International Journal of Recent Advances in Multidisciplinary Topics
Volume 2, Issue 12, December 2021
https://www.ijramt.com | ISSN (Online): 2582-7839

Science Communication through Cinema: Case Study of Avengers: Endgame

Heena*
Assistant Professor, DAV College, Jalandhar, India

***Abstract*: Science fiction, acronym Sci-Fi, a form of fiction that primarily relates to the impact of real or imaginary science on society or individuals. The term science fiction was popularized in the 1920s by one of the major indices in this genre, the American publisher Hugo Gernsback. Sci-Fi is probably the most prevalent genre in society. Behind this is more passion than romance, drama and comedy. His ability to retain imagination and wonder regardless of reality is a hopeful quality. This shapes the public's understanding of things that could change our lives and society above all else in the coming decades, such as artificial intelligence and biotechnology. Believing that genetically engineered clairvoyants, flying cars, or life-like androids are in the immediate vicinity is optimistic, even if the stories they host often ruin modern times. Sci-Fi film can help amateurs become interested in science, and Sci-Fi film can raise awareness and inform them about new scientific research and technologies. Researchers in this study mention the methods, techniques, concepts and theories used in Sci-Fi movies, especially Avengers: Endgame, and how science is important to our lives and lifestyles at different levels. This study examines advances in physics and their implications and confirms their relevance. In addition, it examines viewers' interest in Sci-Fi film, confirms scientific communication between different generations, and estimates adaptation of the Sci-Fi film concept and consumption at different age groups.**

***Keywords*: Sci-fi films, Science communication, Cinema, fiction.**

1. Literature Review

Chris (2020) argued that each and every films is a new development. The only debate is how this development works. Some people chose fashion movies and became critics in the fashion world. Some people watch movies about space aggression and aliens, and become scientists and astronauts. Science fiction movies are about the future, which is becoming more and more existent. Professional academic writers of intelligent essay writing services are confident that watching these films will broaden your horizons and provide you with the opportunity to write better and more qualified essays. Whether you're spending time in the cinema or watching online, it works either way. It's both entertainment and learning. You can take away ideas for your writing and hypotheses for future diplomas. Find out how science fiction movies affect education

Klus. H (2012) found that science fiction is important for at least three reasons. First, science fiction can be used to explore rudimentary philosophical questions about the nature of reality and mind by discovering our place in the universe and exploring the logically possible world. Books dealing with these topics include Edwin Abbott Abbott's Flatland, Philip K. Dick's Ubic, and Arthur C. 2001: A Space Odyssey. Clerk. Clark once described science fiction as "the only true heart-expanding drug." Second, science fiction can encourage more people to become scientists. Edwin Hubble, who provided compelling evidence of the Big Bang theory and first proved that the galaxy was outside the Milky Way, was urged to become a scientist after reading Jules Verne's novel. Astronomer and science fiction writer Carl Sagan was born by Robert A. Heinlein and theoretical physicist Kakumichio enjoyed the television show Flash Gordon as a kid. Third, and perhaps most importantly, science fiction is the only genre that shows how society works differently. This is the first step towards progress as we can imagine the future we want and how to work towards it. It also helps you identify and prevent futures we want to avoid

2. Objectives

- To study the various scientific concepts and theories portrayed in Sci-Fi films, especially in Avengers: Endgame.
- To bring out the concepts that break the laws of science

3. Research Methodology

To fulfill the objectives of the study, researcher has done detailed case study on Avengers: Endgame Sci-Fi Movie as it serves as a climax for every character of the movie, with recap through all the previous series of the Avengers. This case study research design is validated for testing working of scientific theories and models physical world.

4. Limitations

Researcher is from non-science background and tried to identify and analyze scientific concepts so there were chances of some gaps.

5. Cinema and Science Communication

Cinema, or a motion picture, is the art of moving images, a

*Corresponding author: kaurheena12@gmail.com

visual medium that tells a story and reveals its credibility. It is an art form that combines literature, theater, photography, and music. Movies are a very effective medium for communicating dramas, especially for emotional arousal. The movie serves as a medium to entertain people. It gives people the opportunity to explore the bright side and the means to relax. It is recognized that the majority of film audiences are well aware that the film is only composed. This simply shows their willingness to participate in pure entertainment fantasy. Today, movies have become an art medium. Today, intellectuals and serious thinkers connect themselves to cinema. Indeed, today's films are considered the seventh art, like the early arts of painting, sculpture, architecture, theater, poetry and music. A montage-like means, double exposure, made it very artistic. Russia's great film theorist, Pudovkin, called it the best medium for expressing yesterday, today, and tomorrow in his own language.

Science Communication (SciCom) is defined as utilization of affluent skills, media, activities, and dialogue to generate one or more of the following personal reproductions of science (AEIOU vowel analogy). Understanding. In today's world, it's not just about perusing science, it's about communicating effectively about it. It is important to communicate the world's "there" science online, while promoting openness in the scientific community. Today, it's more controversial than ever. However, in most cases, they tend to limit conversations with other scientists, scholars, and businesses. But what is important is to neighbor the gap between the "world of science" and the general non-scientific masses. In summary, establishing a presence in the world of science communication has many benefits, including strengthening calls, building networks, expanding knowledge portfolios, and extending the reach of work beyond colleagues. Increase. The more we talk about science with different people, the more we are working to build a community that enables non-scientists to understand the nuances, complexity and consequences of science.

Movies link us visually, acoustically, viscerally, and emotionally and including scientific subjects in films gives them an incentive to open viewers to scientific concepts, discover their appeal, and engage them in extensive scientific discussions. There are several narrative techniques and strategies used in the film to effectively attract the audience in science fiction, which can be an inconsequential tool for scientists looking to become better communicators.

Scientific concepts and information reach the general public through channels ranging from formal education to digital media and art. One of the most powerful of these channels is a movie that connects heterogeneous audience. With the advent of computer-generated image technology (CGI), the visual realm of cinema as a medium and tool for scientific communication has expanded. As scientists have been trained to retain on precision and accuracy in communication, we can often find ourselves reacting to films by targeting errors or oversimplifications. Given the challenges and opportunities that science and storytelling offer each other, it is more tempting to consider ways to easily incorporate science into storytelling. Indeed, screenwriters take the freedom to twist the scientific facts and take autonomies and use nifty licenses, opting to convolute scientific facts to suit the emotional injunctive authorizations of a good story. But even these mistakes are a form of affirmation of science. Including scientific topics in a film, whether true or not, can open the first audience to the concept of science, broaden the discussion about science itself, and inspire something valuable. A good movie can also educate scientists on how to become a better communicator and storyteller, revealing a human-like emotional foundation at the heart of a science fiction story.

Telling a good story continues to be an important challenge in filmmaking, even if it's not about science. In the best films, the protagonist experiences conflicts of interest, struggles, or other challenges that affect the pathways associated with our emotional empathy, causing emotions of unity and love. The more exciting the story and its character's story arc, the more emotional and sensitive they are, and the more likely they are to understand and engage with the concept. A history of progress, including scientific concepts. However, these concepts are very few in the movie world. Instead, it serves as a tool for promoting dramatic conflicts and personality development. The story benefits only the scientific approach, as science itself contributes to those stories.

6. Consumerism and Sci-Fi Films

It's no secret that Hollywood does a lot of marketing from movies. In recent years, science fiction movies have gone from niche production types to one of the most profitable (and most expensive) movie types. This combination of profitability and popularity means that science fiction movies are also gaining attention as a result of mass consumer merchandising. Star Trek's television series and subsequent films existed more than a decade before Star Wars hit the market. Despite its popularity, Star Trek has remained a niche entertainment format in a fair genre. Making science fiction a full-fledged media format was just the beginning of Star Wars. But in retrospect, Star Wars hasn't just started a mainstream science fiction movement. He also showed how much money can be earned from a successful SciFi franchise in the areas of merchandising and consumer goods. Almost every little boy (and many little girls) had a complete collection that included all the action figures released and their accessories like- lunch boxes, linens, pajamas, luggage, backpacks, dishes, and even bubble baths. Star Wars has changed not only the movie industry, but also the profit model.

Hollywood will market behind crazy movies, but science fiction movies have some unique "privileges" that can help with mass merchandising. One of the great advantages is the component of building the world of science fiction. Action movies have heroes and villains, that's true. However, the cars driven by action movie stars are still just cars, and the cities where those movies are set are still just cities. However, science fiction movies need to build the whole world, and even all kinds of creatures, and in some cases all languages. So, if people love the story and the seeds, characters, and worlds in which it is set, the only way to get close to people is to buy the goods that catch them. Science fiction films create a whole new world for the

audience and offer great merchandising opportunities to help fans feel familiar with those worlds. It's pretty cool when people think about it.

When Disney makes a movie and sells a line of toys to match it, they know they make a lot of money by insisting their parents to buy toys. And that's understandable. But in science fiction movies, there is an opportunity to double it with a toy line. The demographics of science fiction viewers include both children and young adult men known to collect things. These are two different demographics that have a common interest in science fiction. This gives merchandising opportunities with toys, especially collectibles, a great advantage for science fiction films. Browse the store toys section to see how many stores can link to the latest science fiction movies

When a company creates a line of movie merchandising, it makes money. But if they create a merchandising line in a series of 3, 6, or even dozens of movies, they make a huge amount of money. Franchise fans not only buy new products in every movie released, but the longer the franchise, the more new fans the series will get. These fans are interested in buying baked goods and "vintage" items as well as the latest products. Almost all science fiction movies have been franchised from the beginning. Franchise reality is also a good example of why world building adds so much to merchandising and consumer behavior in science fiction films. One of the most successful movie franchises in the last decade was the Fast & Furious series. It breaks the amazing box office record, but it's a movie about a group of ordinary city people driving a car. No one buys a lot of collectibles for this movie, as there are few opportunities to produce such items. But another science fiction franchise that has been popular over the last decade has been the Harry Potter franchise. To date, Harry Potter items are the best-selling items in the world.

7. Marvel Cinematic Universe

The Marvel Cinematic Universe (MCU) is a common fictional universe with over 20 movies and TV shows. This is a media franchise focused on a series of superhero movies produced independently by Marvel Studios and based on the characters appearing in the American comics published by Marvel Comics. Franchises include comics, short films, television series, and digital series. Like the original Marvel Universe in the comic, the common universe was created by crossing common plot elements, settings, casts, and characters. The various franchises and characters in the Marvel Cinematic Universe can and often interact with each other. Lady Schiff (a fictional character) who first appeared in the movie "Thor" appeared on the network TV program "Agents of S.H.I.E.L.D.". This allows for great team movies like The Avengers, and the results of one movie / TV show can influence someone else's event. Marvel Studios releases about two, and in some cases three, movies a year, with an additional twelve. The MCU also contains four TV shows.

1) And avengers background

The Avengers is a fictional team of superheroes appearing in the American comics published by Marvel Comics. The team debuted in The Avengers # 1 (September 1963 cover date) created by writer and editor Stan Lee and artist / coupler Jack Kirby. The Avengers is a renovation of the former superhero team All Winners Squad from the comic series published by Timely Comics, the predecessor of Marvel Comics. Called "the most powerful hero on earth," the Avengers originally consisted of Ant-Man, Hulk, Iron Man, Thor, and Wasp. AntMan became Giant Man from the second issue. Former Captain America was discovered in No. 4 to be trapped in ice and joined the group after being resuscitated. The rotating roster was a feature of the series, but one theme was consistent. That is, the Avengers fight "an enemy that one superhero can't resist". A team famous for the cry of battle "Avengers Assemble!" It shows humans, mutants, non-humans, androids, aliens, supernatural beings, and even former villains. The movie The Avengers account started with "Iron Man" in 2008, but the Marvel Cinematic Universe dates back millions of years. History contains much more than what you see on the screen. The 22 films have many contexts and have been divided into three phases so far, giving you an idea of when important events that aren't in the film will occur. Marvel's film plans are divided into these three phases, each ending with an Avengers crossover. From the birth of Infinity Stone to snapshots of Thanos, the MCU has built an impressive event timeline. Avengers: Endgame is one of the most famous and acclaimed additions in the genre of science fiction. A 2019 American superhero movie based on the Marvel Comics superhero team "Avengers". It is a sequel to "Avengers: Infinity War" in 2012, "Avengers: Age of Ultron" in 2015, and "Avengers: Infinity War" in 2018. Avengers: Endgame is a long-awaited, Disney sponsored the movie with Marvel's biggest marketing campaign. He broke the $ 2.798 billion global box office and became the highest-selling movie in history. The film features a clever and clever script, a dramatically effective three-act structure, and a perfect performance. "Marvel's Avengers" has announced the end of Phase 1, and "Avengers: Age of Ultron" has completed Phase 2. Avengers: Endgame not only ends Phase 3, but also ends 22 movie series. This is the longest entry in the MCU so far in 181 minutes.

2) Science of Avengers: Endgame

Tony Stark (Iron Man) records a message to his wife when Thanos is trapped in space for 21 days after losing half of the universe. He doesn't know if this message will reach her wife, so he uncertainly records it, explains her cosmic situation to her, and tells her about the ‘Void of space’ at 04:10 in the movie.

Void (Astronomy): The cosmic web is one of the largest patterns in nature. It completely fills the universe. It is a huge, spacious and almost dominant structure. Nevertheless, it looks fragile and elegant like a pure silk thread. And between the nexus masonry, between the walls, the knots and the threads, there is a huge cosmic cavity. Outer space is a huge space between strings (the formation of the largest scale in the universe), with very few or no galaxies. Cavities are typically 10-100 megaparsecs in diameter. Very large voids defined by the lack of abundant superclusters are sometimes referred to as supervoids. They are less than one-tenth the standard abundance of matter that is considered an identifiable cosmic classic. They spread everywhere from 20 million to hundreds

of millions of light-years and are the exact mission of the universe, which is not entirely lacking in problems. Due to the mass, the maximum value in our universe is clearly nothing. And when it comes to understanding the universe, "nothing" is very difficult. Void was first discovered in 1978 in an early study by Steven Gregory and Laird A. Thompson at the Kitt Peak National Observatory. The next thing Tony Stark tells both his wife and the audience is how he and one of the superheroes are trying to bring this spacecraft back to Earth, which is useless. He says they fought well in the fight, but the spacecraft have been so damaged that it will take them home forever. He describes it with the phrase "from the nearest 7-Eleven to a thousand light-years." This means they are not even close to the planet Earth. This scene will appear in the movie at 4:42 am.

Light Year In science and astronomy, light-years are a unit of distance. This is the length of time that light can travel in a year. Light travels with an impact of about 300,000 kilometers per second. Therefore, it can cover about 10 trillion kilometers in one year. More precisely, a light-year is equivalent to 9,500,000,000,000 kilometers. One kilometer on earth may be perfectly fine. The city of Jalandhar is hundreds of kilometers from New Delhi. The distance from Kashmir to Kanyakumari is thousands of kilometers. However, in space, kilometers are too small to be effective. Surprisingly, the distance from our galaxy to the nearest large galaxy, Andromeda, is 21 trillion kilometers, or 21,000,000,000,000,000,000 km. This is a very long number, which makes it difficult to write and explain. Astronomers use different units of distance. In the solar system, distances are usually described using astronomical units (AU). Astronomical units can be defined as the average distance between the earth and the sun. It's about 150 million kilometers, or 93 million miles. Mercury is said to be about one-third the astronomical unit from the Sun, and Pluto is on average about 40 astronomical units from the Sun. But when talking about distances to objects outside the solar system, astronomical units are not big enough. Astronomers manipulate light-years or parsec units to estimate distances to other parts of the Milky Way.

Ground Zero - In the context of a nuclear explosion or similar bomb, Ground Zero, also known as Surface Zero, is the closest point on the Earth's surface to the explosion. Like a ground explosion, Ground Zero is a point on the ground beneath the core explosion, sometimes referred to as the epicenter (from the Greek word ὑπο "below" and in the center). The term "Ground Zero" is also commonly used to indicate the most serious damage and destruction points associated with earthquakes, epidemics, and other disasters. The term differs from the term zero point in that it can also be present in the air, underground, or underwater. Ground Zero was also derived as a term for the location of a nuclear explosion and was later used to refer to a point of insignificant or horrific event. On September 11, 2001, a suicide bomber destroyed the Twin Towers, killing nearly 3,000 people, and New Yorker named the location of World Trade Center Ground Zero. For many years this place was also known as the "pit". This was because the construction of a new World Trade Center was blocked, leaving a large hole in the ground. The 14.6 acre area of Lower Manhattan, New York City, where the One World Trade Center is located. One World Trade Center is adjacent to Vesey Street to the north, West Side Highway to the west, Liberty Street to the south, and Church Street to the east. When Captain Marvel returns Stark and Nebula home, they encounter the rest of the Avengers and try to understand what really happened to reverse the effect of the snapshot. In this situation, the rocket raccoon explains what really happened when Thanos snapped his finger and said, "The Earth has gone to zero due to a tremendous surge in cosmic proportions." I will try. and it comes at 13:28 in the movie.

Power Surge - Surge is a fast but short duration of electrical transients in the current, voltage, or transport energy generated in a circuit. Power surges are usually triggered by oversupply from the power company or various external sources, but oversupply can also occur. The term surge is used because it affects the general energy that travels the power line. This is an event that occurs when something at some point in the power line increases the general charge. This increases the potential electrical energy of the power line and more current is supplied from the socket to the electrical equipment or consumer. The most common cause of surges is thunderstorms. If a lightning strike occurs near the power line, even when not in direct contact, the rapid ionization of the air and the total energy of the lightning strike are sufficient to add potential energy to the power line to generate a surge. The best way to prevent a lightning surge from damaging your appliances is to unplug them in the event of a thunderstorm. This can also be caused by rapid changes in circuit load similar to the load in residential or office buildings such as buildings. B. Appliances and machines with large motors to turn inductive and capacitive loads on and off. Inductive or capacitive loads in devices such as air conditioners and refrigerators carry large amounts of current, reducing the overall voltage of other devices. Suddenly turning off such a device can increase the overall voltage and cause a slight surge. This is usually harmless as it is acceptable for most devices, but impact can also be high if the inductive or capacitive load is large enough. Therefore, the surge arrester is installed even under such a load. This can be widespread if part of the power grid fails, and the total load has just been reduced, causing overvoltage in other parts of the grid, but producing or The power generated remains the same until the power supplied is reduced automatically or manually. utility. Scott Lang (AntMan), who happens to come back five years later, learns of the mass extinction and tries to contact Natasha Romanoff (Black Widow) and Captain Steve Rogers (Captain America). Scott Lang tells them that it is possible to go back in time and cancel the effect of a snapshot with the help of quantum physics. "Have you ever studied quantum physics?" He says. While addressing Romanov and Rogers, it comes at 31:11 in the movie.

Quantum Physics -Quantum physics, also known as quantum mechanics and quantum field theory, is a physics that explains how everything works. It is best explained as the nature of the particles that make up a substance and the forces that they interact with. Quantum physics underlies how atoms work and therefore why other sciences work like them. If you need to

explain how electrons move through a computer chip, how photons are converted to electricity by solar panels, how they are amplified by lasers, and how the sun keeps burning, if you need to explain. We need quantum physics. From the beginning, there are innumerable quantum theories. There is quantum mechanics, the basic mathematical substructure that supports everything. It was first developed in the 1920s by Niels Bohr, Werner Heisenberg, Erwin Schrödinger and others. Classify simple things, such as how the position or momentum of a single particle or a group of small particles changes over time. But to understand how things work in the real world, we need to combine quantum mechanics with other elements of physics, primarily Albert Einstein's "general theory of relativity." Now known as "quantum field theory".

There are three different quantum field theories dealing with three of the four fundamental forces that matter interacts with.

1. Electromagnetism: Explains how atoms hold together.
2. The strong nuclear force: Explains the stability of the nucleus at the heart of the atom.
3. The weak nuclear force: Explains why some atoms undergo radioactive decay.

At the basic level, quantum physics forecasts very unusual things about how matter works. This is in complete conflict with the way things seem to work in the real world. Quantum particles can behave like particles in a single place. Alternatively, it can behave like a wave and be distributed throughout the room or in multiple locations at the same time. What a quantum particle looks like depends on how we study it, and before we study it, it does not seem to have any particular properties. This leads to fundamental difficulties with the basic nature of reality. This ambiguity leads to a visible paradox like Schrodinger's cat. In this paradox, cats live at the same time as they die due to uncertain quantum processes. But it's not done here yet. Quantum particles seem to be able to influence each other instantly, even if they are far apart. This completely misleading phenomenon is a term coined by entanglement, or Einstein, the greatest critic of quantum theory, known as "action at a distance." All of these quantum forces are completely foreign to us. They are the basis of established technologies such as ultra-secure quantum cryptography and ultra-strong quantum computing. No one knows what that means. Some people think it is necessary to simply accept that quantum physics describes the material world in terms of its inability to harmonize with their experience. In a larger "classic" world. Some feel that there must be a better, more natural theory that science has not yet discovered. First of all, there is a fourth fundamental force of nature that quantum theory has yet to explain. Gravity continues to be the realm of Einstein's "general theory of relativity". This is a fixed non-quantum theory that does not even contain particles. Decades of careful effort to put gravity under the umbrella of Quantum and therefore explain all the basic physics of the "Theory of Everything" have failed. At the same time, cosmological measurements show that more than 95% of the universe is composed of dark matter and dark energy. This is currently not explained in the Standard Model. There are also mysteries such as the degree of the role of quantum physics in destructive life. The course remains unanswered. To help them understand the complexity of quantum physics, he tries to explain to them what the quantum realm is and how time and space work differently there. He tells them that it's possible if they understand how it works and will do everything the same as it did five years ago. He added, "I was in a place called the Quantum Realm," which will appear in the movie at 3:23 pm.

Quantum Realm - To understand the general strangeness of "quantum mechanics", we first need to think about light. Scientists have long been confused by light. I couldn't tell if it was made of waves or particles. Sir Isaac Newton was one of the first to claim that light was composed of particles, but Albert Einstein (spreading in all directions) and particles (moving and spreading in one direction) in his early twenties. This light was measured today in small energy pockets called quanta or photons. But since then it has only become strange. Although Einstein himself is reportedly skeptical of theory, quantum mechanics for analyzing subatomic particles was born from these new ideas. The problem with Einstein's quantum theory was that he believed that the world should be objective, in a sense predictable and observable. But when you zoom in on the realm of quantum, it's full of crazy and bizarre phenomena that seem to have no place in science at all. Here is our prejudice about what is possible in reality, the usual classic well-known law. Mechanics collapses. In quantum mechanics, everything is in a cloud of probabilities. This looks like a constant "what if". hypothesis. Particles rotate in two directions at the same time. Matter penetrates a ghostly hard barrier. Then the two particles are intertwined and their fate is intertwined. In theory, they could reach the other side of the universe, but somehow they still communicate instantly. Even temperature behaves differently, leaving a cold spot where standard thermodynamics should have heat. There is one thing for sure. To get into a place like this, you have to be incredibly small. Scientists distinguish the smallest part of a quantum range, usually less than 100 nanometers, where one nanometer is one billionth of a meter, as a quantum. Moreover, it is almost impossible to predict what the quantum realm will look like. At this size, all objects lose the sense of all shapes. In a sense, they are between fuzzy and stained fish atoms and particles with an infinite expanse of apparent emptiness. I feel like I was abandoned in a strange space. The important thing is that the particles that cross the path appear to flash and disappear. They solidified only when you saw them and were like shadows in the corners of your eyes when you looked away. In this way, quantum physics leads to a philosophical debate and seems to redefine the relationship between matter and humans. To understand the general strangeness of "quantum mechanics", we first need to think about light. Scientists have long been confused by light. I couldn't tell if it was made of waves or particles. Sir Isaac Newton was one of the first to claim that light was composed of particles, but Albert Einstein (spreading in all directions) and particles (moving and spreading in one direction) in his early twenties. This light was measured today in small energy pockets called quanta or photons. But since then it has only become strange. Although Einstein himself is reportedly skeptical of theory, quantum mechanics for analyzing

subatomic particles was born from these new ideas. The problem with Einstein's quantum theory was that he believed that the world should be objective, in a sense predictable and observable. But when you zoom in on the realm of quantum, it's full of crazy and bizarre phenomena that seem to have no place in science at all. Here is our prejudice about what is possible in reality, the usual classic well-known law. Mechanics collapses. In quantum mechanics, everything is in a cloud of probabilities. This looks like a constant "what if". Hypothesis. Particles rotate in two directions at the same time. Matter penetrates a ghostly hard barrier. Then the two particles are intertwined and their fate is intertwined. In theory, they could reach the other side of the universe, but somehow they still communicate instantly. Even temperature behaves differently, leaving a cold spot where standard thermodynamics should have heat. There is one thing for sure. To get into a place like this, you have to be incredibly small. Scientists distinguish the smallest part of a quantum range, usually less than 100 nanometers, where one nanometer is one billionth of a meter, as a quantum. Moreover, it is almost impossible to predict what the quantum realm will look like. At this size, all objects lose the sense of all shapes. In a sense, they are between fuzzy and stained fish atoms and particles with an infinite expanse of apparent emptiness. I feel like I was abandoned in a strange space. The important thing is that the particles that cross the path appear to flash and disappear. They solidified only when you saw them and were like shadows in the corners of your eyes when you looked away. In this way, quantum physics leads to a philosophical debate and seems to redefine the relationship between matter and humans.

Schrodinger's Cat is Erwin Schrodinger's famous thought experiment on quantum theory. It is assumed that the cat is in a sealed box, has a vial of poison that is randomly released at any time, and will kill the cat if released. From a position outside the box, you cannot tell if the poison is still being released, so you cannot know the fate of the cat. But quantum mechanics says that cats are alive and dead, just as quantum particles are real and not. And only when you look inside the box, the reality is confirmed. Another study showed something similar to the light itself. Double slit experiment. Scientists used two vertical slits and a light screen that hits the canvas behind to find the expected wavy pattern of light and faint stripes. However, even if the particles are separated so that only a single photon passes through the slit, it cannot produce a wavy motion. But when the tester set up the detector to see how this actually happened, the screen changed again and the light began to behave like particles. More generally, the universe works in a way, but when you observe it, the universe changes. Therefore, what we see can be seriously regarded as an "illusion". And if we can see the universe at the quantum level, this will always happen. If the realm somehow enters our daily lives, it will obviously not even obey traditional laws of nature or even basic logic. Your mere existence and perspective always influence the behavior of everything you can understand. It's like having a slice of pizza with all the toppings you can imagine at the same time, but when you decide you want a pepper, it turns into a pepper. Or as if you forgot where you parked your car. In that case, the car exists as a probability cloud, exists in all possible spaces at the same time, and selects only the location that was actually there when you started looking. So in the quantum domain, everything always shifts and only happens when you actually observe it. In fact, that is not possible in our own reality, but even your own body effectively spreads throughout your being until you actually look down on it. But say you are a quantum particle. Like particles, it is highly likely that they will get entangled with other people just by hitting them, and it is inevitable. Then, the actions taken by the other "particle man" affect your own experience, and the decision is suddenly shared between you two. If you choose to work on your bike, the intertwined partners are actually driving the car. If I went to bed early, I would have been up all night. Cock clockwise to rotate counterclockwise. Even if you enter the realm of quantum, life will definitely be difficult, if not impossible, to get used to if you retain the knowledge of your previous life as a normal person. If you know that nature reacts to your own observations, you can't be sure of anything, but you can be sure of nothing. Make yourself convinced that you have adopted a puppy, and you may just find a paw on your paw. Believe you can go through the wall, and you will. Hey, maybe you can even teleport yourself. Like all the particles around you, you are now in all possible places at the same time. So, if you close your eyes and imagine yourself on an uninhabited island, you might get there. It's a unique, colorful, endless mess, full of seemingly impossible phenomena, and even wondering what is real or even exists. After Scott Lang persuaded Romanov and Rogers to work with him to bring the lost people back to life. They all decided to visit Stark and persuade him to join Stark and work on the project. Stark understands that and explains that "quantum fluctuations are confused with the Planck scale, which causes the German proposition." This scene is in the movie 34: 2334: 26.

Quantum Fluctuation - In quantum physics, quantum fluctuations are short-term changes in the amount of energy at one point in space, as explained in Werner Heisenberg's "Uncertainty Principle". As one of the formulation of the principle, energy and time can be linked through relationships. This means that it can violate the law of conservation of energy, but only for temporary values of time (T). This allows the generation of particle-antiparticle pairs of virtual particles. The results of these particles can be measured, for example, by the effective charge of the electrons rather than the "bare" charge. In the magnified view, the energy is always preserved, but the eigenstate of the Hamiltonian operator is not exactly the same as the particle number operator. Quantum fluctuations may have been very important at the beginning of the structure of the universe: as the inflation model requires, what was at the beginning of inflation is amplified and forms the buds of all recently observed structures. did. Vacuum energy may also have been the cause of the current accelerated expansion of the universe. Field Quantum Fluctuations: As the "uncertainty principle" allows, quantum fluctuations are short-term emergences of energy particles from empty space. The "uncertainty principle" means that a pair of conjugate variables such as position / momentum and energy / time cannot have

directly determined values for each member of the pair at the same time. In other cases, a pair of particles can pop out of the vacuum at very short time intervals. Expansion is associated with "time uncertainty" and "energy uncertainty". When the mass is astronomical, such as a macroscopic object, the instability, and therefore the quantum effect, is very small, and classical physics is suitable. This was proposed in a 1916 study by Harvard scientist Adam Jonathon Davis. Davis's theory was later proved by Louis de Broglie in the 1920s and brought up as a law of quantum physics. In quantum field theory, fields experience quantum fluctuations. It can make a very clear distinction between quantum fluctuations and thermal fluctuations of important quantum fields. As the quantized Klein-Gordon field records in vacuum, you can calculate the probability density of observing one configuration at a time in relation to the Fourier transform. In contrast, for the classical Klein-Gordon field at temperatures not equal to zero, the Gibbs probability density is to observe one configuration at the same time, and the amplitude of the quantum fluctuation is manipulated by the amplitude of Planck's constant. .. The amplitude of thermal fluctuation is controlled by. Where is the Boltzmann constant. The following three points are closely related. Planck's constant has a unit of action rather than a unit of energy, instead there is a quantum kernel, and the quantum vacuum state is Lorentz invariant, but there is no classical thermal state. The main contrast with quantum field theory is measurement theory because it is possible to construct a classical continuous probability field with the same probability density as the quantum vacuum state. Quantum effects that result only from quantum fluctuations, not from the subtleties of measurement incompatibilities, can be a model of a classical continuous random field. Scott Lang after persuading Romanov and Rogers to work with him to bring the lost back to life. They all decided to visit Stark and persuade him to join Stark and work on the project. Stark understands that and explains that "quantum fluctuations ruin the Planck scale, which raises the German proposition." This scene is in the movie 34: 2334: 26.

Planck Scale - The Planck scale determines the minimum limit of the universe before the laws of physics are broken. In the late 1890s, physicist Max Planck proposed several units to rationalize the representation of the laws of physics. By using only five constants in nature (counting the speed of light and the gravitational constant), you, I, and even aliens from Sirius, Alpha Centauri, and Capella could reach the same Planck unit. The basic units of a plank are length, mass, temperature, time, and charge. If you look at the unit of Planck length for a moment, you can classify protons into about 100 million times the size of Planck length. For comparison: When the protons are scaled to the size of an observable universe, Planck length is just a journey from Japan to the United States. A 14-hour flight may look long, but it is completely ignored by space. The Planck scale was innovated as a set of universal units, so if it turned out that these limits were also the limits to which the well-known laws of physics apply, it was a perturbation of physics. Physicists don't know what's really happening on the Planck scale, but they can do the theory. Some theoretical particle physicists predict that all four fundamental forces of gravity, weak force, electromagnetism, and strong force will eventually be combined into one force with this energy. .. Quantum gravity and string theory can also be considered as phenomena that can dominate the Planck energy scale. Planck scale is a universal limit that violates all currently known laws of physics. To understand something later, science needs new, unbreakable physics. Scott Lang after persuading Romanov and Rogers to work with him to bring the lost back to life. They all decided to visit Stark and persuade him to join Stark and work on the project. Stark understands that and explains that "quantum fluctuations ruin the Planck scale, which raises the German proposition." This scene is in the movie 34: 2334: 26.

Time Heist (Fiction) - Time Heist is a scheduled mission organized by The Avengers to go back in time to bring Infinity Stone back from major historic events, leading to the final battle with Thanos, the battle of travel from 2014 to 2023. The purpose was to restore the snap. In 2018, Avengers, Captain Marvel and Nebula visited the garden to get Infinity Stones from Thanos. When they arrived, they found a terribly crippled Thanos who destroyed the Infinity Stone to keep his work intact. After realizing that there was no way to bring the disappeared, Thanos led Thanos, and the Avengers were completely destroyed and returned to Earth. By 2023, the Avengers continued to be torn after failing to reverse the effect of snaps. Tony Stark lived with his wife and daughter. Steve Rogers began helping others deal with the treatment, but Black Widow continued to lead the Avengers with Okoye, Rocket Raccoon, War Machine, and Captain Marvel. In a warehouse in San Francisco, a mouse accidentally crossed control of a quantum tunnel housed in a Lewis van, freeing Scott Lang from the quantum realm. Lang then met his daughter and went to a new Avengers facility to find the Avengers. When he got there, Lang discussed the quantum realm with Steve Rogers and Natasha Romanoff, explaining the physics behind the realm and the five years that the Avengers had only five hours old. With this in mind, Lang suggested using a quantum realm to go back in time to prevent snapping. While talking to other superheroes, Stark explains the possible outcomes of the project / mission. He asks Lang to contribute in the way he thinks this will end, and he replies that this will only happen in the concept of time travel. Without knowing the exact process, Lang is confused and says, "I have to strictly follow the rules of time travel," convincing Stark of his thoughts. This scene will appear in the movie at 35:15.

Time Travel - Time travel between different points in time has been a popular topic in scientists and science fiction novels for centuries. In the movie series from "Doctor Who" to "Star Trek" to "Back to the Future", people board some kind of vehicle, arrive in the past or future, explore the past and future, and discover new things. Ready to discover. Adventure. Each of them has its own time travel theory. However, the reality is more confusing. Not all scientists are in favor of time travel and do not believe that time travel is possible. Some of them even say it's deadly to those who choose to do so. Most people think of time as a constant, but physicist Albert Einstein has shown that time is an illusion. It's a comparison and can vary from viewer to viewer, depending on the speed at which it passes

through space. For Einstein, time is "four dimensions." Space is described as a three-dimensional world that provides time travelers with coordinates such as longitude, latitude, and height that indicate a location. However, time usually only assigns different coordinate directions and moves forward. Einstein's "Special Theory of Relativity" states that time can be slower or faster, depending on how fast you are moving or something else. At the speed of light, people on board a spacecraft age much more slowly than their twins at home. According to Einstein's "General Theory of Relativity", gravity can bend time. Imagine a four-dimensional fabric called space-time. The mass of this cloth causes dents and distortions in space-time. A space-time depression or curvature causes the object to move in a curved path. The curvature of this space is known as gravity. Both general and special relativity are proven in global positioning satellite technology with a very perfect clock. Not just the result of gravity The faster speeds of satellites on Earth compared to ground observers mean that misaligned clocks increase by 38 microseconds per day. (The engineer calibrates to explain the dissimilarity.) In a sense, this effect is known as time dilation. In short, astronauts are time travelers, much younger than the same twins living on the planet, and return to Earth. The general theory of relativity also creates scenarios that allow travelers to go back in time, according to NASA research. However, it can be difficult to implement the equation. One of the possible possibilities is that it can be faster than light traveling at 186,282 miles per second or 299,792 kilometers per second in a vacuum. However, according to Einstein's calculations, objects moving at the speed of light will have both infinite mass and zero length. This may seem impossible. However, some scientists extended his calculations and said it was possible. According to NASA, a related possibility is to create a "wormhole" between space-time points. Einstein's calculations were provided to them, but they decay very quickly and are only accepted for very small particles. Moreover, scientists have not yet actually observed these wormholes. In addition, the technology required to create wormholes exceeds what we currently have. Einstein's theory and calculations make time travel a hassle, but some groups suggest different solutions for jumping back and forth in time. Infinite Cylinder Astronomer Frank Tipler has proposed a technique (also known as Tipler Cylinder) that takes 10 times the mass of the Sun and rolls it into a very long but very thick cylinder. After billions of revolutions per minute, a nearby spacecraft that rotates very accurately around this cylinder can fall into a "closed timelike curve" in relation to the Anderson Institute. However, this method also has some limitations. This includes the fact that the cylinder must be very long for this to work. Black Hole Another possibility is to move the spacecraft quickly around the black hole or mistakenly create this condition with a huge revolutionary structure. "The spacecraft can fly anytime, anywhere, and everyone spends only half the time far away from the black hole. The spacecraft and its crew move over time." Stephen Hawking, a physicist. Said in a 2010 daily email. "Imagine they are five black holes Year. Elsewhere, 10 years will pass. When they get home, everyone on the planet will be five years older than before. "He added, the crew needs to move at near the speed of light for this to work. Amos Iron, a physicist at the Technology Israel Institute of Technology in Haifa, Israel, discovered another limitation when using the machine. That is, the machine can collapse before it spins so fast.

Cosmic string One of many theories for potential time travelers is related to the so-called cosmic string, a tapered tube of energy that extends the length of the ever-expanding universe. These thin regions left from the premature universe are likely to contain very large masses and therefore can distort the space-time around them. According to scientists, the cosmic string is an infinite or unlimited loop. Two such string approaches parallel to each other will bend space-time very strongly, and with such a special arrangement, time travel will theoretically be possible. Stark is thinking of evaluating the theory in a new form and executing it in the form of Mobius strip while working on his home machine, but vice versa. He asks the virtual assistant to make an upside-down Mobius strip and says, "This time in the form of a Mobius strip, turn it over." He says this at 39:42 in the movie.

Mobius strip: Mobius strip, also known as a rotated cylinder, is one side without edges. It's like an infinite loop. Like a normal loop, ants dragging along it never reach the end, but in a normal loop the ants could only crawl up or down. Mobius strip has only one side, so ants pulling along it twist both up and down at once. Mobius strip can be modeled by rotating the paper strip half a turn and then joining the ends together. Mobius strip can be of any size and shape, some are easy to see in Euclidean space, others are not easy to visualize. Mobius strip topology made it an infinitely unusual Euclidean representation, which mathematicians extended and generalized in the form of small bottles. In other words, Mobius strip is single-sided and can be constructed by first twisting one of the ends half a turn and then gluing the ends of the rectangular band. This space has interesting properties such as having only one side and staying on one piece. Divide in the middle. The characteristics of the strip were discovered separately and at about the same time in 1858 by two German mathematicians and theoretical astronomers August Ferdinand Mobius and Johann Benedict. Stark evaluates the theory in a new formation while working on his home machine and is thinking of doing it in the form of Mobius strip, but vice versa. He asks the virtual assistant to do it in the reverse Mobius strip and says, "Yes, please tell me the eigenvalues of this particle to be considered in the spectral decomposition." He says this at 39:52 in the movie.

EPR Paradox - In 1935, the orthodox view of quantum mechanics was that quantum systems cannot have position and impulse at the same time. Einstein, Podolski, and Rosen argue that if quantum mechanics is so far correct, quantum systems can have position and momentum at the same time, even if quantum theory does not provide a way to express it. I did. EPR's conclusion: Quantum mechanics is incomplete. To use those terms, there are "real elements" that quantum theory does not include in its mathematical diagram. They clearly allow quantum theory to measure the position on his particle by a scientist she calls Alice, even though she is far from Bob, her

collaborator Bob's particle. I explained the case where you can predict the position of. Alternatively, if you choose to measure the momentum of the particles, you can predict the momentum of Bob. She can't do both. There is no way to measure the position of a particle without losing momentum information. The reverse is also true. However, she can choose whether she wants to know the position or momentum of Bob's particles, if desired. EPR makes decisive assumptions. Alice only measures the particles and does not disturb or affect Bob. So they ask: what explains the fact that Alice can pull off this trick? Your answer: Bob's particles must already have a position that correlates with the position of your particle. Similarly, Bob's particles must have already had an impulse that correlates with the momentum of Alice's particles. From an EPR perspective, there is no paradox here. They believed that their reasoning was scientific common sense applied to certain types of quantum cases. Their goal was simply to show that quantum theory excludes information that would be incorporated into better theories. That's not the only story. Thirty years later, John Bell realized that if the EPR was correct, there would be some kind of experiment in one direction. If they were wrong, the situation would be different. In particular, the EPR perspective predicts something different from quantum mechanics, so if the EPR is correct, quantum theory is not incomplete. That would be wrong. Over 50 years, the experimenter has done the job: EPR made a mistake. Since then, the debate over exactly what this tells us about quantum reality has intensified endlessly. However, despite philosophical disagreements, understanding the physical implications of the EPR debate and the experiments that disprove it is surprisingly fascinating, such as quantum computers and the possibility of undetectable secure communications. The result was obtained. That's not what the EPR had in mind, but if you know how science goes, don't worry. Stark comes up with a device called Timespace GPS for fear of getting stuck in the past or future. According to him, it's a device that can act as a GPS on a journey of time. He shows Rogers the device and talks like "a fully functional cycle GPS." This scene will appear in the movie at 46:33.

Time Space GPS (Fiction): TimeSpace GPS is a device developed by Tony Stark that allows the wearer to safely and accurately navigate time and space using quantum realms. TimeSpace GPS is a wrist device that can move accurately in time and space. When the user enters the date and place they want to visit, the Nanotech-Advanced Tech Suit housed there will appear around the wearer's clothing. The user is then scaled down in Pym Particles, enters the quantum realm, navigated via GPS and displayed at the desired destination. Pim particles are considered the most important particles for traveling from the present to the past or future and are serum. He adds serum to Lang's suit while Robert prepares to move Bruce Banner (Hulk) Lang back and forth in time. The banner looks messy because it's completely trapped in the Hulk's body, so Lang comes to him like "These are Pim particles, right?" This scene appears at 58:10 in the movie.

Pym Particles (Fiction) - Pym particles (also called cross particles) are elementary particles of extradimensional nature that can shift or add mass and reduce or scale the scale of any form of matter, the object or object to which they are exposed. It exerts physical force around the organism to compress it, increasing the density and strength of the object, such as z. Pym particles were only used to reduce the size and mass of organic and inorganic materials, but with some changes the particles could also increase the size and mass of the subject. Pym particles allow users to bypass Squarecube's laws of physics. The particles were originally developed in the 1960s by scientist Hank Pym, who worked for the secret service organization S.H.I.E.L.D. He became a sales representative for his wife Janet van Dyne using Pym Particles in a bespoke suit. Human users of particle-based technology can reduce to the size of insects while maintaining the physical elasticity and strength of humans of average size, as well as their athletic performance. The resizing process compresses force and energy. This manifests itself as a short oscillating shock wave around the target, increasing the force the target can generate. It also improves the density and elasticity of the target, making it stronger and tougher than usual. Living subjects develop inhuman effort and exertion skills, giving them the power of bullets, especially while it is shrinking.

8. Conclusion

Science has consistently surprised us, so we have always drawn clear conclusions about each of its theories. Whether it is the scientific roots of the topic, it is always justified by evidence. As you can infer from the ideology above, the world today has a tremendous impact on cinema. When it comes to science fiction movies, consider some of the laws of science that actors play very intuitively. These sci-fi movies focus on and can be used with the concept of the laws of science in real life. Avengers: Endgame is none other than the greatest example of the existence of scientific law in real life. This film has created tremendous awareness and awareness for people about the notion that we humans are ignoring all our lives. Avengers: Endgame is the highest-selling movie ever. The movie has earned $ 2.79 billion in global box office revenue and has often broken the record for other truly amazing science fiction movies. One of the best examples is "Avatar". Movies like this show a very deep concept of biology. .. Using the concept of cinema, it is sometimes clearly seen that we are coordinating many changes in our lives through these films. And mainly through these science fiction movies, we actually discover many new concepts, insights, ideas and more. For example, how do you know about aliens, lunar life, inventions, planets, and so on.

Avengers: Endgame allows you to clearly guess and confirm the use of quantum mechanics, eigenvalues, and the very famous laws of physics called Mobius stripes. The main premise of cinema and law is that the only thing that can reverse the death of half the universe is the one that caused it in the first place. Is time travel possible? Since Albert Einstein invented his special theory of relativity in 1905, more than 100 years ago, we knew that the movement of time was relatively easy and possible. One of Einstein's predictions, which has been confirmed by countless experiments since then, is best illustrated by the parable of the twins. When one of the twins is

at home and the other goes back and forth in space and travels at almost the speed of light for 10 years. This is measured by having the twins at home. When the traveling twins returned, she noticed that her sister was 10 years old, even though she was barely old. The traveling twins jumped in 10 years ahead. Mobius strip also embodies the concept of time travel, but with a twist that may be a little difficult for the viewer to find, looking at Mobius strip also reverses the jargon of time travel. Mobius strip is a mathematical object invented by the German mathematician Mobius in 1858. Mobius strip is single-sided and can be easily created by taking a squeaky piece of paper, twisting it once, and then taping it. Mobius strip has many very interesting mathematical properties, its technical relevance to time travel is low, and it goes beyond some high-level attempts to explain it. Time travel is probably one of the most fascinating scientific concepts far from scientists, so in a movie about superheroes who can fly, become elementary particles, destroy the universe, and change reality. It plays a very important role. Therefore, we can conclude that everything seen in science fiction movies is not just storyteller illusions and myths. Cinema has taught us many new things, concepts and ideas through our outstanding knowledge of science. Everything you see on your screen has a huge impact on your life. Science is a fact-based concept, not an illusion-based concept. Science has never failed to review its statements, theories, ideas, etc. Science fiction is believed to continue to hit screens around the world in some way. Modern science fiction movies always follow a sense of scientific credibility. The production of Hollywood movies is a very complex process, with multiple actors having different ways of expressing science in their actions. Filmmakers and storywriters are undoubtedly very flexible in deciding what "science" means in the context of feature films. Therefore, scientific accuracy is always a top priority when it comes to storytelling through science fiction movies. The point of science fiction movies is to constantly develop "accurate and educational" communication about science and create an image of science as entertainment. This is a very fun way to learn and educate about science. I really appreciate the film as a form of science communication and its role in helping the audience better understand science.

References

[1] Barnett, M., Wagner, H., Gatling, A., Anderson, J., Houle, M. and Kafka, A. (2004, April) The Impact of Science Fiction Film on Student Understanding of Science. Retrieved on November 10, 2021.

[2] Williamson, P., (2020, January 23). Which Science Fiction Movies Might Come Closest to Science Future? Retrieved on November 15, 2021.

[3] Chris. (2020, February 4). The Role of Science Fiction Movies in Education. Retrieved November 13, 2021.

[4] Ruijter, R., (2014, June 3). Why you should watch science fiction films. Retrieved on November 13, 2021.

[5] Sklar, R., &; Andrew, D. (2020, March 24). Motion picture. Retrieved November 4, 2021.

[6] Imagining the future: Why society needs science fiction. (2017, August 06). Retrieved March 31, 2020.

[7] Why Science Fiction is Important. (2009, November 25). Retrieved November 2, 2021.

[8] Jacobs, B. (2015, February 07). Introduction to Film and Media Studies. Retrieved October 31, 2021.

[9] C; S. (n.d.). The theatre: An effective tool for health promotion. Retrieved October 31, 20.

[10] The Consumerization of Sci-Fi: It's Not Fiction At All. (2017, August 29). Retrieved October 12, 2021