1. What’s the difference between weight and mass?

2. Why does an astronaut feel weightless?

3. Is the moon falling? With respect to what?

4. Do the forces on downhill skiers form an action-reaction pair?

5. How can forces at a distance exist without direct contact between bodies? Consider electromagnetism!

6. The Sun has a little orbit of its own, primarily in response to the gravitational pull of Jupiter (GfGU p.32-33) Suppose you are an extraterrestrial observing the solar system from a somewhere else far away (presumably from a planet around another star.) You have a spectrograph which allows you to accurately measure the Doppler shifts of colors in the Sun’s spectrum (more precisely, the Doppler shifts of the spectral line features of specific elements in the Sun’s atmosphere.) Could you deduce the mass of Jupiter from this measurement? For how long would you have to observe, in order to get a reasonable measurement of the Sun’s orbital velocity.