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Dmitriy Bilyk* (dbilyk@math.umn.edu). *Energy optimization on the sphere.*

We shall discuss various energy optimization problems on the sphere, both for discrete energies of N -point sets and for “continuous” energies of Borel probability measures. In particular, we shall pay special attention to the “orthogonalizing” potentials – i.e. those energies, in which the interaction between points is minimized when they are orthogonal (rather than when they are at opposite poles, as is the case with the standard Coulomb potential). Such problems include the conjecture of Fejes Tóth on the sum of angles between lines, the p -frame energy, and some others. We shall also discuss various forms and applications of the Stolarsky principle – an identity which relates energies on the sphere with another classical object in discrete geometry: discrepancy. (Various parts of this talk are joint work with F. Dai, A. Glazyin, M. Lacey, R. Matzke, J. Park, O. Vlasiuk.) (Received January 23, 2019)