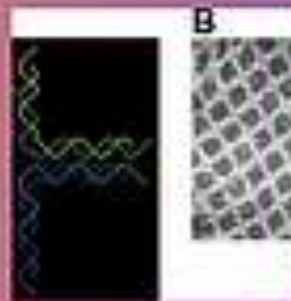


PHYSICS TOMORROW LETTERS

MATERIAL SCIENCE



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A wormhole of light by using electronic materials

Wormhole is a popular tool for interstellar travel in science fiction. It connects two different space-time points directly although such an astrophysical object is not yet observed, but in 2015, researchers in Spain created a tiny magnetic wormhole for the first time ever. They used it to connect two regions of space so that a magnetic field could travel 'invisibly' between them. This article presents a model of making a wormhole of light on the principle of conversion of energy so that light going from one end could come out of another end; hence it can be called a wormhole of light. Materials including solar cell, amplified speaker, one way walkie talkie, alligator clips, light emitting diode, transistors and clapping switch have been used. The method of conversion of energy is used and light is transferred into sound first and then back into light. The preparation of such wormhole of light is split into two parts. One end includes a circuit that would accept light through a box and the other end would provide light coming from another box. In order to utilize a wormhole of light to two locales of room the goal was to make light travel between them. Sound made from light would travel the distance between the two boxes. For this purpose a one way walkie-talkie will provide the connection between the two boxes and thus as a whole it would work as a wormhole of light.



This idea presents how we can make the wormhole of light using simple electronics materials.

COMMUNICATION PAPER.

Keys: light; conversion of energy; wormhole, sound, electronic materials.

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1. Introduction

Wormhole is a popular tool for interstellar travel in science fiction. It connects two different space-time points directly although such an astrophysical object is not yet observed; studying wormhole structure gives us many chances to understand unknown aspects of the gravitational field. The most famous and the common starting model of wormhole is, we think, the one announced by Morris and Thorne as a “traversable wormhole” [1]. In this article a model is presented to make wormhole of light. We can describe light as stream of photons travelling at a speed of light and have wavelike properties. A wormhole of light would look like light entering from one end and coming out of another end. By using the method of conversion of energy, light is transferred into sound first and then back into light. Energy can be converted from one form to another in a device or in a system. A solar cell converts solar radiation into electrical energy that can then be used to light a bulb. Materials including solar cell, amplified speaker, one way walkie talkie, alligator clips, light emitting diode, transistors and clapping switch have been used. In order to utilize a wormhole of light to two locales of room the goal was to make light travel between them. The method is split into two parts. The first part present a circuit in a box through which light will be entered and the second part consist of clapping switch and speaker, through which light will come out of LED through a box. For this purpose a one way walkie-talkie will provide the connection between the two boxes and thus as a whole it would work as a wormhole of light.

2. Background

In 2015, scientists in Spain made a minuscule attractive wormhole unexpectedly. They utilized it to associate two locales of room with the goal that an attractive field could travel 'undetectably' between them. It wouldn't have had the option to ship matter. Be that as it may, the physicists figured out how to make a passage that permitted an attractive field to vanish at a certain point, and afterward return at another, which is as yet a really gigantic arrangement. A wormhole is successfully only a passage that associates two spots in the Universe. So far researchers have reenacted this procedure, yet are not even close to making a gravitational wormhole, as it would expect us to make enormous measures of gravitational vitality - something we don't yet have the foggiest idea how to do. In 2014, they figured out how to make burrows that guided attractive fields starting with one spot then onto the next; however these weren't correct wormholes since they didn't keep the attractive field imperceptible or attractively 'undetectable' while it was going inside the passage. This is something they figured out how to defeat in 2015, by utilizing Meta material to fabricate their tunnel. That implied that they could make the attractive field from a source, for example, a magnet or an electromagnet, show up at the opposite finish of the wormhole with no hint of it in between. This made the deception that the attractive field must go through an additional measurement. Strangely, it additionally implied that a secluded attractive monopole - a magnet with just one post, North or South - showed up haphazardly toward the finish of the tunnel. "This result is

bizarre enough in itself, as attractive monopoles don't exist in nature," a public statement clarified at the time. "The in general impact is that of an attractive field that seems to venture out starting with one point then onto the next through a measurement that lies outside the regular three dimensions. "To be clear, the wormhole in this examination isn't generally undetectable to the natural eye - it's a circle comprised of an external ferromagnetic surface, an inward superconducting layer, and afterward a ferromagnetic sheet folded into a chamber inside. Yet, the way that it's been planned implies that it, and its substance, is absolutely imperceptible attractively. In this article, we present our model of first wormhole of light that will send light starting with one district then onto the next. We will utilize the technique for discussion of vitality to get this going.

3. Preparation of making wormhole of light

3.1. Method used in this preparation

Energy can be converted from one form to another in a device or in a system. For example, batteries convert chemical energy to electrical energy and operate mobile electronic equipment. A dam converts gravitational potential energy to kinetic energy of moving water used on the blades of a turbine, which ultimately converts the kinetic energy to electric energy through an electric generator. A solar cell converts solar radiation into electrical energy that can then be used to light a bulb or power a computer. The energy that enters a conversion device or a process is turned into other forms of energy, so an equal quantity of energy before and after is maintained. [2] There are many different processes and devices that convert energy from one form to another. In order to utilize a wormhole of light to two locales of room with a goal that light could travel "between them", method of conversion of light into sound first and then back into light is used.

3.2. Preparation of one end of model

In order to utilize a wormhole of light to two locales of room, two boxes are used, each representing one end of wormhole of light with goal of sending light from one end and getting light from another end. It will travel in form of sound to cover distance by the conversion of energy.

First of all amplified speaker is connected to solar cell. The solar cell will convert light energy into electrical energy. On the back of solar cell are 2 leads. Then alligator clips are connected to 2 leads. Then mono phono jack is plugged into amplified speaker. Buzzing of room light will be seen. When electric current flows in a circuit, it can transfer energy to do work. Devices convert electrical energy into many useful forms, such as heat (electric heaters), light (light bulbs), motion (electric motors), sound (loudspeaker), and information technological processes (computers). Electric energy is one of the most useful forms of output energy, which can be produced by various mechanical and/or chemical devices. There are seven fundamental methods of directly transforming other forms of energy into electrical energy [3] the solar cell will produce sound coming from

amplified speaker but how will that sound be transmitted to another part of our model? The idea presented in this paper is to use a one way walkie-talkie for this purpose. A one way walkie-talkie has a speaker and a listener. Even baby monitors employ one-way walkie-talkie technology, so that one knows if Junior is sleeping peacefully or attempting escape.

The listener of one way walkie-talkie is put near amplified speaker. This will make one part of wormhole.

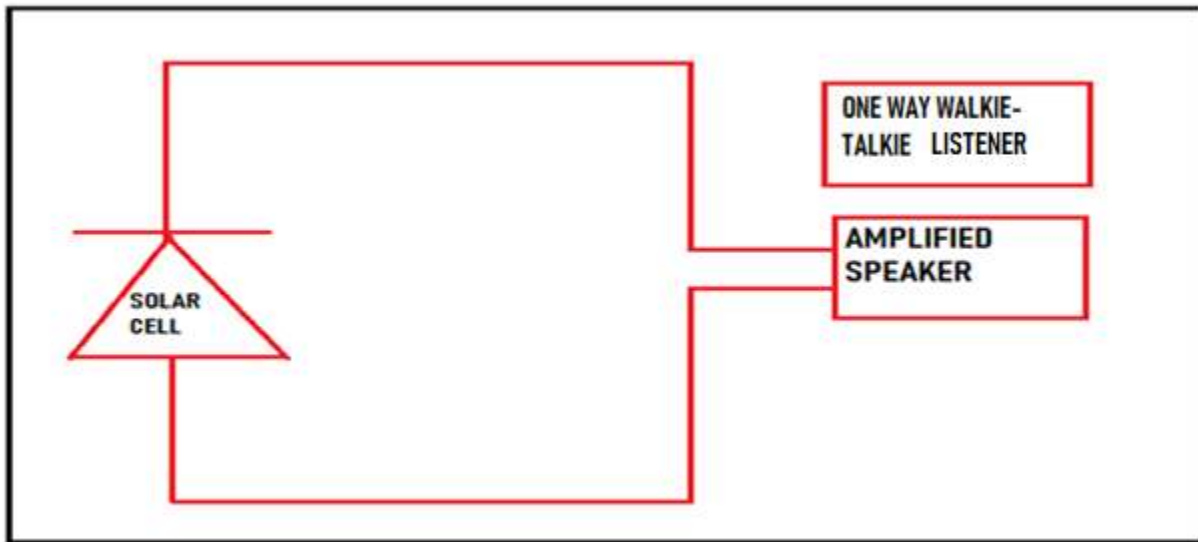


Figure 1 Circuit diagram for one end of model

3.3. Preparation of second end of model

Now to make second part of wormhole which is just like making a clapping switch and speaker is placed near that circuit. The primary purpose of switch is to provide means for connecting two or more terminals in order to permit the flow of current across them, so as to allow for interaction between electric components, and to easily isolate circuits so as to terminate this communication flow when needed be[4]. Here clapping switch is required. To make that circuit 2 transistors are connected. Solder Collector Pin of transistor-1 to Base pin of transistor-2. Next connect 47uf capacitor is connected. Solder negative pin of capacitor to base pin of transistor-1. Next Solder emitter pin of transistor-1 to transistor-2 as solder in the picture. Solder 10K Resistor to positive pin of capacitor. Next solder 1M Resistor to base pin of transistor-1. Solder 120K Resistor to collector pin of transistor-1. Solder 220 ohm resistor to negative leg of LED. Solder 220 ohm resistor which is connected to negative leg of LED to the Collector Pin of Transistor-2. Solder positive leg of LED to 10K, 1M and 120K resistor. Solder positive wire of MIC to positive pin of Capacitor and solder negative wire to emitter pin of Transistors. Now battery clipper wire is connected to the circuit. Solder positive wire of battery clipper to positive leg of LED and solder

negative wire of battery clipper to Emitter pin of transistors as shown in the picture and Connect Battery to battery clipper. To activate LED, it needs sound.

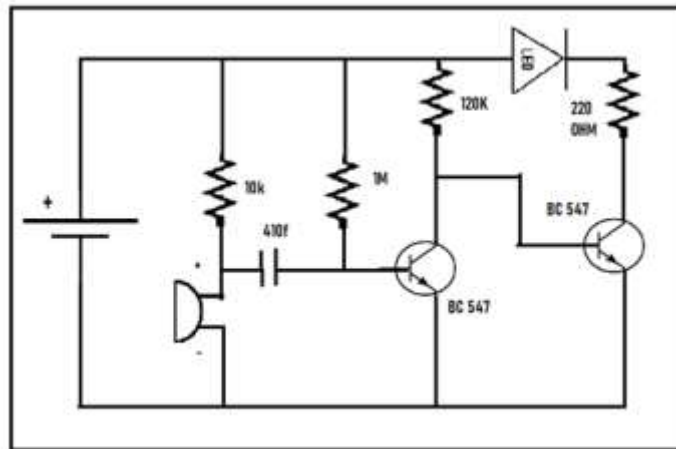


Figure 2 | Circuit diagram for second end of model [5]



Figure 3 | Clapping switch

4. Working of model

So now one part of wormhole is in a box with a hole in one room and the other part of wormhole is in a box with hole and a speaker in another room. Now when the torch light is pointed towards the hole of solar cell box, a solar cell converts light into electric current and brighter light is more electric current, and dimmer light is less electric current and that bright-dim, greater current, lesser current signal, goes into this amplified speaker, and turns it into sound. Now near that speaker will be listener that will send that sound coming from amplified speaker to the speaker of one walkie-talkie in the box that is in another room.

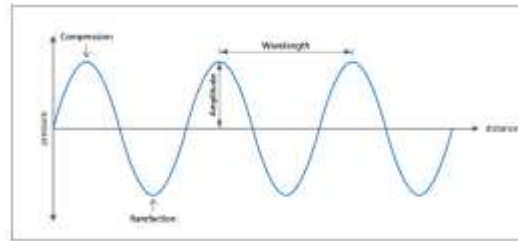


Figure 4 | Graphical representation of sound waves

So when sound will come from speaker that is in another room, it will go into the microphone and lit the LED.

In this way the light sent through first box or one end of wormhole will be received through second box or another end of wormhole. This transmission will be caused by one way walkie talkie. It will travel in form of sound to cover distance by the conversion of energy. So model of wormhole of light will look like this as shown in FIG.6

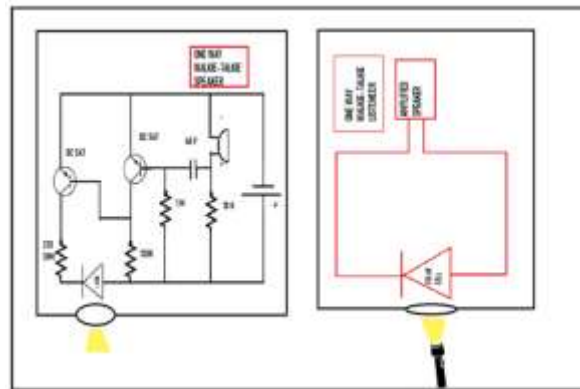


Figure 5 | Final model of wormhole of light

5. Conclusion

A model of wormhole of light that could transmit light from one end to its other end is shown in this paper. By using the method of conversion of energy, light is transferred into sound first and then back into light. The method was split into two parts. One part consisted of a circuit in box that would accept light and the other part consist of a clapping switch, speaker and LED that produces light giving an impression of light transferring between two boxes. Materials including solar cell, amplified speaker, one way walkie talkie, alligator clips, light emitting diode, transistors and clapping switch have been used. The purpose of one way walkie talkie was to provide a source through which sound could travel between the two boxes.

In order to utilize a wormhole of light to two locales of room the goal was to make light travel between them. By putting the circuits in boxes wormhole of light from outside would look like figure6.



Figure 6 | outside look of wormhole of light



References

- [1] M. S. Morris & K. S. Thorne, *Am. J. Phys.* 56, 395 (1988).
- [2] Y. Demirel, *Energy, Green Energy and Technology*, © Springer International Publishing Switzerland 2016; doi: 10.1007/978-3-319-29650-0_7
- [3] Çengel YA, Boles MA, *Thermodynamics: an engineering approach*, 8th edition. (2018)
- [4] Olokede, S.S. Design of a clap activated switch. *Leonardo J. Sci.* 2008, 7, 44-58.
- [5] (utsource123). Clapping Switch with BC547Transistor.instructables.com. <https://www.instructables.com/id/Clapping-Switch-With-BC547-Transistor/>