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**Evolution of Radiative Heat Transfer Between Graphene Nanodisks Over Time**[1] LAUREN ZUNDEL, ALEJANDRO MANJAVACAS, University of New Mexico — Radiative heat transfer is one mechanism by which objects thermalize with one another and their environment. This involves the emission of photons with wavelengths determined by the temperature of the object, and is, at the macroscale, accurately described by Planck's law. On the other hand, when the dimensions of a system are shrunk to below the thermal wavelength, the emergence of strong near-field modes, which can be further enhanced by optical resonances, can result in radiative transfer that is very different from the predictions of this law. This could enable the realization of a diverse range of technologies, such as improved thermophotovoltaics and more efficient thermal management in nanoscale electronics. Specifically, materials whose optical responses can be actively tuned, such as graphene nanostructures, are an ideal platform to achieve these goals. In this work, we study the time evolution of the temperature of graphene nanodisks in different arrangements, taking advantage of their active tunability to achieve dynamical control over the heat exchanged between them. This allows for the design of exotic heat transfer scenarios not possible with passive materials and can therefore help to inspire new technologies requiring active control over nanoscale energy transfer.

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