Anisotropy, multivalency and flexibility-induced effects in colloidal systems

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Author: Verweij, R.W.
Title: Anisotropy, multivalency and flexibility-induced effects in colloidal systems
Issue Date: 2021-05-27

List of publications

In this thesis:

1. **Conformations and diffusion of flexibly linked colloidal chains.**
   R.W. Verweij, P.G. Moerman, L.P.P. Huijnen, N.E.G. Ligthart, I. Chakraborty, J. Groenewold, W.K. Kegel, A. van Blaaderen and D.J. Kraft
   Journal of Physics: Materials, in press (2021). doi:10.1088/2515-7639/abf571 In: Chapter 6.

2. **Height distribution and orientation of colloidal dumbbells near a wall.**
   R.W. Verweij*, S. Ketzetzi*, J. Graaf and D.J. Kraft
   Phys. Rev. E, 102, 062608 (2020). doi:10.1103/PhysRevE.102.062608 In: Chapter 2.

3. **Flexibility-induced effects in the Brownian motion of colloidal trimers.**
   R.W. Verweij*, P.G. Moerman*, N.E.G. Ligthart, L.P.P. Huijnen, J. Groenewold, W.K. Kegel, A. van Blaaderen and D.J. Kraft
   Phys. Rev. Research, 2, 033136 (2020). doi:10.1103/PhysRevResearch.2.033136 In: Chapter 5.

4. **Colloid supported lipid bilayers for self-assembly.**
   M. Rinaldin*, R.W. Verweij*, I. Chakraborty and D.J. Kraft
   Soft Matter, 15, 1345-1360 (2019). doi:10.1039/C8SM01661E In: Chapter 3.

Other:

5. **Dumbbell impurities in 2D crystals of repulsive colloidal spheres induce particle-bound dislocations.**
   V. Meester, C. van der Wel, R.W. Verweij, G. Biondaro, D.J. Kraft
   Under review (submitted Oct. 2020).

6. **Micrometer-sized TPM emulsion droplets with surface-mobile binding groups.**
   C. van der Wel, G.L. van de Stolpe, R.W. Verweij, D.J. Kraft
   J. Phys. Condens. Matter, 30, 094005 (2018). doi:10.1088/1361-648x/aaab22

7. **Preparation of colloidal organosilica spheres through spontaneous emulsification.**
   C. van der Wel, R.K. Bhan, R.W. Verweij, H.C. Frijters, Z. Gong, A.D. Hollingsworth, S. Sacanna and D.J. Kraft
   Langmuir, 33, 8174-8180 (2017). doi:10.1021/acs.langmuir.7b01398

8. **Colloidal recycling: reconfiguration of random aggregates into patchy particles.**
   V. Meester, R.W. Verweij, C. van der Wel and D.J. Kraft
   ACS Nano, 10, 4322-4329 (2016). doi:10.1021/acsnano.5b07901

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About the author

I was born on June 13th, 1992 in the Dutch village Heemskerk and grew up in the neighboring city of Beverwijk. I received my secondary education at the Gymnasium Felisenum in Velsen-Zuid, where I graduated cum laude in 2010. Next, I started my Bachelor studies in Physics at Leiden University. During my Bachelor studies, I additionally obtained a Propaedeutics degree in Computer Science and a Propaedeutics degree in Astronomy. Next to my studies, I worked as a tutor for high school students and as a web developer. I was a member of the student rowing association Asopos de Vliet. In 2014, I finished my Bachelor degree in Physics with the research project titled "Close-packed colloidal clusters" supervised by Vera Meester and Daniela Kraft.

Then, I started my Master studies in Physics at Leiden University, where I specialized in Biological and Soft Matter Physics. During this time, I was a member of the student canoe association Levitas. As part of my studies, I completed two research projects. The first project was titled "Simulation of diffusion-weighted MRI" and was supervised by Joor Arkesteijn, Frans Vos and Lucas van Vliet (Delft University). In this project, we collaborated with Farida Grinberg and Ezequiel Farrher from Forschungszentrum Jülich (Germany). For my second project titled "Synthesis of polymerizable emulsions and bulk synthesis of mobile clusters", I was supervised by Casper van der Wel and Daniela Kraft. I obtained my Master degree in Physics in 2016.

Shortly afterwards, I started my PhD under the supervision of Daniela Kraft, which resulted in the present thesis on the effects of anisotropy, multivalency and flexibility on colloidal systems. In addition to the research presented here, I have supervised four students during their research projects. I was a Teaching Assistent for the "Diffusion" and "Experimental Physics" courses. I have attended the Han-sur-Lesse Winterschool for Physical Chemistry (Belgium) twice and I followed a Master course on "Deep learning and Neural networks". Additionally, I attended several conferences to which I collaborated several poster presentations. I won the prize for the best poster at the Dutch Chemistry conference CHAINS (2017). I have given a talk during the International Soft Matter Conference (Edinburgh, UK, 2019). During my PhD studies, I collaborated with Melissa Rinaldin for Chapter 3, with Pepijn Moerman, Jan Groenewold, Willem Kegel and Alfons van Blaaderen (Utrecht University) for Chapters 5–6 and with Joost de Graaf (Utrecht University) and Stefania Ketzetzi for Chapter 2.

After my PhD studies, I will start as Modeler Air Quality at the *Rijksinstituut voor Volksgezondheid en Milieu* (RIVM, National Institute for Public Health and the Environment).

Acknowledgments

I am deeply grateful to a number of people that helped me during the course of my PhD studies. First, I would like to thank my supervisor Daniela Kraft for her excellent scientific advice, her overall support, enthusiasm and positive attitude: I could not have asked for a better PhD advisor. I thank Martin van Hecke for being my extra promotor and for useful discussions. I am grateful to the members of the Doctoral Committee for their critical assessment of my work.

Next, I would like to thank the people that have collaborated with me on parts of this thesis. I would like to thank Joost de Graaf (Utrecht University) and Stefania Ketzetzi for their contributions to Chapter 2. Joost, thank you for your insightful and speedy contributions, that often arrived late at night. Stefania, you have been a great office mate and I have enjoyed working together with you on this project. Thank you for all of your support and for being my paranymph. I would like to thank my other office mate, Melissa Rinaldin, not only for being a great colleague but also for her extensive contributions to Chapter 3. I am grateful to Indrani Chakraborty, who not only taught me how to make colloid supported lipid bilayers but also contributed additional data to Chapters 3, 6 and 7. I am heavily indebted to our collaborators from Utrecht University: Pepijn Moerman, Nathalie Ligthart, Willem Kegel, Jan Groenewold and Alfons van Blaaderen, who have made significant contributions to Chapters 5 and 6. Pepijn, thanks a lot for the pleasant collaboration and all of your input. I am grateful to Aleksandar Donev (NYU) and Brennan Sprinkle (NYU) for their advise on the simulations in Chapters 6 and 7. I thank Piotr Szymczak (University of Warsaw) for useful discussions about the center of diffusion of flexible objects.

During my PhD studies, I had the pleasure of supervising a number of students during their research projects: Max Ruckriegel, Loes Huijnen, Sarah Smolders and Nick Oikonomeas. Max, thank you for being my first student, I have enjoyed working together. Loes, thank you for your great contributions to Chapters 5–7 and the nice collaboration. Sarah, thank you for paving the way for the measurements in Chapter 2. Nick, thank you for your exploratory experiments that led to Chapter 2, the interesting discussions on holographic microscopy and machine learning and the great collaboration. On that note, I would like to thank Vera Meester and Casper van der Wel, who have been fantastic supervisors during my own respective Bachelor and Master research projects and have inspired me to pursue a PhD in colloid science. I would like to express my gratitude to my high school teacher Winfried Appelman for showing me how exciting Physics can be. I am grateful to my university teacher Robert-Jan Kooman for enthusing me about Mathematics. I thank Kick Moors for his invaluable advise.

I thank the LION and Graduate School secretaries for their administrative support and want to express my deepest gratitude in particular to Daniëlle Duijn-ter Veer, for all her help and patience. I would like to thank the IT department for their support and am grateful for access to the Maris and ALICE computing clusters. I thank the fine mechanical and electronic departments for their technical support.

I would like to thank all former and present members of the Leiden Soft Matter groups for their useful feedback during meetings but moreover, for the nice coffee breaks, long lunches, borrels and group outings. You have made it a pleasure to work each day, even on days when experimental results were scarce. I especially thank Rachel Doherty for keeping the lab running and for her experimental support. Finally, I am deeply grateful to Ali Azadbakht for building the Optical Tweezers setup and for teaching me how to use it.

Als laatste wil ik mijn vrienden bedanken voor hun geduld bij het aanhoren van mijn uitleg over mijn onderzoek en voor hun vriendschap. Ik wil mijn familie bedanken voor al hun steun. Wim en Fieneke Tesselaar, bedankt voor alle goede zorgen toen ik een tijdje bij jullie mocht inwonen, daarvoor en ook daarna. Ik bedank mijn tante Loes voor de logeerplek in Leiden en voor inspirerende gesprekken over studiekeuzes en onderzoek. Ook ben ik mijn opa Peter en oma Luck erg dankbaar, zij zijn heel nauw betrokken geweest bij mijn opvoeding en hebben mij altijd gesteund. Ik bedank mijn ouders Alexander & Désirée en mijn broertje Maurits voor al hun steun. In het bijzonder ben ik mijn moeder heel erg dankbaar, bij wie ik altijd terecht kon voor hulp en advies. Als laatste wil ik mijn partner Mark bedanken voor alles: dit proefschrift heeft ook van jou veel gevergd, maar je bent mij altijd blijven steunen.

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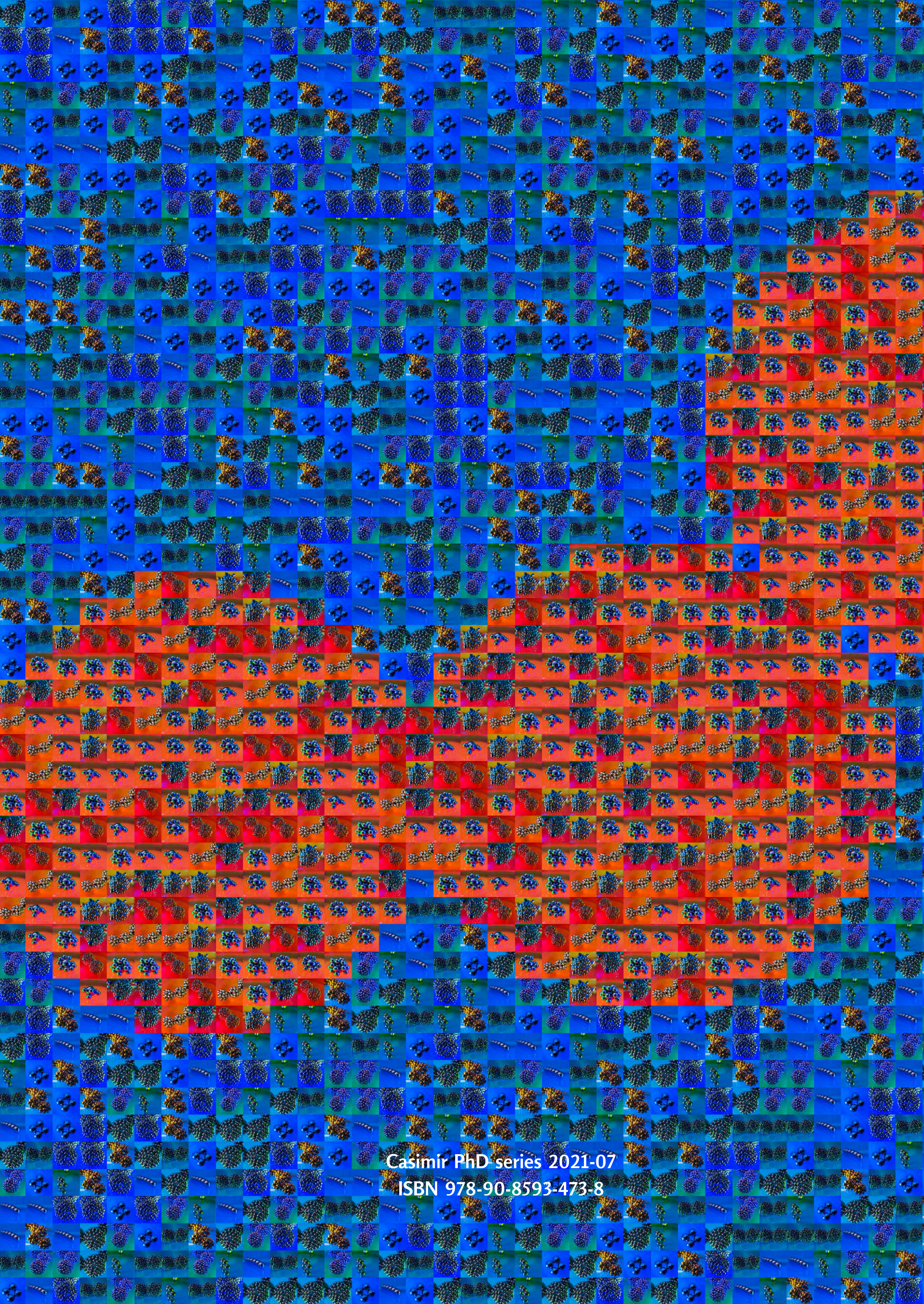

Casimir PhD series 2021-07
ISBN 978-90-8593-473-8