

# Jannis Teunissen

*Ars longa, vita brevis*

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Date of birth: July 8<sup>th</sup>, 1987

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## Academic experience

- 2018–present **Tenure track**, *Centrum Wiskunde & Informatica (CWI)*, Multiscale Dynamics group.  
My research now focuses on two topics: computational plasma physics (mostly applied to electric discharges) and machine learning (mostly applied to space weather phenomena).
- 2016–2018 **Postdoc**, *KU Leuven*, Centre for mathematical Plasma Astrophysics.  
Received three-year FWO Postdoctoral Fellowship, worked with R. Keppens.
- 2011–2015 **PhD**, *Centrum Wiskunde & Informatica (CWI)*, Multiscale Dynamics group.  
“3D Simulations and Analysis of Pulsed Discharges” (*cum laude*), supervisor: Ute Ebert.

## Education

- 2009–2011 **Master**, *University of Amsterdam*.  
Computational Science (*cum laude*)
- 2005–2008 **Bachelor**, *University of Amsterdam*.  
Physics & Astronomy (*cum laude*)
- 1999–2005 **Secondary education**, *Barlaeus Gymnasium, Amsterdam*.  
Track: Nature & Technology

## Other experience

- 2019–now **Co-organizer of the Scientific Meetings**, *Centrum Wiskunde & Informatica*.
- 2018–now **Member of the Advisory Board Information Sciences**, *University of Amsterdam*.
- 2017–2018 **Seminar organization**, *KU Leuven*, Centre for mathematical Plasma Astrophysics.
- 2016–2018 **Member of departmental council**, *KU Leuven*, Department of Mathematics.
- 2015–2016 **Member of works council**, *Centrum Wiskunde & Informatica*.

## Grants & Projects

- 2019 **Plasma for Plants**, *OTP project (TTW/NWO)*.  
Co-PI, project in collaboration with TU/e.
- 2018 **AIDA**, *H2020 (grant ID 776262)*.  
WP leader (took over from E. Camporeale)
- 2019 **ESCAPE**, *H2020 (grant ID 824064)*.  
Co-pi (took over from E. Camporeale)
- 2018 **Opening Project**, *SKLEIPE, Xi'an Jiaotong University, China*.  
Collaboration with A. Sun
- 2016 **Postdoctoral Fellowship**, *Research Foundation – Flanders (FWO)*.  
Three-year postdoctoral fellowship

## Honors & Awards

2015 Student Award of Excellence at the joint meeting of 68<sup>th</sup> Gaseous Electronics Conference (GEC), 9<sup>th</sup> Int. Conf. on Reactive Plasmas (ICRP), and 33<sup>th</sup> Symposium on Plasma Processing, Honolulu, Hawaii, USA.

### Invited conference talks

- 2019 *A computational study of positive streamer branching in air*, XXXIV ICPIG & ICRP-10, Sapporo, Japan
- 2018 *Investigating how streamers interact with dielectrics with 1D PIC & fluid simulations*, 2018 Asia-Pacific Conference on Plasma and Terahertz Science, Xi'an, China
- 2017 *Modeling streamer discharges in strong magnetic fields: from particle to fluid*, 70<sup>th</sup> Gaseous Electronics Conference, Pittsburgh (PA), United States
- 2017 *Modeling streamer discharges in strong magnetic fields*, DPG Spring Meeting, Bremen, Germany
- 2016 *Simulating fast pulsed discharges: The basics, the present and the future*, 19<sup>th</sup> WELTPP (EU-regional workshop), Kerkrade, The Netherlands
- 2015 *3D Models for nanosecond pulsed discharges: with new codes to quantitative understanding*, XXXII ICPIG, Iași, Romania
- 2015 *Streamer simulations in 3D with adaptive grids*, Meeting of ESF network TEA-IS, Vienna, Austria

### Journal publications

- [1] J. Teunissen and R. Keppens. A geometric multigrid library for quadtree/octree amr grids coupled to mpi-amrvac. *Computer Physics Communications*, page 106866, Aug 2019.
- [2] B. Ripperda, F. Bacchini, O. Porth, E. R. Most, H. Olivares, A. Nathanail, L. Rezzolla, J. Teunissen, and R. Keppens. General-relativistic resistive magnetohydrodynamics with robust primitive-variable recovery for accretion disk simulations. *The Astrophysical Journal Supplement Series*, 244(1):10, Sep 2019.
- [3] B Bagheri and J Teunissen. The effect of the stochasticity of photoionization on 3d streamer simulations. *Plasma Sources Science and Technology*, 28(4):045013, Apr 2019.
- [4] Behnaz Bagheri, Jannis Teunissen, Ute Ebert, et al. Comparison of six simulation codes for positive streamers in air. *Plasma Sources Science and Technology*, Aug 2018.
- [5] Jannis Teunissen and Ute Ebert. Afivo: A framework for quadtree/octree amr with shared-memory parallelization and geometric multigrid methods. *Computer Physics Communications*, 233:156–166, Dec 2018.
- [6] Nadine E. Mascini, Jannis Teunissen, Rob Noorlag, Stefan M. Willems, and Ron M.A. Heeren. Tumor classification with maldi-msi data of tissue microarrays: A case study. *Methods*, Apr 2018.
- [7] B. Ripperda, F. Bacchini, J. Teunissen, C. Xia, O. Porth, L. Sironi, G. Lapenta, and R. Keppens. A comprehensive comparison of relativistic particle integrators. *The Astrophysical Journal Supplement Series*, 235(1):21, Mar 2018.
- [8] C. Xia, J. Teunissen, I. El Mellah, E. Chané, and R. Keppens. MPI-AMRVAC 2.0 for solar and astrophysical applications. *The Astrophysical Journal Supplement Series*, 234(2):30, Feb 2018.

- [9] Marc van der Schans, Patrick Böhm, Jannis Teunissen, Sander Nijdam, Wilbert IJzerman, and Uwe Czarnetzki. Electric field measurements on plasma bullets in N<sub>2</sub> using four-wave mixing. *Plasma Sources Science and Technology*, 26(11):115006 [14 pages], Oct 2017.
- [10] Jannis Teunissen and Ute Ebert. Simulating streamer discharges in 3D with the parallel adaptive afivo framework. *Journal of Physics D: Applied Physics*, 50(47):474001 [13 pages], Oct 2017.
- [11] Jannis Teunissen and Ute Ebert. 3D PIC-MCC simulations of discharge inception around a sharp anode in nitrogen/oxygen mixtures. *Plasma Sources Science and Technology*, 25(4):044005 [13 pages], Jun 2016.
- [12] S Nijdam, J Teunissen, E Takahashi, and U Ebert. The role of free electrons in the guiding of positive streamers. *Plasma Sources Science and Technology*, 25(4):044001 [13 pages], May 2016.
- [13] Aram H Markosyan, Jannis Teunissen, Saša Dujko, and Ute Ebert. Comparing plasma fluid models of different order for 1d streamer ionization fronts. *Plasma Sources Science and Technology*, 24(6):065002 [13 pages], Oct 2015.
- [14] S Nijdam, E Takahashi, J Teunissen, and U Ebert. Streamer discharges can move perpendicularly to the electric field. *New Journal of Physics*, 16(10):103038 [9 pages], Oct 2014.
- [15] Anna Dubinova, Jannis Teunissen, and Ute Ebert. Propagation of a positive streamer toward a dielectric tip in pure nitrogen and in air under voltage pulses with subnanosecond rise time. *IEEE Transactions on Plasma Science*, 42(10):2392–2393, Oct 2014.
- [16] Anbang Sun, Jannis Teunissen, and Ute Ebert. 3D particle modeling of positive streamer inception from a needle electrode in supercritical nitrogen. *IEEE Trans. Plasma Sci.*, 42(10):2416–2417, Oct 2014.
- [17] Anbang Sun, Jannis Teunissen, and Ute Ebert. The inception of pulsed discharges in air: simulations in background fields above and below breakdown. *J. Phys. D: Appl. Phys.*, 47(44):445205 [9 pages], Oct 2014.
- [18] Jannis Teunissen, Anbang Sun, and Ute Ebert. A time scale for electrical screening in pulsed gas discharges. *J. Phys. D: Appl. Phys.*, 47(36):365203 [7 pages], Aug 2014.
- [19] Jannis Teunissen and Ute Ebert. Controlling the weights of simulation particles: adaptive particle management using k-d trees. *Journal of Computational Physics*, 259:318–330, Feb 2014.
- [20] A. B. Sun, J. Teunissen, and U. Ebert. Why isolated streamer discharges hardly exist above the breakdown field in atmospheric air. *Geophys. Res. Lett.*, 40(10):2417–2422, May 2013.
- [21] Chao Li, Jannis Teunissen, Margreet Nool, Willem Hundsdorfer, and Ute Ebert. A comparison of 3D particle, fluid and hybrid simulations for negative streamers. *Plasma Sources Sci. Technol.*, 21(5):055019 [14 pages], Sep 2012.