# *In situ* laser scattering and stroboscopic investigations for colloidal self-assembly during spin coating process

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Spin-coating offers a simple, straightforward technique for the fabrication of two and three dimensional colloidal crystals, which have a wide variety of potential industrial applications as photonic materials and as templates for the fabrication of 2D arrays for lithography applications. The realisation of these applications is highly dependent upon the packing quality of thin films, which is determined by complex self-assembly processes that occur during spin coating. The high speed nature of the process (5-30 s) and rapidly rotating sample (1000-10000 rpm) makes *in situ* studies challenging and as such we do not yet fully understand colloidal self-assembly, so are unable to fully optimise processing conditions. This work aims to study the essential factors affecting the degree of ordering of colloids as they self-assemble through the development of *in situ* laser scattering and stroboscopic microscopic experimental techniques. In addition, samples are investigated with scanning electron microscopy (SEM) to characterise the impact of each factor on the colloidal thin films morphology produced. Further understanding of colloidal self-assembly will allow processing conditions to be optimised so that highly uniform, long range and defect free colloidal thin films may be easily fabricated.