

## HOMEWORK SET 20: FERMI ENERGY AND WIEN DISPLACEMENT LAW

Due Friday, April 5, 2024

PROBLEMS FROM OR AFTER TZDII<sup>1</sup> AND TReX<sup>2</sup>

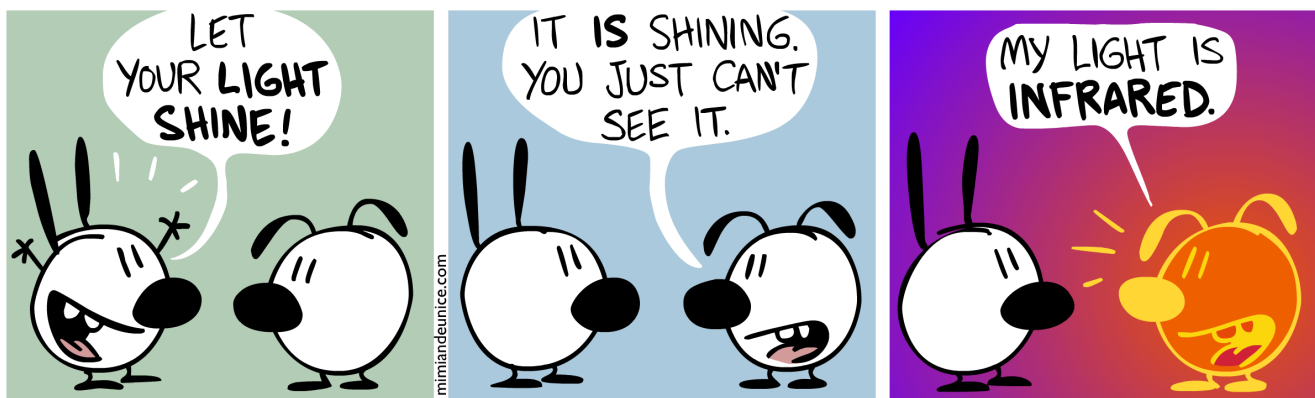
WHEN YOU GET A RESULT, COMMENT ON IT!! DOES IT MAKE SENSE, IS IT INTERESTING, IS IT RIDICULOUS AND INDICATE THAT THE MODEL DOESN'T WORK VERY WELL?

**TReX 9.26)** As written in TReX plus find  $E_{\text{Excited Electrons}}$ . NOTE THAT  $E_{\text{CONDUCTION ELECTRONS}} = \bar{E}_F$ , AND  $E_{\text{EXCITED ELECTRONS}} = \bar{E}_F + 2(E_{EC})$

**TReX 9.35)** As written in TReX.

**TReX 3.18)** As written in TReX. YOU MIGHT FIND EXCEL HELPFUL FOR THESE CALCULATIONS.

**TReX 3.20)** As written in TReX. Take  $T_{\text{human}} = 98.6^\circ\text{F}$ ,  $1 \text{ kcal} = 4.184 \text{ kJ}$ . Then ponder why it is that we don't radiate ourselves to death.



<https://mimianddeunice.com/2011/09/26/let-your-thermal-radiation-emit/>

<sup>1</sup> Taylor, Zafiratos, & Dubson, *Modern Physics for Scientists and Engineers*, 2<sup>nd</sup> Edition, Pearson, Prentice Hall, 2004

<sup>2</sup> Thornton and Rex, *Modern Physics for Scientists and Engineers*, 3<sup>rd</sup> Edition, Cengage Learning, 2013