES)

- 2024 (expected) **TBD**, *Skew Braces, Braids and the Yang-Baxter Equation*, BIRS, Banff
- 2023 **How can we use TDA for breast cancer risk assessment?**, *Combinatorial Algebraic Topology and Applications*, Pisa
- (poster) **Congruence subgroups of braid groups and crystallographic structures**, *Geometric Topology, Art, and Science*, Reggio Emilia
- A topological mammography clock**, *Winterbraids XII*, Tours
- 2022 (poster) **Evaluation of an automated system to assess future breast cancer risk using mammograms at screening**, *The Early Detection of Cancer Conference 2022*, Portland
- Evaluation of an automated system to assess future breast cancer risk using mammograms at screening**, *Why Study Mammographic Density? International Conference 2022*, Melbourne
- (poster) **MammoAI: An AI System for Risk Assessment at Mammography Screening**, *Topology of Data*, Università di Roma Tor Vergata
- MammoAI: An AI System for Risk Assessment at Mammography Screening**, *Applied Topology in Bedlewo 2022*, Bedlewo
- 2021 **Generalisations of Hecke Algebras from Loop Braid Groups**, *II Encuentro de Álgebra y Teoría de Nudos*, Zoom
- 2019 **Loop braid groups and a new lift of Artin's representation**, *56th ARTIN Meeting*, Edinburgh
- Loop braid groups and a new lift of Artin's representation**, *Journées Normandes Topologie*, Caen
- Loop braid groups and a new lift of Artin's representation**, *Unifying 4-Dimensional Knot Theory*, BIRS - Banff
- The ring motion group of an H-trivial link**, *Knots and Braids in Norway*, Trondheim

- (flashtalk) Some properties of congruence subgroups of braid groups, *Winterbraids IX*, Reims
- 2018 **Alexander invariants of ribbon tangles and circuit algebra**, *Twisted and Quantum knot invariants*, Durham
- A journey through loop braid group**, *Joint meeting of the UMI, SIMAI and PMS*, Wrocław
- A journey through loop braid group**, *Workshop on Higher Gauge Theory*, Leeds
- (flashtalk) **Moving towards unexplored motion groups**, *Winterbraids VIII*, CIRM - Marseille
- Moving towards unexplored motion groups**, *13th East Asian School of Knots*, KAIST - Daejeon
- 2017 **A journey through loop braid group**, *Pan Pacific International Conference on Topology*, Busan
- Moving towards unexplored motion groups**, *4-dim topology 2017*, Osaka City University
- A journey through loop braid group**, *Women in Mathematics*, Sapporo
- Towards a Markov theorem for ribbon links in \mathbb{R}^4** , *Tsuda University Topology Workshop*, Tokyo
- Towards a Markov theorem for ribbon links in \mathbb{R}^4** , *Self-distributive systems and quandle (co)homology theory in algebra and low-dimensional topology*, Busan
- (flashtalk) **A journey through loop braid group**, *Braids in algebra, geometry and topology*, ICMS - Edinburgh
- A journey through loop braid group**, *The 12th East Asian School of Knots and Related Topics*, Tokyo
- 2016 **Alexander invariants of ribbon tangles and circuit algebra**, *Four dimensional topology 2016*, Osaka City University
- Alexander invariants of ribbon tangles and circuit algebra**, *Knots in Hellas*, Olympia
- Alexander invariants of ribbon tangles and circuit algebra**, *Winterbraids VI*, Lille
- 2015 **On the Alexander polynomial of a (ribbon) tangle**, *Glances at Manifolds*, Kraków
- On the Alexander polynomial of a (ribbon) tangle**, *Young Topologists' Meeting*, EPFL
- Sur le polynôme d'Alexander d'un enchevêtrement classique**, *Journée de la Fédération de Recherche Normandie-Mathématiques*, Le Havre

SUPERVISION AND TEACHING

- 2022 - 23 **L^AT_EX for writing your thesis**, *training sessions for PhD students*, Queen Mary University
- L^AT_EX for the Absolute Beginner**, *training sessions for PhD students*, Queen Mary University
- 2021 - 22 **Research Methods (Fundamentals of Statistics)**, *web-based training*, *Global Parkinson's genetics program*
- Human Science and Public Health PBL facilitator**, *year 2 MBBS*, Queen Mary University
- Locomotor PBL facilitator**, *year 2 MBBS*, Queen Mary University

- L^AT_EX** for writing your thesis, *training sessions for PhD students*, Queen Mary University
- L^AT_EX** for the Absolute Beginner, *training sessions for PhD students*, Queen Mary University
- Statistics for CANM937 Research Methods Module**, *shared course*, Queen Mary University
- 2020 - 21 **Human Science and Public Health PBL facilitator**, *year 2 MBBS*, Queen Mary University
- Locomotor PBL facilitator**, *year 2 MBBS*, Queen Mary University
- L^AT_EX** for writing your thesis, *training sessions for PhD students*, Queen Mary University
- L^AT_EX** for the Absolute Beginner, *training sessions for PhD students*, Queen Mary University
- Statistics for CANM937 Research Methods Module**, *shared course*, Queen Mary University
- 2019 **Co-supervision of a Ph.D candidate (Basmah Alsubhi)**, *Ph.D thesis in algebra and topology*, University of Leeds
- 2019 **Co-supervision of 2 summer bursaries (Laidlaw Undergraduate Research and Leadership Scholarship)**, University of Leeds
- 2015 – 16 **Algebra (Exercises)**, L3 MATHS (*terzo anno triennale Matematica*), Université de Caen Normandie, 32h
- 2015 – 16 **Probability (Exercises)**, L1 MIASH (*primo anno triennale Matematica e Informatica per le Scienze Umane*), Université de Caen Normandie, 32h

RESEARCH FUNDING AND AWARDS

- 2023 **First prize for Best Poster**, *conference [Geometric Topology, Art, and Science](#)*, Reggio Emilia
- 2019 **Conference grant**, *Loops in Leeds: motion groups and related topics*, **Role:** PI and Chair organiser, **Funding body:** Research and Innovation Committee of the School of Mathematics (Univ. of Leeds), Value: £5,358
- 2019 **Conference grant**, *Loops in Leeds: motion groups and related topics*, **Role:** PI and Chair organiser, **Funding body:** London Mathematical Society, Scheme 1, Value: £4,004
- 2018 **Personal travel grant**, **Funding body:** European Mathematical Society, Value: €500
- 2018 **Research project: [Emergent physics from lattice models of higher gauge theory](#)**, **Role:** Participant, **Funding body:** the Leverhulme Trust
- 2016–18 **Grant-in-Aid for JSPS Research Fellow**, **Role:** Co-I, joint with Seiichi Kamada, **Funding body:** JSPS, **Dates:** 01/11/2016 - 31/03/2018, Value: ¥1,500,000
- 2012 **International Mobility Grant**, *Stay at Université de Caen*, Funding body: Italian Government
- 2008–09 **Erasmus**, *Fribourg*, Switzerland

OUTREACH

- 2022 **QMUL Festival of Communities**, *Animation of the stall “Can you operate a Turing Machine?”*, Tower Hamlets, London
- 2020 **Leeds Festival of Science Roadshow**, *Workshop at KS5 level*, Leeds

- 2019 **Academic taster session**, *Part of the programme [Reach for Excellence](#)*, University of Leeds
- Leeds Festival of Science Roadshow**, *Workshop at KS5 level*, Bradford
- 2017 **What is a knot?** - JSPS Science Dialogue program, *Fujishima High School*, Fukui, Japan
- 2014–15 **Interventions in schools**, *doctoral mission in scientific communication*, Caen
- 2013–16 **Fête de la Science**, *Stand animation, Conference for general public*, *Atelier du chercheur*, Caen
- 2012 **Ten hours with Henri Poincaré**, *Animation of the [Labosaïque](#) stand*, Sorbonne, Paris
- 2010 **Science Centre Immaginario Scientifico**, *Internship as guide for primary schools*, Trieste

ORGANISATIONAL ACTIVITIES AND COMMUNITY INVOLVEMENT

Reviewer for MathSciNet and zbMath

- 2021 – 22 **Co-organiser of the Wolfson [Institute Statisticians meeting](#)**, Queen Mary U. of London
- 2020 – 22 **Planning of Patients and Public Involvement meeting for the Mammo AI project**, Queen Mary Univ. of London
- 2019 **Workshop [Loops in Leeds: motion groups and related topics](#)**, *With: J. Faria Martins, P. Martin, A. Bullivant, F. Torzewska, H. Albeladi*, School of Mathematics, Univ. of Leeds
- 2018 **[Study group on Loop Braid Groups, TQFTs, and Higher Gauge Theory](#)**, Univ. of Leeds
- 2015–16 **Ph.D. students representative at the Laboratory Council**, LMNO, Univ. de Caen

LANGUAGES

Native: Italian

Fluent: English, French, Spanish

Notions: Japanese

METRICS

Metrics from Scopus	Value
Number published works	10
Total Citations	58
H index	3

Genova, 8th January 2024