Math 243 - Functional Analysis Seminar

Prof. Isaac Goldbring
University of California, Irvine

The Connes Embedding Problem, MIP*=RE, and the Completeness Theorem

Abstract:
The Connes Embedding Problem (CEP) is arguably one of the most famous open problems in operator algebras. Roughly, it asks if every tracial von Neumann algebra can be approximated by matrix algebras. Earlier this year, a group of computer scientists proved a landmark result in complexity theory called MIP*=RE, and, as a corollary, gave a negative solution to the CEP. However, the derivation of the negative solution of the CEP from MIP*=RE involves several very complicated detours through C*-algebra theory and quantum information theory. In this talk, I will present joint work with Bradd Hart where we show how some relatively simple model-theoretic arguments can yield a direct proof of the failure of the CEP from MIP*=RE while simultaneously yielding a stronger, Godelian-style refutation of CEP as well as the existence of many counterexamples to CEP. No prior background in any of these areas will be assumed.

Host: David Jekel

Tuesday, September 28, 2021
11:00 AM
Zoom. For details, email djekel@ucsd.edu