

Abstract Submitted  
for the APR16 Meeting of  
The American Physical Society

**Deformations of  $W_{A,D,E}$  SCFTs** EMILY NARDONI, KENNETH INTRILIGATOR, University of California, San Diego — We discuss aspects of theories with superpotentials given by Arnold's  $A, D, E$  singularities, particularly the various novelties that arise when the fields are matrices. E.g. we discuss aspects of the classical non-truncation of the chiral ring, flat directions, and the non-Abelian representations of the deformed chiral ring in the  $D$  and  $E$  cases. We focus on 4d  $\mathcal{N} = 1$  variants of susy QCD, with  $U(N_c)$  or  $SU(N_c)$  gauge group,  $N_f$  fundamental flavors, and adjoint matter fields  $X$  and  $Y$  appearing in  $W_{A,D,E}(X, Y)$  superpotentials. Many of our considerations also apply in other possible contexts for matrix-variable  $W_{A,D,E}$ . The 4d  $W_{A,D,E}$  SQCD-type theories RG flow to superconformal field theories, and there are proposed duals in the literature for the  $W_{A_k}$ ,  $W_{D_k}$ , and  $W_{E_7}$  cases. As we review, the  $W_{D_{even}}$  and  $W_{E_7}$  duals rely on a conjectural, quantum truncation of the chiral ring. We explore these issues by considering various deformations of the  $W_{A,D,E}$  superpotentials, and the resulting RG flows and IR theories. Rather than finding supporting evidence for the quantum-truncation and  $W_{D_{even}}$  and  $W_{E_7}$  duals, we note some challenging evidence to the contrary.

Emily Nardoni  
University of California, San Diego

Date submitted: 08 Jan 2016

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