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In 1975, N. Hitchin proved that the Hirzebruch surfaces $\mathbb{F}_n = \mathbb{P}(\mathcal{O}_{\mathbb{P}^1}(n) \oplus \mathcal{O}_{\mathbb{P}^1})$, $n \geq 0$, admit (Hodge) metrics of positive holomorphic sectional curvature K . In this talk, I will determine explicit positive pinching constants c, C such that $c \leq K \leq C$ for these metrics. I will also discuss possible extensions of our methods to projectivized vector bundles of higher rank. This is joint work with Dr. Gordon Heier (University of Houston) and Ananya Chaturvedi (University of Houston). (Received July 06, 2014)