

Valeria Fascianelli

Associate Research Scientist, Center for Theoretical Neuroscience,
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Research activities

- 2025– ongoing **Associate Research Scientist , Computational Neuroscience**, Center for Theoretical Neuroscience, Columbia University, New York, USA.
- 2025 **Italian Academy Bodini Fellow**, Italian Academy, Columbia University, New York, USA.
- 2020–20205 **Postdoctoral Research Scientist , Computational Neuroscience**, Center for Theoretical Neuroscience, Columbia University, New York, USA.
- 2019 **Ph.D. visitor at Columbia University**, Center for Theoretical Neuroscience, Columbia University, New York, USA.

Education and training

- 2016-2020 **Ph.D. in Neuroscience**, La Sapienza University, Rome, Italy.
Grade: with honors
- 2015 **Master student visitor at CERN**, CERN, Geneva, Switzerland.
- 2014-2016 **Master of Research in Particle Physics**, University of Birmingham, Birmingham, UK.
Grade: with honors
- 2013-2014 **Undergraduate fellow at the Italian National Laboratories of Nuclear Physics**, INFN, Rome, Italy.
- 2012-2014 **M.Sc. in Nuclear and Subnuclear Physics**, University Tor Vergata, Rome, Italy.
Grade: 110/110 with honors
- 2008-2011 **B.Sc. degree in Physics**, University Tor Vergata, Rome, Italy.
Grade: 110/110 with honors
- 2008 **High School Graduation at Classical Lyceum**, Liceo Classico Ugo Foscolo, Albano Laziale, Rome, Italy.
Grade: 100/100

Teaching activities and mentorship

- 2025 **Invited as Teacher to Mathematical Methods in Computational Neuroscience Summer School**, Kavli Institute for Systems Neuroscience, Eresfjord, Norway.
- 2024 **Lecturer for the Advanced Neurotheory Course**, Center for Theoretical Neuroscience, Columbia University, New York, USA.
- 2023 **Teaching assistant of Cognitive Science**, Barnard College, New York, USA.
- 2023 **Teaching assistant at the Methods in Computational Neuroscience summer school**, Marine Biological Laboratory, Woods Hole, MA, USA.
- 2022 **Teaching assistant of Cognitive Science**, Barnard College, New York, USA.
- 2022 **Mentor for the Summer program within the Leadership Alliance Program**, Center for Theoretical Neuroscience, Columbia University, New York, USA.
- 2022 **Lecturer for the Advanced Neurotheory Course**, Center for Theoretical Neuroscience, Columbia University, New York, USA.
Lecture's title: The geometries of Abstraction

2014-2015 **Teaching Assistant of Calculus**, School of Physics and Astronomy, University of Birmingham, Birmingham, UK.

Journal Reviewer and Workshop organization

2025- **Reviewer for Nature Communications.**

2024- **Reviewer for COSYNE.**

2024- **Reviewer for Journal of Neuroscience.**

2023- **Reviewer for PNAS journal.**

2021- **Reviewer for PeerJ journal.**

2022 **Organizer of the workshop at COSYNE2022.**

Workshop title: "Is geometry all you need?"

2021-2022 **Organizer of the weekly Seminar at the Center for Theoretical Neuroscience,**
Columbia University, New York (USA)

Invited Talks, Research Visiting, and Poster presenter

2026 **Invited Speaker**, Workshop: "Renormalization Principles in Neural Systems", Cosyne, Lisbon, Portugal.

2025 **Invited Speaker**, Institute of Neuromodulation, Neurospin, Paris, France.

2025 **Invited Speaker**, Paris Brain Institute, Paris, France.

2025 **Invited Speaker**, Italian Academy of Advanced Studies, Columbia University, New York.

2025 **Invited Speaker**, IMT Advanced Studies Lucca, Italy.

2025 **Invited as Research Visitor**, Kavli Institute for Systems Neuroscience, Trondheim, Norway.

2025 **Invited as Co-chair of Biocomputation Session**, Mathematics of Neuroscience and AI Conference, Split, Croatia.

2025 **Kavli Institute for Systems Neuroscience**, Norway.

Invited Speaker to the Comp Neuro Week at KISN

2025 **Bernstein Conference**, Main, Germany.

Invited Speaker to the workshop "Relational Inference and knowledge composition via neuronal geometric representations"

2025 **Neuro-inspired AI**, La Sapienza, Rome, Italy.

Invited Speaker to the workshop "Neuro-inspired AI"

2025 **Mathematics for Neuroscience and AI**, Split, Croatia.

Invited Co-Chair of the session "Neural Data"

2025 **Invited Speaker**, Workshop: "Brain mechanisms of working memory: where do we stand?", Cosyne, Montreal, Canada.

2024 **AREADNE**, Milos, Greece.

Poster title: "Neural signatures of stress susceptibility and resilience in amygdala-hippocampal network"

2024 **COSYNE2024**, Lisbon, Portugal.

Poster title: "Neural signatures of stress susceptibility and resilience in amygdala-hippocampal network"

2023 **COSYNE2023**, Montreal, Canada.

Poster title: "Decoding stress susceptibility from activity in amygdala-ventral hippocampal network"

2022 **SFN 2022**, San Diego, USA.

Poster title: "Neural representational geometry correlates with behavioral differences between monkeys"

2022 **Neuronex meeting**, San Diego, USA.

Poster title: "Neural representational geometry correlates with behavioral differences between monkeys"

- 2022 **Swartz meeting**, Cold Spring Harbor Laboratory, Long Island, USA.
Talk title: "Neural representational geometry correlates with behavioral differences between monkeys"
- 2022 **Tri-Center Gatsby meeting**, Hebrew University, Jerusalem, Israel.
Talk title: "Neural representational geometry correlates with behavioral differences between monkeys"
- 2021 **SFN 2021**, online.
Poster title: "Stimulus and response encoding in a population of Purkinje cells in Crus I and Crus II of the cerebellum during learning of a visuomotor association task"
- 2021 **SFN 2021**, online.
Poster title: "Neural representational geometry correlates with behavioral differences between monkeys"
- 2018 **Italian National Congress in Neuroscience**, Ischia, Italy.
Poster title: "Autocorrelation structure in the macaque dorsolateral, but not orbital or polar, prefrontal cortex predicts response-coding strength in a visually cued strategy task"
- 2017 **Italian national Meeting of PhD students in Neuroscience**, Naples, Italy.
Poster title: "Neural intrinsic timescales in the macaque dorsal premotor cortex predict the strength of spatial response coding"

Grants, Fellowships and Awards

- 2025 **Research Bodini Fellowship at the Italian Academy in New York**, New York, USA.
- 2018 **"Avvio alla Ricerca" grant of Sapienza University of Rome**, Sapienza University of Rome, Rome, Italy.
Project title: "Neural correlates of rule switching in orbital prefrontal cortex"
- 2018 **Best Project Award at BCBT Summer School**, Institute for Bioengineering of Catalonia (IBEC), Barcelona, Spain.
Project title: "Evaluation of metacognitive abilities in an uncertain collaborative task"
- 2017 **Best Poster Award at Italian National Congress in Neuroscience**, Italian Society for Neuroscience, Ischia, Italy.
Poster title: "Autocorrelation structure in the macaque dorsolateral, but not orbital or polar, prefrontal cortex predicts response-coding strength in a visually cued strategy task"
- 2017 **Best Poster Award at National Meeting of PhD students in Neuroscience**, Italian Society for Neuroscience, Naples, Italy.
Poster title: "Neural intrinsic timescales in the macaque the strength of spatial response coding"
- 2013-2014 **Undergraduate research fellow at the National Laboratories of Nuclear Physics, INFN**, Rome, Italy.
- 2012-2013 **First classified for the grant "Best students" as undergraduate student, University Tor Vergata**, Rome, Italy.

List of Publications

Neuroscience publications

- 2025 F.Xia*, **V.Fascianelli***, N.Vishwakarma, F.G.Ghinger, A.O. Kwon, M.M. Gergues, L.K. Lalani, S.Fusi, M.A. Kheirbek, *Understanding the neural code of stress to control anhedonia.*, Nature.
*Equal contribution
- 2025 L.Vignozzi, S.Varani, A. Leparulo, **V. Fascianelli**, E.Beretta, S.Vassanelli, G. Deidda, M. Allegra, *Intra-hemispheric functional signatures predict motor recovery after stroke*, Under revision.

- 2025 **V.Fascianelli***, J. Munuera*, B. Wang, S. Bernardi, C. D. Salzman, S. Fusi, *Neural Geometry Dynamics Reveal Computational Roles In Multiple Brain Regions During Decision Making*, Under preparation.
**Equal contribution*
- 2024 **V.Fascianelli**, A.Battista, F.Stefanini, S.Tsujimoto, A.Genovesio, S.Fusi, *Neural representational geometries reflect behavioral differences in monkeys and recurrent neural networks*, Nature Communications.
- 2024 A.E.Ipata*, **V.Fascianelli***, C.I. De Zeeuw, N.Sendhilnathan, S. Fusi, M.E. Goldberg, *Purkinje cells in Crus I and II encode the visual stimulus and the impending choice as monkeys learn a reinforcement based visuomotor association task*, bioRxiv, Under review in Journal of Neuroscience.
** equal contribution*
- 2024 S.Nougaret, L.Ferrucci, F.Ceccarelli, S.Sacchetti, D.Benozzo, **V.Fascianelli**, R.C.Saunders, L.Renaud, A. Genovesio, *Neurons in the monkey frontopolar cortex encode learning stage and goal during a fast learning task*, PLoS Biology.
- 2023 F.Xia*, **V.Fascianelli***, N.Vishwakarma, F.G.Ghinger, S.Fusi, M.A.Kheirbek, *Neural signatures of stress susceptibility and resilience in the amygdala-hippocampal network*, bioRxiv.
** equal contribution*
- 2022 L.Ferrucci, S.Nougaret, F.Ceccarelli, S.Sacchetti, **V.Fascianelli**, D.Benozzo, A.Genovesio, *Social monitoring of actions in the macaque frontopolar cortex*, Progress in Neurobiology.
- 2021 S.Nougaret, **V.Fascianelli**, S.Ravel, A.Genovesio, *Intrinsic timescales across the basal ganglia*, Scientific Reports .
- 2020 **V.Fascianelli**, L.Ferrucci, S.Tsujimoto, A.Genovesio, *Neural correlates of strategy switching in the macaque orbital prefrontal cortex*, Journal of Neuroscience.
- 2019 **V.Fascianelli**, E.Marcos, S.Tsujimoto, A.Genovesio, *Autocorrelation structure in the macaque dorsolateral, but not orbital or polar, prefrontal cortex predicts response-coding strength in a visually cued strategy task*, Cerebral Cortex .
- 2018 R.Cirillo*, **V.Fascianelli***, L.Ferrucci, A.Genovesio, *Neural intrinsic timescales in the macaque dorsal premotor cortex predict the strength of spatial response coding*, iScience.
** equal contribution*

Physics selected publications¹

- 2024 **EC.Gil et al.**, *Measurement of the $K^+ \rightarrow \pi^+ \gamma\gamma$ decay*, Physics Letters B.
- 2023 **EC.Gil et al.**, *Performance of the NA62 trigger system*, Journal of High Energy Physics.
- 2023 **EC.Gil et al.**, *A search for the $K^+ \rightarrow \mu^- \nu e^+ e^+$ decay*, Physics Letters B.
- 2022 **EC.Gil et al.**, *A measurement of the $K^+ \rightarrow \pi^+ \mu^+ \mu^-$ decay*, Journal of High Energy Physics.

For a complete list of all publications refer to My Google Scholar page