

PhysH308

Lagrangian Mechanics, cont.

Class logistics

HW grade progress

Graded HWs 1 and 2 should be available HW 3 is not far behind.

All HWs #1 will be treated as “satisfactory” whether or not you revise and resubmit. Solns posted on Moodle.

HW 2 Revisions are due by Tuesday, October 29.

Mid-semester feedback: I will post this evening. Please complete it by class next Tuesday for a quiz/feedback credit.



Class logistics

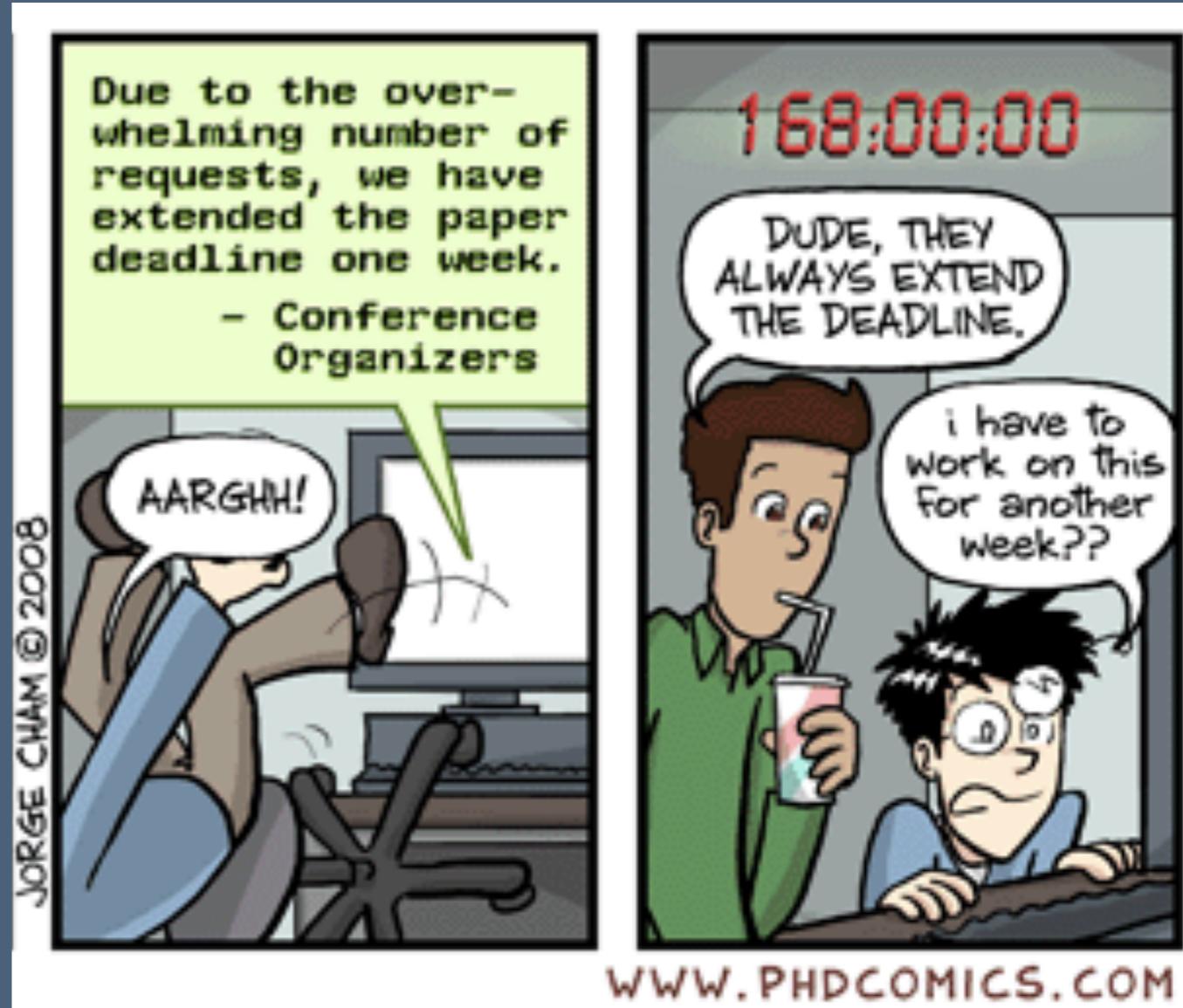
Reminder - deadlines

Wednesday — Exam II due

Friday — Final draft of HW #6
due

Monday — quiz on Chap 7,
rough draft of HW #7

Next week, back to normal!
(Discuss schedule with peer
reviewer)



This week:

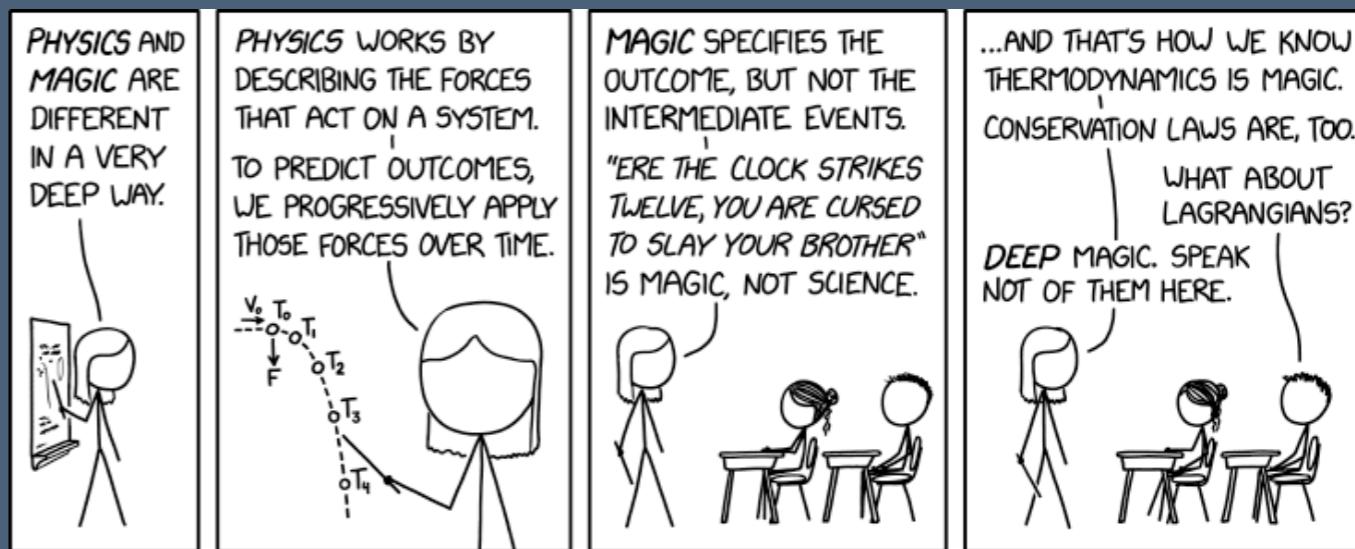
More Lagrangian mechanics!

Last time: we wrote down

$\mathcal{L} = T - U$, applied constraints, and set up E-L, but mostly stopped short of solving.

Today: We're going to go all the way!

In general, solutions will be of the form $\ddot{x} = f(\dot{x}, x, t)$. I expect you to be able to find solutions of the form $x = x(t)$ for these Diff. EQs, but don't ask for that in general



This week:

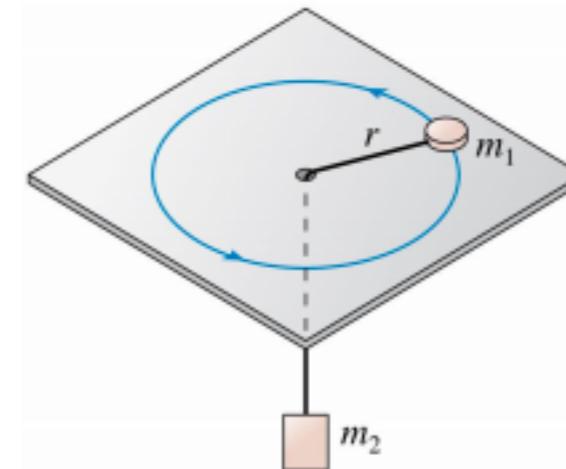
More Lagrangian mechanics!

Returning this week - two of your favorite systems!

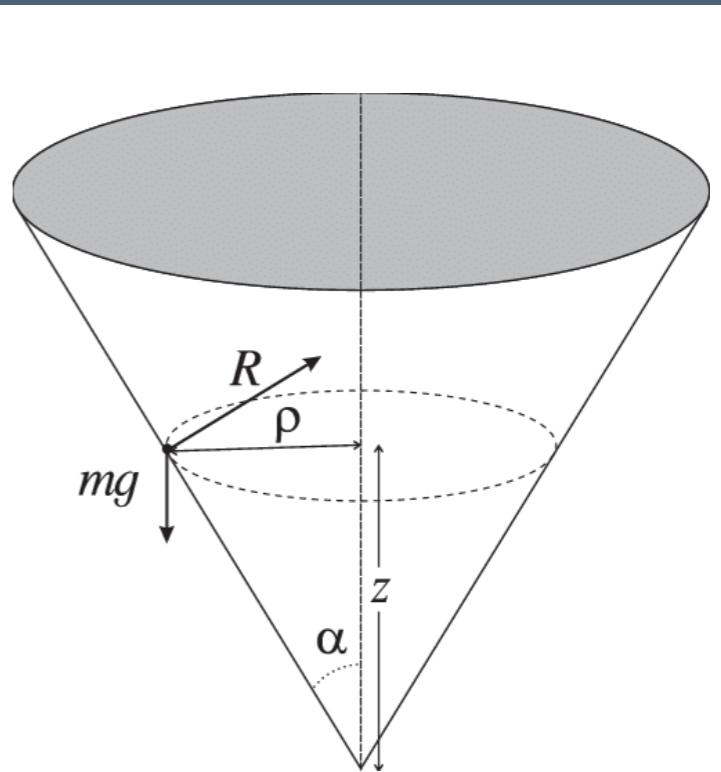
You'll arrive at an answer,
 $\ddot{r} = f(\ell_z, r, t)$, using conservation
of ℓ_z as a constraint!

You'll be asked about stability of
circular orbits: if $r = r_0 + \epsilon(t)$,
what does $\dot{\epsilon} = f(\dot{\epsilon}, \epsilon, t)$ tell us?

Today



Thursday



Today's problems

- 7.14 — Equation of motion for a yo-yo! This is a challenging problem in NF, but straightforward in the LF.
- 7.37 — Calling back the system from the chapter on W-E!

