**A simple $C^*$-algebra.**

**********

$K(H)$ is a simple $C^*$-algebra. For if $I$ is a nonzero closed bi-ideal of $K(H)$, then it is a closed bi-ideal of $B(H)$, so by [Mur, Th. 2.4.7] $F(H) \subseteq I$, hence $K(H) = \overline{F(H)} \subseteq \bar{I} = I$. Therefore $I = K(H)$.

**Ref.**

[**Mur**] G.J. Murphy, $C^*$-algebras and operator theory, Academic Press, 1990.