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Iva Halacheva* (i.halacheva@lancaster.ac.uk), **Joel Kamnitzer**, **Leonid Rybnikov** and **Alex Weekes**. *Cacti, crystals, and monodromy of the shift of argument algebras*. Preliminary report.

The cactus group $J_{\mathfrak{g}}$ is a cousin of the braid group and can be defined for any finite-dimensional, complex, reductive Lie algebra \mathfrak{g} . We describe a combinatorial action of $J_{\mathfrak{g}}$ on any \mathfrak{g} -crystal using Schützenberger involutions. On the other hand, there is a family of maximal commutative subalgebras in $U(\mathfrak{g})$, known as the shift of argument algebras, which act with simple spectrum on any highest weight, irreducible \mathfrak{g} -representation V . These subalgebras are indexed by points in a certain De Concini-Procesi moduli space, and so induce a covering on it for a fixed V . We show that the corresponding monodromy action, at least in type A and as work in progress for other types, agrees with the combinatorial action of the cactus group on the crystal corresponding to V . Skew Howe duality relates this result to an analogous construction for the Gaudin algebras. (Received August 27, 2016)