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**Kevin O'Bryant\*** ([obryant@gmail.com](mailto:obryant@gmail.com)), Building 1S, 2800 Victory Boulevard, Staten Island, NY 10314. *Dense sets of integers without long arithmetic progressions.*

In 1946, Behrend gave a construction of dense finite sets of integers that do not contain 3-term arithmetic progressions. In 1961, Rankin generalized Behrend's construction to sets avoiding  $k$ -term arithmetic progressions, and in 2008 Elkin refined Behrend's 3-term construction. In this work, we combine Elkin's refinement and Rankin's generalization. Arithmetic progressions are handled as a special case of polynomial progressions. (Received February 03, 2009)