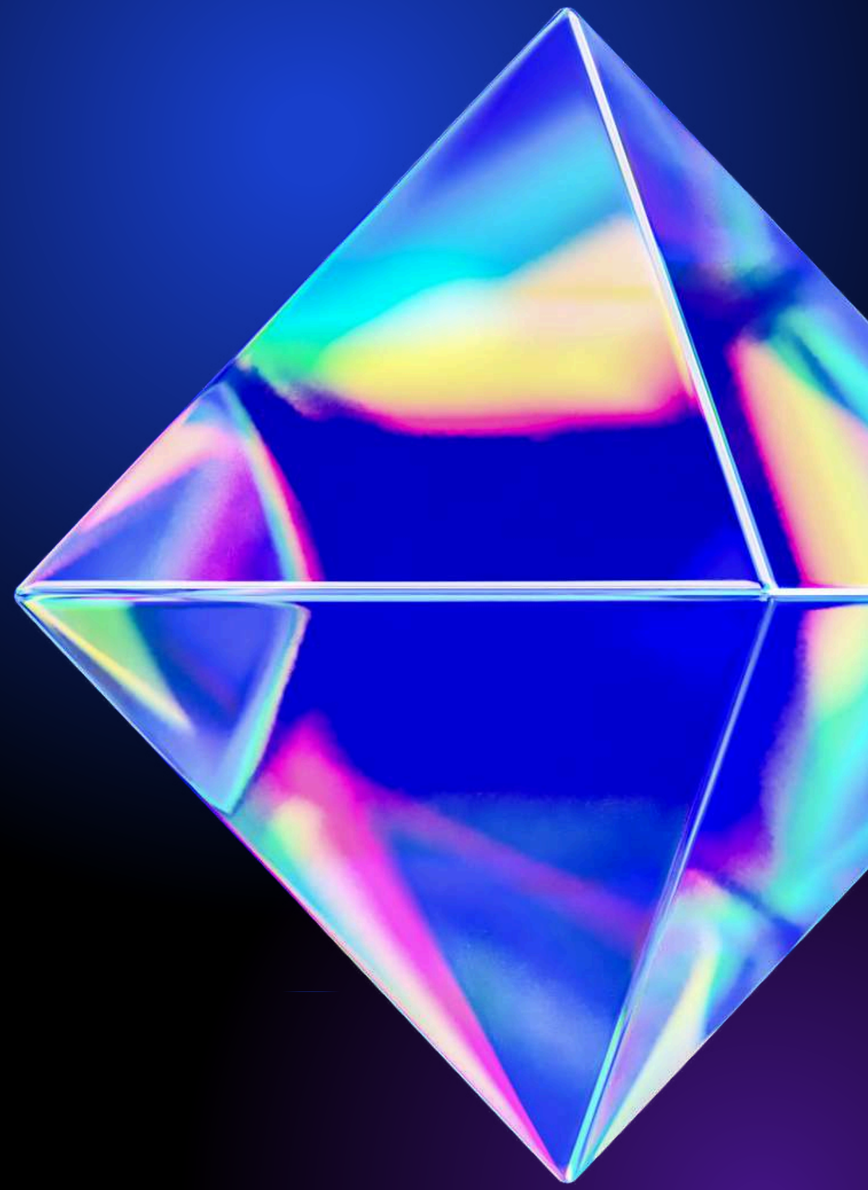
Light Fidelity

Li-Fi

INTRODUCTION

- WiFi runs our life. In fact, according to a survey carried out by Direct Line by Opinium Research online it is the number one thing that their respondents couldn’t live without. But no matter where you are in the world, you’ve probably experienced internet connectivity problems at one point or another.

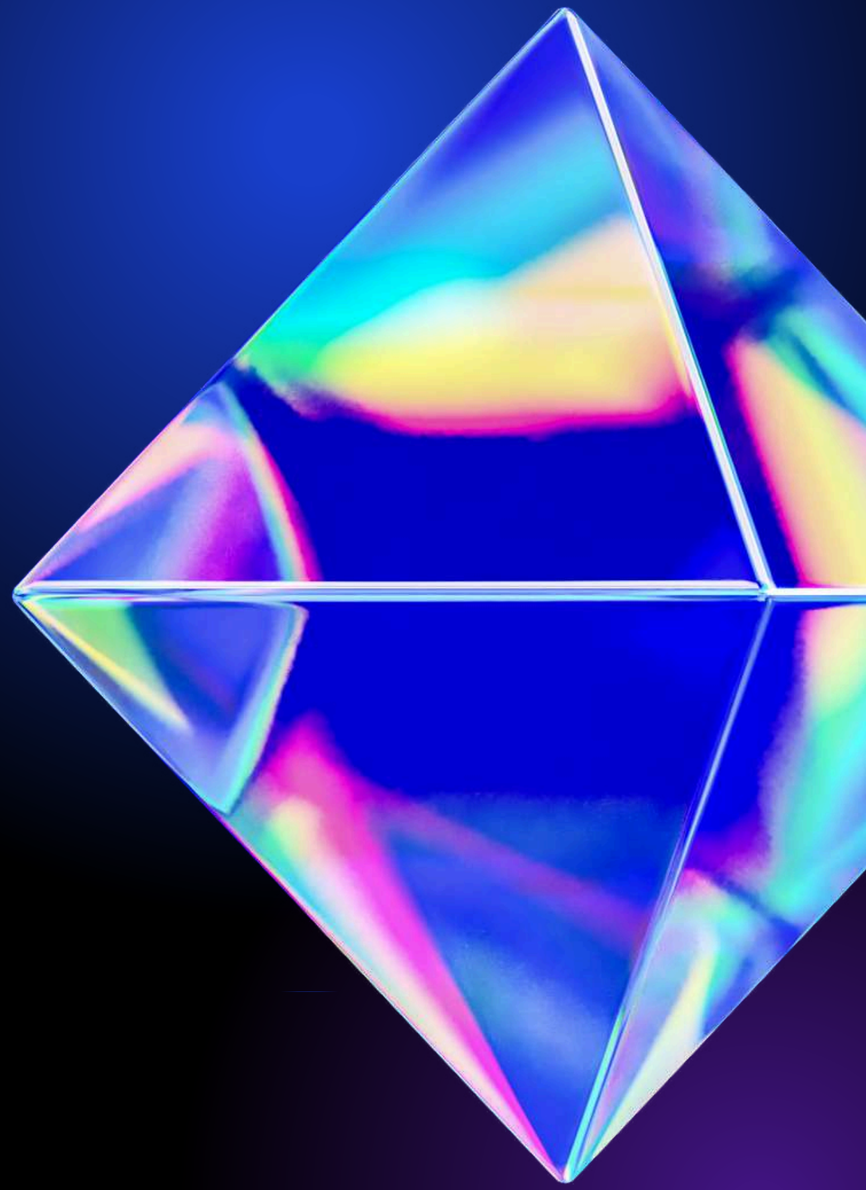
- Enter LiFi, a type of wireless connection that can be up to 100 times faster than WiFi.



INTRODUCTION

- Imagine a world where you can connect to high-speed internet by just flicking on your light switch.

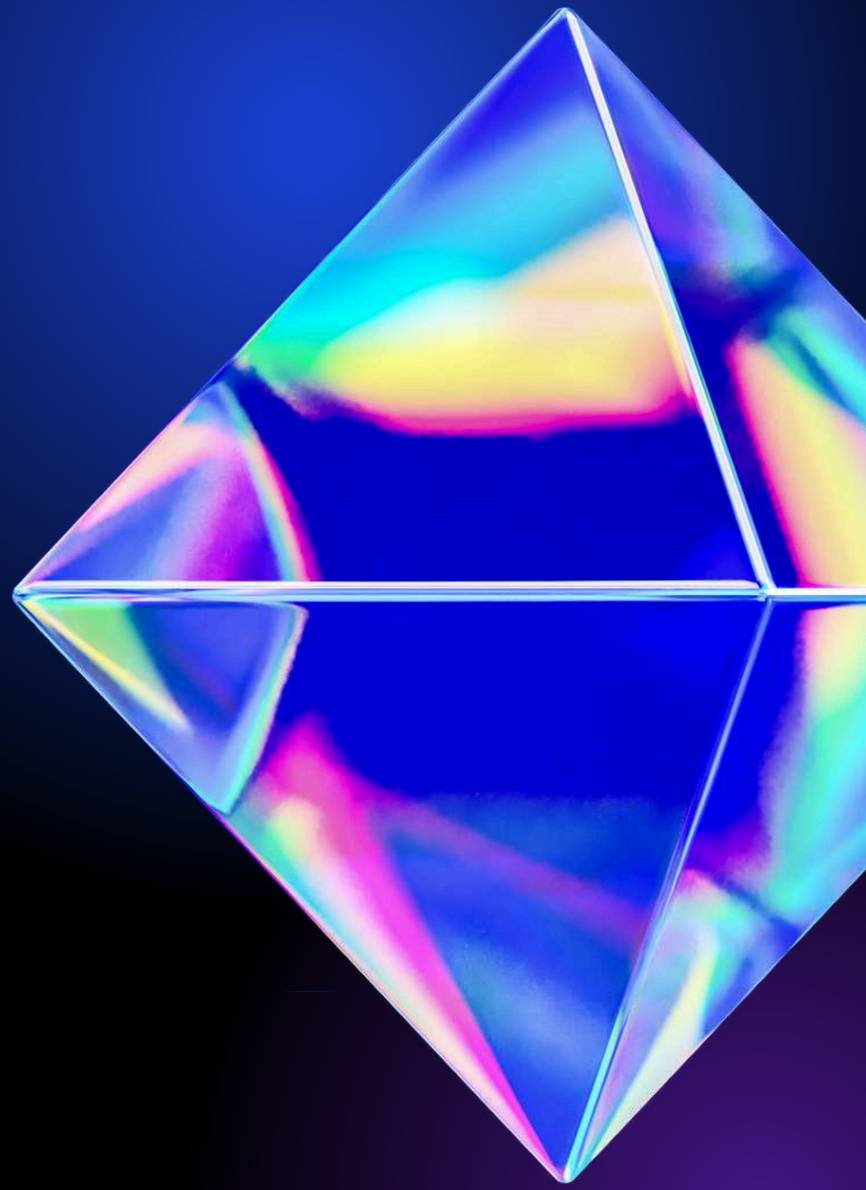
- LiFi is a wireless optical networking technology that uses LEDs for data transmission. In simpler terms, LiFi is considered to be a light-based WiFi that uses light instead of radio waves to transmit information.



INTRODUCTION

- Using light to transmit data allows LiFi to deliver a couple of advantages such as working in areas susceptible to electromagnetic interference like hospitals and aircraft cabins and working across higher bandwidth while offering higher transmission speeds.

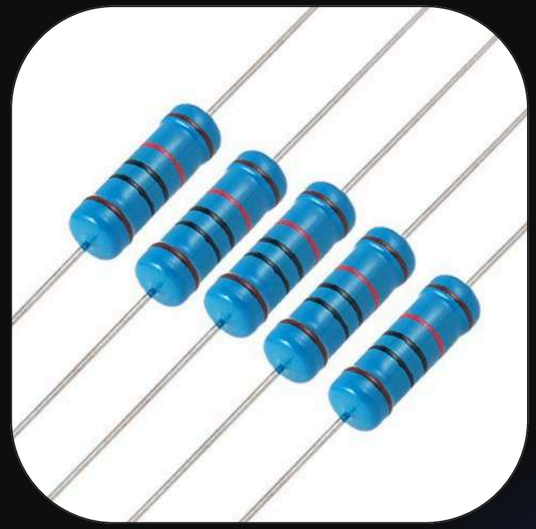
- The LiFi technology is currently being developed by numerous organizations around the world.



Components

LED
light-emitting diode

WIRES



RESISTOR
220 Ohm, 3W, 5% Tolerance

Components

SOLAR PANEL

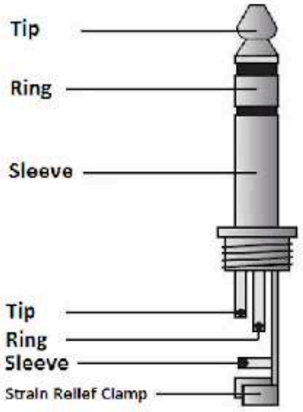
AUX CABLE

CIRCUIT DIAGRAM

Speaker With Internal Amlifire

Mini Solar panel 5 Volt

2 Normal Led Light



9 Volt Battery

Smartphone with play song

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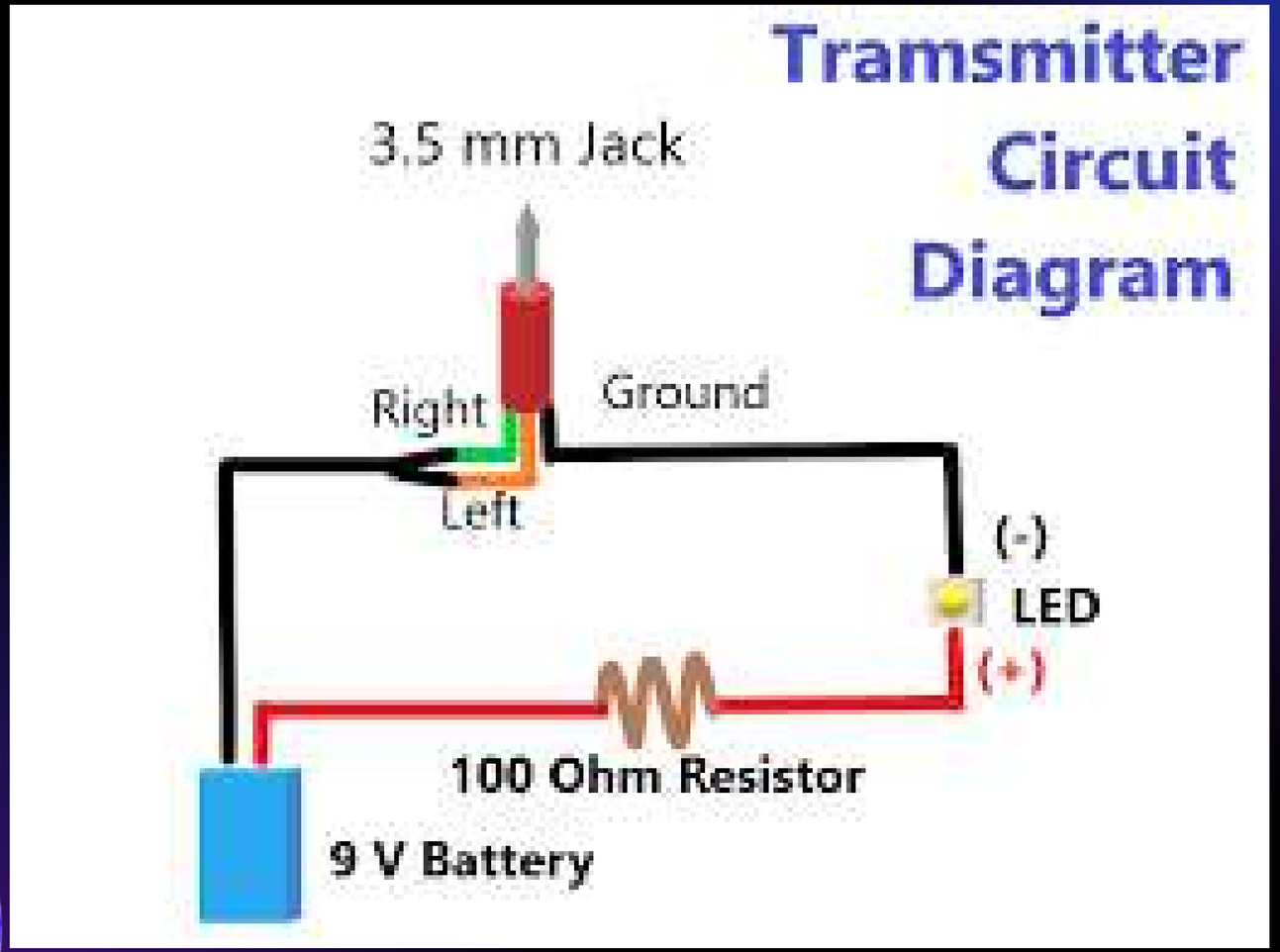
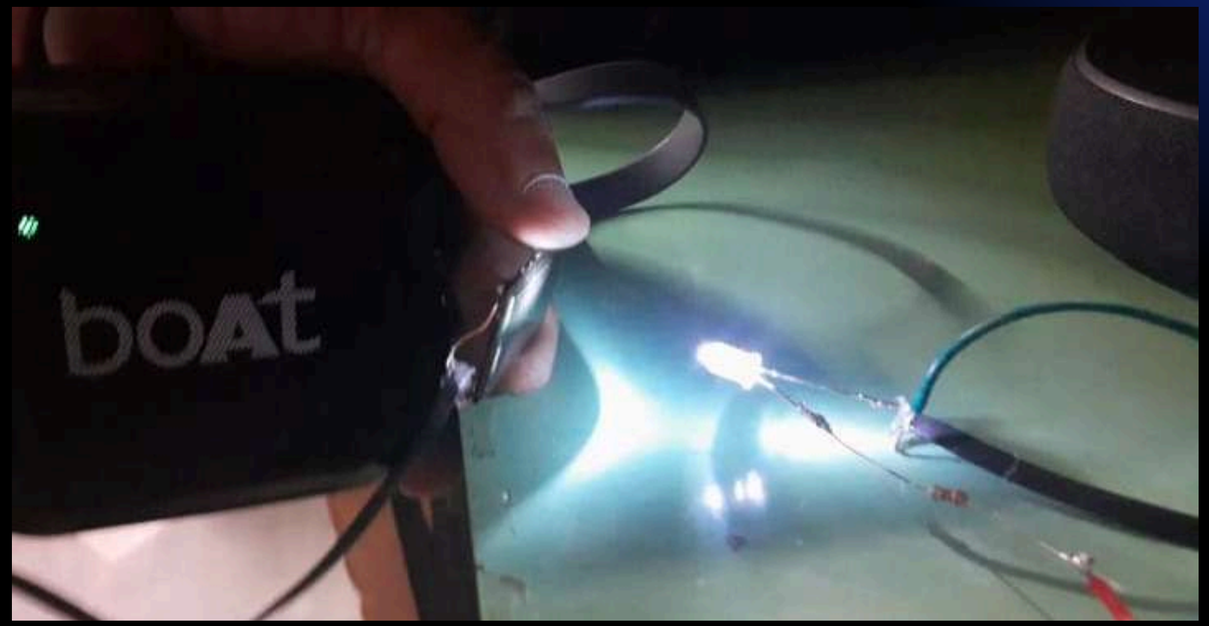
CIRCUIT DIAGRAM



REAL WORLD MODEL



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REAL WORLD MODEL

How does LiFi work?

- LiFi is a Visible Light Communications system transmitting wireless internet communications at very high speeds.

- The technology makes a LED light bulb emit pulses of light that are undetectable to the human eye and within those emitted pulses, data can travel to and from receivers. Then, the receivers collect information and interpret the transmitted data.

How does LiFi work?

- This is conceptually similar to decoding Morse code but at a much faster rate – millions of times a second.

- LiFi transmission speeds can go over 100 Gbps, 14 times faster than WiGig, also known as the world’s fastest WiFi.

How does LiFi work?

- A photosensitive detector demodulates the light frequency signal and converts it back into an electronic data stream and – in so doing – allows for faster-than-ever, more secure, bi-directional wireless communication.


pureLiFi

- WiFi (Wireless Fidelity)

Advantages

More interference, cannot pass through seawater, works in less dense regions

Application

Used for internet browsing with the help of WiFi hotspots

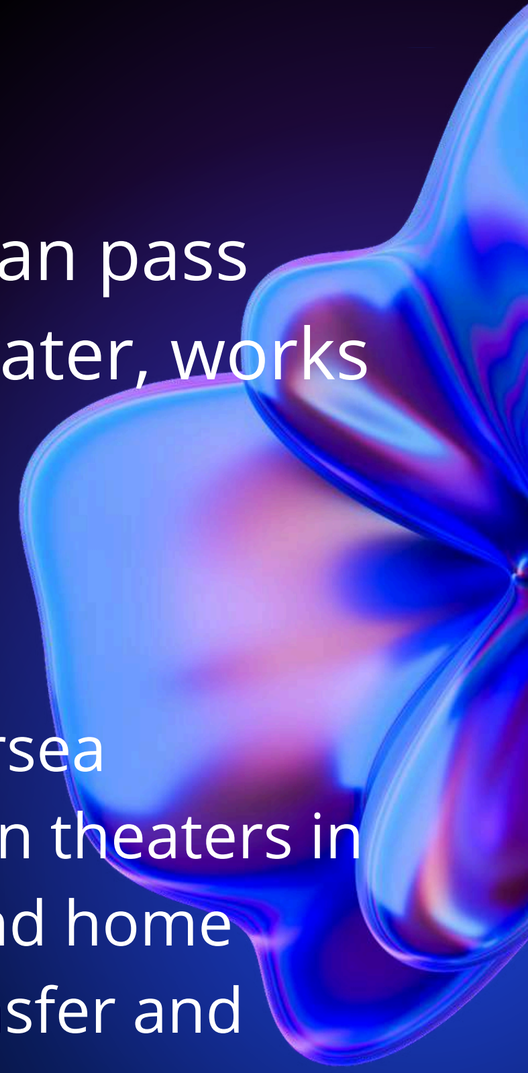
- LiFi (Light Fidelity)

Advantages

Less interference, can pass through salty sea water, works in dense region

Application

Used in airlines, undersea explorations, operation theaters in the hospitals, office and home premises for data transfer and internet browsing



- WiFi (Wireless Fidelity)

Coverage distance

About 32 meters (WLAN 802.11b/11g), varies based on transmit power and antenna type

Data density

Works in less dense environments due to interference related issues

- LiFi (Light Fidelity)

Coverage distance

About 10 meters

Data density

Works in high-density environments

- WiFi (Wireless Fidelity)

Privacy

WiFi is less secure because the signal cannot be blocked by walls and most objects

- LiFi (Light Fidelity)

Privacy

With LiFi, light is blocked by the walls and hence will provide more secure data transfer

Advantage

- Its transmission speed would be much higher than that of Wifi transmissions. As already mentioned, it would move in the range of 10 to 20 Gbps, and maybe even more (in some tests it has even reached 224 Gbps)

- Lifi could be used in certain places sensitive to electromagnetic areas, such as airplanes or hospitals, without causing interference

Advantage

- while the electromagnetic spectrum used by Wifi technology runs the risk of becoming saturated, it does not seem that the visible light spectrum **(10,000 times greater)** will do so in the short term.

- Lifi technology would be quite cheap to implement. It would be enough to incorporate modulators to the lights and to include the necessary receivers in the devices

Disadvantage

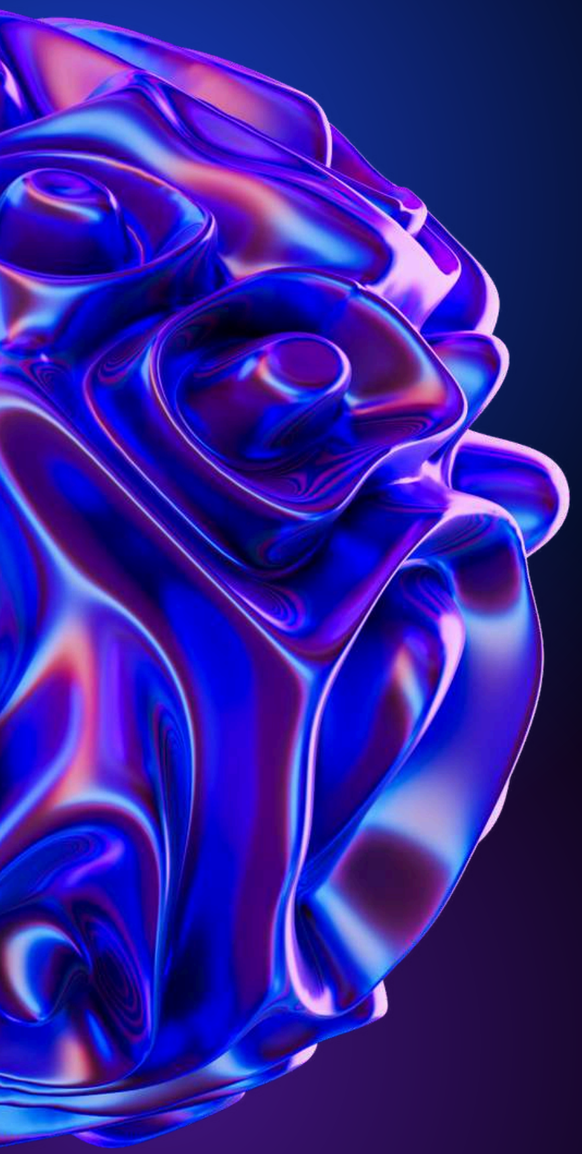
- Looking at the data above, the biggest disadvantage of LiFi technology is its coverage distance.

- Since light can’t pass through walls, the signal’s range is limited by physical barriers.

Disadvantage

- LiFi is probably not the replacement of WiFi technology anytime soon. Instead, it is an incredible companion for it.

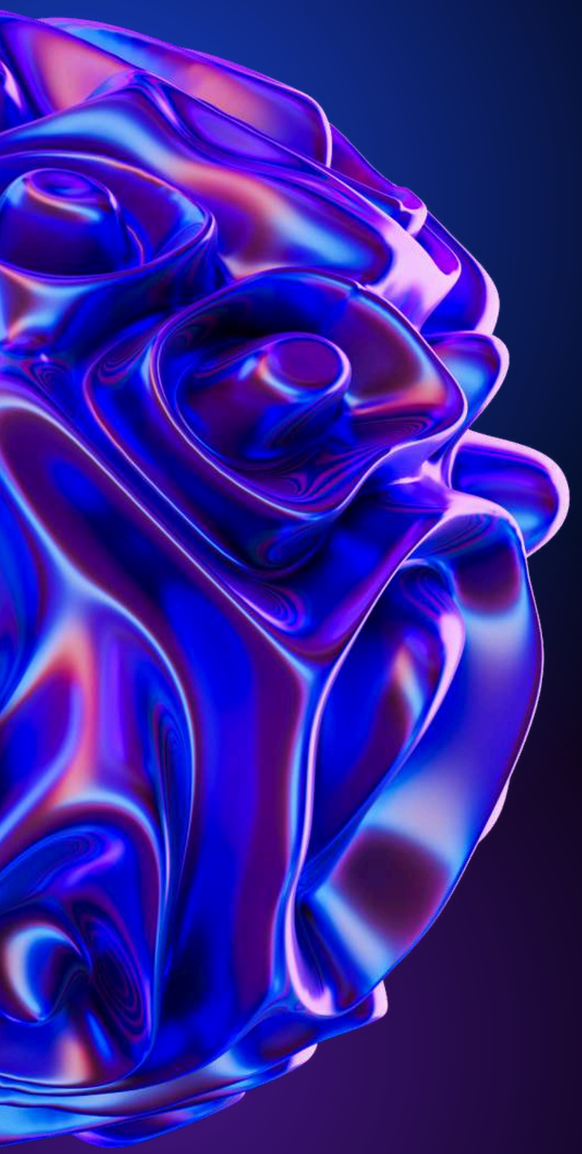
- By positioning LiFi as a complementary technology to WiFi, this promising technology will take wireless connectivity to new heights.



CONSLUSION

The world is hungry for more data, more connection, more intelligence, more speed. What happens is that current technologies have their limits, and therefore new solutions are knocking strongly at the door from time to time.

Lifi (Light Fidelity) technology is one of the options proposed as a new form of data transmission.



CONSLUSION

Data transmission technique that uses visible light and ultraviolet and infrared lights to carry out the communication.

FUTURE SCOPES

- This research report categories the global VLC technology market based on component, application and geography.

- Li-fi uses light emitting diodes (LEDs) which are rapidly gaining in popularity for standards light bulbs and other domestic and commercial purposes. They are expected to be ubiquitous in 20 years.

LIMITATIONS

•Still under research :

• What will be effect of interference from external light sources like sun light and normal bulbs?

• What about the limited bandwidth of existing copper cable used for electrical connection.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"BE A PART OF LIGHT REVOLUTION"

THANK YOU!!