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**Yuri Nikolayevsky\*** ([y.nikolayevsky@latrobe.edu.au](mailto:y.nikolayevsky@latrobe.edu.au)), Department of Mathematics and Statistics, La Trobe University, Melbourne, Victoria 3086, Australia. *Geodesic orbit and naturally reductive nilmanifolds associated with graphs.*

We study Riemannian nilmanifolds associated with graphs. We prove that such a nilmanifold is geodesic orbit if and only if it is naturally reductive if and only if its defining graph is the disjoint union of complete graphs and the left-invariant metric is generated by a certain naturally defined inner product. (Received September 25, 2017)