

Quantum Physics, Preparation for Tuesday, Apr. 16

Study Moore Q15

The final chapter, technological applications of nuclear physics.

Presentation

Miles (maybe someone wants to join him!?): How are atoms or electrons or ions counted so as to make 1 mole (abbreviated mol) *in practice*; and in particular, how is the gram which is now defined as $1/12$ of the mass of an Avogadro's number (602,214,076,000,000,000,000) of Carbon-12 atoms counted, *in practice*

Special Topics

Let's plan (so I can start preparing) the special topics for the last two Fridays of the semester. See schedule below:

- Friday, Apr. 19 — Special Topic 1 (your choice, such as an atomic or nuclear physics phenomenon like MRI?)

Week 14 — Exam 4 — Final Topic

- Tuesday, Apr. 23 — Exam 4 Covering Problem Sets 14-18 (Moore Section Q12.5 to end of Chapter Q15)
 - Friday, Apr. 26 — Special Topic 2 (your choice, such as an introduction to special relativity focusing on time dilation or an introduction to the Feynman path integral)
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For Problem Set 18

I hope and think you will find these easy, so I assigned more than usual.

Energy Released in Fission

1. Q15B.5, p.249, answer in MeV, and as far as I can see there isn't an estimate in Section Q15.4 to compare to

Energy Released in Fusion

2. Q15B.7, p.249

CONTINUED ON REVERSE

For Problem Set 18 (CONT'D)

Temperature Required to Initiate Fusion of Deuterium

3. Q15B.8, p.249

Temperature Required to Initiate Fusion of Carbon-12

4. Q15B.9, p.249

The Age of the Sun

5. Q15M.5, p.249, in the early 1900s, before fusion, people thought the Sun might be burning coal or gasoline

6. Q15M.6, p. 250, what the Sun is actually doing instead of burning gasoline

Carbon Dating

7. Q15M.9, p.250

Some of the scrolls found near Qumran, between late 1946 and 1956:

