The structure of simple operator algebras

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008 Kemeny, 4:00PM
(Tea: 300 Kemeny, 3:30 pm)

Abstract

The theory of operator algebras is relatively new, introduced less than 100 years ago to accommodate quantum mechanics. Since then the field has made deep connections with many areas of mathematics, including geometry, topology, probability, numerical analysis, dynamical systems and more. Just like in group theory, the simple operator algebras (those without ideals, in the ring theoretic sense) play a distinguished role and many deep parallels and analogies have recently been discovered. I will start at the beginning, with definitions and several important examples of operator algebras. Then I will explain the main discoveries of the 1970s (due to Alain Connes and others), and some of the amazing recent work (due to Wilhelm Winter and others) that points to a very bright future.

This talk should be accessible to graduate students.