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## Unravelling Heterodyne Force Microscopy

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# Unravelling Heterodyne Force Microscopy

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Cover illustration: Artist impression of the most important experiment described in this thesis; the surface image are the real data that we obtained during the measurement on a well-defined sample: A planar ultrasonic wave is sent from the bottom into a polymer sample, which contains spherical gold nanoparticles. These nanoparticles dissipate a significant amount of energy due to a process, which we called friction at shaking nanoparticles. This leads to a reduction in the amplitude of the ultrasonic wave. We detect this reduction in amplitude as “black dots” on the surface with the cantilever in an Atomic Force Microscope (for details see Chap. 6).

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# Unravelling Heterodyne Force Microscopy

**Proefschrift**

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door

**Gerard Jan Verbiest**  
geboren te Schiedam  
in 1986

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*aan Nicole, aan mijn ouders*





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