# Anne-Florence BITBOL

Tenure-Track Assistant Professor, Institute of Bioengineering, School of Life Sciences, EPFL

## Personal information

**Date of birth:** November 19, 1986 (age: 38)
**Nationality:** French
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**Website:** `https://www.epfl.ch/labs/bitbol-lab/`
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## Education

**2012** PhD in Physics, *summa cum laude* — Université Paris-Diderot, Paris, France
**2009** MSc in Physics, *summa cum laude* — ENS & Université Pierre et Marie Curie, Paris, France
**2007** BSc in Physics, *summa cum laude* — ENS Lyon & Université Claude Bernard, Lyon, France
**2006** Admitted to École Normale Supérieure (ENS) Lyon, France (rank: 6th out of ∼1000 applicants)

## Academic positions

**Since February 2020:** Tenure-Track Assistant Professor, Institute of Bioengineering, School of Life Sciences, École Polytechnique Fédérale de Lausanne (EPFL), Lausanne, Switzerland
& Swiss Institute of Bioinformatics (SIB) group leader since February 2021
**2016-2020:** Tenured CNRS Researcher, Laboratoire Jean Perrin, CNRS – Sorbonne Université (formerly Université Pierre et Marie Curie), Paris, France (rank: 1st out of ∼100 applicants)
**2012-2016:** Postdoctoral Research Fellow, Biophysics Theory group, Lewis-Sigler Institute for Integrative Genomics & Physics Department, Princeton University, NJ, USA
*Topics:* Multi-protein complexes: functions and constraints; Evolution of subdivided populations
*Principal investigators:* Ned Wingreen, William Bialek and Curtis Callan
**2009-2012:** PhD student, Laboratoire Matière et Systèmes Complexes, Université Paris-Diderot, Paris, France
*Topic:* Statistics and dynamics of complex membranes – *Advisor:* Jean-Baptiste Fournier

## Funding

**2025-2029** SNSF (Swiss National Science Foundation) Project Grant, PI, 648 kCHF
**2024-2025** CZI (Chan-Zuckerberg Initiative) Theory for Biology Grant, PI, 200 kUSD
**2023-2027** SNSF (Swiss National Science Foundation) Project Grant, PI, 584 kCHF
**2020-2026** ERC (European Research Council) Starting Grant, PI, 1.5 M€ (success rate ∼14%)
**2020** ANR (French National Research Agency) Young Researcher Grant, PI, 286 k€ (success rate ∼15%) — *Declined (cannot be held together with an ERC grant)*
**2020** Emergence grant from Sorbonne Université, PI, 70 k€
**2018-2019** Collaborative grant from IBPS, Sorbonne Université, PI, co-PI: Martin Weigt, 10 k€
**2013-2016** HFSP Cross-Disciplinary Fellowship (success rate ∼10%)
**2010-2012** Teaching assistantship, Université Paris-Diderot
**2010-2012** PhD scholarship, ENS Lyon
**2006-2009** Four-year scholarship, ENS Lyon (success rate ∼10%)

## Awards

**2025** Reviewer Excellence award, PRX Life, American Physical Society
**2023** Best teacher award, Life Sciences Engineering teaching section, EPFL
**2023** Early Career Scientist Prize in Biological Physics for 2020, International Union of Pure and Applied Physics
**2014** Michelin Young Researcher Prize (PhD prize), French Physical Society
**2013** Louis Forest PhD Thesis Prize in the Life Sciences, Chancellery of the Universities of Paris
**2010** Second Ben Widom prize (clearest contributed talks), International School of Physics Enrico Fermi, CLXXVI Course, Complex materials in physics and biology, Varenna (Italy)
**2004** First prize in Italian in a national high-school competitive exam (Concours Général)
**2003** Second prize in Latin in a national high-school competitive exam (Concours Général)

# Teaching

### EPFL teaching

**Since 2024**  Lecturing and course construction, population genetics and phylogeny inference sections of the mandatory class on "Genomics and bioinformatics", EPFL (MSc level; 6h lectures + 6h problems)

**Since 2024**  Lecturing and course construction, biological data section of "Lecture series on scientific machine learning", EPFL (PhD level; 4h lectures)

**Since 2022**  Main organizer of the EDCB (computational biology) graduate school seminar series, EPFL (PhD level; 1 credit).

**Since 2022**  Responsible of the *Biological Data Science* specialization, Life Sciences Engineering MSc, EPFL.

**Since 2021**  Lecturing and course construction, "Randomness and information in biological data", EPFL (third-year BSc level, also open to MSc students; 4 credits, 28h lectures + 28h problems)

**Since 2021**  Contributions to "Scientific literature analysis in computational molecular biology", EPFL (MSc level; 4h lectures)

**2021**  Accompanied the class trip of the Life Sciences Engineering BSc students

**Since 2020**  Ad-hoc contributions to EPFL classes: "Selected Topics in the Life Sciences" (MSc level; one lecture); "Advances in Physics" (PhD level; one lecture).

### Teaching outside EPFL

**Since 2023**  Invited lectures, "Quantitative Evolution", Physics MSc, ENS Lyon, France (8h lectures/year).

**2018-2020**  Tutorials, "Mathematical Methods" (fourth-year level), ESPCI, Paris, France (10h/year)

**2016-2018**  Problem classes, "Statistical Physics" (third-year level), ESPCI, Paris, France (10h/year)

**2016-2017**  Problem classes, "Numerical Simulation for Statistical Physics", MSc in Physics of Complex Systems (fifth-year level), Sorbonne Université, Paris, France (15h/year)

**2016**  Tutorials, "Statistical Physics" (third-year level), ESPCI, Paris, France (16h/year)

**2010-2012**  Teaching assistant, Université Paris-Diderot, Paris, France. Problem classes, "Physics for Biologists" (first-year level) and "Statistical Physics" (third-year level) (64h/year)

**2009-2010**  Tutorials, Physics & Chemistry (first-year level), Lycée Saint-Louis, Paris, France (30h/year)

# Service

### EPFL service

- Committee for the new PhD Program in Life Sciences Engineering
- Life Sciences Engineering Teaching Section committee, since 2024
- Jury member for the Institute of Bioengineering *Jeffrey Hubbell and Melody Swartz Young Bioengineer Award*, 2024
- Organizer of the Physics of Living Systems (PoLS) monthly EPFL symposium, since 2022
- Faculty search committees, three since 2021
- ELISIR (early life science independent research) fellowship committee (yearly search; evaluation), since 2021
- EDCB (graduate school in Computational Biology) committee (search for PhD students), since 2020
- SV green team, since 2020
- SV gender and minority committee, since 2020
- WISH (Women In Sciences and Humanities) Foundation bureau, since 2020
- CIS (Center for Intelligent Systems) scientific committee, 2021-2023
- AI4Science fellowship committee (search for independent postdoctoral fellows), 2021-2022
- Co-organizer of the Physics of Living Systems (PoLS) virtual seminar series (2021)
- Co-organizer of the 2021 SV Faculty virtual retreat
- Student evaluation and mentoring: Internal examiner for 7 PhD theses, jury member or president for 12 PhD candidacy exams, EPFL supervisor of 11 external MSc projects, mentor of 9 PhD students and 1 junior group leader

### Organization of scientific meetings

**2026**  Co-chair of the scientific committee, ECCB (European Conference on Computational Biology) 2026, Geneva, Switzerland (organized by SIB; other co-chair: Niko Beerenwinkel, ETHZ) – *forthcoming*

**2026**  Member of the scientific committee of the KITP program on "New trends in out-of-equilibrium dynamics", UC Santa Barbara, CA, USA – *forthcoming*

**2025**  Member of the "Biological physics" topic committee, StatPhys29 conference, Florence, Italy – *forthcoming*

**2025**  Chair of the "Evolution and Environmental Bioinformatics" session at the Basel Computational Biology Conference (BC2), Switzerland – *forthcoming*

**2024** Co-organizer of a one-week workshop at the Schloss Dagstuhl – Leibniz Center for Informatics, Dagstuhl, Germany, "Machine Learning for Protein-Protein and Protein-Ligand Interactions", with Tomáš Pluskal (Czech Academy of Sciences) and Jennifer Listgarten (UC Berkeley, USA)

**2024** Co-organizer of a four-week workshop at the Aspen Center for Physics in Aspen, CO, USA, "The physics of biological data analysis", with Marianne Bauer (TU Delft, Netherlands), Ilya Nemenman (Emory University, USA) and Greg Stephens (VU Amsterdam, Netherlands & OIST Graduate University, Japan)

**2023** Co-organizer of a four-week summer school in Les Houches, France, "Theoretical Biological Physics", with Thierry Mora (CNRS – ENS, France), Ilya Nemenman (Emory University, USA) and Aleksandra Walczak (CNRS – ENS, France)

**2022** Member of the Scientific Committee of a one-week spring school co-organized by the SIB Swiss Institute of Bioinformatics, the NCCR Microbiomes, and the NCCR AntiResist, in Nottwil, Switzerland, "Bioinformatics and Computational Approaches in Microbiology".

**2021** Co-organizer of a six-week workshop at Institut Henri Poincaré (IHP) in Paris, France, "Quantitative Evolution, Phylogeny and Ecology: from models to data and back", with Claude Loverdo (CNRS – Sorbonne Université, France), Mikhail Tikhonov (Washington University in St-Louis, USA) and Aleksandra Walczak (CNRS – ENS, France). *Turned into a fully online program due to the pandemic.*

**Since 2019** Board Member, Q-Bio conference (yearly international quantitative biology conference attended by ∼200 persons)

**2019** Program Committee Chair, Q-Bio conference (San Francisco, CA)

**2015-2020** Program Committee Member, Q-Bio conference

## Other external service

**Committees:** Scientific Advisory Board of the Max Planck Institute for Evolutionary Biology (since 2025); Selection of the IUPAP Medal for the Physics of Life awardee (2023); Faculty Hiring committee at the University of Lausanne (2023)

**Editorial boards:** Reviewing editor at eLife (since 2022); guest editor at PNAS (2023)

**Reviewing of papers:** Nature Communications, PNAS, eLife, PLOS Computational Biology, Bioinformatics, Nucleic Acids Research, American Naturalist, Current Opinion in Structural Biology, Current Genomics, Neuroscience, Biophysical Journal, Physical Biology, Journal of Theoretical Biology, Physical Review Letters, Physical Review X, PRX Life, Physical Review E, European Physical Journal

**Reviewing of grants:** ANR (France), ISF (Israel), NWO (Netherlands)

**Student evaluation:** PhD thesis examiner for 10 external PhDs (7 in France, 2 in Switzerland, 1 in Germany); PhD committee member for 4 external PhDs (3 in Switzerland, 1 in France)

**Mentoring:** Mentor in the ETH Domain "Fix the leaky pipeline" program, aiming to foster the career growth of junior female researchers

## Languages

**French:** native speaker
**English:** fluent (TOEIC score: 990/990, June 2012)
**Italian:** fluent

## Publications

In this list, my name is underlined; * denotes equal contributions, while § indicates corresponding author(s).

### Articles in peer reviewed journals

1. D. Sgarbossa and A.-F. Bitbol§, *RAG-ESM: Improving pretrained protein language models via sequence retrieval*, PRX Life 3(3): 033013 (2025)

2. D. Sgarbossa*, C. Malbranke*, and A.-F. Bitbol§, *ProtMamba: a homology-aware but alignment-free protein state space model*, Bioinformatics 41(6): btaf348 (2025)

3. C. Fruet, E.L. Müller, C. Loverdo and A.-F. Bitbol§, *Spatial structure facilitates evolutionary rescue by drug resistance*, PLOS Computational Biology 21(4): e1012861 (2025)

4. R. Servajean, A. Alexandre and A.-F. Bitbol§, *Impact of complex spatial population structure on early and long-term adaptation in rugged fitness landscapes*, Evolution 79(6): 935–950 (2025)

5. A. Alexandre, A. Abbara, C. Fruet, C. Loverdo and A.-F. Bitbol§, *Bridging Wright-Fisher and Moran models*, Journal of Theoretical Biology 599: 112030 (2025)

6. U. Lupo§, D. Sgarbossa, M. Milighetti and A.-F. Bitbol§, *DiffPaSS—High-performance differentiable pairing of protein sequences using soft scores*, Bioinformatics 41(1): btae738 (2025)

7. B. Borges*, N. Foroutan*, D. Bayazit*, A. Sotnikova*, [19 other authors], A. Bosselut§, EPFL Grader Consortium, EPFL Data Consortium [including <u>A.-F. Bitbol</u>], *Could ChatGPT get an engineering degree? Evaluating higher education vulnerability to AI assistants*, Proceedings of the National Academy of Sciences, 121(49): e2414955121 (2024)

8. N. Dietler, A. Abbara, S. Choudhury and <u>A.-F. Bitbol</u>§, *Impact of phylogeny on the inference of functional sectors from protein sequence data*, PLOS Computational Biology 20(9):e1012091 (2024)

9. A. Abbara, L. Pagani, C. García-Pareja and <u>A.-F. Bitbol</u>§, *Mutant fate in spatially structured populations on graphs: connecting models to experiments*, PLOS Computational Biology 20(9):e1012424 (2024)

10. S.B. Otto, R. Servajean, A. Lemopoulos, <u>A.-F. Bitbol</u> and M. Blokesch§, *Interactions between pili affect the outcome of bacterial competition driven by the type VI secretion system*, Current Biology 34:1-15 (2024)

11. U. Lupo*§, D. Sgarbossa*and <u>A.-F. Bitbol</u>§, *Pairing interacting protein sequences using masked language modeling*, Proceedings of the National Academy of Sciences, 121(27):e2311887121 (2024)

12. A. Moawad, A. Abbara and <u>A.-F. Bitbol</u>§, *Evolution of cooperation in deme-structured populations on graphs*, Physical Review E 109(2):024307 (2024)

13. B. Spreng, H. Berthoumieux, A. Lambrecht, <u>A.-F. Bitbol</u>§, P.M. Neto§and S. Reynaud§, *Universal Casimir attraction between filaments at the cell scale*, New Journal of Physics 26(1):013009 (2024)

14. A. Abbara§, and <u>A.-F. Bitbol</u>§, *Frequent asymmetric migrations suppress natural selection in spatially structured populations*, PNAS Nexus, 2(11):pgad392 (2023)

15. R. Servajean and <u>A.-F. Bitbol</u>§, *Impact of population size on early adaptation in rugged fitness landscapes*, Philosophical Transactions of the Royal Society B: Biological Sciences, 378: 20220045 (2023)

16. C.A. Gandarilla-Pérez, S. Pinilla, <u>A.-F. Bitbol</u>§ and M. Weigt§, *Combining phylogeny and coevolution improves the inference of interaction partners among paralogous proteins*, PLOS Computational Biology 19(3): e1011010 (2023)

17. N. Dietler, U. Lupo and <u>A.-F. Bitbol</u>§, *Impact of phylogeny on structural contact inference from protein sequence data*, Journal of the Royal Society Interface 20(199):20220707 (2023)

18. D. Sgarbossa, U. Lupo§ and <u>A.-F. Bitbol</u>§, *Generative power of a protein language model trained on multiple sequence alignments*, eLife 12:e79854 (2023)

19. U. Lupo§, D. Sgarbossa and <u>A.-F. Bitbol</u>§, *Protein language models trained on multiple sequence alignments learn phylogenetic relationships*, Nature Communications 13(1):6298 (2022)

20. A. Gerardos, N. Dietler and <u>A.-F. Bitbol</u>§, *Correlations from structure and phylogeny combine constructively in the inference of protein partners from sequences*, PLOS Computational Biology 18(5):e1010147 (2022)

21. D. Labavić, C. Loverdo*§ and <u>A.-F. Bitbol</u>*§, *Hydrodynamic flow and concentration gradients in the gut enhance neutral bacterial diversity*, Proceedings of the National Academy of Sciences 119(1):e2108671119 (2022)

22. A. Colavin*, E. Atolia*, <u>A.-F. Bitbol</u> and K.C. Huang§, *Extracting the phylogenetic dimension of coevolution reveals hidden functional signal*, Scientific Reports 12(1):1-19 (2022)

23. L. Marrec, I. Lamberti and <u>A.-F. Bitbol</u>§, *Toward a universal model for spatially structured populations*, Physical Review Letters 127(21):218102 (2021)

24. P. Ortet, S. Fochesato, <u>A.-F. Bitbol</u>, D.E. Whitworth, D. Lalaouna, C. Santaella, T. Heulin, W. Achouak and M. Barakat§, *Evolutionary history expands the range of signaling interactions in hybrid multikinase networks*, Scientific Reports 11:11763 (2021)

25. L. Marrec and <u>A.-F. Bitbol</u>§, *Adapt or perish: Evolutionary rescue in a gradually deteriorating environment*, Genetics 216(2):573-583 (2020)

26. N. Dietler*, M. Minder*, V. Gligorovski, A.M. Economou, D.A.H.L. Joly, A. Sadeghi, C.H.M. Chan, M. Koziński, M. Weigert, <u>A.-F. Bitbol</u> and S. J. Rahi§, *A convolutional neural network segments yeast microscopy images with high accuracy*, Nature Communications 11(1):1-8 (2020)

27. N. Patil, S. Bonneau, F. Joubert, <u>A.-F. Bitbol</u> and H. Berthoumieux§, *Mitochondrial cristae modeled as an out-of-equilibrium membrane driven by a proton field*, Physical Review E 102(2): 022401 (2020)

28. L. Marrec and <u>A.-F. Bitbol</u>§, *Resist or perish: Fate of a microbial population subjected to a periodic presence of antimicrobial*, PLOS Computational Biology 16(4):e1007798 (2020)

29. C.A. Gandarilla-Pérez, P. Mergny, M. Weigt§ and <u>A.-F. Bitbol</u>§, *Statistical physics of interacting proteins: impact of dataset size and quality assessed in synthetic sequences*, Physical Review E 101(3):032413 (2020)

30. P. Thomen, J.D.P. Valentin, <u>A.-F. Bitbol</u> and N. Henry§, *Spatiotemporal pattern formation in E. coli biofilms explained by a simple physical energy balance*, Soft Matter 16(2):494-504 (2020)

31. G. Marmier, M. Weigt and <u>A.-F. Bitbol</u>§, *Phylogenetic correlations can suffice to infer protein partners from sequences*, PLOS Computational Biology 15(10):e1007179 (2019)

32. F. Bansept\*, L. Marrec\*, <u>A.-F. Bitbol</u>§ and C. Loverdo§, *Antibody-mediated cross-linking of gut bacteria hinders the spread of antibiotic resistance*, Evolution 73(6):1077-1088 (2019)
    Selected for a highlight

33. S.-W. Wang\*, <u>A.-F. Bitbol</u>\*§ and N.S. Wingreen§, *Revealing evolutionary constraints on proteins through sequence analysis*, PLOS Computational Biology 15(4):e1007010 (2019)

34. <u>A.-F. Bitbol</u>§, *Inferring interaction partners from protein sequences using mutual information*, PLOS Computational Biology 14(11):e1006401 (2018)

35. L. Marrec and <u>A.-F. Bitbol</u>§, *Quantifying the impact of a periodic presence of antimicrobial on resistance evolution in a homogeneous microbial population of fixed size*, Journal of Theoretical Biology 457:190-198 (2018)

36. P. Thomen, J. Robert, A. Monmeyran, <u>A.-F. Bitbol</u>, C. Douarche, N. Henry§, *Bacterial biofilm under flow: First a physical struggle to stay, then a matter of breathing*, PLOS ONE, 12(4):e0175197 (2017)

37. <u>A.-F. Bitbol</u>§, R.S. Dwyer, L.J. Colwell§ and N.S. Wingreen§, *Inferring interaction partners from protein sequences*, Proceedings of the National Academy of Sciences, 13(43):12180-12185 (2016)

38. <u>A.-F. Bitbol</u>§ and N.S. Wingreen§, *Fundamental constraints on the abundances of chemotaxis proteins*, Biophysical Journal 108(5):1293-1305 (2015)

39. <u>A.-F. Bitbol</u>§ and D.J. Schwab, *Quantifying the role of population subdivision in evolution on rugged fitness landscapes*, PLOS Computational Biology 10(8):e1003778 (2014)

40. R.M. Barry, <u>A.-F. Bitbol</u>, A. Lorestani, E.J. Charles, C.H. Habrian, J.M. Hansen, H.-J. Li, E.P. Baldwin, N.S. Wingreen, J.M. Kollman and Z. Gitai§, *Large-scale filament formation inhibits the activity of CTP synthetase*, eLife 3:e03638 (2014)

41. N. Khalifat, M. Rahimi, <u>A.-F. Bitbol</u>, M. Seigneuret§, J.-B. Fournier, N. Puff, M. Arroyo and M.I. Angelova§, *Interplay of packing and flip-flop in local bilayer deformation. How phosphatidylglycerol could rescue mitochondrial function in a cardiolipin-deficient yeast mutant*, Biophysical Journal 107(4):879-890 (2014)

42. <u>A.-F. Bitbol</u>§ and J.-B. Fournier, *Membrane properties revealed by spatiotemporal response to a local inhomogeneity*, Biochimica et Biophysica Acta – Biomembranes 1828:1241-1249 (2013)

43. <u>A.-F. Bitbol</u>, A. Canaguier-Durand, A. Lambrecht and S. Reynaud, *Pairwise summation approximation for Casimir potentials and its limitations*, Physical Review B 87:045413 (2013)

44. <u>A.-F. Bitbol</u>, D. Constantin and J.-B. Fournier§, *Bilayer elasticity at the nanoscale: the need for new terms*, PLoS ONE 7(11):e48306 (2012)

45. <u>A.-F. Bitbol</u>, N. Puff, Y. Sakuma, M. Imai, J.-B. Fournier and M.I. Angelova§, *Lipid membrane deformation in response to a local pH modification: theory and experiments*, Soft Matter 8:6073 (2012)

46. <u>A.-F. Bitbol</u>, K. Sin Ronia and J.-B. Fournier§, *Universal amplitudes of the Casimir-like interactions between four types of rods in fluid membranes*, Europhysics Letters 96:40013 (2011)

47. <u>A.-F. Bitbol</u>, J.-B. Fournier, M.I. Angelova§ and N. Puff, *Dynamical membrane curvature instability controlled by intermonolayer friction*, Journal of Physics: Condensed Matter 23:284102 (2011)

48. <u>A.-F. Bitbol</u> and J.-B. Fournier, *Forces exerted by a correlated fluid on embedded inclusions*, Physical Review E 83:061107 (2011)

49. <u>A.-F. Bitbol</u>, L. Peliti and J.-B. Fournier§, *Membrane stress tensor in the presence of lipid density and composition inhomogeneities*, European Physical Journal E 34:53 (2011)

50. <u>A.-F. Bitbol</u>, P.G. Dommersnes and J.-B. Fournier, *Fluctuations of the Casimir-like force between two membrane inclusions*, Physical Review E 81:050903(R) (2010) – Rapid Communication

51. <u>A.-F. Bitbol</u>, N. Taberlet, S.W. Morris, and J.N. McElwaine, *Scaling and dynamics of washboard roads*, Physical Review E 79:061308 (2009)
    Selected for a summary in Nature Physics 5:232 (2009): *Research highlights: The dirt on corrugations*

**Book chapters and review papers**

1. <u>A.-F. Bitbol</u>§, D. Constantin and J.-B. Fournier, *Membrane-mediated interactions*, invited chapter in the Springer book "Physics of biological membranes" edited by Patricia Bassereau & Pierre Sens, 2018

2. M.I. Angelova§, <u>A.-F. Bitbol</u>, M. Seigneuret, G. Staneva, A. Kodama, Y. Sakuma, T. Kawakatsu, M. Imai, N. Puff, *pH sensing by lipids in membranes: The fundamentals of pH-driven migration, polarization and deformations of lipid bilayer assemblies*, Biochimica et Biophysica Acta - Biomembranes 1860(10):2042-2063 (2018)

# Invited lectures

## Invited lectures at international conferences

**07/2025** Invited talk, "Eco-evolutionary processes in context" workshop, Nordita, Stockholm, Sweden

**05/2025** Invited talk, "Mathematical Foundations of Biological Organization" workshop, Les Diablerets, Switzerland

**05/2025** Invited talk, CECAM workshop "Stochastic processes: Inferences in complex systems", Lausanne, Switzerland

**05/2025** Invited talk, EMBO/EMBL "Theory and concepts in biology" symposium, Heidelberg, Germany

**03/2025** Invited talk, "AI in Biophysics" symposium, German Physical Society (DPG) Spring Meeting, Regensburg, Germany

**01/2025** Invited talk, focus session "Information and Statistical Physics Approaches to Biophysics", Dutch Research Council (NWO) Physics conference, Veldhoven, Netherlands

**01/2025** Invited masterclass, Dutch Research Council (NWO) Physics conference, Veldhoven, Netherlands

**12/2024** Invited talk, EPFL-Pasteur Symposium, Institut Pasteur, France

**10/2024** Invited talk, "Evolutionary graph theory" workshop, Max Planck Institute for Evolutionary Biology, Plön, Germany

**10/2024** Keynote talk, "AI in Biology & Health" symposium, Institut Pasteur, France

**09/2024** Invited talk, "Multiscale & integrative complex networks: experiments & theories" workshop (Conference on Complex Systems, CCS), University of Exeter, UK

**07/2024** Keynote talk, "Leeds 2024 eco-evolutionary dynamics" workshop, University of Leeds, UK

**07/2024** Invited talk, "Frontiers in biophysics" workshop, University of Tokyo, Japan

**06/2024** Invited talk, International Union of Pure and Applied Biophysics (IUPAB) conference, Kyoto, Japan

**05/2024** Keynote talk, CNRS meeting "Quantitative approaches for life sciences", Vogüé, France

**05/2024** Invited talk, "Stochastic models and experiments in ecology and biology" (SMEEB) conference, L'Aquila, Italy

**04/2024** Invited talk, "Probabilistic modeling in genomics" conference, Vienna, Austria

**12/2023** Invited talk, "Population dynamics: from rare events to evolution" workshop, Grenoble, France

**09/2023** Invited talk, Physics of Living Matter Symposium (PLM17), University of Cambridge, UK

**09/2023** Invited talk, CECAM workshop "Macromolecular complexes: from ab initio and integrative modeling to functional dynamics", Lausanne, Switzerland

**08/2023** Plenary invited talk, International Conference on Biological Physics (ICBP) 2023, Seoul, Republic of Korea (as recipient of IUPAP C6 Young Scientist Prize)

**04/2023** Invited talk, "Mathematical Foundations of Biological Organisation" workshop, Oberwolfach Research Institute for Mathematics, Germany

**04/2023** Invited talk, workshop "Biological sequence variation: from statistical modeling to structure, function, and evolutionary dynamics", Cargese, France

**03/2023** Invited talk, session "Physics of biological computation across scales", American Physical Society (APS) March Meeting, Las Vegas, NV, USA

**03/2023** Invited tutorial, session "Machine learning and model inference for biological physicists", American Physical Society (APS) March Meeting, Las Vegas, NV, USA

**01/2023** Keynote talk, Joint CNRS meeting "Interdisciplinary approaches in molecular evolution" and "Evolutionary genomics, bioinformatics, alignments and phylogeny", Grenoble, France

**12/2022** Invited talk, "Computational Aspects and Modeling of Biological Information" workshop, Milan, Italy

**11/2022** Invited talk, Department of Fundamental Microbiology Impromptu Symposium, University of Lausanne, Switzerland

**09/2022** Invited talk, 121st International Titisee Conference "Space, Time and Life", Boehringer Ingelheim Foundation, Titisee, Germany

**09/2022** Invited talk, EMBO workshop "When predictions meet experiments: the future of structure determination", Palermo, Italy

**08/2022** Invited talk, EMBO workshop "Cell and developmental systems", Arolla, Switzerland

**07/2022** Invited talk, Aspen Center for Physics, Aspen, CO, USA (Statistical physics of ecology and evolution Working Group)

**06/2022** Invited talk, Conference in the honor of Ned Wingreen's 60th birthday, Princeton University, NJ, USA

**03/2022** Invited talk, Applied Machine Learning Days conference, Lausanne, Switzerland

**11/2021** Invited talk, CECAM workshop "Co-evolutionary analysis meets machine learning for modelling biomolecular structures and interactions", Lausanne, Switzerland

**10/2021** Invited talk, Paris biophysics community day, ENS, Paris, France

**09/2021** Invited talk, online workshop, "4D Cellular Physiology Reimagined: Theory as a Principal Component", Janelia Research Campus, Howard Hughes Medical Institute, USA

**06/2021** Invited talk, online EMBO workshop, "Predicting evolution"

**11/2020** Invited talk, online workshop, "Modeling and Computation for Life and Environment Sciences", University of Montpellier, France

**09/2019** Invited talk, French-German WE-Heraeus-Seminar, "Novel Physics in Living Systems?", Roscoff, France

**07/2019** Invited talk, Nordita program "From Molecular Basis to Predictability and Control of Evolution", Stockholm, Sweden

**06/2019** Invited talk, CECAM workshop "Co-evolutionary methods for the prediction and design of protein structure and interactions", Lausanne, Switzerland

**01/2019** Invited talk, "Statistical Physics Days" conference, ENS, Paris, France

**09/2018** Invited talk, "Physics and biology of subcellular structure & remodeling" workshop, Carnegie Mellon University, Pittsburgh, PA, USA

**08/2017** Invited talk, Aspen Center for Physics, Aspen, CO, USA (Covariance analysis Working Group)

**12/2016** Invited talk, CECAM workshop "Mesoscopic Modeling in Physics of Molecular and Cell Biology", Toulouse, France

**09/2016** Invited talk, 20th Evolutionary Biology Meeting, Marseille, France

**10/2015** Invited talk, workshop "Women in Applied Math and Soft Matter Physics", Mainz, Germany

### Invited lectures at international summer schools

**06/2025** Invited lecture, "Evolution by nature and by design" ETHZ-EPFL summer school, Lausanne, Switzerland

**04/2025** Invited lecture, AIChemist CECAM school, Lausanne, Switzerland

**08/2024** Invited lecture series (3 lectures), "Energy, information and evolution in biology" summer school, Cargese, France

**11/2023** Invited lecture, Multiscale integration in biological systems school, Institut Curie, Paris, France

**11/2021** Invited lecture, Advanced systems biology school, Aussois, France

**11/2021** Invited lecture, Multiscale integration in biological systems school, Institut Curie, Paris, France

**07/2021** Invited lecture, "Fundamental Problems in Statistical Physics" summer school, Brunico, Italy

**04/2018** Invited lecturer at the "Living Matter" school, International Center for Theoretical Science (ICTS), Bangalore, India (2 lectures + 10 daily tutorials)

### Invited seminars

**06/2025** CMCB Life Sciences Seminar, TU Dresden, Germany

**04/2025** D-BSSE seminar, ETH Zürich, Basel, Switzerland

**10/2024** AI4Science seminar, Chalmers University, Gothenburg, Sweden

**09/2024** Gulliver seminar, ESPCI, Paris, France

**02/2024** Simons Center for Quantitative Biology seminar, Cold Spring Harbor Laboratory, NY, USA

**09/2023** Theory seminar, Instituto Gulbenkian de Ciência, Oeiras, Portugal

**05/2023** Theory of Living Matter online seminar, University of Cambridge, UK

**05/2023** Bionanoscience Seminar, TU Delft, Netherlands

**10/2022** NCCR Microbiomes online seminar, Switzerland

**05/2022** Population Dynamics virtual seminar, University of Edinburgh, UK & University of Jena, Germany

**02/2022** Biomathematics virtual Seminar, Imperial College London, UK

**02/2022** Seminar, Physics department, ENS Lyon, France

**12/2021** Online seminar, Theory of Living Systems, Australia

**10/2021** Ecology and Evolution seminar, University of Lausanne, Switzerland

**06/2021** Online Biological Physics seminar, Hebrew University of Jerusalem, Israel

**05/2021** Online Evolutionary & Behavioural Ecology seminar, University of Bern, Switzerland

**04/2021** Online seminar, Theoretical Biology Network in Western Switzerland

**04/2021** Online seminar, Symposium on Ecological Dynamics, CUNY & Princeton University, USA

**03/2021** Online Computational Biology seminar, University of Lausanne, Switzerland

**01/2021** Online seminar, Simons Webinar on Cracking the Glass Problem

**01/2020** Computational Biology seminar, Institut Pasteur, Paris, France

**09/2019** Computational Biology seminar, Biozentrum, University of Basel, Switzerland

**12/2017** Seminar, Center for Nanoscience, Ludwig Maximilian University (LMU), Munich, Germany

**12/2015** Biological Physics Seminar, Rutgers University, New Brunswick, NJ, USA

## Outreach

**10/2024** Lecture on "Probabilities and risks", one-week immersion program at EPFL for primary school teachers (SEMIEL)

**05/2024** Interview about the EPFL WISH (Women In Science and Humanities) Foundation on RedLine Radio

**06/2022** Podcast "On the trail of life", EPFL Humanities College

## Advisees

**Postdoctoral researchers (7 total: 5 alumni & 2 current)**

**Cyril Malbranke**  since March 2023.
> Best paper award, 2024 ICML workshop on Accessible and Efficient Foundation Models for Biological Discovery.

**Arthur Alexandre**  since October 2022.

**Alia Abbara**  January 2021 - December 2024.
> *From October 2025: permanent CNRS researcher at Sorbonne Université, Paris, France.*

**Luca Biggio**  October 2023 - August 2024, AI4Science fellow, co-advised with Lenka Zdeborová, Physics, EPFL.
> *Now tenure-track assistant professor at Bocconi University, Milan, Italy.*

**Umberto Lupo**  July 2020 - July 2024.
> Best poster award, 2022 ICML workshop on Computational Biology.
> *Now senior AI scientist at Absci (US-based drug design company).*

**Celia García-Pareja**  March 2022 - August 2023, co-advised with Fabio Nobile, Mathematics, EPFL.
> *Now permanent lecturer at KTH, Stockholm, Sweden.*

**Darka Labavić**  January 2020 - December 2020, at Sorbonne Université, co-advised with Claude Loverdo.
> *Now postdoc at ESPCI, Paris, France.*


**PhD students (7 total: 3 graduated & 4 current)**

**Anamay Samant**  Since December 2024, EDCB (Computational Biology), EPFL.

**Alexandre Littiere**  Since October 2024, EDCB (Computational Biology), EPFL.

**Cecilia Fruet**  Since April 2023, EDPY (Physics), EPFL. Passed candidacy in March 2024.

**Damiano Sgarbossa**  April 2021 - June 2025, EDCB (Computational Biology), EPFL.
> Contributed talk award, 2022 ICML workshop on Computational Biology.

**Richard Servajean**  October 2020 - September 2024, EDPY (Physics), EPFL.
> *Now postdoc at RIKEN, Tokyo, Japan.*

**Nicola Dietler**  February 2020 - September 2024, EDPY (Physics), EPFL.
> Proposed for top 8% graduate school distinction by the PhD examination jury.
> *Now postdoc at the Human Technopole, Milan, Italy.*

**Loïc Marrec**  October 2017 - September 2020, at Sorbonne Université, co-advised with Raphaël Voituriez (HDR).
> Short-listed (top 8) for a PhD thesis award by the Complex Systems Institute, Paris, France.
> *Since 01/2025: postdoc at the University of Lausanne; 11/2020-12/2024: postdoc at the U. of Bern, Switzerland.*


**MSc students and BSc students (38 total, not listed for brevity)**