

PERSONAL INFORMATION

Rita Fioresi



FaBiT

+39 333 8652673

rita.fioresi@unibo.it

Nationality Italian

AREA DI RICERCA

Deep Learning, Lie Theory, Quantum Theory

ESPERIENZE LAVORATIVE

- 2020 – Presente Professore Ordinario, FaBiT, Università di Bologna, Italy
- 2020 – 2025 Professore Associato, FaBiT, Università di Bologna, Italy
- 2008 – 2020 Professore Associato, Dip. di Matematica, Università of Bologna, Italy
- 2000 – 2008 Ricercatore, Dip. di Matematica, Università di Bologna, Italy
- 1998 – 2000 Adjunct Professor, Dept of Mathematics, UCLA, Los Angeles, USA

STUDI

- 1992–1997 PhD in Mathematics, UCLA, Los Angeles, USA
- 1991–1993 Laurea in Matematica, Università di Bologna, Italy
- 1989–1991 Laurea in Ingegneria Nucleare, Università di Bologna, Italy

FONDI COMPETITIVI

- 2024-presente Principal Investigator, CaLiFoRNIA MSCA-DN-101119552
EU funding: 2.5 M euros
- 2023-presente Principal Investigator, CaLIGOLA MSCA-2021-SE-01-101086123
EU funding: 874000 euros
- 2022-presente Action Chair, COST Action CaLISTA CA 21109
EU funding: 500000 euros
- 2022-presente Principal Investigator: Geometric Deep Learning
BAM Institute: 87000 euros

COMMISSIONI

- 2021 - presente Membro of ELLIS Society (AI)
- 2020 – presente Membro of the Supervisory Board AddU

Women Association of Università di Bologna Professors, Università di Bologna, Italy

2020 – presente **Membro of the Supervisory Board of the Collegium of Excellence**
Università di Bologna, Italy

2020 – presente **Membro of the European Women in Mathematics**

2020 – 2023 **Membro of the Supervisory Board of Unione Matematica Italiana**
Mathematics and Artificial Intelligence section, Italy

2015-presente **Membro of AFR-FNR Luxembourg Board**

2024 – presente **Membro del Collegio dei docenti del Dottorato in Fisica (Unibo)**

2020 - presente **Membro del Collegio dei docenti del Dottorato in Matematica(Unife)**

2015 – 2020 **Membro del Collegio dei docenti del Dottorato in Matematica (Unibo)**

COMITATI EDITORIALI

Journal of Lie Theory

International Journal of Geometric Methods in Modern Physics

Expositiones Mathematicae

LINGUE

Mother tongue Italian

Other languages

	UNDERSTANDING		SPEAKING		WRITING
	Listening	Reading	Spoken interaction	Spoken production	
English	C2	C2	C2	C2	C2
French	A1	A2	A1	A1	A1

Levels: A1 and A2: Basic user – B1 and B2: Independent user – C1 and C2: Proficient user
[Common European Framework of Reference for Languages](#)

Pubblicazioni, selezione ultimi 5 anni

- Tron, E., Fioresi, R., Couëllan, N. et al. Cartan moving frames and the data manifolds. Info. Geo. (2024).
<https://doi.org/10.1007/s41884-024-00159-8>
- Dimitrov, Ivan; Fioresi, Rita; *Generalized Root Systems*, Trans. Amer. Math. Soc. Ser. B, 11 (2024), 1462-1508 DOI:
<https://doi.org/10.1090/btran/214>.
- Ercolessi, E.; Fioresi, R.; Weber, T., *The geometry of quantum computing*, Int. J. Geom. Methods Mod. Phys. 21 (2024), no. 10.
- Aschieri, P.; Fioresi, R.; Latini, E.; Weber, T. *Differential calculi on quantum principal bundles over projective bases* Aschieri, P.; Fioresi, R.; Latini, E.; Weber, T. Comm. Math. Phys. 405 (2024), no. 6, Paper No. 136.
- Fioresi, R.; Petkovic, J. A precortical module for robust CNNs to light variations, Neural Comput. 36 (2024), no. 9, 1832-1853, (2024).
- Lapenna, M.; Faglioni, F.; Zanchetta, F.; Fioresi, R. *Geometric Deep Learning: A Temperature Based Analysis of Graph Neural Networks* Lecture Notes in Comput. Sci., 14072 Springer, Cham, 2023, 634-643.

7. M. Lapenna, F. Faglioni, R. Fiorese, Thermodynamics modeling of deep learning systems for a temperature based filter pruning technique, *Frontiers in Physics* 11, 1145156, 2023.
8. R. Fiorese and F. Zanchetta *Deep learning and geometric deep learning: An introduction for mathematicians and physicists*, *International Journal of Geometric Methods in Modern Physics*, 2023, no. 12, Paper No. 2330006, 39 pp.
<https://doi.org/10.1142/S0219887823300064>
9. C. Carmeli, R. Fiorese, V.S. Varadarajan, *Unitary Harish-Chandra representations of real supergroups* *J. Noncommut. Geom.* 17 (2023), no. 1, 287–303.
10. Fiorese, R.; V. S. Varadarajan, *Harish-Chandra highest weight representations of semisimple Lie algebras and Lie groups*, *J. Lie Theory* 33 (2023), no. 1, 217–252.
11. Fiorese, R; Gavarini, F, *Real Forms of Complex Lie Superalgebras and Supergroups*, *Comm. Math. Phys.*, 2023, 397, pp. 937 – 965.
12. R. Fiorese, F. Zanchetta, A. Simonetti, A. Malagoli, G. Faglioni, A Geometric Deep Learning approach to blood pressure regression Geometric Deep Learning in Medical Image Analysis (Extended abstracts, proceedings), 2022.
13. A. Tsamos, S. Evseyleev, R. Fiorese, F. Faglioni, G. Bruno, Synthetic Data Generation for Automatic Segmentation of X-ray Computed Tomography Reconstructions of Complex Microstructures, *J Imaging*. 2023, 9(2):22 doi: 10.3390/jimaging9020022.
14. R. Fiorese, P. Demurtas, G. Perini, Deep learning for MYC binding site recognition, *Front Bioinform.* 2022, 2:1015993. doi: 10.3389/fbinf.2022.1015993
15. Fiorese, R.; Lledó, M. A.; Razzaq, J. *N=2 quantum chiral superfields and quantum super bundles* *J. Phys. A* 55 (2022), no. 38.
16. L. Gremontieri, R. Fiorese *Model-centric Data Manifold: the Data Through the Eyes of the Model* *SIAM J. Imaging Sci.* 15 (2022), no. 3, 1140–1156.
17. Chuah, M.-K.; Fiorese, R., *Levi Factors and Admissible Automorphisms Algebras and Representation Theory*, *Algebr. Represent. Theory* 25 (2022), no. 2, 341–358.
18. Fiorese, R.; Kwok, S. D.; Taylor, D. W. *Quotients of complex algebraic supergroups.* *J. Geom. Phys.* 170 (2021), Paper No. 104367.
19. Fiorese R., Faglioni F., Morri F., Squadrani L. (2021), *On the Thermodynamic Interpretation of Deep Learning Systems*. In: Nielsen F., Barbaresco F. (eds) *Geometric Science of Information. GSI 2021. Lecture Notes in Computer Science*, vol 12829. Springer, Cham. https://doi.org/10.1007/978-3-030-80209-7_97.
20. Aschieri, P., Fiorese, R., Latini, E. *Quantum Principal Bundles on Projective Bases.* *Commun. Math. Phys.* 382, 1691–1724 (2021). <https://doi.org/10.1007/s00220-021-03985-4>
21. Blasius, Don; Digernes, Trond; Fiorese, Rita; Gangolli, Ramesh; Rapoport, Michael; Varadhan, S. R. S. *Recollections of V. S. Varadarajan.* *Notices Amer. Math. Soc.* 67 (2020), no. 9, 1365–1373.
22. Dimitrov, Ivan; Fiorese, Rita; *On Kostant root systems of Lie superalgebras.* *J. Algebra* 570 (2021), 678–701.
23. R. Fiorese, P. Chaudhari, S. Soatto, *A geometric interpretation of stochastic gradient descent using diffusion metrics*, *Entropy*, 2020, 22(1), 101.
24. Chuah, M.-K.; Fiorese, R., *Equal rank real forms of affine non-twisted Kac-Moody Lie superalgebras*, *Journal of Pure and Applied Algebra*, *J. Pure Appl. Algebra* 224 (2020), no. 7.
25. C. Carmeli, R. Fiorese, V.S. Varadarajan, *The exponential of nilpotent supergroups in the theory of Harish-Chandra representations.* *Geometric science of information*, 188–195, *Lecture Notes in Comput. Sci.*, 11712, Springer, Cham, 2019.
26. C. Carmeli, R. Fiorese, V.S. Varadarajan, *Highest Weight Harish-Chandra supermodules and their geometric realizations*, *Transf. Groups*, 25 (2020), no. 1, 33–80.