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Let $G = (V, E)$ be a simple graph. The *critical group* (also called the *sandpile group*), denoted $K(G)$, is a finite abelian group associated with G . Concretely, viewing the Laplacian matrix L as a linear mapping $\mathbb{Z}^{|V|} \rightarrow \mathbb{Z}^{|V|}$, it turns out that $\mathbb{Z}^{|V|}/\text{Im}(L) \cong \mathbb{Z} \oplus K(G)$. In this talk, we discuss our results regarding the critical groups of strongly regular graphs Γ . In particular, we provide a complete characterization of $K(\Gamma)$ under certain assumptions regarding the associated eigenvalues of Γ . In other cases, when the eigenvalues of Γ satisfy different (weaker) conditions, we are able to provide constraints on the form of the critical group. We conclude with a brief discussion regarding the question of existence of a strongly regular graph with given parameters, and explore how our work could be used to resolve this inquiry. (Received September 17, 2019)