

# Applied Mathematics Seminar

Friday, March 20, at 2pm, in DON 2159

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## An Attempt to discretize Wittens Deformation using concepts from Discrete Exterior Calculus

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In 1980s, Edward Witten miraculously proved strong and weak Morse inequalities of Morse Theory by a supersymmetric quantum mechanical model. The relation between supersymmetry and Morse theory was simply established by deforming the exterior differential and co-differential operator on a Riemannian manifold by the Morse function. We will give a short review of Morse theory and then discuss how to discretize Wittens deformation in the framework of the discrete exterior calculus.

$$d \rightarrow d_S = e^{-Sf(x)} d e^{Sf(x)}$$
$$d^* \rightarrow d_S^* = e^{Sf(x)} d^* e^{-Sf(x)}$$

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Students are welcome to the Informal Discussion Seminar. We assume knowledge in mathematics and in physics at the level of MAT 253 and PHY 202.