

# Homework 1

AST 422 Spring 2007

- (a) Assume power,  $P(z)$  (= Luminosity,  $L(z)$ ), and density  $\rho(z)$  are all constant.
  - Show for the Euclidian case:  $N(> S) \propto S^{-3/2}$   
where  $S$  = flux.
  - Discuss what will change if your assumptions don't hold?
- (b) Compute the Sky Brightness (in Radio). Integrate!!
  - Assume  $N(> S) \propto S^{-\gamma}$ . For which values of  $\gamma$  the sky brightness is infinite (or finite).  
This is called the *Olbers' Paradox*.
- (c) Using the same assumptions as in part (a):
  - Show for the Euclidian case:  $N(< m) \propto 10^{0.6m}$   
where,  $m$  = magnitude.
  - For  $N(< m) \propto 10^{\alpha m}$ , which values of  $\alpha$  will cause the Olber's Paradox.
  - Discuss about what you can conclude from the assumptions we made.