

Stéphane d'Ascoli

Born March 9th 1996,
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EDUCATION

- 2019 – **Ph.D. in Theoretical Physics / Artificial Intelligence**, supervised by **G. Biroli / Levent Sagun**
Laboratoire de Physique de l'ENS / Facebook Artificial Intelligence Research, Paris
Theory of deep learning from a theoretical physics point of view
- 2018 – 2019 **Pre-Ph.D. in Theoretical Physics / Artificial Intelligence**, supervised by **G. Biroli**
Laboratoire de Physique de l'ENS, Paris
Member of the Simons Collaboration on Cracking the Glass Problem
Theory of deep learning from a theoretical physics point of view
- 2016 – 2018 **Master's degree in Theoretical Physics**
ENS Ulm, Paris
Obtained with first class honours (average grade : 16.48/20)
- 2015 – 2016 **Bachelor's degree in Fundamental Physics**
ENS Ulm, Paris
Obtained with first class honours (average grade : 17.00/20)
- 2015 **Entered the École Normale Supérieure (ENS)**
ENS Ulm, Paris
Ranked 6th nationwide, accepted in all other top French schools including École Polytechnique
- 2013 – 2015 **“Classe Préparatoire aux Grandes Écoles”**
Lycée Thiers, Marseille
Intensive two-year undergraduate course in Mathematics, Physics and Chemistry, in preparation for the nationwide competitive entrance exams for the top French schools
- 2013 **Science Baccalaureate, specialized in maths**
Lycée Sainte-Marie, Aubagne
Obtained with first class honours (average grade : 19.63/20)

EXPERIENCE

- Apr – Aug 2019 **Machine learning research internship, supervised by M. Lelarge and A. Coucke**
Inria and Snips, Paris
Variational Auto-Encoders for Text Generation
GitHub repository open-sourced at github.com/snipsco/automatic-data-generation
- Apr – Jul 2018 **Research internship, supervised by G. Biroli,**
ENS Ulm, Paris / CEA, Saclay
Member of the Simons Collaboration on Cracking the Glass Problem
Loss landscape of deep neural networks
- Feb – Jul 2017 **Research internship, supervised by S. Noble and M. Campanelli,**
NASA Goddard Space Flight Center, Greenbelt, Maryland / Center for Computational Relativity and Gravitation, Rochester, New York
Electromagnetic counterparts to gravitational waves in supermassive binary black hole mergers
- Jun – Jul 2016 **Research internship, supervised by C. Schimd**
Laboratoire d'Astrophysique de Marseille, Marseille
Cosmological simulations for the spectro-imager BATMAN

PUBLICATIONS

Peer-reviewed :

- Stéphane d'Ascoli, Scott C Noble, Dennis B Bowen, Manuela Campanelli, Julian H Krolik, and Vassilios Mewes. Electromagnetic emission from supermassive binary black holes approaching merger. *The Astrophysical Journal*, 865(2) :140, 2018
- Mario Geiger, Stefano Spigler, Stéphane d'Ascoli, Levent Sagun, Marco Baity-Jesi, Giulio Biroli, and Matthieu Wyart. Jamming transition as a paradigm to understand the loss landscape of deep neural networks. *Physical Review E*, 100(1) :012115, 2019
- S Spigler, M Geiger, S d'Ascoli, L Sagun, G Biroli, and M Wyart. A jamming transition from under-to over-parametrization affects generalization in deep learning. *Journal of Physics A : Mathematical and Theoretical*, 52(47) :474001, 2019
- Mario Geiger, Arthur Jacot, Stefano Spigler, Franck Gabriel, Levent Sagun, Stéphane d'Ascoli, Giulio Biroli, Clément Hongler, and Matthieu Wyart. Scaling description of generalization with number of parameters in deep learning. *Journal of Statistical Mechanics : Theory and Experiment*, 2020(2) :023401, 2020
- Stéphane d'Ascoli, Levent Sagun, Giulio Biroli, and Joan Bruna. Finding the needle in the haystack with convolutions : on the benefits of architectural bias. In *Advances in Neural Information Processing Systems*, pages 9330–9340, 2019
- Stéphane d'Ascoli, Maria Refinetti, Giulio Biroli, and Florent Krzakala. Double trouble in double descent : Bias and variance (s) in the lazy regime. In *International Conference on Machine Learning*, pages 9210–9220, 2020

Preprints :

- Stéphane d’Ascoli, Alice Coucke, Francesco Caltagirone, Alexandre Caulier, and Marc Lelarge. Conditioned query generation for task-oriented dialogue systems. *arXiv preprint arXiv :1911.03698*, 2019
Accepted at SLSP 2020
- Stéphane d’Ascoli, Levent Sagun, and Giulio Biroli. Triple descent and the two kinds of overfitting : Where & why do they appear ? *arXiv preprint arXiv :2006.03509*, 2020
Accepted at NeurIPS 2020

Books :

- Stéphane d’Ascoli. *Comprendre la révolution de l’intelligence artificielle*. First, 2020
- Stéphane d’Ascoli. *L’Intelligence Artificielle en 5 minutes par jour*. First, 2020
- Stéphane d’Ascoli and Arthur Touati. *Voyage au coeur de l’espace-temps*. First, 2021

TEACHING

- Fall-Winter 2019 **Deep Learning M1 Course**
ENS Ulm, Paris
Teacher assistant of Marc Lelarge for the graduate course on theory and applications of deep learning
- Sep 2017 – **“Classe Préparatoire aux Grandes Écoles” examiner**
Lycée Henri-IV, Lycée Saint-Louis, and Lycée Michelet, Paris
Oral examinations in Physics given on a weekly basis to undergraduate students

TALKS

- Aug 2020 **On Double and Triple descent in deep learning**
Ecole de Physique des Houches, Les Houches
Summer School on Statistical Physics and Machine Learning
- Jul 2020 **Bias and Variances in deep learning**
Online
ICML 2020
- Jun 2020 **Reconciling double descent with older ideas**
Abdus Salam International Centre for Theoretical Physics, Trieste
Youth in High-dimensions : Machine Learning, High-dimensional Statistics and Inference for the New Generation
- Jun 2020 **Triple descent and the two kinds of overfitting**
Facebook, Paris
FAIR reading group
- Dec 2019 **Bias and Variances in deep learning**
ENS Ulm, Paris
Golosino Machine Learning Seminar
- Jul 2019 **Architectural priors in deep learning**
ENS Ulm, Paris
Golosino Machine Learning Seminar

- Jul 2019 **Architectural priors in deep learning**
Istanbul Center for Mathematical Sciences, Istanbul
 Theoretical Advances in Deep Learning Workshop
- Jun 2019 **Generative models in deep learning**
Université Pierre et Marie Curie, Paris
 Inria Summer School on Deep Learning
- Jun 2019 **Semi-supervised text generation**
Snips, Paris
 Machine Learning Study Group Seminar

REVIEWING DUTIES

- Information and Inference : a journal of the IMA

CONFERENCES AND WORKSHOPS

- Jul 2020 **ICML 2020**
Online
- Dec 2019 **NeurIPS 2019**
Convention and Exhibition Centre, Vancouver
- Jul – Aug 2019 **Theoretical Advances in Deep Learning**
Center for Mathematical Sciences, Istanbul
- Feb – Mar 2019 **The Rough High-Dimensional Landscape Problem**
Kavli Institute for Theoretical Physics, University of California at Santa Barbara
- Dec 2018 **NeurIPS 2018**
Palais des Congrès, Montréal
- Sep 2018 **Disordered Serendipity**
University La Sapienza, Rome
- Jul 2018 **Beg Rohu Summer School**
Beg Rohu Summer School, Saint-Pierre Quiberon

SKILLS

- Languages
 - French : fluent *Father's first language*
 - English : fluent *Mother's first language*
 - German : proficient *Attended school near Stuttgart*
- Programming
 - Python, C/C++, Matlab, Mathematica...
 - Familiar with Unix systems and multiprocessing
 - Solid knowledge of machine learning algorithms (sklearn, keras, pytorch...)
- Driving
 - Current full European driving licence

IMPLEMENTATIONS

- Jun 2017 **Bothros**
NASA Goddard Space Flight Center, Rochester
A fully relativistic ray-tracing code for ray-tracing simulations of binary black holes
- Jun 2019 **Conditional variational auto-encoder for semi-supervised text generation.**
Snips, Paris
Open-sourced at <https://github.com/snipsco/automatic-data-generation>

INTERESTS

- Music Clarinet :
* 2019 : Second prize, Amiens Clarinet Competition
* 2017-present : Solo clarinet at the “Philharmonie du COGE”
* 2014 : “Diplôme d’Etudes Musicales” (Toulon Conservatoire)
* 2012 : First prize, Hyères Clarinet Competition
- Sport Tennis, squash, badminton, cycling, climbing, swimming, surf, snowboard...
- Outreach Published two general public books on Artificial Intelligence
- Other Economics, neuroscience, philosophy, musicology *Courses followed at ENS*
Cinema, painting, pottery, theatre...