

Abstract Submitted
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Electric Current Flow Through Two-Dimensional Networks¹

MALLORY GASPARD, Rensselaer Polytech Inst — In modern nanotechnology, two-dimensional atomic network structures boast promising applications as nanoscale circuit boards to serve as the building blocks of more sustainable and efficient, electronic devices. However, properties associated with the network connectivity can be beneficial or deleterious to the current flow. Taking a computational approach, we will study large uniform networks, as well as large random networks using Kirchhoff's Equations in conjunction with graph theoretical measures of network connectedness and flows, to understand how network connectivity affects overall ability for successful current flow throughout a network. By understanding how connectedness affects flow, we may develop new ways to design more efficient two-dimensional materials for the next generation of nanoscale electronic devices, and we will gain a deeper insight into the intricate balance between order and chaos in the universe.

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