University of Crete
Departments of Mathematics and Applied Mathematics

Analysis Seminar

1:15pm, Tuesday, 6 December, 2016
Room A-303

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Infinitely many electrons on a line, at equilibrium

We study equilibrium configurations of infinitely many identical particles on the real line or finitely many particles on the circle, such that the (repelling) force they exert on each other depends only on their distance. The main question is whether each equilibrium configuration needs to be an arithmetic progression. Under very broad assumptions on the force we show this for the particles on the circle. In the case of infinitely many particles on the line we show the same result under the assumption that the maximal (or the minimal) gap between successive points is finite (positive) and assumed at some pair of successive points. Under the assumption of analyticity for the force field (e.g., the Coulomb force) we deduce some extra rigidity for the configuration: knowing an equilibrium configuration of points in a half-line determines it throughout. Various properties of the equlibrium configuration are proved.