Spectral Properties of Bounded Linear Operators[1]

Spectral Properties	Space			Operator		
	NLS	Banach	Hilbert	$T = T^*$	$T \geq 0$	T Compact
$\rho(T)$ open						
$\sigma(T) \subset \overline{B_{\lVert T \rVert}(0)}$						
$\sigma(T)$ compact						
$\lambda \in \rho(T) \Leftrightarrow T_\lambda$ bdd below						
$\sigma_r(T) = \varnothing$						
$\sigma_p(T) \subset \sigma(T) \subset [r, R] \subset \mathbb{R}$						
$\lVert T \rVert = \max\{\lvert r \rvert, \lvert R \rvert\}$						
$r, R \in \sigma(T)$						
$\sigma(T) \geq 0$						
$\exists!\ T^{1/2} \geq 0$						
$\sigma_p(T)$ countable, can only $\to 0$						
$\lambda \neq 0 \Rightarrow \dim N(T_\lambda) < \infty$						
$0 \neq \lambda \in \sigma(T) \Rightarrow \lambda \in \sigma_p(T)$						
$\exists$ ON basis of e-vectors, $Tx = \sum_\alpha \lambda_\alpha \langle x, u_\alpha \rangle u_\alpha$						
$\exists!$ compact $T^{1/2} \geq 0$						

[1] Michael B. Williams, Fall 2007