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## Origami metamaterials : design, symmetries, and combinatorics

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## Publication List

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### Published work presented in this thesis:

- P. Dieleman, N. Vasmel, S. Waitukaitis, and M. van Hecke. ‘Design of Pluripotent Origami’, *in preparation*.
- S. Waitukaitis, P. Dieleman, and M. van Hecke. ‘Multistable Mechanisms of Non-Euclidean 4-vertex Origami’, *in preparation*.

### Other published work:

- M.K. Jawed, P. Dieleman, B. Audoly, and P.M. Reis, ‘Untangling the Mechanics and Topology in the Frictional Response of Long Overhand Elastic Knots’, *Physical Review Letters*, **115**, 118302 (2015).



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# Curriculum Vitae

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I was born in Rotterdam on the 31st of May in 1990, and grew up in the town of Oostvoorne, to the west of Rotterdam. I received my secondary education at the Scholengemeenschap Helinium, in Hellevoetsluis.

After graduating, I enrolled in the BSc program of Physics at *Leiden University*. During my third year, I followed courses at the *Erasmus University* to complete a pre-master program for *Econometrics & Management Science* as my minor. I finished my BSc program with a thesis on the measurement of the electrical conductance of a monolayer of gold nanoparticles in a hexagonal array, in the group of Prof. dr. ir. S. J. van der Molen.

Upon finishing my BSc, I continued in the MSc program *Research in Experimental Physics* at *Leiden University*. I spent seven months in the research group of Prof. dr. Martin van Hecke, where I used density matched hydrogel spheres floating in water to investigate the jamming transition. After this, I went abroad, to the group of Prof. dr. Pedro Reis at the *Massachusetts Institute of Technology*, where I investigated the relation between the mechanics, friction, and topology of knots. In July 2014, I received my MSc diploma cum laude.

Upon returning to the Netherlands, I continued in the group of Prof. dr. Martin van Hecke as a PhD candidate. Here I studied the folding behavior of four-vertices and patterns of four-vertices, the results of which are presented in this thesis. The research in this work has been performed at the Leiden Institute of Physics as well as the NWO-I institute AMOLF, as part of the dual appointment of Prof. dr. Martin van Hecke. I presented my work at various international conferences: the APS March meetings of 2015, 2016, 2017, and 2018 (USA), the MRS Fall meeting 2015 (Boston, USA), ESMC9 2015 (Madrid, Spain), Metamaterials 2015 (Oxford, UK), and the 2015 *Folding and Creasing of Thin Plate Structures* workshop at *ESPCI* (Paris, France).

Throughout my PhD and MSc studies I have assisted in teaching the courses of *Experimentele Natuurkunde 2* (fall 2014, 2015, 2017, and 2018), *Experimentele Natuurkunde 3* (spring 2015), *Fysica van Energie* (spring 2013), *Wiskunde Aan-sluiting* (fall 2012), and *Inleiding Natuurkunde* (fall 2012). In addition, I was employed by the university as a 1-to-1 tutor for a first year student, and worked at *Stichting Studiebegeleiding Leiden* during my BSc and MSc studies, where I assisted in teaching mathematics to high-school students.

After my PhD, I want to apply my research and analytical skills to challenging contemporary questions, in a position in industry.



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I would also like to thank the people of the soft matter community in Leiden and AMOLF, for the many interesting conversations during coffee and lunch breaks, all the people of the Kraft-group, and in particular Vera Meester, who spent three autumns together with me, supervising first-year students during their first open practicals.

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