

# Curriculum Vitae

## Dr. Hanneke Gelderblom

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Turbulence and Vortex Dynamics  
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Physics of Fluids  
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## Personal

- **Born** on September 30, 1985 in the Netherlands
- Married, one daughter (born in 2017)
- **Research interests:** fluid dynamics, capillary flows, droplet dynamics, liquid fragmentation, laser-liquid interaction, evaporation & pattern formation, biofluids, cardiovascular fluid mechanics

## Education

- **2009 – 2013** — Ph.D. (*cum laude*)  
Physics of Fluids group, University of Twente  
Supervisors: Prof.Dr. Detlef Lohse and Prof.Dr. Jacco Snoeijer  
Thesis: "Fluid flow in drying drops"
- **2006–2009** — MSc. Biomedical Engineering (*cum laude*),  
Cardiovascular Biomechanics group, Eindhoven University of Technology  
Supervisors: Prof.Dr. Frans van de Vosse and Dr. Fons van de Ven  
Thesis: "Characterization of a thermal sensor for coronary flow assessment"
- **2007** — Internship at the Auckland Bioengineering Institute, New Zealand, on modelling of cardiac mechanics, with Dr. Martyn Nash and Prof.Dr. Peter Hunter
- **2007** — Internship at the Academic Hospital Maastricht, on blood flow in the upper limb arterial tree, with Dr. Carole Leguy and Prof.Dr. Frans van de Vosse
- **2003–2006** — BSc. Biomedical Engineering (*cum laude*), Eindhoven University of Technology

## Employments

- **Jan. 2018 – present** — Assistant Professor (UD), Turbulence and Vortex Dynamics group, Department of Applied Physics, Eindhoven University of Technology

- **June 2013 – present** — Project leader NWO (Netherlands Organisation for Scientific Research)-Industrial Partnership Programme “Fundamental fluid dynamics challenges in EUV lithography” (group based at ASML Veldhoven); Research Fellow in the Physics of Fluids group, University of Twente
- **Sept. 2015 – Nov. 2015** — Researcher Laboratoire d’Hydrodynamique, group C. Clanet and D. Quéré, École Polytechnique, Palaiseau, France
- **Feb. 2009 – May 2009** — Researcher Cardiovascular Biomechanics, Eindhoven University of Technology

## Honours & Awards

- **2016** — Veni laureate
- **2014** — FOM Physics Thesis Award for best PhD thesis in Physics in 2014
- **2014** — Charles Hoogendoorn Award for best PhD thesis in Fluid Mechanics 2014
- **2014** — Milton van Dyke Award, Gallery of Fluid Motion, *Laser impact on a drop*, Division of Fluid Dynamics, American Physical Society Meeting, San Francisco 2014
- **2012** — Winner EPJ/Springer Young Speakers Contest, Fysica-Chemie 2012
- **2011** — Physical Review Letters selected our paper *Order to disorder transition in ring-shaped colloidal stains*, Phys. Rev. Lett. 107, 085502 (2011), as Editor’s Suggestion and issued a special Viewpoint article
- **2011** — Best Poster Award JMBC Burger’s day 2011
- **2010** — Milton van Dyke Award, Gallery of Fluid Motion, *Avalanche of particles in evaporating coffee drops*, Division of Fluid Dynamics, American Physical Society Meeting, Long Beach 2010
- **2009** — Best MSc. thesis in Biomedical Engineering, Eindhoven
- **2006** — Sixma Organic Chemistry Award, Eindhoven
- **2004** — Prof. Huson Award for best first-year student Biomedical Engineering, Eindhoven

## Grants

- **2016** — NWO Veni grant *Evaporation of living liquid drops*
- **2013** — I was one of the initiators of the FOM Industrial Partnership Programme *Fundamental fluid dynamics challenges of extreme ultraviolet lithography*, with ASML. 1 programme leader, 3 PhD and 1 PD positions.

## Supervision & Teaching

### Supervision Postdoc

- Riëlle de Ruiter (2015–2016)

### Supervision Ph.D. students

- Marise Gielen (2013–present)
- Sten Reijers (2015–present)
- Alexander Klein (2013–2017)

#### Supervision MSc. students

- Bo Liu (2016–2017)
- Koen Arens (2015–2016)
- Sten Reijers (2014–2015)
- Oscar Bloemen (2011)

#### Teaching

- **2016** — University of Twente, lecturer Advanced Fluid Mechanics (MSc course Applied Physics)
- **2010, 2011** — University of Twente, tutorials on Heat & Mass Transfer (3rd year physics)
- **2005 – 2008** — Eindhoven University of Technology, teaching assistant for several BSc. courses Biomedical Engineering

## Publications

Peer-reviewed journal publications (H-index Google Scholar 10, Web of Science 9):

1. A.L. Klein, D. Lohse, M. Versluis and **H. Gelderblom**,  
*Apparatus to control and visualize the impact of a high-energy laser pulse on a liquid target*,  
Rev. Sci. Instrum. 88, 095102 (2017) [19 pages];  
see also the “Editor’s pick” of that issue.
2. S.A. Reijers, J.H. Snoeijer and **H. Gelderblom**,  
*Droplet deformation by short laser-induced pressure pulses*,  
J. Fluid Mech. 828, pp. 374-394 (2017).
3. M.V. Gielen, P. Sleutel, J. Benschop, M. Riepen, V. Voronina, D. Lohse, J.H. Snoeijer, M. Versluis and **H. Gelderblom**,  
*Oblique drop impact onto a deep liquid pool*,  
Phys. Rev. Fluids 2, 083602 (2017) [13 pages].
4. R. de Ruiter, P. Colinet, P. Brunet, J.H. Snoeijer and **H. Gelderblom**,  
*Contact line arrest in solidifying spreading drops*,  
Phys. Rev. Fluids 2, 043602 (2017) [12 pages].
5. D. Kurilovich, A.L. Klein, A. Lassise, F. Torretti, R. Hoekstra, W. Ubachs, **H. Gelderblom**, and O. Versolato,  
*Plasma propulsion of a metallic micro-droplet and its deformation upon laser impact*,  
Phys. Rev. Applied 6, 014018 (2016) [8 pages].
6. S.A. Reijers, **H. Gelderblom** and F. Toschi,  
*Axisymmetric multiphase Lattice Boltzmann method for generic equations of state*,  
J. Comp. Sci. 17, pp. 309-314 (2016).

7. **H. Gelderblom**, H. Lhuissier, A.L. Klein, W. Bouwhuis, D. Lohse, E. Villermaux, and J.H. Snoeijer, *Drop deformation by laser-pulse impact*, J. Fluid Mech. 794, pp. 676-699 (2016).
8. A.L. Klein, W. Bouwhuis, C.W. Visser, H. Lhuissier, C. Sun, J.H. Snoeijer, E. Villermaux, D. Lohse and **H. Gelderblom**, *Laser impact on a drop*, Phys. Fluids 27, 091106 (2015) [2 pages]; see also:
  - Corresponding winning entry to the Gallery of Fluid Motion,
  - "Assaulting ink drops for science", by Andrew Grant, Science News, December 1, 2015.
9. A.L. Klein, W. Bouwhuis, C.W. Visser, H. Lhuissier, C. Sun, J.H. Snoeijer, E. Villermaux, D. Lohse and **H. Gelderblom**, *Drop shaping by laser-pulse impact*, Phys. Rev. Applied 3, 044018 (2015) [6 pages]; see also:
  - NRC Handelsblad "Laserlicht laat druppel koken en uiteenspatten", May 4, 2015,
  - "Vuren op water" by Timo Können, De Ingenieur 7, pp. 33-35 (2015).
10. **H. Gelderblom**, H.A. Stone and J.H. Snoeijer, *Stokes flow in a drop evaporating from a liquid subphase*, Phys. Fluids 25, 102102 (2013) [15 pages].
11. A.G. Marin, **H. Gelderblom**, A. Sussarey-Arce, A. van Houselt, L. Lefferts, H. Gardeniers, D. Lohse and J.H. Snoeijer, *Building microscopic soccer balls with evaporating colloidal fakir drops*, Proc. Natl. Acad. Sci. U.S.A. 109, 16455 (2012) [4 pages]; see also:
  - "Health News from National Public Radio", "Fun with physics: How to make tiny medicine nanoballs", by Joe Palca, October 10, 2012,
  - De Volkskrant, "Spijkerbed: Polystyreen op pilaartjes", September 25, 2012.
12. **H. Gelderblom**, A.G. Zijlstra, L. van Wijngaarden and A. Prosperetti, *Oscillations of a gas pocket on a liquid-covered solid surface*, Phys. Fluids 24, 122101 (2012) [15 pages].
13. **H. Gelderblom**, O. Bloemen and J.H. Snoeijer, *Stokes flow near the contact line of an evaporating drop*, J. Fluid Mech. 709, pp. 69-84 (2012).
14. A.G. Marin, **H. Gelderblom**, D. Lohse and J.H. Snoeijer, *Rush hour in evaporating coffee drops*, Phys. Fluids 23, 091111 (2011) [1 page]; see also the corresponding winning entry to the Gallery of Fluid Motion.
15. A.G. Marin, **H. Gelderblom**, D. Lohse and J.H. Snoeijer, *Order-to-disorder transition in ring-shaped colloidal stains*, Phys. Rev. Lett. 107, 085502 (2011) [4 pages]; see also:

- "Editor's Suggestion" of that issue,
  - Viewpoint by Greg Huber, "Rush hour in a drop of coffee", *Physics* 4, 65 (2011),
  - "Dwingend Drogen: Het praktische nut van koffiekringen", by Timo Können, *De Ingenieur* 127, No. 6, pp. 36-38 (2015),
  - NRC Handelsblad "De verfijnde fysica van koffievlekken", August 23, 2011,
  - NRC Next "In de ban van de kring", August 25, 2011.
16. **H. Gelderblom**, A.G. Marin, H. Nair, A. van Houselt, L. Lefferts, J.H. Snoeijer and D. Lohse, *How water droplets evaporate on a superhydrophobic substrate*, *Phys. Rev. E* 83, 026306 (2011).
  17. **H. Gelderblom**, A. van der Horst, J.R. Haartsen, M.C.M. Rutten, A.A.F. van de Ven and F.N. van de Vosse, *Analytical and experimental characterization of a miniature calorimetric sensor in pulsatile flow*, *J. Fluid Mech.* 666, pp. 428-444 (2011).
  18. C.A.D. Leguy, E.M.H. Bosboom, **H. Gelderblom** and F.N. van de Vosse, *Estimation of arterial mechanical properties using a reverse method applying a patient specific wave propagation model*, *Med. Eng. Phys.* 32 (9), pp. 957-967 (2010).
  19. R.H. Keldermann, M.P. Nash, **H. Gelderblom**, V.Y. Wang and A.V. Panfilov, *Electromechanical wavebreak in a model of the human left ventricle*, *Am. J. Physiol.-Heart C.* 299 (1), pp. H134-H143 (2010).

#### Articles for the general physics community

20. **H. Gelderblom** and O.O. Versolato, *Laserschieten op tindruppels*, *Nederlands Tijdschrift voor Natuurkunde* 83, pp. 26-29 2017.
21. **H. Gelderblom**, A.G. Marin, D. Lohse and J.H. Snoeijer, *Fysica aan de koffietafel*, *Nederlands Tijdschrift voor Natuurkunde* 78, pp. 22-26 (2012).

#### Book contributions (not or barely refereed)

22. **H. Gelderblom**, C.W. Visser, C. Sun and D. Lohse, *Drop impact on solid substrates: bubble entrapment and spreading dynamics*, In: *Soft Interfaces*, Les Houches 2012, Section XCVIII, Editors: L. Bocquet, D. Quere, T.A. Witten, and L.F. Cugliandolo, pp. 147-162, Oxford University Press (2017).
23. **H. Gelderblom** *I see what you don't see - Stains in Science*, In: *The Living Surface*, art book by Lizan Freijsen, pp. 103-112, Jap Sam Books (2017)

## Talks & seminars

#### Invited talks:

- International Workshop on EUV and Soft X-Ray Sources, Amsterdam (2016)
- Physics@FOM, talks in focus session "light moves matter" & prize winners session (2015)

- 11th Dutch Soft Matter Meeting (2011)
- Invited seminars (9): IUSTI Université Aix-Marseille (2016), Process & Engineering lab TU Delft (2016), Gulliver seminar ESPCI Paris (2015), Amsterdam Research Center for Nanolithography (2015), Soft Matter Group University of Amsterdam (2015), Physical Chemistry and Soft Matter lab Wageningen University (2015), Fluid Dynamics seminar Eindhoven University of Technology (2014), Physical and Theoretical Chemistry Laboratory University of Oxford (2012), TIPs physique des fluides Université Libre de Bruxelles (2012)

Other talks: 17 international conference talks (e.g. APS-DFD, DROPLETS<sub>2013</sub>, FLOW<sub>14</sub>)

## Organization & Committees

- **2015**— Co-organizer Lorentz Center workshop “Liquid fragmentation in Nature & Industry” Leiden, The Netherlands
- **2015**— Co-organizer “Droplets 2015” conference, University of Twente, The Netherlands
- **2011–2013** — Member program committee Studium Generale Enschede
- **2011–2013** — Member PhD students committee national research school JMBC
- **2006–2007** — Member education committee BME Eindhoven University of Technology

## Popularization & Outreach

- *Waarom word je zo nat van miezer?* Participation in Het Lab, online lecture series produced by De Universiteit van Nederland (November 24, 2017)
- *De natuurkunde van vloeistoffen*, lecture for primary school kids in Bibliotheek Dommeldal (November 5, 2017)
- Two contributions to the Dutch television quiz Universiteitsstrijd (September 2016)
- *Ik zie wat jij niet ziet*, contribution to Dutch television show De Kennis van Nu (February 11, 2016)
- *De fysica van festivalvloeistoffen*, popular science talk at the Zwarte Cross Festival in Lichtenvoorde, The Netherlands (July 24, 2015)
- *De fysica van drogende en spetterende druppels*, Science Cafe, Concordia Theater Enschede (March 19, 2015)
- *Van spetterende fysica tot snellere iPhone*, popular science talk at NWO Bessensap (scientists meet press), Media Plaza Utrecht (June 6, 2014)
- *The physics of coffee stains*, popular science talk at Pecha Kucha Eindhoven, Temporary Art Centre, (February 20, 2014)
- Two contributions to De Nationale Wetenschapsquiz 2013 (Dutch National Science Quiz): Bouncing drops and Cheerios effect
- Radio interview BNR News radio (April 2013)
- Science Cafe on *Huis- Tuin- en Keukennatuurkunde*, Enschede, (December 12, 2012)

## References

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University of Twente  
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Prof. Dr. E. Villermaux  
Aix-Marseille Université  
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