

**AST 300B – Spring 2017**  
**In-class/take-home Problems Due: Monday Feb. 6**

14. In the diffuse ISM, dust grains have a differential size distribution given by

$$dn/da \sim a^{-3.5}$$

for grain radii ( $a$ ) between  $0.005 < a < 0.25 \mu\text{m}$  [Note:  $n$  is the number density of dust grains  $\text{cm}^{-3}$ ]. This is called the “MRN” size distribution (Mathis, Rumpl, & Nordsieck 1977 ApJ, 217, 425). What fraction of the total dust grain mass in the ISM is in dust grains with  $a > 0.1 \mu\text{m}$ ? You may assume dust grains are spherical (although you can see from the image – they are not spheres!).

