

# ASTR430 HW#5 (due 11/23/05)

1. Problem #15 from Ch. 9 (p. 269). *Hint: for part (a), just estimate the total mass excavated and compute the energy required to lift it 10 times the crater diameter. Assume the acceleration due to gravity  $g$  over that height remains constant. You'll need to assume a bulk density for the material. For part (b), see Fig. 9-6.*
2. Problem #13 from Ch. 10 (p. 315). *Hint: use the expression involving  $\phi$  in the mathematical notes on p. 297.*
3. Don't forget your term project essay!