

## Chemical Evolution of the Universe

### Problem sheet 8

1. In the lecture we derived the system of differential equations governing the s-process:

$$\frac{dN_A}{d\tau} = \sigma_{A-1}N_{A-1} - \sigma_A N_A$$

for  $56 \leq A \leq 208$ . We will now assume that all neutron capture cross-sections are equal, i.e.  $\sigma_A = \sigma$  for all  $A$ .

- (a) Show that the solution to the above differential equation for a single exposure  $\tau$  is a Poisson distribution.
- (b) Following the lecture, assume an exponential probability distribution for  $\tau$  and find the solution for  $\tilde{N}_A$ .

**6 points**