1012-14-191   **Maciej Mizerski*** (`mizerski@math.ubc.ca`), Department of Mathematics, The University of British Columbia, Room 121, 1984 Mathematics Road, Vancouver, BC V6T 1Z2, Canada. *Group quantum cohomology and applications to flag varieties with Dynkin diagram automorphisms.*

Given a finite group G acting on a smooth projective variety X, there exists a G-algebra $qH^*(X, G)$ whose structure constants are defined by integrals over moduli spaces of G-equivariant stable maps of Jarvis-Kaufmann-Kimura. It is a deformation of the Fantechi-Göttsche group cohomology, and its invariant part $qH^*(X, G)^G$ is canonically isomorphic to the Abramovich-Graber-Vistoli orbifold quantum cohomology of the quotient stack $[X/G]$. We describe properties of $qH^*(X, G)$ and deduce some consequences about the orbifold quantum cohomology. We provide the technology to study the associativity of the above algebra, and we prove it for some special cases. Finally we apply this to flag varieties with automorphisms coming from the symmetries of their Dynkin diagrams, describe Peterson's twisted quantum cohomology and its possible links to mirror symmetry. (Received September 20, 2005)