Atiyah-Singer Revisited

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Thursday, January 20, 2011
007 Kemeny Hall, 4:00 pm
(Tea 3:30 pm 300 Kemeny Hall)

Abstract

This will be an expository talk about the Atiyah-Singer index theorem. This celebrated theorem gives a topological formula for the index of elliptic operators on closed manifolds. First, some low dimensional examples will be considered. Next, the proof of the theorem will be outlined. One point will be to make precise the role of Bott periodicity in the proof. The proof is done in a way that allows an extension of the theorem to certain non-elliptic operators. These non-elliptic operators have been studied by E. van Erp, C. Epstein, R. Melrose and a number of other mathematicians. Partial results were obtained. Recently E. van Erp and P. F. Baum have obtained a complete solution to the index problem for these operators using the framework that will be indicated in this talk.

This talk should be accessible to graduate students.