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In the high-energy quantum-physics literature one finds statements such as “matrix algebras converge to the sphere”. Earlier I provided a general setting for understanding such statements, in which the matrix algebras are viewed as compact quantum metric spaces, and convergence is with respect to a quantum Gromov-Hausdorff-type distance. More recently I have dealt with corresponding statements in the literature about vector bundles on spheres and matrix algebras. I will very briefly indicate how some of this works.

But physicists want, even more, to treat structures on spheres (and other spaces) such as Dirac operators, Yang-Mills functionals, etc., and they want to approximate these by corresponding structures on matrix algebras. I am currently exploring how to make precise the situation for Dirac operators. This is confusing because in the physics literature there are at least 3 inequivalent suggestions as to what the Dirac operators on the matrix algebras should be. This is work in progress. I will report on what I have found by the time of the meeting. (Received July 15, 2017)