Theory: T-6

“Supernova 1987A ”

Motivation

- Supernova 1987A

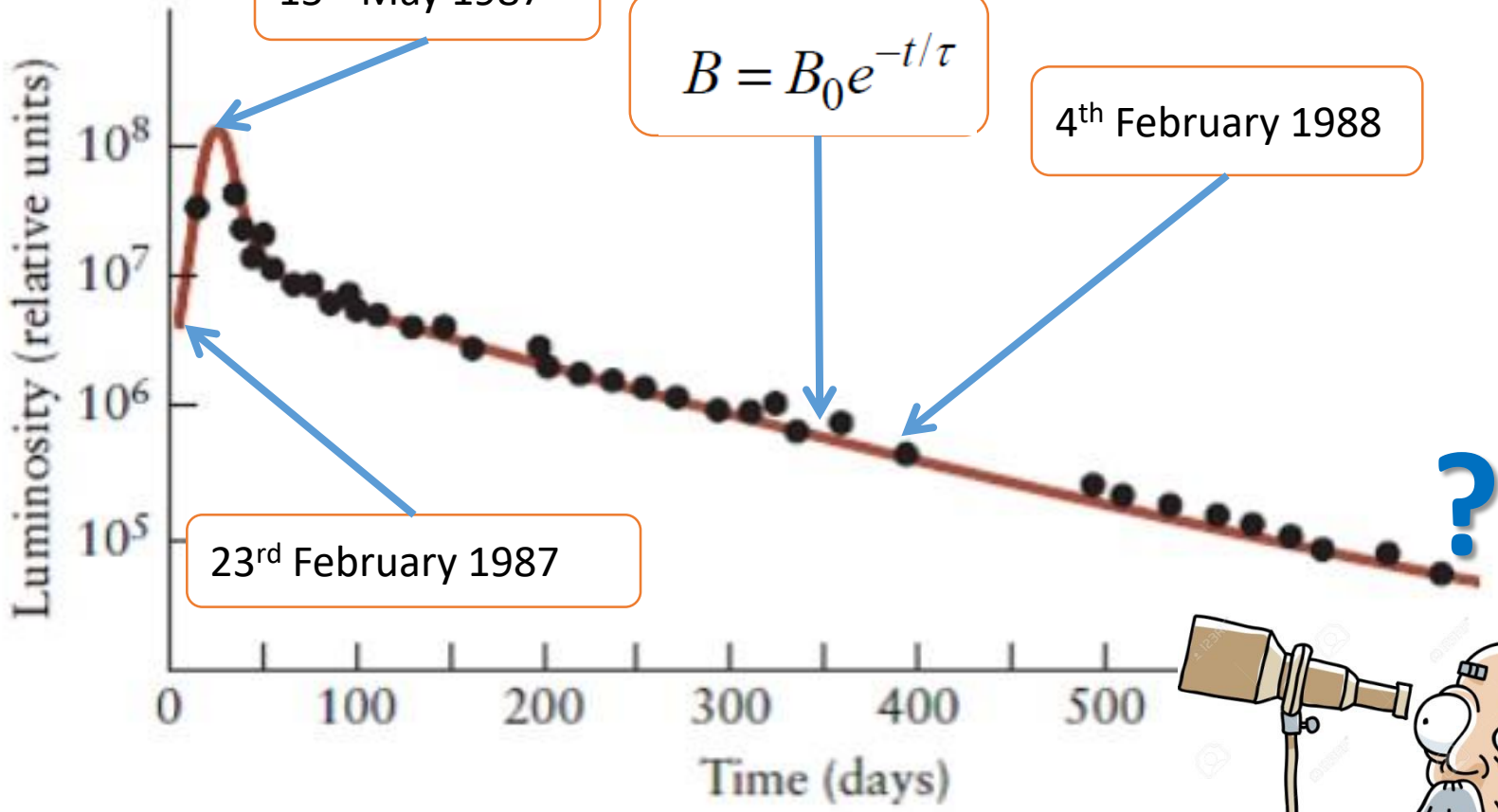
T-6 Supernova 1987A

15th May 1987

$B = B_0 e^{-t/\tau}$

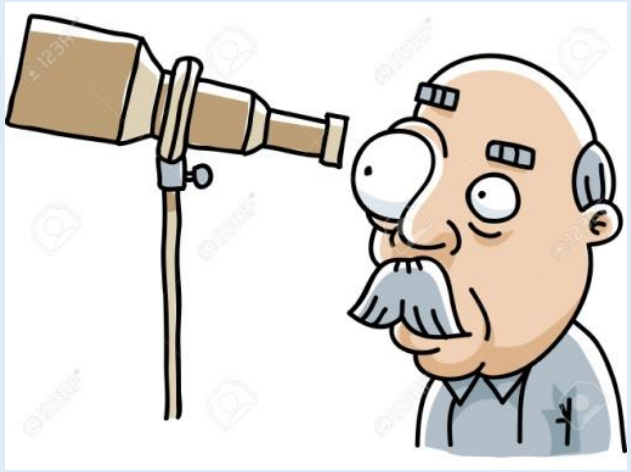
4th February 1988

23rd February 1987



Objectives

- Find the last day that observers could have seen the supernova by a telescope.



Task T6a (7 marks)

- Determine the valued of □ in days.

$$B = B_0 e^{-t/\tau}$$

$$m - m_0 = -2.5 \log_{10}\left(\frac{B}{B_0}\right)$$

- 15th May 1987 → the brightest date
- 4th February 1988 → invisible to the naked eye

Task T6a (13 marks)

- Find the last day that observers could have seen the supernova if they had a 6 inch telescope
- The rate of energy passing through the telescope and the pupil is

$$B_e d^2 = T B_T D^2$$

$$m_{\lim} - m_e = 2.5 \log_{10}\left(\frac{B_e}{B_T}\right)$$

$$m_{\lim} = m_e + 2.5 \log_{10} T + 5 \log_{10}\left(\frac{D}{d}\right)$$

$$m_{\lim} = 3 + 2.5 \frac{t}{\tau} \log_{10} e$$

Knowledge

- Stars
  - Stellar Properties
- Instrumentation & Space Technology
  - Instrumentation