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**James S Cook\*** (jcook4@liberty.edu). *An Invitation to  $\mathcal{A}$ -Calculus for Undergraduates.*

Let  $\mathcal{A}$  denote a real associative unital algebra of finite dimension. The calculus for  $\mathcal{A} = \mathbb{R}$  or  $\mathcal{A} = \mathbb{C}$  are widely known, however, for other choices of  $\mathcal{A}$  there are open questions which are accessible to undergraduates. In this talk I plan to discuss the rich history of the subject, summarize what we currently know, and outline possible directions for future research projects. I also describe some past projects by undergraduates: W.S. Leslie's of Laplace's equation for a commutative semisimple algebra, Bailu Zhang's work in Maple to verify Leslie's conjecture in noncommutative case, Daniel Freese's  $k$ -thagorean Theorem for the  $n$ -complex or  $n$ -hyperbolic numbers, and Nathan BeDell's novel solution techniques for  $\mathcal{A}$ -ODEs. (Received August 22, 2016)