Tim Kamsma

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Education

2019–2022 **MSc Theoretical Physics**, *Utrecht University*
- Cum Laude, GPA 4.0
- Honours double MSc programme

2019–2022 **MSc Mathematical Sciences**, *Utrecht University*
- Cum Laude, GPA 4.0
- Honours double MSc programme
- Track: Applied Mathematics, Complex Systems and Scientific Computing

2016–2019 **BSc physics and astrophysics**, *Utrecht University*
- Cum Laude, GPA 4.0

2016–2019 **BSc mathematics**, *Utrecht University*
- Cum Laude, GPA 4.0

2010–2016 **Gymnasium, N&G and N&T profile (natural sciences)**, *KSG De Breul*, Zeist
- Cum Laude
- Best Science Student award

Experience

Research

2022 – Present **PhD Candidate Theoretical Physics & Mathematics**, *Utrecht University*, Institute for Theoretical Physics & Mathematical Institute
- Received a unique personal grant for my own proposal, allowing me to run my own research.
- Instigated Neuromorphic Computing research at Utrecht University.
- Supervised numerous students, leading to fruitful projects with some ending up as co-authors.
- Became a representative for research at Utrecht University, while also contributing to outreach at primary schools, department visitations, podcasts, and more.

2025 **Visiting PhD Student**, *University of Cambridge*, Cambridge
- Set up a new research collaboration with the group of Prof. Chris Pickard.

2022 **Visiting Graduate Student**, *University of Cambridge*, Cambridge
- I was offered a fully funded PhD position with a Harding Distinguished Postgraduate Scholarship.

2019 **Research Intern**, *Netherlands Institute for Neuroscience*, Amsterdam
- My work formed the basis for an ongoing research project.

Teaching

2017–present **Teaching Assistant**, *Utrecht University*

2013–present **Private Tutor**

2017–2021 **Teaching Assistant**, *SSL*, Leiden

Papers and talks

First-author papers

[1] **Iontronic Neuromorphic Signaling with Conical Microfluidic Memristors**, *T. M. Kamsma, W. Q. Boon, T. Ter Rele, C. Spitoni, and R. Van Roij*, Physical Review Letters, Vol. 130, Issue 26 (2023)

[2] **Unveiling the capabilities of bipolar conical channels in neuromorphic iontronics**, *T. M. Kamsma, W. Q. Boon, C. Spitoni, and R. van Roij*, Faraday Discussions, Vol. 246, 125-140 (2023)

[3] **Brain-inspired computing with fluidic iontronic nanochannels**, *T. M. Kamsma, J. Kim, K. Kim, W. Q. Boon, C. Spitoni, J. Park, and R. van Roij*, Proceedings of the National Academy of Sciences, Vol. 121, Issue 18 (2024)

[4] **Advanced iontronic spiking modes with multiscale diffusive dynamics in a fluidic circuit**, *T. M. Kamsma, E. A. Rossing, C. Spitoni, and R. van Roij*, Neuromorphic Computing and Engineering, Vol. 4, 024003 (2024)

[5] **A simple mathematical theory for Simple Volatile Memristors and their spiking circuits**, *T. Kamsma, R. van Roij, and C. Spitoni*, Chaos, Solitons & Fractals, Vol. 186 (2024)

[6] **Chemically Regulated Conical Channel Synapse for Neuromorphic and Sensing Applications**, *T. M. Kamsma, M. S. Klop, W. Q. Boon, C. Spitoni, B. Rueckauer, and R. Van Roij*, Physical Review Research, Vol. 7, Issue 1 (2025)

[7] **Echo state and band-pass networks with aqueous memristors: leaky reservoir computing with a leaky substrate**, *T. M. Kamsma, J. J. Teijema, R. van Roij, and C. Spitoni*, Chaos, Vol. 35, 093133 (2025)

[8] **Energy-efficient time series processing in real-time with fluidic iontronic memristor circuits**, *T. M. Kamsma, Y. Gu, C. Spitoni, M. Dijkstra, Y. Xie, and R. van Roij*, Faraday Discussions, (2026)

[9] **Nonlinear iontronic signal processing with neuromorphic Spike Rate-Dependent Plasticity**, *T. M. Kamsma, Y. Gu, D. Shi, C. Spitoni, M. Dijkstra, R. van Roij, and Y. Xie*, arXiv:2603.20126, (2026)

(Some of my) Talks

Apr. 2026 **Faraday Discussions**, *University of Manchester, Plenary Speaker*

Mar. 2026 **Reservoir Computing Conference**, *Technical University Berlin, Plenary Speaker*

Jan. 2026 **NWO Physics**, *Veldhoven*, Speaker at the Dutch national Physics conference in Veldhoven

Nov. 2025 **Emerging Research Seminar**, *Christ's College, Cambridge University, Plenary Speaker*

Sep. 2025 **Neuromorphic Computing Netherlands**, *University of Delft, Plenary Speaker*

Jan. 2025 **NWO Physics**, *Veldhoven*, Speaker at the Dutch national Physics conference in Veldhoven

Sep. 2024 **Liquid Matter Conference**, *Mainz*, Speaker at the large international LMC

Jan. 2024 **NWO Physics**, *Veldhoven*, Speaker at the Dutch national Physics conference in Veldhoven

Nov. 2023 **QBio Symposium, Invited**, *Utrecht University, Plenary Speaker*

June 2023 **Faraday Discussions**, *University of Edinburgh, Plenary Speaker*

May 2022 **UEA seminar, Invited**, *University of East Anglia, Norwich, Plenary Speaker*

Other experiences

2019–2021 **Rowing coach**, *A.U.S.R. Orca*, Utrecht
Along with three fellow coaches I selected, trained and coached the women's eight.

2021 **Flow Traders business course**, *Flow Traders*, Amsterdam
This highly selective event familiarizes the participants with trading and features a group assignment. My group was the only to finish the assignment and won the prize for best group.

2017–2019 **Student rower**, *A.U.S.R. Orca*, Utrecht
I rowed for the lightweight men's eight and regularly went to national regattas.

Awards and certificates

GPS4S Grant	The "Graduate Programme Science for Sustainability" grants are competitive unique grants awarded to only a handful of excellent students for their own research proposals. I was awarded the GPS4S grant for my proposal on Neuromorphic Computing.
Best thesis presentation	Out of all 41 presentations of my cohort, my bachelor thesis presentation got selected by a jury of academics as the best presentation.
Best science student	At my high school, when graduating, I earned the award for the best science student out of all the graduating students (roughly 120 students).
U-Talent certificate	This is a selective program of Utrecht University for talented high school students with an affinity for science.

Programming/Software

Mathematica	Experienced	C#	Familiar with
Machine learning	Familiar with	C/C++	Familiar with
LaTeX	Experienced	NEURON	Experienced
Computer modelling	Experienced	COMSOL	Experienced
Python	Experienced		