Samuel H. A. von der Dunk

Natruperstrasse 160A, Apartment A4-02, 49090 Osnabrück
+31 643205147, sam.vonderdunk@physics.ox.ac.uk

Education & academic roles

2011	Finished secondary school Stedelijk Gymnasium Leiden *cum laude*. Science project The Walking Fridge awarded the highest mark (10/10).
2012—2016	Undergraduate (BSc) Biology at Utrecht University. Research internship and thesis on The RNA World with Paulien Hogeweg.
2016—2018	Graduate (MSc) Molecular and Cellular Life Sciences at Utrecht University. Research internships with Paulien Hogeweg on RNA-like replicators [1] and with Berend Snel on recurrent sequence evolution [2].
2018—2023	Doctoral (PhD) at Utrecht University. Thesis "Constructive evolution and the emergence of complexity" succesfully defended on November 27th, 2023 [2,3,5,6].
2023—2026	Postdoc at University of Oxford. Main work on evolutionary dynamics of RNA folding and protein folding [9,10].
2026—present	Postdoc at University of Osnabrück. Main work on integration of informational and metabolic perspectives on evolution of cellular and genomic complexity.

Courses (1.5 EC = 40 hours)

Giving Effective Presentation, UU, 2019.	0.6 EC
Breaking Science, UU, 2020.	2.0 EC
Algorithms for Biological Networks, BioSB, 2021.	1.5 EC
PhD Day "When Creativity Meets Science", UU, 2021.	0.2 EC
Linear Algebra – Foundations to Frontiers, UTAustinX, 2021.	3.0 EC
Complex Systems Summer School, SFI, 2022.	6.0 EC
Journal Clubs / TBB Seminars / PhD Evenings, UU, 2018—2023.	3.0 EC
Biology Tutor Training Course, UOxf, 2025.	3.0 hrs
Physics Engagement Training, UOxf, 2025.	3.0 hrs

Teaching

Systems biology, UU (x3): 2014, 2015, 2018.
Theoretical ecology, UU (x1): 2015.
Experiment & Statistiek, UU (x2): 2016, 2017.
Computational biology, UU (x2): 2016, 2023.
Data science & biology, UU (x3): 2020, 2021, 2022.
RNA and protein folding, UOxf: 2025.

Designed and coordinated:
Theoretical Ecology & Evolution, UOsn: 2026.

Supervision

2019—2020	Nathalie Nijs. BSc internship on origin of mitochondrial genes and thesis on primary endosymbiosis with focus on *Paulinella chromatophora*.
2021—2022	Oane Gros. MSc internship on multilevel modelling of mitochondrial evolution.
2022	Leon van Mierlo. BSc internship on the usage of ALE (amalgamated likelihood estimation).
2022	Juliette Luiselli. ENS internship on multilevel modelling of mitochondrial evolution (following Oane).
2022—2023	Nathan Eolin. MSc internship on recurrent sequence evolution after independent gene duplication in vertebrates.
2023	Luuk van Vliet. BSc internship on the evolution of robustness in gene regulatory networks of a model of the prokaryotic cell cycle.
2023—2024	Mahima Sakalle. MathPhys internship on the genotype—phenotype map of L-systems.
2023—2025	Alkmini Zania. MSc internship on the evolution of seks in a multilevel model of proto-eukaryotes [7].
2023—2025	Jamie Malone. MSc/PhD on genotype—phenotype map of angiosperm leaf shape development [8].
2025—present	Luis Busto Demoner. PhD on protein structure prediction algorithms.

Adjacent activities

2019—2023	PhD programme coordinator for Computational Life Sciences, UU (0.2 FTS). Organization of monthly PhD evenings, career events and social activities.
2021—2023	Member of Junior Board NLSEB. Organization of two PhD/postdoc meetings and two lab visits.
2022	Co-organizer workshop “CPM Cell Modelling” for the NLSEB PhD/postdoc meeting.
2023	Main organizer symposium “Evolution of genomic and cellular complexity” prior to my PhD defense.
2024—2025	Member of Theory Computing Committee, UOxf.
2025	Co-organizer ESEB symposium “Unraveling the origin of eukaryotes”, Barcelona.

Conference talks

NVTB, Schoorl (x5): 2016, 2019, 2021, 2023, 2024.
BioSB, online: 2021.
NLSEB, Wageningen: 2023.
Evol of compl & stat phys, Yerevan/online: 2025.
ESEB, Barcelona: 2025.

Other talks

Guest lecture for Computational biology, UU (x4): 2022, 2023, 2025, 2026.
Visit to Vroomans lab, Cambridge: 2024.
Visit to Ettema lab, WUR: 2025.
Visit to Huynen lab, Radboud: 2025.
Visit to Wortel lab, UvA: 2025.
Online symposium for Liberles group, Temple University: 2025.

Honours Academy symposium “The Origin and Evolution of Life”, UU: 2026.

Posters

SMBE, Manchester/online (x2): 2019, 2021.
BioSB, online: 2020.
NLSEB, online: 2021.
Collaboratorium Annual Symposium, Barcelona: 2024.
Physics of Life, Harrogate: 2025.
ESEB, Barcelona: 2025.

Awards / Funding

OoL CSSS program, Tuition scholarship and travel allowance to SFI, 2022 ($6,600).
NVTB early-career Presentation Award, 2023 (€100).

Publications

[1] **Von der Dunk, S. H. A.**, Colizzi, E. & Hogeweg, P. (2017). Evolutionary conflict leads to innovation: symmetry breaking in a spatial model of RNA-like replicators. *Life*, 7(4): 43.

[2] **Von der Dunk, S. H. A.** & Snel, B. (2020). Recurrent sequence evolution after independent gene duplication. *BMC evolutionary biology*, 20:98.

[3] **Von der Dunk, S. H. A.**, Snel, B. & Hogeweg, P. (2022). Evolution of Regulatory Complexity for Cell-cycle Control. *Genome biology and evolution*, 14(5): evac056.

[4] Vosseberg, J., Stolker, D., **Von der Dunk, S. H. A.** & Snel, B. (2023). Integrating phylogenetics with intron positions illuminates the origin of the spliceosome. *Molecular biology and evolution*, 40(1): msad011.

[5] **Von der Dunk, S. H. A.**, Hogeweg, P. & Snel, B. (2023). Obligate endosymbiosis explains genome expansion during eukaryogenesis. *Communications Biology*, 6: 777.

[6] **Von der Dunk, S. H. A.**, Hogeweg, P. & Snel, B. (2023). Intracellular signaling in proto-eukaryotes evolves to alleviate regulatory conflicts of endosymbiosis. *PloS Computational Biology*, 20(2): e1011860.

[7] Zania, A., Hogeweg, P. & **Von der Dunk, S. H. A.** (2025). The risk of sexual reproduction promotes the evolution of regulation between host and symbiont. *bioRxiv*, 2025.07.30.667627.

[8] Malone, J. S., Martin, N. S., **Von der Dunk, S. H. A**., Davalos, L. M. & Louis, A. A. (2025). Developmental bias explains the evolutionary trend towards simple leaf shapes. *bioRxiv*, 2025.08.17.670617.

[9] **Von der Dunk, S. H. A.**, Martin, N. S., Dingle, K. & Louis, A. A. (2025). RNA secondary structures are conserved but random. *bioRxiv*, 2025.08.18.670923.

[10] **Von der Dunk, S. H. A.**, Dingle, K., Louis, A. A., Snel, B. & Hogeweg, P. (2025). Natural protein structures have evolved exceptional robustness to mutations. *bioRxiv*, 2025.08.27.672565.