

There are 8 videos (animations) on this page. The number in front of the description corresponds to the name of the video in the description (given above). Each animation was made with PSM.

1. a. Newton 50 Body Problem – 50 equal mass bodies randomly distributed on sphere surface, angular momentum conserved to 15 digits
- b. Newton 50 Body Problem – 50 equal mass bodies randomly distributed on sphere, center of sphere has a body with mass 10 times of other bodies, angular momentum conserved to 15 digits

$$u_t + c u_x + d u_{xx} = 0$$

2. Advection Diffusion – advection constant ($c=1$), diffusion changes (left $d=0$, right $d=0.33$), forward difference advection derivative
3. Advection Diffusion – advection changes ($c_L=1$, $c_R=5$), diffusion changes (left $d=0$, right $d=0.33$), backward difference advection derivative
4. Advection Diffusion – advection constant ($c=1$), diffusion changes (left $d=0$, right $d=0.33$), centered difference advection derivative
5. Advection Diffusion – advection changes ($c_L=1$, $c_R=5$), diffusion changes (left $d=0$, right $d=0.33$), centered difference advection derivative

$$u_{tt} - c^2 u_{xx} = 0$$

6. 1d Wave Propagation - speed change ($c_L=1, c_R=2$)

$$u_{tt} - c^2(u_{xx} + u_{yy}) = 0$$

7. 2d Wave Propagation - speed change (vertical interface ($c_L=1, c_R=2$))

8. Sine-Gordon Partial Differential Equation - $u_{tt} = u_{xx} - \sin u$