1135-35-2084 **Timothy E. Faver*** (tef36@drexel.edu) and **J. Douglas Wright**. *Traveling waves in mass and spring dimer Fermi-Pasta-Ulam-Tsingou lattices.*

A Fermi-Pasta-Ulam-Tsingou lattice is a one-dimensional chain of particles connected to their nearest neighbors by nonlinear springs. It is well-established that monatomic lattices, which consist of identical particles and springs, possess solitary traveling wave solutions to their equations of motion; these are waves that decay exponentially fast to zero at spatial infinity. We study two species of more general, heterogeneous lattices: mass dimer lattices, in which the masses of the particles alternate between two values but all springs exert the same force, and spring dimer lattices, in which the spring forces alternate but the masses are all the same. For each species, we prove the existence of nanopteron traveling wave solutions. These waves are the sum of an exponentially decaying term and a periodic term, so that, in contrast to the solitary wave, the nanopteron may asymptote to a nonvanishing oscillation. Our existence proof relies on a quantitative contraction mapping argument that incorporates a natural singular perturbation found in the dimer traveling wave equations. (Received September 25, 2017)