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Daniel Joseph Wackwitz* (wackwidj@uwec.edu), 510D Chancellor’s Hall, 820 University Drive, Eau Claire, WI 54701, and Michael Robert Penkava. Moduli spaces of low dimensional associative algebras and their deformations.

The speaker has been studying low dimensional algebras, including $\mathbb{Z}_2$-graded algebras, as an undergraduate researcher. In this talk, I will discuss how we use the ideas of extensions of algebras by algebras, and the fundamental theorem of finite dimensional algebras, to construct the moduli space of algebras of a certain dimension using a classification of the nilpotent algebras and simple algebras of smaller dimension. This method uses a classification of $\mathbb{Z}_2$-graded division algebras which we have obtained in some research last year. Then I will talk about how the deformations of these algebras, in particular, the versal deformations of an algebra, give a decomposition of the moduli space into families, which at least in the examples we have studied, are unique. These families give a stratification of the moduli space by very simple orbifolds. These strata are connected by deformations which factor through jump deformations. I will show how the versal deformations can be computed using some Maple worksheets which have been developed by the professor I am working with and some of his students, including myself. (Received September 21, 2009)