

Curriculum Vitae of Johan Padding

Personal details

Name: Prof. Dr Ir Johannes Tiemen Padding
Gender: Male
Date/place of birth: 20th July 1975, Steenwijk (NL)
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Education

- 1993 – 1998 MSc Applied Physics at University of Twente, Netherlands. Graduated Summa Cum Laude in Sept. 1998, highest average grades since the foundation of Applied Physics at the UT in 1968.
- 1997 Four month internship at Ångström Laboratory, Uppsala University, Sweden (quantum chemistry).
- 1998 – 2003 PhD research on *Viscoelasticity of polymer melts: coarse-grained simulations* in the Chemical Physics group at the University of Twente, Netherlands. PhD degree obtained Summa Cum Laude on January 24, 2003 (Promotor: Prof. Wim J. Briels).

Academic Career

- 2003 – 2006 Three year fellowship at University of Cambridge, United Kingdom, developing *hydrodynamic and multi-particle collision models for colloidal suspensions* (0.4 fte).
- 2003 – 2006 Consultant at Schlumberger Cambridge Research, United Kingdom, focusing on *viscoelasticity of wormlike micellar solutions and asphaltene aggregation / deposition* (0.6 fte).
- 2006 – 2010 Postdoc on a personal VENI grant at University of Twente, The Netherlands, focusing on *hydrodynamics of fiber networks and solid-fluid drag on rod-particles near walls*.
- 2010 – 2011 Postdoc (EU FP7 collaborative project ‘Modify’) at Université de Louvain, Belgium, on *multiscale modelling & experiments of the flow behaviour of pressure sensitive adhesives*.
- 2011 – 2016 Tenure-track Assistant (later Associate) Professor in Multiscale Modelling of Multiphase Flows at Eindhoven University of Technology, The Netherlands. Leading PhD projects on *gas-solid flows, direct simulation monte carlo of droplets in turbulent flows, models for triboelectrification, dissipative granular flows, kinetic theory of granular flow of frictional particles*.
- 2016 – 2018 Associate Professor in the Process & Energy department at Delft University of Technology.
- 2018 – now Full Professor, with chair in *Complex Fluid Processing* in the Process & Energy department at Delft University of Technology. Leading projects on *multiscale modelling of fluidization of non-spherical particles (application: biomass conversion), non-Newtonian fluid flows through porous media (application: enhanced oil recovery), multicomponent flows in micro-structured reactors (application: heterogeneous catalysis, electrolysis), packing, flow and heat-transfer in columns with non-spherical particles (application: packed bed reactors), and drying of multi-component dispersion droplets (application: spray drying)*.

Vice-director of the Delft Process Technology Institute (DPTI).

Young Executive Board Member of the e-Refinery programme at TU Delft.

Board member of Stichting Leerstoel Management of Engineering Projects (MEP).

Member of the Chemistry Round Table of the Dutch Research Council (NWO).

University teaching profile

Bachelor courses

- Physical Transport Phenomena (TU/e Bachelor course, responsible teacher)
- Introduction to Modelling (TU/e Bachelor course, developer, co-teacher)
- Introduction to Chemical Engineering and Chemistry (TU/e Bachelor course, tutorials)
- Process Engineering & Thermodynamics (TUD Bachelor course, coordinator and teacher)

Master courses

- Thermodynamics and Statistical Physics (UT Master course, developer, responsible teacher)
- Soft Matter (UT Master course, developer, responsible teacher)
- Particle-based Simulations (TU/e Master course, developer, responsible teacher)
- Advanced Computational Fluid and Plasma Dynamics (TU/e Master course, co-teacher)
- Design Project Renewables Based Energy Conversion and Storage (TUD Minor course, coordinator)

PhD/PdEng courses

- Theory of Polymer Dynamics (PhD course, developer, responsible teacher)
- Statistical Mechanics of Liquids (PhD course, developer, responsible teacher)
- Particle-based Modelling Techniques (JMBC PhD course, developer, co-teacher)
- Numerical Methods for Chemical Engineers (OSPT PhD course, co-teacher)
- Multiphase Computational Fluid Dynamics (OSPT PhD course, co-teacher)

Industrial courses

- Process Technology for non-Process Technologists (industrial course, director and developer)

Guided MSc projects

1. Leon van Heijkamp (UT), Molecular Dynamics simulations of the viscosity of n-alkanes.
2. Alex Wilber (U Cambridge), Sedimentation of aggregating solids in a fluid.
3. Ainsley Mayhew Seers (U Cambridge), Theoretical aspects of Stochastic Rotation Dynamics.
4. Merijn Buyst (TU/e), 3D-PTV of granular chute flow.
5. Niek Steendijk (TU/e), Theory for the effect of salinity on the rheology of polyelectrolyte solutions.
6. Geert Eikelboom (TU/e), GPU-optimized Stochastic Rotation Dynamics simulations.
7. Filip Henrikson (U Lund, visiting TU/e), High-speed camera expts. of particle-droplet collisions.
8. Pavithra Jayaprakash (TU/e), 3D-Magnetic Particle Tracking of non-spherical particle fluidization.
9. Leander Boersma (TU/e), Quasi-2D PIV/DIA of non-spherical particle fluidization.
10. Jan Willem Oortwijn (TU/e), Dynamics of a gas bubble in a viscoelastic fluid (expt. & theory).
11. Pradyumna Krishnan (TU/e), Viscoelastic flooding of oil from microfluidic pillared arrays.
12. Junaid Mehmood (TUD), Rheological behavior of rod-like particle suspensions (coupled CFD-DEM).
13. Peter Jamar (TUD), Coherent effects in bubble generation during electrolysis.
14. Koen de Jongh (TUD), Multiscale CFD simulations of gas-solid fluidized beds.
15. Thomas Schönweitz (TUMünchen, visiting TUD), Effects of hydrodynamic forces on rod fluidization.
16. Daniel Dacomba (TUD), Fluidization behaviour of granular activated carbon.
17. Mark van der Linde (TUD), SPH simulations of viscoelastic fluids by direct particle interactions.
18. Githin Tom Zachariah (TUD), Real-time temperature measurement in Stochastic Rotation Dynamics.
19. Parsa Habibi (TUD), Stochastic Rotation Dynamic simulations of heterogeneous catalysis.
20. Zahra Abdolmaleki (SUPSI, visiting TUD), Packed bed generation of highly non-spherical particles.
21. Fidllan Nurkhour (TUD), Modelling of an indirectly heated bubbling fluidized bed steam reformer.
22. Robbert Leliveld (TUD), Flow alignment of non-spherical particles in confined microfluidic channels.
23. Duncan de Voogt (TUD), Modelling the hydrodynamics of an indirectly heated FB steam reformer.
24. Avinash Mohan (TUD), Tuning of particle interactions in SPH towards realistic viscoelasticity.
25. Max de Graaf (TUD), Large Amplitude Oscillatory Shear of viscoelastic SPH fluids.
26. Kjeld Broekema (TUD), Effect of particle interactions on surface tension in SPH fluids.

Guided PDEng projects

1. Maryam Shazad (Janssen Pharmaceutica, Beerse): crystallisation modelling and expts.
2. Iria Kaperoni (Shell Technology Center Amsterdam): classified project.
3. Yulyanna Carrasco Febres (Unilever, Vlaardingen): butter crystallisation modelling.
4. Alessandro Lopez Perez (Shell Technology Center Amsterdam): classified project.
5. Amin Ahmadzadeh (Unilever, Vlaardingen): granulation of food powder products.
6. Akshaya Sundar (Hydro.Re.Gen consortium): design of a regeneration reactor for sodium borohydride.
7. Ali Hashempour (Hydro.Re.Gen consortium): design of a sodium borohydride ship propulsion system.

Guided PhD projects

1. Jimaan Sane (U Cambridge), Taylor dispersion of colloidal particles in microchannel flow.
2. Peter Kindt (UT), Coarse-grained simulations of entangled polymer melts.
3. Albert van der Noort (UT, Unilever), Coarse-grained simulations of core-shell particles.
4. Yuguo Tao (UT), Dynamics of rigid rod suspensions.
5. Amol Thakre (UT), Fluid-fluid phase separation and hydrodynamic instabilities.
6. Igor Santos de Oliveira (UT), Flow-induced ordering of hard particles in viscoelastic fluids.
7. Li Liu (UT), Coarse-graining complex polymer architectures.
8. Daniel Reid (RU Groningen), Collective effects in high-Reynoldsnumber swimming organisms.
9. Kristina Milinkovic (U Utrecht), Hydrodynamics of sedimenting bidisperse mixtures of spheres.
10. Vikrant Verma (TU/e), Two-Fluid Model in cylindrical coordinates for fluidized gas-solid flows.
11. Sushil Shirsath (TU/e, Tata Steel), Segregation of granular particles in rotating chute flows.
12. Sandip Pawar (TU/e, TetraPak), Expts. & Direct Simulation Monte Carlo modelling of spray drying.
13. Yupeng Xu (TU/e), Dynamics of large intruders impacting granular beds.
14. Martin Korevaar (TU/e), Triboelectric charging of particles in long narrow ducts for dry separation.
15. Luuk Seelen (TU/e), Dynamics of granular systems of non-spherical particles.
16. Lei Yang (TU/e), Kinetic theory of granular flow for rough frictional spheres.
17. Shauvik De (TU/e, Shell), Viscoelastic flow through porous media for enhanced oil recovery.
18. Rohit Maitri (TU/e, Shell), Sedimentation and resuspension in solid-liquid flows.
19. Sathish Sanjeevi (TUD), Hydrodynamic forces on non-spherical particles (Lattice Boltzmann).
20. Giulia Finotello (TU/e, TetraPak), Modelling & expts. of droplet-droplet collisions for spray drying.
21. Maxim Masterov (TU/e), Highly parallelizable CFD methods for dense bubbly flows.
22. Satish Kamath (TU/e), Direct Simulation Monte Carlo methods applied to dense bubbly flows.
23. Harshil Patel (TU/e, Shell), Lagrangian Voronoi-cell-based methods for CFD applications.
24. Vinay Mahajan (TUD), Wall effects on the orientation dynamics of non-spherical fluidized particles.
25. Ivan Mema (TUD), Effect of aspect ratio on the dynamics of non-spherical fluidized particles.
26. Aditya Sengar (TU/e), Advection-diffusion-reaction mechanisms near corrugated walls.
27. Giulia Fiorucci (U Utrecht), Effect of hydrodynamics on confined colloidal crystallization dynamics.
28. Elyas Moghaddam (TUD), Packing, flow and heat transfer in packed beds with non-spherical particles.
29. Rong Fan (TUD), Multicomponent transport in micro-structured reactors.
30. Stephan Snejders (TUD), Drying of multicomponent dispersion droplets.
31. Onno Kramers (TUD), Hydraulics of fluidized particles for water treatment processes.
32. Rumen Georgiev (TUD), Shape-induced interactions between particles in a quasi-2D flow.
33. Max Döpke (TUD), Molecular dynamics simulations of electrolyte properties near solid surfaces.
34. Christos Tsekos (TUD), Processing of biomass in fluidized bed reactors.
35. Joseph Blake (TUD), Modelling of transport in porous electrodes.
36. Arvind Pari (TUD), Modelling of bubble phenomena in porous electrodes.
37. Esaar Naeem Butt (TUD), Bridging scales in electrochemical reactor design.
38. Nagaraj Nagalingam (TUD), Modelling of non-photochemical laser-induced nucleation phenomena.
39. Victor Koppejan (TUD), Modelling of expanded bed adsorption
40. Mark Sassenburg (TUD), Modelling and experimentation on electrochemical CO₂ reduction.
41. Nathalie Ligthart (TUD), Modelling and experimentation on carbon slurry electrodes.

I am or have been (co-)promotor of all PhD students except 1, 4-9, and 27.

Funding ID

Project title	Applicants	Funding agency	Date of grantin	Positions
Viscoelasticity of wormlike micellar solutions	<u>Padding</u>	EPSRC (UK)	02/2003	1
Microrheology of cell membranes and the cytoskeleton (VENI)	<u>Padding</u>	NWO (NL)	12/2005	1
Directed and Controlled Self-Assembly of nano-Colloids	6 universities / institutes	FP7 (EU)	02/2008	2 for UT
Dynamics of Architecturally Complex Polymers (Dynacop)	12 universities / companies	FP7 (EU)	11/2008	1 for UT
Nanomechanical Characterization of supramolecular protein structures using	Bennink / <u>Padding</u>	FOM-DPI (NL)	05/2009	2
Manufacturing techniques of organic solar cells (Energy Research grant – Long term)	ECN Petten / UT / Fujifilm	Agentschap NL	07/2010	1 for UT
ESMI: European Facilities for Soft Matter Technologies	12 universities / institutions	FP7 (EU)	01/2011	1 for UT
Viscoelastic flow simulations of polymer flooding	<u>Padding</u> / Peters	FOM-Shell(NL)	12/2012	1
Simulation of proppant transport for shale gas production	Peters / <u>Padding</u>	FOM-Shell(NL)	10/2013	1
Multiscale modelling of dense gas-fluidized flows of non-spherical particles (ERC-CoG)	<u>Padding</u>	ERC CoG (EU)	11/2013	8
Flow structure formation and evolution of GLS reactive flows	<u>Padding</u> / Kuipers / Lohse / Sun	NWO	11/2014	1
Influence of wall corrugation on mass transfer in catalytic reactors	<u>Padding</u> / Kuipers / Van Santen	NWO	11/2014	1
Hydrodynamics and interaction of self-assembly in droplet environment	Dijkstra / Filion / <u>Padding</u>	NWO	11/2014	1
Interfacial dynamics in multiphase flow through pores	Peters / <u>Padding</u>	FOM-Shell(NL)	12/2014	1
Toepassing pyrolyse olie in een gemodificeerde dieselmotor	3 companies and TU/e	EZ (TKI)	12/2015	1 for TU/e
Drying of multi-components dispersion droplets	TUD, WUR, 3 companies	TTW-OTP	03/2017	2 for TUD
Multicomponent transport in micro-structured reactors	Fan / <u>Padding</u>	CSC	05/2017	1
Electrons to Chemical Bonds (E2CB)	TUD, UT, TU/e, WUR, UG, UL	TTW Perspectief	11/2018	15 (10 for TUD)
LightX: Light induced seed generation for industrial crystallization	Eral / <u>Padding</u> / vd Heijden	TTW-OTP	01/2019	3
Pyrolysis in molten salt reactors	<u>Padding</u> / v Ommen / Westerweel	Shell	01/2019	1
Towards Large-scale electro-conversion systems (TOeLS)	Large team at TUD	Shell, TKI, TUD	03/2019	11 (1 for CFP)
Bubble dynamics in electrolysis	TU/e, TUD, UT, Shell, Nouryon	NWO	04/2019	4 (1 for CFP)

Total funding obtained through external grants (counting local positions in collaborative projects): 9.1 M€.

Research focus and recognition of scientific contributions

I have a long-time research focus on development of novel simulation models for multiphase flows, mesoscale transport phenomena, soft matter, rheology, and heterogeneous catalysis, including validating experiments, with the goal to improve production processes and process equipment.

My research is multiscale, ranging from molecular to granular, as well as interdisciplinary, connecting areas of physics, chemistry, and engineering. The most important contributions include (acknowledging collaborators in parentheses):

1. Systematic coarse-graining of interactions in polymer melts and wormlike micelles. The innovative method and algorithm for topology (entanglement) conservation are well-cited: 306 and 192 times for the two main papers. The work has led to an invited review paper and invited presentations at the International Liquid Matter conference (The Netherlands and Sweden), International Soft Matter Days (Germany), and the International Congress on Rheology (USA). (Briels, Boek)
2. Reintroduction of memory effects (transient forces) in super-coarse-grained particles. Several papers appeared, one of which (2009) has been cited 55 times. In all cases the results are quantitatively validated against experimental results. Invited presentations at De Gennes Discussion Conference (France) and International Soft Matter Days (Germany). (Briels, Sprakel, Bailly)
3. Coarse-graining of hydrodynamic interactions in sedimenting and flowing suspensions of solid particles. I was the first to apply a stochastic multi-particle collision method to model hydrodynamic flow between solid particles. The main papers describing the methodology and results are well-cited: 420 and 169 times, respectively. Invited presentations at the Newton Institute (United Kingdom), Physics@FOM Conference (The Netherlands), Joint Soft Matter Conference (Germany) and Faraday Discussions (The Netherlands). (Louis, Moncho-Jordá, Dijkstra).
4. Aggregation and deposition of sticky asphaltene particles in capillary flow. I have performed both coarse-grained hydrodynamic simulations and micro-Particle Image Velocimetry experiments. Several papers appeared, one of which has been cited 72 times. Invited presentations at the International Soft Matter Days (Germany), International Congress on Rheology (USA) and International Conference on Petroleum Phase Behaviour and Fouling (France). (Boek)
5. Determination of drag forces and drag torques on solid particles near walls, with fully resolved fluid flow. Experimental validation of reduced diffusion of particles near confining walls. The main paper (2010) has been cited 52 times. Invited presentation at the Joint Soft Matter Conference (Germany). (Briels, Imperio)
6. Determination of high-Reynolds hydrodynamic flow and drag and lift forces on objects and swimmers. A paper on hydrodynamic interactions between fully deforming fish has appeared in 2015 and has been cited 128 times. (Hemelrijk, Reid)
7. Development of an efficient accurate Direct Simulation Monte Carlo algorithm for simulation of systems containing millions to billions of particles, droplets or bubbles. Paper have appeared from 2013 to now. (Pawar, Finotello, Kamath, Deen, Kuipers)
8. Experimental and simulation investigations into hydrodynamic instabilities appearing in low Reynoldsnumber flow of viscoelastic fluids through microchannels and porous media. A number of papers have appeared (2015-2017) and received considerable attention. (De, Peters)
9. A new kinetic theory of granular flow for rough frictional spheres. Papers on this theoretical tour-de-force have appeared in 2016 and 2017. (Yang, Kuipers)
10. A particle-based mesoscale model for multi-component mass transfer and heterogeneous catalytic reactions in structured reactors. Papers have appeared in 2017, 2018 and 2019. (Sengar, Van Santen, Padding)
11. A new multiscale simulation methodology to model fluidized beds with non-spherical particles, including a novel coarse-grained method. This is my ERC Consolidator work, and papers have appeared from 2016 to 2020.

Selection of invited presentations to conferences and international advanced schools

1. *DNS and force correlations for assemblies of non-spherical particles*, presentation at 13th International Conference on Computational Fluid Dynamics in the Minerals and Process Industries, Melbourne, Australia (2018).
2. *Elastic instabilities in pillared micro channels*, invited lecture at Annual European Rheology Conference, Copenhagen, Denmark (2017).
3. *Mesoscale particle-based modelling of flow & diffusion in colloidal suspensions*, invited lecture at JMBC course on dispersed multiphase flow, University of Twente (2017).
4. *Application of Direct Simulation Monte Carlo to particles and droplets in a spray drying device*, invited keynote lecture at Discrete Simulation of Fluid Dynamics Conference, Edinburgh, United Kingdom (2015).
5. *Hydrodynamic interactions in non-equilibrium computer simulations of colloidal systems*, invited lecture at European Summer School on Electrochemical Engineering, Leeuwarden, The Netherlands (2015).
6. *Cross-validation of 3D particle tracking in granular flows down rotating chutes*, presentation at Physics@FOM, Veldhoven, The Netherlands (2015).
7. *Particle-based simulations: what do we learn and why should you care?*, invited keynote lecture at NPS conference, Utrecht, The Netherlands (2014).
8. *From atoms to galaxies*, presentation at Jülich Soft Matter Days special session, Bad Honnef, Germany (2014).
9. *Modelling of granular flows through inclined rotating chutes using a discrete particle model*, presentation at Ninth International Conference on CFD in the Minerals and Process Industries, CSIRO, Melbourne, Australia (2012). (*Invited chairman for the session on particle collisions.*)
10. *Statistical Mechanics of Liquids*, invited lectures (5x2 hours) at Advanced School for Theoretical Chemistry and Spectroscopy, Han-sur-Lesse, Belgium (2010).
11. *Hydrodynamics of confined colloidal fluids in two dimensions*, invited lecture at the 144th Faraday Discussion, Groningen, The Netherlands (2009).
12. *Hydrodynamic interactions in polymer networks and embedded particles*, invited lecture at the Joint Soft Matter Conference, Forschungszentrum Jülich, Jülich, Germany (2009).
13. *Computer simulation of the rheology of concentrated star polymer suspensions*, lecture at De Gennes Discussion Conference “From Reptation to Glossy Materials – De Gennes Pioneering Work in Rheology and Recent Developments”, Chamonix, France (2009).
14. *Deposition of colloidal asphaltene in capillary flow: Experiments and mesoscopic simulations*, lecture at 8th International Conference on Petroleum Phase Behavior and Fouling, Pau, France (2008).
15. *Colloidal asphaltene deposition and aggregation in capillary flow: Experiments and mesoscopic simulation*, lecture at 15th International Congress on Rheology, Monterey, USA (2008).
16. *Simulations of the dynamics and rheology of wormlike micelles*, lecture at 15th International Congress on rheology, Monterey, USA (2008).
17. *Deposition of colloidal asphaltene in capillary flow: Experiments and mesoscopic simulation*, invited lecture at the International Soft Matter Days, Aachen, Germany (2007).
18. *Brown vs Stokes: sedimentation of colloidal suspensions*, invited lecture at the Newton Institute, Cambridge, United Kingdom (2005).
19. *Theory of Polymer Dynamics*, invited lectures (4x2 hours) at Advanced School for Physical Chemistry, Han-sur-Lesse, Belgium (2005).

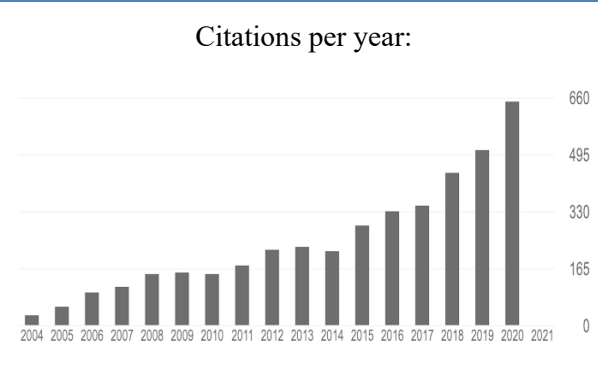
Examples of other academic activities

- Invited lecturer at Advanced School for Physical Chemistry, Han-sur-Lesse, Belgium (2005), Advanced School for Theoretical Chemistry and Spectroscopy, Han-sur-Lesse, Belgium (2010), and J.M. Burgerscentrum Advanced Course in Particle-based Modeling Techniques, Eindhoven, NL (2013), and European Summer School on Electrochemical Engineering, Leeuwarden, NL (2015).
- Collaborator (by invitation) with academic groups in London (UK), Oxford (UK), Harvard (USA), Patras (Greece), Düsseldorf (Germany), San Sebastian (Spain), Groningen, Utrecht, Wageningen and Twente (Netherlands), Leuven and Louvain (Belgium), Zürich (Switzerland) and Melbourne (Australia).
- External (international) opponent at PhD-defences of Dr. B. O’Conchuir (University of Cambridge, 2015), Dr. A. Soleimani (University of Linz, 2016), Dr. A. Villa (University of Linz, 2020).
- Invited coach and jury of “Physics with Industry” workshop (Lorenz Center Leiden, 2016, 2017).
- Invited reviewer for the Dutch Research Council (NWO) in the years 2011-2020, National Science Foundation (USA) in the years 2006-2020, and German Science Foundation (DFG) in 2020.
- Invited reviewer for Physical Review (A,E,Let), Europhysics Letters, European Physics J., J. Chemical Physics, Physical Chemistry Chemical Physics, Macromolecules, Biomacromolecules, Soft Matter, Colloid and Interface Science, Rheologica Acta, J. Fluid Mechanics, J. Non-Newtonian Fluid Mechanics, Microfluidics and Nanofluidics, Energy & Fluids, Chemical Engineering Science, AIChE J., and Nature.

Memberships and organisational activities

- Vice-director of the Delft Process Technology Institute (DPTI).
- Young Executive Board member of the TU Delft e-Refinery initiative (responsible for coordinating research activities related to transport phenomena).
- Board member of Stichting Leerstoel Management of Engineering Projects (MEP).
- Member of the Chemistry Round Table of the Dutch Research Council (NWO).
- Former member of the educational committee of MCEC (Netherlands Center for Multiscale Catalytic Energy Conversion); organizer of MCEC PhD/Postdoc schools of 2015, 2016 and 2017.
- Former member of the educational committee of TU/e Chemical Engineering department (OC-ST).
- Member of the Master admission committee of 3mE, TUD.
- Jury member for NWO-TTW Perspectief proposals.
- Member of the program committee of Physics@Veldhoven 2019.
- Member of the core team guiding reorganization of the Process & Energy department, with the goal to improve collaboration between its members and definition of equal and shared responsibilities.
- Co-organiser of the CECAM workshop “Structure and rheology of self-assembling and aggregating colloidal suspensions: theory, simulation and experiment”, Lyon, France (2005) (40 participants).
- Co-organiser of the Eindhoven Multiscale Institute workshop “Porous Media”, Eindhoven, The Netherlands (2013) (70 participants).
- Co-organiser of the kick-off of the Delft Institute for Computational Science and Engineering (DCSE) (May 2017) (180 participants).
- Chair of the organizing committee of Netherlands Process Technology Symposium (NPS) 2020 & 2021.

Scientific Track Record (citation records retrieved from Google Scholar, January 2021)

Publications in refereed journals:	137	 <p>Citations per year:</p> <table border="1"><thead><tr><th>Year</th><th>Citations</th></tr></thead><tbody><tr><td>2004</td><td>10</td></tr><tr><td>2005</td><td>15</td></tr><tr><td>2006</td><td>20</td></tr><tr><td>2007</td><td>25</td></tr><tr><td>2008</td><td>30</td></tr><tr><td>2009</td><td>35</td></tr><tr><td>2010</td><td>40</td></tr><tr><td>2011</td><td>45</td></tr><tr><td>2012</td><td>50</td></tr><tr><td>2013</td><td>55</td></tr><tr><td>2014</td><td>60</td></tr><tr><td>2015</td><td>70</td></tr><tr><td>2016</td><td>80</td></tr><tr><td>2017</td><td>90</td></tr><tr><td>2018</td><td>100</td></tr><tr><td>2019</td><td>110</td></tr><tr><td>2020</td><td>120</td></tr><tr><td>2021</td><td>130</td></tr></tbody></table>	Year	Citations	2004	10	2005	15	2006	20	2007	25	2008	30	2009	35	2010	40	2011	45	2012	50	2013	55	2014	60	2015	70	2016	80	2017	90	2018	100	2019	110	2020	120	2021	130
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2021	130																																							
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Total number of citations:	4251																																							
h-index:	34																																							
Number of chapters in published books:	4																																							
Supervised PhD theses (28 finished, 13 ongoing):	41																																							
Number of papers reviewed:	~370																																							
Number of proposals reviewed:	15																																							
(7 for NSF/USA, 1 for DFG/DE, 7 for NWO/NL)																																								

Publications in international (refereed) journals

2021

137. E.M. Moghaddam, E.A. Foumeny, A.I. Stankiewicz and **J.T. Padding**, Heat transfer from wall to dense packing structures of spheres, cylinders and Raschig rings, **Chem. Eng. J.** **407**, 127994 (2021).

136. O.J.I. Kramer, P.J. de Moel, S.K.R. Raaghav, E.T. Baars, W.H. van Vugt, W.-P. Breugem, **J.T. Padding** and J.P. van der Hoek, Can terminal settling velocity and drag of natural particles in water ever be predicted accurately?, accepted for publication in **Drinking Water Engineering and Science** (2021).

135. I. Mema and **J.T. Padding**, Fluidization of elongated particles - effect of multi-particle correlations for drag, lift and torque in CFD-DEM, accepted for publication in **AIChE Journal** (2021).

2020

134. R.V. Maitri, **J.T. Padding**, J.A.M. Kuipers, and E.A.J.F. Peters, Lift-off of multiple particles in a narrow channel, **Chem. Eng. Sci.** **X 8**, 100086 (2020).

133. I. Mema and **J.T. Padding**, Spherical versus elongated particles - numerical investigation of mixing characteristics in gas fluidized bed, **Chem. Eng. Sci.** **X 8**, 100079 (2020).

132. G. Finotello, **J.T. Padding**, K.A. Buist, A. Schijve, A. Jongsma, F. Innings, and J.A.M. Kuipers, Numerical investigation of droplet-droplet collisions in a water and milk spray with coupled heat and mass transfer, to appear in **Drying Technology** (2020).

131. O.J.I. Kramer, P.J. de Moel, **J.T. Padding**, E.T. Baars, Y.M.F. El Hasadi, E.S. Boek and J.P. van der Hoek, Accurate voidage prediction in fluidisation systems for full-scale drinking water pellet softening reactors using data driven models, **J. Water Process Engineering** **37**, 101481 (2020).

130. I. Mema, E.C. Wagner, J.R. van Ommen and **J.T. Padding**, Fluidization of spherical versus elongated particles - experimental investigation using X-ray tomography, **Chem. Eng. J.** **397**, 125203 (2020).

129. S.K. Pacha Sanjeevi and **J.T. Padding**, Hydrodynamic forces on monodisperse assemblies of axisymmetric elongated particles: orientation and voidage effects, to appear in **AIChE Journal** (2020).

128. S. Kamath, M.V. Masterov, J.T. Padding, K.A. Buist, M.W. Baltussen and J.A.M. Kuipers, Parallelization of a stochastic Euler-Lagrange model applied to large scale dense bubbly flows, **Journal of Computational Physics: X** **8**, 100058 (2020).

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