Graduate Seminar in Mathematics

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The unit graph of a ring

Abstract:

In this talk, we introduce the unit graph of a ring defined by Ashrafi, Maimani, Pournaki and Yassemi. Let R be a ring with identity. The unit graph of R, denoted by \( G(R) \), is a simple graph with vertex set \( R \), and two distinct vertices \( x \) and \( y \) are adjacent if and only if \( x+y \) is a unit of \( R \). In this talk, we will firstly present some examples and basic properties of \( G(R) \). Then we characterize the rings \( R \) such that \( G(R) \) is a complete graph, or a (complete) bipartite graph. We also give the sufficient and necessary condition for \( G(R) \) to be a connected graph. Finally, we classify all finite commutative rings by the diameter of their unit graphs.