**Unusual order in squeezed repulsive spheres** WOUTER G. ELLEN-BROEK, Eindhoven University of Technology — The soft spheres that we have been using for years to study jamming into disordered packings can make a range of surprising ordered structures at higher densities. Monodisperse repulsive harmonic disks in two dimensions form, apart form the triangular lattice everyone would expect, a square lattice and various non-bravais lattices that can be described as a triangular lattice with a basis. The latter class includes the honeycomb structure, a chiral structure, and a structure which is best described as a tiling of pentagons and triangles. The appearance of these structures, some of which have not been previously reported, is surprising because the potential between the disks only very weakly violates the condition of complete monotonicity which has been conjectured to guarantee the triangular lattice to be the ground state structure. I will discuss how these structures come about, how they are related to tiny periodic packings of hard spheres and in what ways the resulting structures might be useful.

Wouter G. Ellenbroek
Eindhoven University of Technology