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**Gaps and Tails: The restricted N-body problem in colliding galaxies and the asteroid belt** ANNA PANCOAST, SHEA GARRISON-KIMMEL, PETER LOVE, Haverford College — We report simulations of the restricted n-body problem performed in the class Computational Physics at Haverford College. We simulated gravitational interactions in a large system in which nearly all of the particles, such as asteroids or stars, are assumed to have no effect on the trajectories of other particles. We begin by simulating the emergence of Kirkwood Gaps in the asteroid belt. We then modify the code to include the extensive initial conditions necessary to model the parabolic collision of two galaxies. We explored both direct and retrograde passages between the galaxies, reproducing the results of the 1972 paper by Toomre and Toomre, specifically the formation of galactic bridges and tails.

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