Department of Mathematics, BGU

Operator Algebras

On *Tuesday, December ,6 2016*

At *16:00 – 17:00*

In *Math 101-*

Victor Vinnikov (BGU)

will talk about

OH

Abstract: An operator space is a complex vector space V together with a sequence of (complete) norms on square matrices of all sizes over V satisfying certain compatibility conditions. These conditions are due to Ruan who showed that they are necessary and sufficient for the sequence of matrix norms to be induced from a linear embedding of V as a closed subspace into the space of bounded linear operators on a Hilbert space. There are notions of completely bounded maps and complete isometries between operator spaces that correspond to bounded maps and isometries between Banach spaces. There is also a notion of the dual operator space.

There are (infinitely) many ways to extend the given norm on a Banach space to a sequence of matrix norms to obtain an operator space. In particular, there is a variety of natural operator space structures on a Hilbert space H, none of which turns out to be sefl dual. Pisier showed that there is a unique operator space structure on H that is sefl dual, i.e., such that the canonical isometry from

H to the conjugate Hilbert space is a complete isometry; he called this operator space the (corresponding) operator Hilbert space, or OH.

There are two constructions of OH, a rather abstract one using complex interpolation for operator spaces and a more concrete one, using a noncommutative version of the Cauchy–Schwartz inequality that is due to Haagerup. In this talk, I will review some operator space basics, and then present a variation of the second construction that is motivated by the recent theory of completely positive noncommutative kernels (see Ball–Marx–Vinnikov, arXiv:1602.00760[1].(

[1] https://arxiv.org/abs/1602.00760