Answer on Question #55189, Physics Other

I want the detailed physical explanation for homogeneous and Isotropic materials. Also, explain with at least five examples, the materials that are homogeneous but not isotropic and vice versa.

Answer:

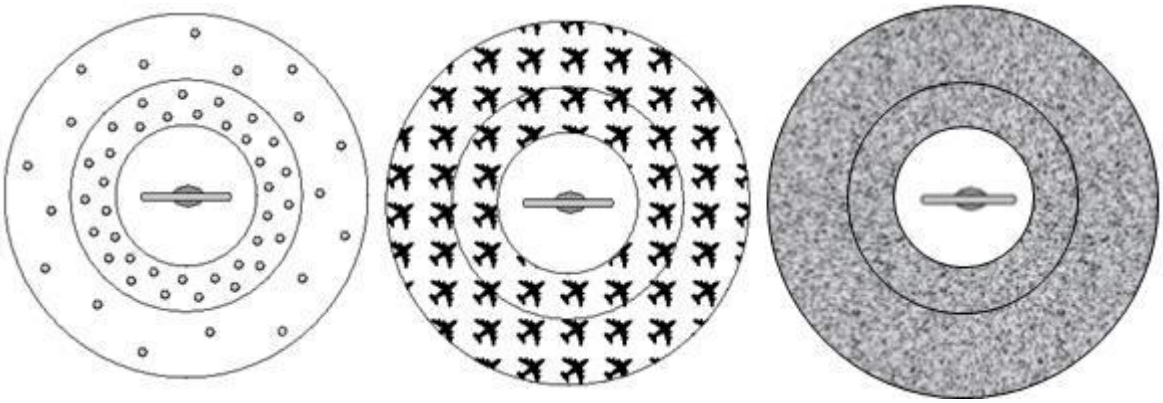

Fig.1 The illustrations above give examples of the cosmological principles. The illustration on the left, outside the inner circle, is isotropic, but not homogeneous. The illustration in the center is homogeneous, but not isotropic. The illustration on the right is both homogeneous and isotropic.

A property of materials can be both homogeneous and isotropic, however this two have different meanings respect to their property of body and direction of the position. The difference between the two are that homogeneous material has the same body of properties at every place, but an isotropic material has the same looking in all of the directions at different point of the property. In addition homogeneous properties not changing with a position, all of the material property points are similar. The class note definition for homogeneous is that “the properties of the body do not vary from one point in the body to another”. For isotropic materials the classification is that “the stress strain relations do not change with direction at a point”.

An example of homogeneous is a uniform electric field, since the looks of a uniform electric field is the same at different point of the property. However, a uniform electric field cannot be isotropic because this property has only one preferred direction. Moreover, an even-grained wood or an item of uniform density can be categorized as homogeneous, but it cannot be isotropic. An example of isotropic can be a fine suspension of particles in a liquid, because it has similar direction, but it is not homogeneous since it has different looks in each position in the body. In addition, an example of anisotropic material can be crystals because crystals physical properties is different in the different directions, so it cannot be isotropic if we measure the different axes it has more axes. Nevertheless, a uniform crystal property of body doesn't change with one position to another position