

PHY151 – Practical Session 2

Mini-presentation

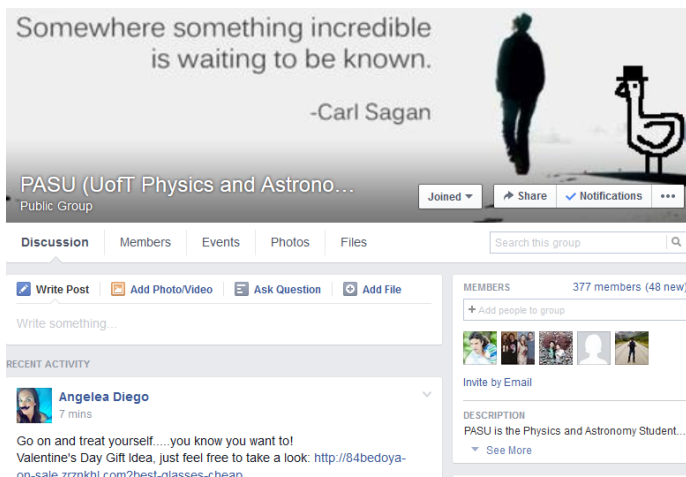
- “Belonging” in Physics, and doing well going forward
- Special Relativity

Last week you were asked...

- Recommendations for a student who has no friends in physics, and who feels lonely and isolated, or excluded.
- Recommendations for a student who did not understand Problem Set 1, or who is having trouble following lecture derivations, etc, feeling overwhelmed.
- Please share your answers with your pod-members, and decide on a “best” recommendation. Each pod will be asked to provide one recommendation to the rest of the Practical.

PASU = Physics and Astronomy Student Union

- PASU is in MP217 – you are **all** welcome!
- There is a facebook page:
- <https://www.facebook.com/groups/pasu.physics/>




**First Year
Representative
Elections!**



Asu

Come and vote for your fellow students!
(You can vote if you take any PHY/AST courses)



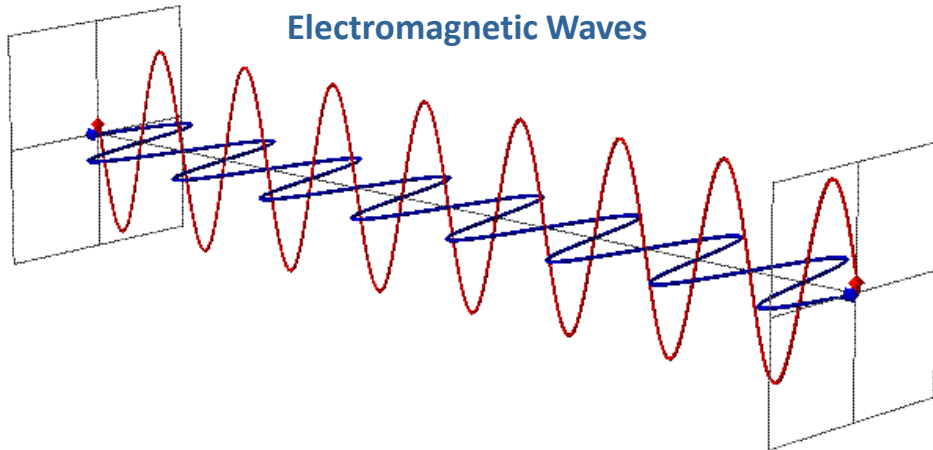

 Physics
UNIVERSITY OF TORONTO

Feeling Excluded: Thoughts from upper-level undergraduates in PASU

- “Physics students are mostly cool people, but they have their own problems too. Sometimes they're shy and don't want to interact with people outside their group of friends, and sometimes they don't have the greatest social skills.”
- “If someone is excluding or disrespecting you, it likely has more to do with them than with you, and they may not realize that they're doing it.”
- “a vague feeling of not belonging” ... “is perfectly understandable, as is feeling inadequate. But I would say that if you're interested then you shouldn't let this hold you back. A lot of physics skill comes with time and training.”

Feeling Overwhelmed: Thoughts from upper-level undergraduates in PASU

- “Every single one of us has found the material hard and not followed the derivations at one point or another. Literally every single physics student I know.”
- “As far as I'm concerned the only indicator that you can't do physics is if you don't like physics.”
- “As long as you find the material interesting and “get” most of it eventually, at least for the fields that interest you and that you want to pursue further, you're good. If you decide after you finish a physics undergrad that the field isn't for you, you can enter a huge variety of careers and graduate programs with your physics background.”



All electromagnetic waves travel in a vacuum with the same speed, a speed that we now call the *speed of light*.

$$v_{\text{em}} = \frac{1}{\sqrt{\epsilon_0 \mu_0}} = 3.00 \times 10^8 \text{ m/s} = c$$

Believe it

Every experiment to date (circa 2015) has found that light travels at $c = 3.00 \times 10^8$ m/s in every inertial reference frame, regardless of how the reference frames are moving with respect to each other.

If this makes you feel uncomfortable, you are not alone.
But it is still true.

Today's Schedule

- The next hour: Practice Problem Set, Student Presentations
- What remains of Hours 2 and 3: Today's Practicals activities in your TERM booklet (one per pod)
- Booklets must be handed in at the end of the Practical.

Notes on "half-life"

- If there are N_0 muons at time $t = 0$, then there will be N muons at time, t :

$$\frac{N}{N_0} = \left(\frac{1}{2}\right)^{t/t_{half}}$$

- Here t_{half} is the half-life.
- t is the "proper time" in the muons' rest frame.
- Taking the logarithm of both sides and solving for t gives:

$$\ln\left(\frac{N}{N_0}\right) = \ln\left[\left(\frac{1}{2}\right)^{t/t_{half}}\right] = \frac{t}{t_{half}} \ln\left(\frac{1}{2}\right)$$

$$t = t_{half} \frac{\ln(N/N_0)}{\ln(1/2)}$$