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Iva Halacheva* (iva.halacheva@utoronto.ca), **Joel Kamnitzer**, **Leonid Rybnikov** and **Alex Weekes**. *A cactus group action on crystals*. Preliminary report.

Given a complex, finite-dimensional semisimple Lie algebra \mathfrak{g} , we define a combinatorial action of the cactus group $J_{\mathfrak{g}}$, and in particular the pure cactus group $PJ_{\mathfrak{g}}$, on any \mathfrak{g} -crystal corresponding to a highest weight representation V using Schutzenberger involutions. In type A, we show that this action also has a geometric realization in the following way: The moduli space of stable, real, genus zero curves with n marked points indexes a family of maximal commutative (shift of argument) subalgebras in $U_{\mathfrak{g}}$ which act on V with simple spectrum. This produces a covering of the moduli space whose monodromy action coincides with that of $PJ_{\mathfrak{g}}$ on the crystal. We conjecture that this is also true in general. Time permitting, I will discuss the connection to another family of algebras, the Gaudin algebras living in the n th tensor product of $U_{\mathfrak{g}}$, using skew-howe duality of crystals. (Received August 11, 2015)