MATH PRESENTATION

The University of Winnipeg
Department of Mathematics and Statistics

Welcomes

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of
Ryerson University

To present a paper

WHEN　　　Friday, March 18—12:30 pm
WHERE　　Room 1L12

TITLE:　　Bounded linear operators with no adjoints

ABSTRACT:

For an inner product space $(X, \langle \, , \, \rangle)$, we let $\mathcal{B}(X)$ be the collection of all bounded linear operators on X. As usual, an element $T \in \mathcal{B}(X)$ has an adjoint $S \in \mathcal{B}(X)$ if $\langle Tx, y \rangle = \langle x, Sy \rangle$ for all $x, y \in X$.

Let $\mathcal{A}$ be the collection of all $T \in \mathcal{B}(X)$ which has an adjoint and let

$$\mathcal{A}_0 = \mathcal{B}(X) \setminus \mathcal{A}.$$

The purpose of this elementary talk is to discuss the relative sizes of $\mathcal{A}$ and $\mathcal{A}_0$ when X is not a Hilbert space. In particular, it is shown that for inner product spaces which are not Hilbert spaces, the collection $\mathcal{A}_0$ is quite large and possesses many surprising properties. We will also introduce several ways to measure how "bad" a $T \in \mathcal{A}_0$ can fail to have an adjoint by investigating the sizes of various sets in X generated by T. Some questions about the relationships between $\mathcal{A}$ and $\mathcal{A}_0$ are also presented with answers.