

Problems on the loss of heat and capacities for constellations of disks and balls.

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We will discuss several problems on the loss of heat and capacities of configurations consisting of $n \geq 3$ balls in \mathbb{R}^3 or n disks in \mathbb{R}^2 . This study was initiated by M. L. Glasser and S. G. Davison in 1978, who considered the so-called “Sleeping armadillos problem”, that is the problem on the distribution of heat in systems of n balls. First, we will identify configurations which minimize the Newtonian capacity or logarithmic capacity under certain geometrical restrictions. Then, we will prove that the linear string of balls maximizes the Newtonian capacity among all strings consisting of n equal balls and that the circular necklace maximizes the logarithmic capacity over the set of all necklaces consisting of n equal disks.

Several open questions on the capacities of constellations of balls in \mathbb{R}^3 or disks in \mathbb{R}^2 also will be also discussed.