

Mazur Clip 1 Transcript

ERIC MAZUR: Somebody else said-- highlighting this passage here-- when charged particles are moved around in electrostatic fields, no energy is irreversibly converted to other forms of energy.

And the person here said, is this just a theoretical of a perfect world? I thought that anytime particles move, there is entropy, referring to the thermodynamics law. Even a particle, as small as it is, must interact, lose some energy, traveling from something as small as the resistance of travel.

If it's just the electrostatic field, the answer is, no, there is no dissipation whatsoever. If there are other things in the way, like other particles it bumps into, collisions, this, and that, and the other, which will be the case inside a wire, for example, or inside a fluid, like air or liquid, the answer is yes. But if you have a vacuum and you have a particle, and it's just an electrostatic field, there is no dissipation whatsoever.

Somebody else said-- and this is related-- good to know that-- the word electrostatic was not there, but that's what they refer to-- electrostatic work is independent of the paths taken. And the answer is, yes, that's because there are no dissipative interactions. There are no interactions that dissipate in the energy.

If you have not taken AP58 or if you feel kind of shaky in some of the things that we're doing today, you should review chapter 5 and 9. If you have not taken AP58, I would highly recommend you read chapter 5 and chapter 9. Otherwise, you'll get into terminology problems and not quite understand what we're doing moving forward.

And, having said that, use the book as a resource. When you're looking to solve your problem set or an RA, there are lots of example that are completely worked out. There's a summary of the chapter in the practice book.

And to get to the practice book, you have to scroll down all the way to the bottom in Perusal. So the first 32 chapters are the principles chapter. And then the next 32 chapters are the 32 practice chapter corresponding each to the principle's chapter.