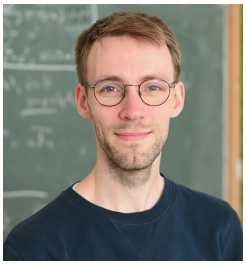

Dr. Timo Plath

Curriculum Vitae

Education

2024–present **PostDoc**, *University of Münster*, Münster; *University of Twente*, Enschede (0.8 fte)
Reduced order modelling (pyMOR) of the discrete particle method (MercuryDPM)
Dr. Thomas Weinhart (PI), Dr. Stephan Rave (PI) & Prof. Dr. Anthony Thornton (Co-PI)

2020–2024 **PhD Candidate**, *University of Twente*, Enschede
ViPr: Virtual prototyping of particulate processes
Dr. Thomas Weinhart (PI, Promotor), Prof. Dr. Stefan Luding & Prof. Dr. Anthony Thornton

2018–2019 **Mechanical Engineering M. Sc.**, *Ruhr-Universität Bochum*, Bochum
Specialization: Energy and Process engineering

Thesis Implementation, calibration and comparison of a DEM contact model for cohesive and rigid concrete flows

2013–2018 **Mechanical Engineering B. Sc.**, *TU-Dortmund*, Dortmund

Experience

Vocational

03.2020–present **Scientific software developer**, *MercuryDPM (0.2 fte)*
Scientific software engineering (Python, C++) on the discrete particle method (`www.MercuryDPM.org`)

09.2018–10.2019 **Research assistant**, *Energy plant and energy process technology (LEAT)*, Ruhr-Universität Bochum
Experimental and simulation (DEM) support as well as assistance in programming (*Python, C++*)

09.2017–05.2018 **Engineering intern**, *RAG Mining Solutions GmbH*, Herne
Project management in the field of shaft and conveyor technology as well as subsequent Bachelors Thesis

Miscellaneous

03.2018–05.2020 **Chairman**, *Kita71 – „Der Kotten“*, Münster
Honorary chairman of a Kindergarten with employee responsibility

Languages

German native
English C1/C2
Swedish A2
Dutch A1

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Scientific track record

Papers

- Plath, T., Weinhart, T., Thornton, A. R. (2025), Model order reduction for discrete particl systems, in preparation.
- Plath, T., Weinhart, T., Tunuguntla, D. R., Thornton, A. R. (2025), Comparing and contrasting Bayesian- and ML-based calibration methods for granular materials, in preparation.
- Plath, T., Luding, S., Weinhart, T. (2025), Population balance modelling and reconstruction by quadrature method of moments for wet granulation, Powder Technology, 449(1), 120374, 10.1016/j.powtec.2024.120374.
- Plath et al. (2024), Rapid Prototyping of a Twin-Screw Granulator for lab-scale research, Pharmaceutical Development and Technology, submitted.
- Plath, T., Luding, S., Weinhart, T. (2023), Non-dimensionalisation of quadrature method of moments for wet granulation, Powder Technology 437(1), 119490, 10.1016/j.powtec.2024.119490.
- Thornton, A. R., Plath, T., Götz, H., et al. (2023), Recent Advances in MercuryDPM, Mathematics in Computer Science, 17(2). 10.1007/s11786-023-00562-x.
- Plath, T., Korte, C., Sivanesapillai, R., Weinhart, T. (2021), Parametric Study of Residence Time Distributions and Granulation Kinetics as a Basis for Process Modeling of Twin-Screw Wet Granulation. Pharmaceutics, 13(5), 10.3390/pharmaceutics13050645.
- Ostanin, I., Angelidakis, V., Plath, T. et al. (2024), Rigid Clumps in the MercuryDPM Particle Dynamics Code, Computer Physics Communication Volume 296, 109034, 10.1016/j.cpc.2023.109034.

Datasets

- Plath, T., Luding, S., Weinhart, T. (2024), Data to reproduce the paper: "Population balance modelling and reconstruction by quadrature method of moments for wet granulation". 4TU.ResearchData, 10.4121/f5cfe2b8-2896-433a-887e-45c397d64ade.
- Plath et al. (2024), Data and code underlying the publication: Rapid Prototyping of a Twin-Screw Granulator for lab-scale research. 4TU.ResearchData, 10.4121/4bfdbdc1-7b23-4fc0-82e0-b0956308a341.
- Plath, T., Luding, S., Weinhart, T. (2023), Data to reproduce the paper: “Non-dimensionalization of quadrature method of moments for wet granulation.” 4TU.ResearchData, 10.4121/22093397.
- Plath, T., Korte, C., Sivanesapillai, R., Weinhart, T. (2021), Dataset as a basis for process modeling of twin-screw wet granulation: A parametric study of residence time distributions and granulation kinetics. 4TU.ResearchData, 10.4121/14248433.

Conference proceedings

- Plath, T., Luding, S., Weinhart, T. (2023), Non-dimensionalisation of quadrature method of moments for wet granulation, Conference proceeding on the 10th granulation conference in Sheffield.
- Thornton, A. R., Nguyen, Q. H., Polman, H., Plath, T. et al. (2023), Simulating industrial scenarios with the open-source software MercuryDPM, Conference proceeding on PARTICLES 2023

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Talks

- Plath, T., Rave, S., Weinhart, T., Thornton, A. R., MOR Than DPM: Model Order Reduction for the Discrete Particle Method, ESCO 2024, June 10–14 2024, Pilsen, Czech Republic.
- Plath, T., Luding, S., Weinhart, T., Quadrature method of moment modeling of wet granulation, 10th International Granulation Workshop – Granulation conference, June 21–23 2023, Sheffield, United Kingdom.
- Plath, T., Korte, C., Sivanesapilai, R., Weinhart, T., Parametric Study of Residence Time Distributions and Granulation Kinetics as a Basis for Process Modeling of Twin-Screw Wet Granulation, CHOPS 2022 – 10th International Conference on Conveying and Handling of Particulate Solids, July 05–09 2022, Salerno, Italy.
- Plath, T., Luding, S., Weinhart, T., Population balance method and adaptive reconstruction of density functions via quadrature method of moments, JMBC Burgers Symposium, June 08–09 2022, Lunteren, Netherlands.

Posters

- Plath, T., Bisschop, J. W., Thornton, A. R., Luding, S., Weinhart, T., From characterization to calibration in the cloud using the open-source software MercuryDPM, PARTEC 2023 international congress on particle technology, September 26–28, 2023, Nuremberg, Germany.
- Plath, T., Luding, S., Weinhart, T., Virtual prototyping of wet granulation processes, 10th International Granulation Workshop – Granulation conference, June 21–23 2023, Sheffield, United Kingdom.

Grants

- Authored and obtained a 1 million € NWO-OTP grant on modelling of smart additive-manufacturing processes for high-performance concrete (SMATTER) by developing a digital twin.

Open-source contributions

- Inventor and lead developer of MercuryPBM, an open-source code for population balance modelling of granular materials, 2024.
- Lead developer of MercuryDPM, an open-source code for particle simulations, 2020.
- Reviewed over 200 pull requests for MercuryDPM
- Authored 64 pull requests for MercuryDPM. (18 features)
- Committed a bugfix to fix self-tests in oomph-lib.
- Commited a pyMOR feature for data-driven model order reduction using neural networks.

Academic committment

Chaired and organised:

- Code development workshop for MercuryDPM, April 19 – May 20, 2022.
- Code development workshop for MercuryDPM, April 17 – May 19, 2023.
- Code development workshop for MercuryDPM, May 6 – May 31, 2024.
- PhD project dissemination workshop, Jan. 28, 2025.
- Bi-weekly Q&A session for MercuryDPM.

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- Bi-weekly main developers meeting for MercuryDPM

Memberships:

- European COST Action: "Open Network on Discrete Element Method (DEM) Simulations, (ON-DEM)", CA22132, 2023.
- Open Science Community Twente
- J. M. Burgerscentrum Research School for Fluid Mechanics (JMBC), 2020.

Supervision and Teaching

- 1 BSc student.
- 9 pre-master students.
- Teacher for *Programming in Engineering: C++ & Python* and *Advanced Programming in Engineering: Arduino*.

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