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Peter Koroteev* (koroteev@ucdavis.edu), One Shields Drive, Davis, CA 95616. *Elliptic Algebras from Instanton Counting.*

We explore the correspondence between geometric representation theory, integrable systems, and supersymmetric gauge theories and string/M theory. In the example which will be presented we find intricate connections between representations of algebras (like double affine Hecke algebra, Ding Iohara algebra), quantization of integrable many-body systems (like Calogero-Moser, Ruijsenaars-Schneider), and instanton (vortex) counting of supersymmetric gauge theories of Seiberg-Witten type. Our results give rise to some new mathematical conjectures. (Received August 22, 2016)