Anisotropy, multivalency and flexibility-induced effects in colloidal systems

Verweij, R.W.

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).

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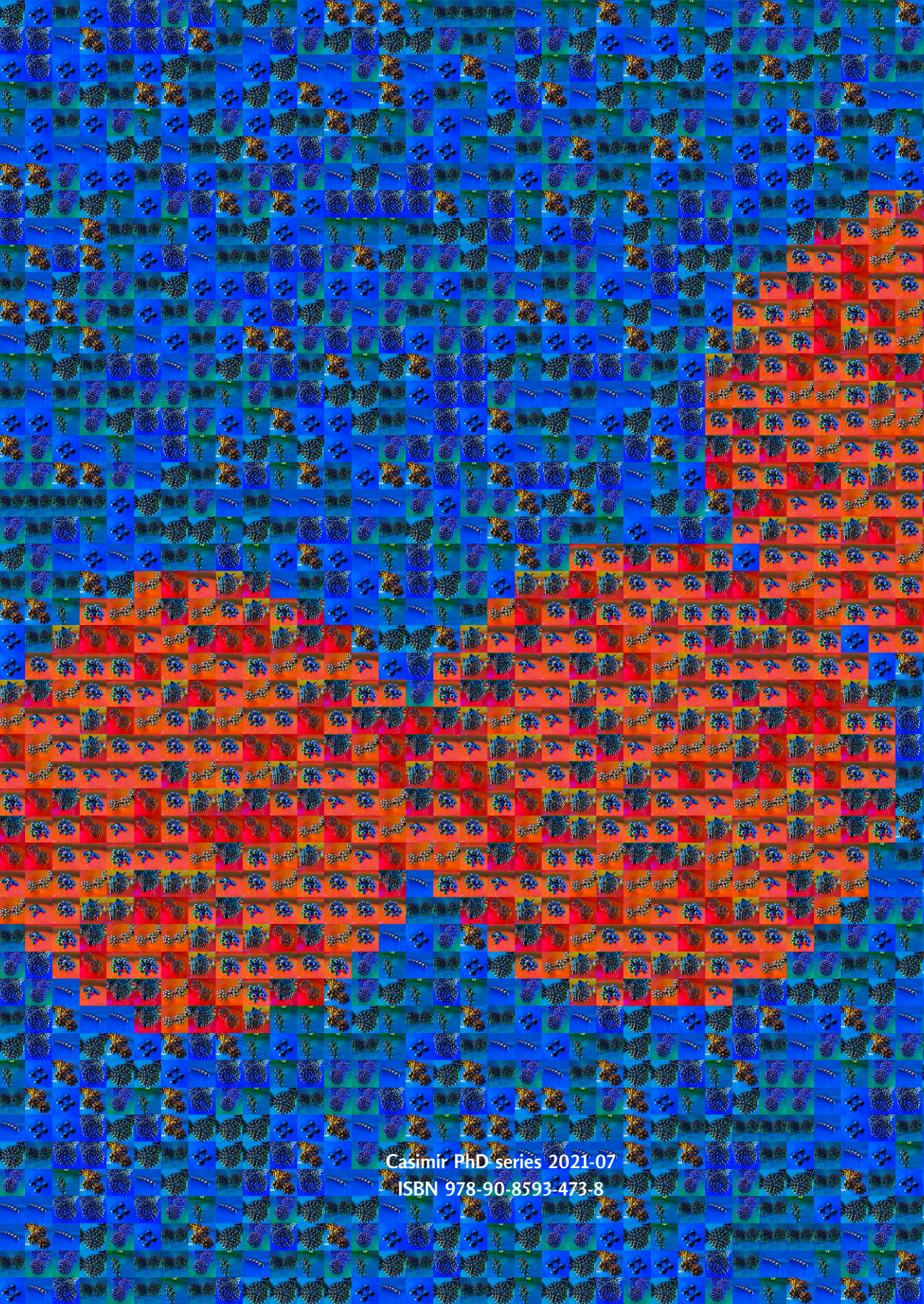

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