Alessandro Sanzeni

Curriculum Vitae

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Education

2012–2016 **Ph.D. in Physics**, *University of Milan*, Milan, Italy
Title: "Theoretical physics modeling of neurological problems"
Advisors: Massimo Vergassola (University of California, San Diego, CA, United States) and Guido Tiana

2009–2012 **Master in Physics**, *University of Milan*, Milan, Italy
Title: "Nonlinear realization of the SU(5) Georgi-Glashow model"
Final mark: 110/110 *cum laude*
Advisor: Ruggero Ferrari

2006–2009 **Bachelor in Physics**, *University of Milan*, Milan, Italy
Title: "Effects of retarded and advanced electromagnetic field on the dispersion relation of ionic crystals"
Final mark: 110/110 *cum laude*
Advisors: Andrea Carati and Luigi Galgani

Experience

2022–Present **Assistant Professor**, *Bocconi University*, Milan, Italy

2021–2022 **Postdoctoral Researcher**, *Columbia University*, New York, NY, United States

2019–2021 **Postdoctoral Researcher**, *Duke University*, Durham, NC, United States

2016–2019 **Postdoctoral Researcher**, *National Institute of Health*, Bethesda, MD, United States

2017–2019 **Visiting Researcher**, *Duke University*, Durham, NC, United States

2016–2017 **Visiting Researcher**, *University of Chicago*, Chicago, IL, United States

2014–2016 **Visiting Researcher**, *University of California, San Diego*, La Jolla, CA, United States

2012–2013 **Visiting Researcher**, *Pasteur Institute*, Paris, France

Fellowships and prizes

2012–2016 Fellowship for Ph.D. studies from University of Milan, Milan, Italy

2012 Scholarship from Campus France, sponsoring a visiting position at the Pasteur Institute, Paris, France

2012 Dr. Davide Colosimo Award, prize to the first named for Ph.D. at University of Milan, Milan, Italy

2012 Scholarship from BCC, Banca di Credito Cooperativo di Verolavecchia, Brescia, Italy

2012 Travel Award for Summer school "Emergent order in Biology", Institut d'Etudes Scientiques de Cargese, Cargese, Corsica, France

2009 Travel Award for Summer school "Quantum Many Body Systems", Cetraro (CS), Italy

Publications

[1] A. Sanzeni, M. H. Histed, and N. Brunel. "Emergence of Irregular Activity in Networks of Strongly Coupled Conductance-Based Neurons". In: *Phys. Rev. X* 12 (1 2022), p. 011044. DOI: 10.1103/PhysRevX.12.011044.

[2] A. Sanzeni, A. Palmigiano, T. Nguyen, J. Luo, J. Nassi, J. Reynolds, M. Histed, K. Miller, and N. Brunel. "Mechanisms underlying reshuffling of visual responses by optogenetic stimulation

in mice and monkeys". In: *bioRxiv* (2022). DOI: 10.1101/2022.07.13.499597.

[3] A. Sanzeni and M. H. Histed. "Computational Neuroscience: Finding patterns in cortical responses". In: *eLife* 9 (2020), e56234. DOI: 10.7554/eLife.56234.

[4] A. Sanzeni, M. H. Histed, and N. Brunel. "Response nonlinearities in networks of spiking neurons". In: *PLOS Computational Biology* 16.9 (2020), pp. 1–27. DOI: 10.1371/journal.pcbi.1008165.

[5] A. Sanzeni*, B. Akitake*, H. C. Goldbach, C. E. Leedy, N. Brunel, and M. H. Histed. "Inhibition stabilization is a widespread property of cortical networks". In: *eLife* 9 (2020), e54875. DOI: 10.7554/eLife.54875.

[6] S. Katta, A. Sanzeni, A. Das, M. Vergassola, and M. B. Goodman. "Progressive recruitment of distal MEC-4 channels determines touch response strength in C. elegans". In: *Journal of General Physiology* 151.10 (2019), pp. 1213–1230. DOI: 10.1085/jgp.201912374.

[7] A. Sanzeni, S. Katta, B. Petzold, B. L. Pruitt, M. B. Goodman, and M. Vergassola. "Somatosensory neurons integrate the geometry of skin deformation and mechanotransduction channels to shape touch sensing". In: *eLife* 8 (2019), e43226. DOI: 10.7554/eLife.43226.

[8] A. Sanzeni, V. Balasubramanian, G. Tiana, and M. Vergassola. "Complete coverage of space favors modularity of the grid system in the brain". In: *Phys. Rev. E* 94 (6 2016), p. 062409. DOI: 10.1103/PhysRevE.94.062409.

[9] A. Sanzeni, A. Celani, G. Tiana, and M. Vergassola. "Theory of feedback controlled brain stimulations for Parkinson's disease". In: *Physica A: Statistical Mechanics and its Applications* 441 (2016), pp. 121–130. DOI: 10.1016/j.physa.2015.08.019.

[10] A. L. Eastwood*, A. Sanzeni*, B. C. Petzold*, S.-J. Park, M. Vergassola, B. L. Pruitt, and M. B. Goodman. "Tissue mechanics govern the rapidly adapting and symmetrical response to touch". In: *Proceedings of the National Academy of Sciences* 112.50 (2015), E6955–E6963. DOI: 10.1073/pnas.1514138112.

[11] A. Lerose, A. Sanzeni, A. Carati, and L. Galgani. "Classical microscopic theory of polaritons in ionic crystals". In: *The European Physical Journal D* 68.2 (2014), p. 35. DOI: 10.1140/epjd/e2013-40331-y.

[12] D. Bettinelli, R. Ferrari, and A. Sanzeni. "Nonlinear Realization of the SU(5) Georgi-Glashow Model". In: (2012). DOI: 10.48550/ARXIV.1210.1486.

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Mentorship and teaching activity

2022–present Director (BSc course), "Mathematical modeling for neuroscience" (48 hrs), Bocconi University, Milan, Italy

2022–present Director (MSc course), "Methods and data analytics for risk assessment" (56 hrs), Bocconi University, Milan, Italy

2022 Lecturer for the course "Advance methods in computational neuroscience", Columbia University, New York City, NY, United States

2022 Mentor for Neuromatch Academy in Computational Neuroscience. I supervised one group of 6 students during a research project that lasted three weeks

2021 Guest lecturer for the course "Theoretical neuroscience", Duke University, Durham, NC, United States

2021 Lead project Teaching Assistant (TA) for Neuromatch Academy in Computational Neuroscience. I supervised 13 groups of students (approximately 5 students per group) and 8 other TAs for three weeks

* Denotes co-first authors

2019-2020 Mentor for Georgi Hristov Spasov, Master student at the Polytechnic University of Turin, Turin, Italy. Co-advised with Massimo Vergassola (École normale supérieure, Paris, France)

Service to the scientific community

2022–present Reviewer at Computational and Systems Neuroscience (Cosyne)

2016–present *Ad hoc* reviewer for: Nature Neuroscience; eLife; Nature Communications; PLOS Computational Biology; Physical Review X; Physical Review E; The Journal of Neuroscience

Memberships of Scientific Societies

2022–present Bocconi Institute for Data Science and Analytics (BIDSA)

2022–present Bernstein Network Computational Neuroscience

2018–2020 Society for Neuroscience

Invited talks

Sep 2022 Bernstein Conference, workshop "Information processing through correlated and coordinated responses", Berlin, Germany

Jun 2022 Gatsby Tri-Center annual meeting, The Edmond and Lily Safra Center for Brain Sciences at the Hebrew University of Jerusalem, Israel

Apr 2021 Department of Decision Sciences, Bocconi University, Milan, Italy

Febr 2021 Department of Physics, École Normale Supérieure, Paris, France

Feb 2021 Department of basic neurosciences, University of Geneva, Geneva, Switzerland

Jan 2021 Center for Theoretical Neuroscience, Columbia University College of Physicians and Surgeons, New York, NY, United States

Dec 2020 Institute for Advanced Study, Princeton, NJ, United States

Aug 2020 Imperial College London, London, United Kingdom

Dec 2016 The University of Chicago, Chicago, IL, United States

May 2016 National Institute of Mental Health, NIH, Bethesda MD, United States

Apr 2016 Center for Theoretical Neuroscience, Columbia University College of Physicians and Surgeons, New York, NY, United States

Apr 2016 Emory University, Atlanta, GA, United States