

# Student Differential Geometry Seminar

Stony Brook University

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**Jae Ho Cho** : “Metrics of Non-negative Scalar Curvature and Incompressible Minimal Surfaces.”

ABSTRACT: In this talk, we will discuss about the theorem saying that for a continuous map  $f$  from a Riemann surface of genus  $g > 0$  to a compact manifold  $M$  which is not homotopically degenerate, a non-trivial extremal map homotopic to  $f$  always exists. Also, we will talk about one of its byproducts stating that if  $M$  is an orientable 3-dimensional manifold with non-negative scalar curvature, and if the fundamental group of  $M$  contains a subgroup which is isomorphic to the fundamental group of a compact surface of genus  $g > 0$ , then  $M$  is isometric to the flat torus. This talk is based on the paper, [R. Schoen, S.T. Yau - Existence of incompressible minimal surfaces and the topology of three dimensional manifolds with non-negative scalar curvature].