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The Ground States of Nematic Order on a Sphere and Topological Defects HOMIN SHIN, MARK BOWICK, XIANGJUN XING, Syracuse University — We study the ground states of a spherical nematic order and the resulting configuration of topological defects. To emulate the ground state, we use hard rods confined on the surface of a sphere and very gradually compress the system upto the maximum packing density with Monte Carlo simulations. The nematic phases with four +1/2 disclination defects are clearly observed. Although the tetrahedral structure of four +1/2 defects is expected, we find all the defects most likely sitting on a great circle. The theoretical reasoning is provided with the calculation of defect energies in terms of the elastic anisotropy. Finally, we present that the allowance of some softness to the rods gives arise to qualitative changes in the director field surrounding the defect core.

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