

# Giorgio NICOLETTI



## PERSONAL DATA

---

PLACE AND DATE OF BIRTH: Dolo, Italy | 9<sup>th</sup> July 1995  
ADDRESS: Department of Physics and Astronomy "Galileo Galilei"  
Room 382  
Via Francesco Marzolo 8, 35131 Padova, Italy  
PHONE: +39 333 6751887  
PERSONAL WEBSITE: giorgionicoletti.github.io  
EMAIL: giorgio.nicoletti.1@phd.unipd.it

## EDUCATION

---

OCT 2019 - PRESENT



### PhD in PHYSICS

Laboratory of Interdisciplinary Physics, **University of Padova**

Supervisor: Prof. AMOS MARITAN

Co-supervisor: Prof. SAMIR SUWEIS

OCT 2017 - JULY 2019



### Master's Degree in PHYSICS

**University of Padova**, Padova

Thesis: *Scaling and renormalization group for models of neural activity.*

Advisor: Prof. AMOS MARITAN

Co-Advisor: Prof. SAMIR SUWEIS

FINAL GRADE: 110/110 *cum laude*

GPA: 29.93/30

SEPT 2018 - FEB 2019



### Erasmus semester

INTERNATIONAL MASTER IN PHYSICS OF COMPLEX SYSTEM, **Sorbonne University**, Paris Diderot University, Paris-Sud University, Paris

ECTS GPA: A/A

OCT 2014 - JULY 2017



### Bachelor's Degree in PHYSICS

**University of Padova**, Padova

Thesis: *Quantum Mechanics and de Finetti theorem. A Bayesian interpretation of quantum probability.*

Advisor: Prof. PIERALBERTO MARCHETTI

FINAL GRADE: 110/110 *cum laude*

GPA: 29.19/30

SEPT 2009 - JULY 2014

### High school diploma, Liceo Scientifico "U. Morin", Venice

Final essay: *The emergent universe. Beyond mechanicism: does something fundamental exist?*

FINAL GRADE: 100/100 *cum laude*

## PUBLICATIONS

---

In preparation (2022)	Giorgio Nicoletti, Daniel M. Busiello, Amos Maritan. <b>Information-driven phase transitions in optimal projections of underdamped dynamics.</b>
In preparation (2022)	Giacomo Barzon, Giorgio Nicoletti, Benedetta Mariani, Marco Formentin, Samir Suweis. <b>Emergence and disruption of a bistable region in a whole-brain stochastic model.</b>
PHYS. REV. LETT. 127, 228301 (2021)	Giorgio Nicoletti, Daniel M. Busiello. <b>Mutual information disentangles interactions from changing environments</b> - Physical Review Letters editors' suggestion.
ARXIV 2110.10014 (2021)	Giorgio Nicoletti, Leonardo Saravia, Ferdinando Momo, Samir Suweis. <b>The emergence of scale-free fire outbreaks in Australia.</b>
FRONT. SYST. NEUROSCIENCE 15:709677 (2021)	Benedetta Mariani, Giorgio Nicoletti, Marta Bisio, Marta Maschietto, Oboe Roberto, Alessandro Leparulo, Samir Suweis, Stefano Vassanelli. <b>Neuronal avalanches across the rat somatosensory barrel cortex and the effect of single whisker stimulation.</b>
ARXIV 2105.05070 (2021)	Benedetta Mariani, Giorgio Nicoletti, Marta Bisio, Marta Maschietto, Stefano Vassanelli, Samir Suweis. <b>On the critical signatures of neural activity.</b>
PHYS. REV. RESEARCH 2, 023144 (2020)	Giorgio Nicoletti, Samir Suweis, Amos Maritan. <b>Scaling and criticality in a phenomenological renormalization group.</b>

## CONTRIBUTED TALKS AND POSTERS

---

25 <sup>TH</sup> - 29 <sup>TH</sup> OCT 2021 CONFERENCE	<b>Conference on Complex Systems 2021</b> , Lyon, France. <b>CONTRIBUTED TALK:</b> <i>Disentangling the role of external and intrinsic dynamics on the critical signatures of neural activity.</i> <b>CONTRIBUTED TALK:</b> <i>Modeling the emergence of scale-free fire outbreaks in Australia.</i> <b>CONTRIBUTED POSTER:</b> <i>Disentangling internal interactions from noisy environments through mutual information.</i>
22 <sup>ND</sup> - 25 <sup>TH</sup> JUNE 2021 CONFERENCE	<b>Stochastic Models and Experiments in Ecology and Biology 2021</b> , ECLT, Venice, Italy. <b>CONTRIBUTED POSTER:</b> <i>Modeling the emergence of scale-free fire outbreaks in Australia.</i>
6 <sup>TH</sup> - 9 <sup>TH</sup> OCT 2020 CONFERENCE	<b>Brain Criticality Virtual Meeting</b> , sponsored by the Brain Initiative and the Marie Skłodowska-Curie Actions. <b>CONTRIBUTED POSTER:</b> <i>What can a phenomenological Renormalization Group teach us about criticality in a network of neurons?</i>
29 <sup>TH</sup> SEPT 2020 1 <sup>ST</sup> OCT 2020 CONFERENCE	<b>Bernstein Conference 2020</b> , organized by the Bernstein Network. <b>CONTRIBUTED POSTER:</b> <i>Scaling and criticality in a phenomenological renormalization group.</i>

1<sup>ST</sup> - 3<sup>RD</sup> JULY 2019 **First Italian Conference on Complex Systems**, Bruno Kessler Foundation, Trento.  
**CONFERENCE**  
**CONTRIBUTED POSTER:** *Scaling and Renormalization Group for the activity of neurons.*

## ORGANIZED CONFERENCES

---

27<sup>TH</sup> OCT 2021 **Robustness, Adaptability and Critical Transitions in Living Systems**  
**SATELLITE** **Satellite** held at the Conference on Complex Systems 2021, Lyon, France. Main organizer.

## ATTENDED CONFERENCES, SCHOOLS AND WORKSHOPS

---

30<sup>TH</sup> MAY 2021 **The Beg Rohu Summer School “Statistical Mechanics and Emergent Phenomena in Biology”**, Beg Rohu, Saint Pierre Quiberon, France.  
12<sup>TH</sup> JUNE 2021 **SCHOOL**

30<sup>TH</sup> NOVEMBER 2020 **Winter School on Quantitative Systems Biology**, organized by the International Center for Theoretical Physics, Italy, online.  
18<sup>TH</sup> DECEMBER 2020 **SCHOOL**

18<sup>TH</sup> - 23<sup>RD</sup> JULY 2020 **29th Annual Computational Neuroscience Meeting**, organized by the Organization for Computational Neuroscience, online.  
**CONFERENCE**

29<sup>TH</sup> JUNE **Youth in High Dimensions: Machine Learning, High Dimensional Statistics and Inference for the New Generation**, organized by the International Center for Theoretical Physics, Italy, online.  
3<sup>RD</sup> JULY 2020 **WORKSHOP**

9<sup>TH</sup> - 16<sup>TH</sup> SEPT 2019 **Computational and Theoretical Models in Neuroscience Summer School**, Venice, Italy.  
**SCHOOL**  
**WORKING GROUP PROJECT:** “Spiking models of metastable activity: theory and applications” with prof. Luca Mazzucato, University of Oregon.

## TEACHING EXPERIENCE AND STUDENT SUPERVISION

---

2021/22 **Co-supervisor of one master’s thesis. Supervision of two students research projects, Master’s Degree in Physics of Data, University of Padova.**  
**SUPERVISION**

2021/22, 1<sup>ST</sup> SEMESTER **Models of Theoretical Physics**, Master’s Degree in Physics of Data, University of Padova. *Teaching assistant (20 hours).*  
**TEACHING**

2021/22, 1<sup>ST</sup> SEMESTER **IT and Bioinformatics**, Bachelor’s Degree in Molecular Biology, University of Padova. *Teaching assistant (20 hours) for the Python programming language.*  
**TEACHING**

2020/21, 1<sup>ST</sup> SEMESTER **IT and Bioinformatics**, Bachelor’s Degree in Biology, University of Padova. *Teaching assistant (21 hours) for the Python programming language.*  
**TEACHING**

21<sup>ST</sup> - 30<sup>TH</sup> OCT 2020 **Innovative University Teaching and Learning Physics**, University of Padova.  
ATTENDED WORKSHOP

## SERVICE AND MEMBERSHIPS

---

2021 - PRESENT Member of the **Complex Systems Society**.

2021 - PRESENT Elected representative in the **PhD Program Committee** and in the **Academic Board of the PhD program**, Department of Physics and Astronomy, University of Padova.

## HONORS AND AWARDS

---

20<sup>TH</sup> DEC 2021 **Winner of the SECS grant**, provided by the *Young Researchers in Complex Systems Society*.

22<sup>ND</sup> NOV 2021 **Physical Review Letters Editors' Suggestion, viewpoint in "Physics" magazine and highlight in PRL's weekly tip sheet for reporters** for the paper *Mutual information disentangles interactions from changing environments*, Phys. Rev. Lett. 127, 228301 (2021).

25<sup>TH</sup> JUNE 2021 **Best Poster Award** for the poster "Modeling the emergence of scale-free fire outbreaks in Australia" at *Stochastic Models and Experiments in Ecology and Biology 2021*, ECLT, Venice, Italy. **Sponsored by MDPI**.

2020 Graduate Alumni Award for the best students who graduated in the academic year 2018/2019, **University of Padova**.

15<sup>TH</sup> JULY 2019 First student to graduate in the Master of Science in Physics, **University of Padova**.

FEB 2017 Winner of the grant for the best students of scientific first cycle degrees, granted by **University of Padova**.

10<sup>TH</sup> OCT 2014 Winner of the award for the high school students with the highest final grade and honors, granted by **MIUR**, the Italian Ministry for Education, University and Research.

## IT SKILLS

---

ADVANCED KNOWLEDGE Python

GOOD KNOWLEDGE Mathematica,  $\text{\LaTeX}$

BASIC KNOWLEDGE C++, ROOT, Matlab, LINUX, HTML, CSS

2020 - PRESENT Web curator and administrator of the website of the Laboratory of Interdisciplinary Physics, University of Padova, and of the related academic initiatives (workshops, conferences, etc.).

## LANGUAGES

---

ITALIAN: Native.  
ENGLISH: Fluent, C1 level per the Cambridge English assessment.  
FRENCH: Intermediate knowledge, B1-B2 level per the Erasmus OLS language assessment.