

## BRIEF CURRICULUM VITAE

### Prof. Dr. Jacobus Pieter (Ko) van der Weele



Jacobus Pieter (Ko) van der Weele was born in the Netherlands in 1959. He studied theoretical physics with Nobel laureate Prof. Dr. Gerard 't Hooft in Utrecht (1983) and did his PhD -- on chaos theory -- with Prof. Dr. Hans Capel at the University of Amsterdam (1987). Since then he has been working at the University of Twente (1987-2005), the Hellenic Open University (2006-2007) and the University of Patras (2006-now). His official research theme at the University of Patras is "Differential Equations with Applications in the Physical and/or Economical Sciences and/or Technology" (ΦΕΚ τ.Γ 697/9-8-2010).

Department of Mathematics,  
University of Patras,  
26500 Patras, Greece

Telephone: +30-2610-997457  
E-mail: [weele@math.upatras.gr](mailto:weele@math.upatras.gr)  
Site: <http://math.upatras.gr/~weele/>

**Date and place of birth:** 17 December 1959, Bruinisse, The Netherlands

**Citizenship:** Dutch, **Marital status:** married, two children

### EDUCATION

University of Utrecht, The Netherlands:

- **1980: B.Sc. in Physics and Chemistry**
- **1983: M.Sc. in Theoretical Physics and Mathematics**, with diploma thesis on "The Inflationary Universe" under supervision of Nobel laureate Prof. Dr. G. 't Hooft.
- **1980, 1983: Professional Licenses for Teaching** Physics, Mathematics, and Chemistry.

University of Amsterdam, The Netherlands:

- **1987: Ph.D. in Theoretical Physics**, with PhD thesis on "Scaling and Squeezing in Nonlinear Dynamics" under supervision of Prof. Dr. H.W. Capel.

### PROFESSIONAL EXPERIENCE

**Teacher** of Physics, College Blaucapel, Utrecht, The Netherlands, Jan. 1984 – Aug. 1984

**Graduate Research Assistant**, Institute of Theoretical Physics, University of Amsterdam, The Netherlands, April 1984 – Nov. 1987

**Assistant Professor**, Department of Technical Physics, University of Twente, The Netherlands, Dec. 1987 – Dec. 2005 (with continuous tenure).

**Visiting Lecturer** (twice) at the University of Patras, Greece, Jan. – March 1998 and May 2003.

**Associate Professor**, Department of Mathematics, University of Patras, Greece, Jan. 2006 – July 2010 (with continuous tenure).

**Instructor** of Mathematics and Physics, Department of the Physical Sciences, Hellenic Open University, Greece, Sept. 2006 – Aug. 2007 (part-time).

**Professor**, Department of Mathematics, University of Patras, Greece, Aug. 2010 – present (with continuous tenure).

## RESEARCH INTERESTS

Pattern Formation and Collective Dynamical Phenomena in Agitated Granular Matter; Traffic Flow; Nonlinear Dynamics and Chaos in Physical Systems; Coupled Oscillators.

## CURRENT EXTERNAL COLLABORATIONS

- Active ongoing collaboration with the Physics of Fluids group at the University of Twente, The Netherlands, notably with Profs. D. Lohse, D. van der Meer, J.H. Snoeijer and M.A. van der Hoef.
- Active collaboration with Prof. Nico Gray's group at the Mathematics Department of the University of Manchester, UK.
- Principal Investigator and Coordinator of the funded European ERA-NET project “Complex Matter” (Jan. 2011–Dec. 2012), a collaboration between four research teams from the University of Manchester (UK), the Université Libre de Bruxelles (Belgium), the University of Twente (The Netherlands), and the University of Patras (Greece); see <http://complexmatter.wordpress.com>.
- 2012–2015, Participation as senior researcher in two Pan-Hellenic THALES projects: (a) COVISCO (Complex Visco-Elastic and Visco-Plastic Materials: From Microscopic Structure and Dynamics to Macroscopic Flow) coordinated by Prof. G. Petekidis from IESL-FORTH, University of Crete, Herakleion and (b) MACOMSYS (Mathematical Modeling of Complex Systems with Applications to Biomedicine, Physics and the Technology of Materials) coordinated by Prof. T. Bountis from the University of Patras.

## TEACHING AND SUPERVISING

**University of Amsterdam (1984-1987):** *Graduate courses:* (1) Nonlinear Dynamics and Chaos (Advanced Students Seminar), (2) Theory of the Solid State, (3) Statistical Physics III. *MSc theses:* 2 completed.

**University of Twente (1987-2005):** *Undergraduate courses:* (4) Classical Newtonian Mechanics, (5) Classical Mechanics: Lagrangian and Hamiltonian formalism, (6) Quantum Mechanics I, (7) Quantum Mechanics II, (8) Quantum Mechanics Computer Classes, (9) Statistical Physics, (10) Introduction to Contemporary Physics, *Graduate courses:* (11) Special Theory of Relativity, (12) Advanced Statistical Mechanics, (13) Physics of Sports, (14) Dynamics of Nonlinear Systems, (15) Granular Matter. *BSc theses and projects:* 8 completed. *M.Sc. theses:* 16 completed, *PhD theses:* 4 completed.

**Hellenic Open University (2006-2007):** *Undergraduate courses:* (17-19) Introduction to the Physical Sciences: I. Mathematics, II. Classical Mechanics, and III. Electromagnetism.

**University of Patras (2006-present):** *Undergraduate courses:* (20) Real Analysis IV (Vector Analysis and Fourier Series), (21) Fluid Mechanics, (22) Special Theory of Relativity, (23) Chaos and Fractals, *Graduate courses:* (24) Industrial Mathematics I, (25) Industrial Mathematics II, (26) Applications of Mathematics in Science and Technology. *BSc theses:* 2 completed, *MSc theses:* 3 completed, 2 in progress, *PhD theses:* 1 completed, 1 in progress.

**Three textbooks:** *Opgaven Quantummechanica, Volume I* (Exercise Book in Quantum Mechanics, Volume I), University of Twente, 1995, 125 pages, in Dutch; *Opgaven Quantummechanica, Volume II* (Exercise Book in Quantum Mechanics, Volume II), University of Twente, 1997, 95 pages, in Dutch; *Σειρές Φουριέ* (Fourier Series), University of Patras, 2007, 120 pages, in Greek.

#### **Daily guidance and supervision of MSc theses:**

*University of Amsterdam* (under the formal supervision of Prof. Dr. H.W. Capel):

1. T. Post: «Order and chaos in area-preserving maps» (1987)
2. R. Kluiving: «The period doubling route to chaos» (1987)

*University of Twente:*

3. J. Nijhof: «The dynamics of two coupled pendulums in parametric resonance» (1991)
4. M.T. Westra: «Resonances in symmetric Hamiltonian systems» (1994)
5. T. Claassen: «On phase space symmetries and bifurcations in dynamical systems» (1995)
6. E. de Kleine: «Mode competition in a system of two parametrically driven pendulums: the dissipative case» (1995)
7. J.R. Ross: «The dynamics of a system of two parametrically driven pendulums with nonlinear coupling» (1995)
8. M.M. Kettenis: «Symmetry breaking and mode interaction in a system of two coupled nonlinear oscillators» (1996)
9. P. Timmerman: «Friction» (1997)
10. M. Oosterhof: «Mode interaction in a system of four parametrically driven coupled pendulums and its application to animal gaits» (1997)
11. J.M. Bergamin: «Localized states in quantum-chaotic systems and anharmonic lattices» (1999)
12. M. Kloosterman: «Running patterns versus clustering in a granular gas: Maxwell's Demon in a tilted setup» (2001)
13. R. Stelwagen: «The flight of a baseball» (2001)
14. A. van Bilsen: «Fluxes and coarsening of a compartmentalized granular gas: a Molecular Dynamics approach» (2002)
15. P.G. Eshuis: «Leidenfrost effect and coarsening in a granular gas» (2003)
16. R. Bos: «Towards a phase diagram of vertically vibrated granular matter» (2004)
17. R.M. Snijdewind: «Particle tracking in granular matter» (2004)
18. R. Rauhé: «Jet formation and clustering in granular matter» (2005)

*University of Patras:*

19. G. Kanellopoulos: «Critical Flow of Granular Matter on a Conveyor Belt» (2008)

20. Ch. Tsiavos: «Pattern Formation and Critical Flow of Granular Matter in a Two-Dimensional Tilted Transport System» (2009)
21. A. Daskalaki: «Dimensional Analysis» (2011)
22. P. Verra: «Self-Similarity Solutions in Fluid Dynamics» (2013, expected)
23. V. Stamouli: «On the proper discretization of partial differential equations with soliton solutions» (2013, expected)

**PhD theses supervised (and current positions of the candidates):**

1. Ir. E.J. Banning, *On the Dynamics of Two Coupled Parametrically Driven Pendulums: Mode Competition and Transitions to Chaos*, Department of Technical Physics, University of Twente, The Netherlands (1993–1997). Dr. ir. E.J. Banning now works for the Shell Oil Company, Oman.
2. René Mikkelsen M.Sc., "Granular Dynamics: Clustering and Shear Flows", Department of Science and Technology, University of Twente, The Netherlands (2001–2005). Dr. R. Mikkelsen now works for FMC Technologies, Brazil.
3. Ir. Peter G. Eshuis, "Collective Dynamical Phenomena in Vibrated Granular Matter", Department of Science and Technology, University of Twente, The Netherlands (2003–2008). Dr. ir. P.G. Eshuis now works for Philips Healthcare Technologies, The Netherlands.
4. Ir. Henk-Jan van Gerner, "Newton vs. Stokes: Competing Forces in Granular Matter", Department of Science and Technology, University of Twente, The Netherlands (2004–2009). Dr. ir. H.J. van Gerner now works for the National Aerospace Laboratory, The Netherlands.
5. Georgios Kanellopoulos B.Sc., "Transport Phenomena and Clustering in Dynamical Systems consisting of Granular Matter", Department of Mathematics, University of Patras, Greece (2008–2013). Dr. G. Kanellopoulos is currently fulfilling his term of obligatory service in the Greek army.
6. Dimitrios Razis M.Sc., "Mathematical Modeling of Granular Avalanches" and Department of Mathematics, University of Patras, Greece (2012–2015, expected).

**HONORS AND AWARDS**

**More than 100 invited lectures** at international conferences, summer schools, and seminars. A selection: Key-note lectures at the Spring Meeting of the German Physical Society, Regensburg: *Birth and Sudden Death of a Granular Cluster* (2002), Annual Meeting of the Fluid Physics Division of the Dutch Physical Society: *Many Balls in the Air* (2005), Dynamics Days Europe, Loughborough, UK: *Phase Transitions in Vibrated Granular Matter* (2007).

**Three winning entries** in the annual "Gallery of Fluid Motion" of the American Physical Society: *Granular Eruptions* (2002), *Competitive Clustering in a Granular Gas* (2003), *Leaping shampoo and the stable Kaye effect* (2007); the three 3-minute videos can be viewed at [http://pof.aip.org/gallery\\_of\\_fluid\\_motion](http://pof.aip.org/gallery_of_fluid_motion).

**Member of Scientific Panels:** Dutch Organization for the Physical Sciences FOM (Projectruimte, 2001), National Committee for the selection of Excellent Young Researchers (VENI, 2003), Selection Committee for proposals in the Special Research Program Turbulence (2004).

**Research grants as Principal Investigator** on *Complex Dynamics and Synchronization of Nonlinear Oscillators* (University of Twente, The Netherlands, 1993-1997), *Maxwell's Demon in a Granular Gas* (FOM, The Netherlands, 2001-2005), *Rapid granular matter*

*at its edge: Exploring critical phenomena and ratchets* (FOM, The Netherlands, 2003-2008), *Newton vs. Stokes: Competing Forces in Granular Matter* (FOM, The Netherlands, 2004-2009), *Nonlinear Transport and Wave Transmission in Technology and Medicine* (Carathéodory grant, University of Patras, Greece, 2007-2010); *Complex Matter* (ERA-Net Complexity, European Union, 2011-2012).

## DISCIPLINE-RELATED ACTIVITIES

**Referee** on a regular basis for the following journals: Physical Review Letters, Physical Review E, Journal of Fluid Mechanics, Physics Letters A, Europhysics Letters, Physica A, Zeitschrift für Physik B: Condensed Matter, Granular Matter, Journal of Chemical Physics, and book reviewer for Contemporary Physics.

**Organization of scientific meetings:** Annual “Spring Meeting on Nonlinear Dynamics” (University of Twente, The Netherlands, 1988, 1989, 1990, 1991), Chairman of the monthly “General Physics Colloquium” (University of Twente, The Netherlands, 1998 – 2003), Co-organizer of the “International NWO-Symposium on Nonlinear Systems” (2002, 2004), Co-organizer of the 20<sup>th</sup> Conference/Summer School on “Nonlinear Science and Complexity” (University of Patras, Greece, 2007), Member of the International Advisory Board for the “Dynamics Days Europe 2008” (University of Delft, The Netherlands, 2008), Co-organization of the First European Ph.D. School on “Mathematical Modeling of Complex Systems” (University of Patras, Greece, 2011), Co-organization of the Satellite Meeting “Phase Transitions and Pattern Formation in Complex Multi-Particle Systems” (ECCS’12 Conference, Brussels, Belgium, 2012).

**Various executive positions** (a selection): Member of the Committee “Mathematics in the Physics Curriculum” (University of Twente, 1994-2002), Member of the Board of Studium Generale (University of Twente, The Netherlands, 2002-2005), Member of the Advisory Committee for Post-Graduate Studies (Mathematics Department, University of Patras, 2007-2011), Director of the Division of Applied Analysis (Mathematics Department, University of Patras, 2008-2010), Coordinator of the Internal Evaluation Committee of the Department of Mathematics (University of Patras, 2010-now).

## TEN MOST CITED PUBLICATIONS (counted with Google Scholar, July 2013)

- D. Lohse, R.P.H. Bergmann, R. Mikkelsen, C. Zeilstra, D. van der Meer, M. Versluis, K. van der Weele, M.A. van der Hoef, and J.A.M. Kuipers, *Impact on soft sand: Void collapse and jet formation*, Phys. Rev. Lett. **93**, 198003 (2004) -- cited **120** times.
- K. van der Weele, D. van der Meer, M. Versluis, and D. Lohse, *Hysteretic clustering in granular gas*, Europhys. Lett. **53**, 328-334 (2001) -- cited **96** times
- D. van der Meer, K. van der Weele, and D. Lohse, *Sudden Collapse of a Granular Cluster*, Phys. Rev. Lett. **88**, 174302 (2002) -- cited **78** times
- T. Bountis, H.W. Capel, M. Kollman, J.M. Bergamin, J.C. Ross, and J.P. van der Weele, *Multibreathers and homoclinic orbits in 1-dimensional nonlinear lattices*, Phys. Lett. A **268**, 50-60 (2000) -- cited **69** times.
- R. Mikkelsen, D. van der Meer, K. van der Weele, and D. Lohse, *Competitive clustering in a bidisperse granular gas*, Phys. Rev. Lett. **89**, 214301 (2002) -- cited **55** times
- D. van der Meer, K. van der Weele, and D. Lohse, *Bifurcation Diagram for Compartmentalized Granular Gases*, Phys. Rev. E **63**, 061304 (2001) -- cited **55** times.
- P.G. Eshuis, K. van der Weele, D. van der Meer, and D. Lohse, *Granular Leidenfrost effect: Experiment and theory of floating particle clusters*, Phys. Rev. Lett. **95**, 258001 (2005) -- cited **48** times.

- D. van der Meer, P. Reimann, K. van der Weele, and D. Lohse, *Spontaneous Ratchet Effect in a Granular Gas*, Phys. Rev. Lett. **92**, 184301 (2004) -- cited **48** times.
- J.P. van der Weele and T.P. Valkering, *The birth process of periodic orbits in non-twist maps*, Physica A **169**, 42-72 (1990) -- cited **40** times.
- J.P. van der Weele, T.P. Valkering, H.W. Capel, and T. Post, *The birth of Poincaré-Birkhoff chains near 1:3 resonance*, Physica A **153**, 283-294 (1988) -- cited **38** times.

#### **PUBLICATIONS IN CHRONOLOGICAL ORDER:**

1. J.P. van der Weele, H.W. Capel, and Ch.J. Calkoen, *Crossover from dissipative to conservative systems*, Phys. Lett. **111A**, 5-11 (1985).
2. J.P. van der Weele, H.W. Capel, T. Post, and Ch.J. Calkoen, *Crossover from dissipative to conservative behaviour in period-doubling systems*, Physica A **137**, 1-43 (1986).
3. J.P. van der Weele, H.W. Capel, and R. Kluiving, *On the scaling factors  $\alpha(z)$  and  $\delta(z)$* , Phys. Lett. **119A**, 15-20 (1986).
4. J.P. van der Weele, H.W. Capel, and R. Kluiving, *Period doubling in maps with a maximum of order  $z$* , Physica A **145**, 425-460 (1987).
5. J.P. van der Weele and H.W. Capel, *The  $f(\alpha)$  formalism applied to the crossover from conservative to dissipative scaling behaviour in period-doubling systems*, Physica A **147**, 297-314 (1987).
6. A. van der Bilt, L.W. Olthoff, H.W. van der Glas, K. van der Weele, and F. Bosman, *A mathematical description of the comminution of food during mastication in man*, Archives of Oral Biology **32**, 579-586 (1987).
7. J.P. van der Weele, *Scaling and squeezing in nonlinear dynamics*, thesis (University of Amsterdam, 1987) 184 pages.
8. J.P. van der Weele, H.W. Capel, T.P. Valkering, and T. Post, *The squeeze effect in non-integrable Hamiltonian systems*, Physica A **147**, 499-532 (1988).
9. J.P. van der Weele, T.P. Valkering, H.W. Capel, and T. Post, *The birth of Poincaré-Birkhoff chains near 1:3 resonance*, Physica A **153**, 283-294 (1988).
10. T. Post, H.W. Capel, and J.P. van der Weele, *Short-phase anomalies in intermittent band switching*, Phys. Lett. **133A**, 372-377 (1988).
11. T. Post, H.W. Capel, and J.P. van der Weele, *Short-phase anomalies in intermittent switching*, in: Proceedings of the Conference on Nonlinear Dynamics, Bologna 1988, G. Turchetti ed. (World Scientific, Singapore, 1989) 297-302.
12. K. van der Weele, *The birth of twin Poincaré-Birkhoff chains near 1:3 resonance*, in: Proceedings of the Conference on Singular Behaviour and Nonlinear Dynamics, Samos, Greece 1988, St. Pnevmatikos, T. Bountis and Sp. Pnevmatikos eds. (World Scientific, Singapore, 1989) volume 1, 118-129.
13. T. Post, H.W. Capel, and J.P. van der Weele, *New results in intermittent band switching*, in: Proceedings of the Conference on Singular Behaviour and Nonlinear Dynamics, Samos, Greece 1988, St. Pnevmatikos, T. Bountis and Sp. Pnevmatikos eds. (World Scientific, Singapore, 1989) volume 1, 195-200.
14. T. Post, H.W. Capel and J.P. van der Weele, *Window scaling in one-dimensional maps*, Phys. Lett. **136A**, 109-113 (1989).
15. T. Post, H.W. Capel and J.P. van der Weele, *Phase length distributions in intermittent band switching*, Physica A **160**, 321-350 (1989).
16. T. Post, H.W. Capel, G.R.W. Quispel, and J.P. van der Weele, *Bifurcations in two-dimensional reversible maps*, Physica A **164**, 625-662 (1990).

17. J.P. van der Weele and T.P. Valkering, *The birth process of periodic orbits in non-twist maps*, Physica A **169**, 42-72 (1990).
18. J.P. van der Weele, *De wonderlijke dynamica van de parametrisch aan-gedreven slinger*, in: Chaos, revolutie of rage?, T. Van Daelen, J. Goosens, H. Heijman and J. de Vletter eds. (Studium Generale, Technical University of Eindhoven, 1991) 77-86.
19. J.P. van der Weele and T.P. Valkering, *Orde en chaos in de parametrisch aangedreven slinger*, in: Dynamische Systemen en Chaos, F. Verhulst and H.W. Broer eds. (Epsilon, Utrecht, 1992) 232-255.
20. J.P. van der Weele, *Symmetry breaking in the period doubling route to chaos*, in: Proceedings of the NATO ASI Conference on Chaotic Dynamics - Theory and Practice, Patras, Greece, 11-20 July 1991, T. Bountis ed. (Plenum Press, New York, 1992) 357-369.
21. E.J. Banning and J.P. van der Weele, *Mode competition in a system of two parametrically driven pendulums; the Hamiltonian case*, Physica A **220**, 485-533 (1995).
22. J.P. van der Weele and E. de Kleine, *The order-chaos-order sequence in the spring pendulum*, Physica A **228**, 245-272 (1996).
23. E.J. Banning, J.P. van der Weele, E. de Kleine, J.C. Ross, and M.M. Kettenis, *Mode competition in a system of two parametrically driven pendulums; the dissipative case*, Physica A **245**, 11-48 (1997).
24. E.J. Banning, J.P. van der Weele, J.C. Ross, and M.M. Kettenis, *Mode competition in a system of two parametrically driven pendulums with nonlinear coupling*, Physica A **245**, 49-98 (1997).
25. E.J. Banning, J.P. van der Weele, and M.M. Kettenis, *Mode competition in a system of two parametrically driven pendulums; the role of symmetry*, Physica A **247**, 281-311 (1997).
26. T. Bountis and J.P. van der Weele, *Subharmonic bifurcations and Melnikov's theory in a system of parametrically driven pendulums*, Journal for Nonlinear Phenomena in Complex Systems **2**, 1-13 (1999).
27. P. Timmerman and J.P. van der Weele, *On the rise and fall of a ball with linear or quadratic drag*, Am. J. Phys. **67** (7), 538-546 (1999).
28. J.P. van der Weele and E.J. Banning, *Mode interaction in a cup of coffee and other nonlinear oscillators*, Journal for Nonlinear Phenomena in Complex Systems **3**, 268-283 (2000).
29. T. Bountis, H.W. Capel, M. Kollman, J.M. Bergamin, J.C. Ross, and J.P. van der Weele, *Multibreathers and homoclinic orbits in 1-dimensional nonlinear lattices*, Phys. Lett. A **268**, 50-60 (2000).
30. J.P. van der Weele and A. Bountis, *Multibreathers in nonlinear lattices*, in: "Order and Chaos", Vol. 6, edited by T. Bountis and Sp. Pnevmatikos (G.A. Pnevmatikos Publ., Athens, 2000, ISBN 960-7258-47-9) 187-200.
31. J.P. van der Weele and E.J. Banning, *Mode interaction in horses, tea, and other nonlinear oscillators: the universal role of symmetry*, Am. J. Phys. **69** (9), 953-965 (2001).
32. K. van der Weele, *Van gekoppelde slingers tot galopperende paarden*, AIGG Kennisgeving (Orgaan van de Nederlandse Artificiële Intelligentie gebruikers-groep), Volume **14**, 1-13 (March 2001).
33. K. van der Weele, D. van der Meer, M. Versluis, and D. Lohse, *Hysteretic clustering in granular gas*, Europhys. Lett. **53**, 328-334 (2001).

34. D. van der Meer, K. van der Weele, and D. Lohse, *Bifurcation Diagram for Compartmentalized Granular Gases*, Phys. Rev. E **63**, 061304 (2001).
35. D. van der Meer, K. van der Weele, and D. Lohse, *Sudden Collapse of a Granular Cluster*, Phys. Rev. Lett. **88**, 174302 (2002).
36. K. van der Weele, D. van der Meer, and D. Lohse, *Clustering in granular gas; Maxwell's duivel op de korrel genomen*, Ned. Tijdschrift voor Natuurkunde **68**, 22-25 (January 2002).
37. M. Sandtke and K. van der Weele, *Maxwells duivel staat naast je in de file*, Natuur en Techniek, 28-33 (February 2002). See also the accompanying editorial article by J. van den Broek, *Fascinerende fysica van fietskogeltjes*, same issue, pp. 76-77.
38. K. van der Weele, D. van der Meer, and D. Lohse, *Birth and sudden death of a granular cluster*, in "Advances in Solid State Physics, Vol. 42", B. Kramer (Ed.), Proc. DPG Spring Meeting 2002 in Regensburg, Germany (Springer, Berlin, 2002) 371-382.
39. R. Mikkelsen, M. Versluis, E. Koene, G.W. Bruggert, D. van der Meer, K. van der Weele, and D. Lohse, *Granular eruptions: void collapse and jet formation*, Phys. Fluids **14**(9), S14 (September 2002); paper accompanying the winning video entry in the Gallery of Fluid Motion, APS Meeting on Fluid Physics, San Diego, USA, November 18-20, 2001.
40. R. Mikkelsen, D. van der Meer, K. van der Weele, and D. Lohse, *Competitive clustering in a bidisperse granular gas*, Phys. Rev. Lett. **89**, 214301 (2002).
41. R. Mikkelsen, K. van der Weele, D. van der Meer, M. Versluis, and D. Lohse, *Competitive Clustering in a Granular Gas*, Phys. Fluids **15**(9), S8 (September 2003); paper accompanying the winning video entry in the Gallery of Fluid Motion, APS Meeting on Fluid Physics, Dallas, USA, November 24-26, 2002.
42. K. van der Weele, D. van der Meer, and D. Lohse, *Maxwell's Demon in a Granular Gas*, in "Order and Chaos", Vol. **8**, edited by T. Bountis and Sp. Pnevmatikos (K. Sfakianakis Publ., Thessaloniki, 2003, ISBN 960-87136-2-5) 239-254.
43. K. van der Weele, D. van der Meer, and D. Lohse, *Formation and collapse of clusters in a granular gas*, Proc. 4th Panhellenic Conference on Chemical Engineering, Patras, Greece, May 29-31, 2003 (Tziola Publ., Thessaloniki, 2003, ISBN 960-418-011-8) 913-916.
44. K. van der Weele, D. van der Meer, and D. Lohse, *Birth and Sudden Death of a Granular Cluster*, in "Granular Gas Dynamics", T. Pöschel and N. Brilliantov (eds.), Lecture Notes in Physics **624**, 335-346 (Springer, Berlin, 2003).
45. D. van der Meer and K. van der Weele, *Breakdown of a near-stable granular cluster*, Prog. Theor. Phys. Suppl. **150**, 297-312 (2003).
46. D. van der Meer, P. Reimann, K. van der Weele, and D. Lohse, *Spontaneous Ratchet Effect in a Granular Gas*, Phys. Rev. Lett. **92**, 184301 (2004).
47. R. Mikkelsen, D. van der Meer, K. van der Weele, and D. Lohse, *Competitive clustering in a bidisperse granular gas: Experiment, Molecular Dynamics, and Flux Model*, Phys. Rev. E **70**, 061307 (2004).
48. K. van der Weele, R. Mikkelsen, D. van der Meer, and D. Lohse, *Cluster formation in compartmentalized granular gases*, in "The Physics of Granular Media", H. Hinrichsen and D.E. Wolf (Eds.) (Wiley-VCH Verlag, Weinheim, 2004) pp. 117-139. ISBN 3-527-40373-6.
49. K. van der Weele, W. Spit, T. Mekkes, and D. van der Meer, *From granular flux model to traffic flow description*, in "Traffic and Granular Flow '03", S. Hoogendoorn, S. Luding, P.H.L. Bovy, M. Schreckenberg, and D.E. Wolf (Eds.) (Springer, Berlin, 2004) pp. 569-578. ISBN 3-540-25814-0.



50. D. Lohse, R.P.H. Bergmann, R. Mikkelsen, C. Zeilstra, D. van der Meer, M. Versluis, K. van der Weele, M.A. van der Hoef, and J.A.M. Kuipers, *Impact on soft sand: Void collapse and jet formation*, Phys. Rev. Lett. **93**, 198003 (2004).
51. K. van der Weele and P. Eshuis, *Zand: Vaste Stof, Vloeistof, of Gas?* (in Dutch), Proc. Woudschotenconferentie “New Trends in Physics”, Noordwijkerhout, December 12-13, 2003, A. Mooldijk (Ed.) (Werkgroep Natuurkunde-Didactiek, University of Utrecht, 2004).
52. D. van der Meer, K. van der Weele, and D. Lohse, *Coarsening Dynamics in a Vibrofluidized Compartmentalized Granular Gas*, J. Stat. Mech.: Theory and Experiment, P04004 (April 2004).
53. R. Mikkelsen, K. van der Weele, D. van der Meer, M. van Hecke, and D. Lohse, *Small-number statistics near the clustering transition in a compartmentalized granular gas*, Phys. Rev. E **71**, 041302 (2005).
54. P. Eshuis, K. van der Weele, D. van der Meer, and D. Lohse, *The granular Leidenfrost effect*, in “Powders and Grains 2005”, Volume 2, R. García-Rojo, H.J. Herrmann, and S. McNamara (eds.) (Balkema Publ., Leiden, 2005) pp 1155-1158. ISBN: 0 415 38349 8
55. R. Bergmann, R. Mikkelsen, C. Zeilstra, D. van der Meer, M. Versluis, K. van der Weele, M. van der Hoef, H. Kuipers, and D. Lohse, *Impact on soft sand: Void collapse and jet formation*, in “Powders and Grains 2005”, Volume 2, R. García-Rojo, H.J. Herrmann, and S. McNamara (eds.) (Balkema Publ., Leiden, 2005) pp 1211-1214. ISBN: 0 415 38349 8
56. P.G. Eshuis, K. van der Weele, D. van der Meer, and D. Lohse, *Granular Leidenfrost effect: Experiment and theory of floating particle clusters*, Phys. Rev. Lett. **95**, 258001 (2005).
57. K. van der Weele, D. van der Meer, and D. Lohse, *Ultraslow coarsening in compartmentalized granular gases*, in “Order and Chaos”, Vol. **9**, Proceedings 18th Summer School on Complexity and Nonlinear Systems, Volos, Greece, 18-29 July 2005, A. Bountis and N. Vlachos (eds.) (University of Thessaly Editions, Volos, 2006) pp. 239-252.
58. D. van der Meer, K. van der Weele, and P. Reimann, *Granular fountains: Convection cascade in a compartmentalized granular gas*, Phys. Rev. E **73**, 061304 (2006).
59. M. Versluis, C. Blom, D. van der Meer, K. van der Weele, and D. Lohse, *Leaping shampoo and the stable Kaye effect*, J. Stat. Mech.: Theory and Experiment, P070007 (July 2006). See also: *Bouncing fluids make a splash* News in Brief, Nature **440**, p. 858 (13 April 2006), and: L. Courbin, E. Denieul, and H.E. Stone, *Rodeo in a Petri dish*, News and Perspectives, J. Stat. Mech.: Theory and Experiment, N10001 (2006).
60. M. Versluis, C. Blom, D. van der Meer, K. van der Weele, and D. Lohse, *Springende shampoo*, Ned. Tijdschrift voor Natuurkunde **72**, pp. 2-3 (September 2006).
61. K. van der Weele, D. van der Meer, and D. Lohse, *Ultraslow coarsening in compartmentalized granular gases*, Journal for Nonlinear Phenomena in Complex Systems **10**, 116-126 (2005).
62. D. van der Meer, K. van der Weele, P. Reimann, and D. Lohse, *Compartmentalized granular gases: Flux model results*, J. Stat. Mech.: Theory and Experiment, P07021 (July 2007).
63. M. Versluis, C. Blom, D. van der Meer, K. van der Weele, and D. Lohse, *Leaping shampoo*, Phys. Fluids **19**, 091106 (2007).
64. J.P. van der Weele and J.H. Snoeijer, *Beyond the pole-barn paradox: How the pole is caught*, Journal for Nonlinear Phenomena in Complex Systems **10**, 271-277 (2007).

65. H.J. van Gerner, M.A. van der Hoef, D. van der Meer, and K. van der Weele, *Interplay of air and sand: Faraday heaping unravelled*, Phys. Rev. E **76**, 051305 (2007).
66. P. Eshuis, K. van der Weele, D. van der Meer, R. Bos, and D. Lohse, *Phase diagram of vertically shaken granular matter*, Phys. Fluids **19**, 123301 (2007).
67. K. van der Weele, *Granular gas dynamics: How Maxwell's demon rules in a non-equilibrium system*, Contemporary Physics **49**, 157-178 (2008).
68. G. Kanellopoulos and K. van der Weele, *Critical flow of granular matter on a conveyor belt*, AIP Conference Proceedings Vol. **1076**, "Let's Face Chaos through Nonlinear Dynamics", Maribor, Slovenia, 29 June-13 July 2008, M. Robnik and V.G. Romanovski (Am. Inst. Physics, 2008) pp. 112-121. ISBN: 978-0-7354-0607-0.
69. H.J. van Gerner, G.A. Caballero-Robledo, D. van der Meer, K. van der Weele, and M.A. van der Hoef, *Coarsening of Faraday heaps: Experiment, simulation, and theory*, Phys. Rev. Lett. **103**, 028001 (2009).
70. P.G. Eshuis, K. van der Weele, E. Calzavarini, D. Lohse, and D. van der Meer, *Exploring the limits of granular hydrodynamics: A horizontal array of inelastic particles*, Phys. Rev. E **80**, 011302 (2009).
71. K. van der Weele, G. Kanellopoulos, Ch. Tsiavos, and D. van der Meer, *Transient granular shock waves on a staircase*, Phys. Rev. E **80**, 011305 (2009).
72. P. Eshuis, D. van der Meer, M. Alam, H.J. van Gerner, K. van der Weele, and D. Lohse, *Onset of convection in strongly shaken granular matter*, Phys. Rev. Lett. **104**, 038001 (2010).
73. P. Eshuis, K. van der Weele, D. Lohse and D. van der Meer, *Experimental realization of a rotational ratchet in a granular gas*, Phys. Rev. Lett. **104**, 248001 (2010).
74. K. Andriopoulos, T. Bountis, K. van der Weele, and L. Tsigaridi, *The shape of soliton-like solutions of higher-order KdV equations*, J. Nonlin. Math. Phys. **16**, Suppl. 1-12 (2009).
75. H.J. van Gerner, M.A. van der Hoef, D. van der Meer, and K. van der Weele, *Inversion of Chladni patterns by tuning the vibrational acceleration*, Phys. Rev. E **82**, 012301 (2010).
76. D. van der Meer, M.A. van der Hoef, H.J. van Gerner, and K. van der Weele, *De zandhopen van Faraday*, Nederlands Tijdschrift voor Natuurkunde **76** (2010).
77. T. Bountis, K. van der Weele, G. Kanellopoulos, and K. Andriopoulos, *Model reduction of a higher-order KdV equation for shallow water waves*, in: Lecture Notes in Computational Science and Engineering **75**, "Coping with Complexity: Model Reduction and Data Analysis", Eds. A.N. Gorban and D. Roose (Springer, Berlin-Heidelberg, 2011) pp 287-298, ISBN: 978-3-642-14940-5.
78. G. Kanellopoulos and K. van der Weele, *Subcritical pattern formation in granular flow*, Int. J. of Bifurcation and Chaos **21**, 2305-2319 (2011).
79. H.J. van Gerner, D. van der Meer, K. van der Weele, and M.A. van der Hoef, *Air-induced inverse Chladni patterns*, J. Fluid Mech. **689**, 203-220 (2011).
80. G. Kanellopoulos and K. van der Weele, *Critical flow and clustering in a model of granular transport: The interplay between drift and antidiffusion*, Phys. Rev. E **85**, 061303 (2012).
81. P. Eshuis, K. van der Weele, M. Alam, H.J. van Gerner, M.A. van der Hoef, H. Kuipers, S. Luding, D. van der Meer, and D. Lohse, *Buoyancy-driven convection in vertically shaken granular matter: Experiment, numerics, and theory*, submitted to Granular Matter (2012).
82. K. van der Weele and G. Kanellopoulos, *Modelling Complex Multi-Particle Transport: From Smooth Flow to Cluster Formation*, in: Proc. European Conf. on Complex

- Systems 2012, Series Springer Proceedings in Complexity, Eds. T. Gilbert, M. Kirkilionis, and G. Nicolis (Springer, Berlin-Heidelberg, 2013) ISBN 978-3-319-00394-8
83. H.J. van Gerner, K. van der Weele, D. van der Meer, and M.A. van der Hoef, *Coarsening Faraday heaps: Survival of the biggest*, preprint (2013).
  84. J.H. Snoeijer and K. van der Weele, *Physics of the granite sphere fountain*, submitted to Am. J. Phys. (2013).
  85. J.H. Weijs, K. van der Weele, X. Zhang, and D. Lohse, *Ultrasonically induced growth of surface nanobubbles: Experiment, numerics, and theory*, preprint (2013).
  86. G. Kanellopoulos, D. van der Meer, and K. van der Weele, *On the emergence of travelling waves in multi-particle transport: The importance of feedback loops*, preprint (2013).
  87. D. Razis, A.N. Andrews, J.M.N.T. Gray, and K. van der Weele, *Arrested coarsening of granular roll waves*, in preparation (2013).