

APM 426 / 1700
Assignment 10

Prof. McCann

Due: by 1 pm Friday Mar. 31
to Diana Leonardo in BA 6290

1. Compute the perihelion precession per orbit and per year for Venus ($R = 1.1 \times 10^{11}m$, $T = 1.9 \times 10^7s$), Earth ($R = 1.5 \times 10^{11}m$, $T = 3.2 \times 10^7s$) and Mars ($R = 2.3 \times 10^{11}m$, $T = 5.9 \times 10^7s$) given their orbital period T and distance R from the sun.
2. Paul orbits a neutron star in a circular orbit at radial coordinate $r = 4M$. Peter has been fired radially from a cannon on the neutron star with less than escape velocity. He flies outward, passes Paul in his orbit, reaches a maximum radius, and fall back down just happening to meet Paul again. Between their two meetings Paul has completed 10 circular orbits of the neutron star. If they synchronized their watches at their first meeting, by how much do their watches disagree at the time of their second meeting?
3. Wald # 6.5

REMINDER: Project write-ups are due in class Thursday, March 30. Please email a .pdf file of your write-up (can be wordprocessed or scanned) to mccann@math.toronto.edu on the same date you submit it for posting at www.math.toronto.edu/mccann/426.html

Presentations should be between 20 and 25 minutes in length, not including questions, and can be done using blackboard or transparencies. Written assignments and the presentation schedule will be accessible on the webpage above. Please come prepared for the other students presentations with a question or two based on their written presentations.

I will be out of town Wednesday April 12, so am cancelling lecture that day and will hold my office hours 16h30-17h20 on Tuesday April 11 instead.

To compensate, I will arrange to schedule extra class meetings on one or two of the following three dates (rooms TBA):

14h10-15h00 Friday March 31

11h10-12h00 Friday April 7

14h10-15h00 Friday April 7

RECALL: TERM TEST 12h10-14h00 THURSDAY APRIL 13 in our usual classroom.