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HYPOTHETICAL DYSON

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ABSTRACT

A Dyson Sphere is a megastructure the completely encompasses a star ad captures all of its power output. Basically this concept is a hypothetical which describes a per the type 2 civilization that a concept in which sun will be enclosed by a big structure which will hold the all energy of sun and will send a bulk amount to its baby planets. So the idea is that can we use the technique of type 2 to acquire type 1civilization.to acquire type 1 civilization the only way is the nonrenewable energy resources and there to more solar energy so , we postulated the technique by which we can acquire type 1civilization as early as possible to fulfil the need of energy.

Keywords: *Energy demand, Dyson sphere, Type 1 civilization, type 2 civilization, Kardashiv scale*.

I. INTRODUCTION

A **Dyson sphere** is a hypothetical mega- structure that completely encompasses a star and captures most or all of its power output. It means that this technique or concept is it uses nearly equal to 100% energy of its parent star for fulfilling the energy requirements of its child planets. The concept is a thought experiment that attempts to explain how a spacefaring civilization would meet its energy requirements once those requirements exceed what can be generated from the home planet's resources alone.

This concept was mainly explained by Freeman Dyson in his 1960 paper "Search for Artificial Stellar Sources of Infrared Radiation". Dyson postulated that such structures would be the logical consequence of the escalating energy needs of a technological civilization and would be a necessity for its long-term survival. He proposed that searching for such structures could lead to the detection of advanced, intelligent extraterrestrial life. Different types of Dyson spheres and their energy-harvesting ability would correspond to levels of technological advancement on the Kardashev scale.

Most fictional depictions describe a solid shell of matter enclosing a star, which is considered the least plausible variant of the idea. In May 2013, at the Starship Century Symposium in San Diego, Dyson repeated his comments that he wished the concept had not been named after him.

II. ORIGIN OF CONCEPT

The concept of dysonsphere was originated for the fulfilling the future energy demand that all the technological civilization constantly increased. The whole Dyson sphere concept is depend on the Kardashev Scale in which we have 3 types of civilizations which is abbreviated as Type 1 civilization, Type 2 civilization, and type 3 civilizations. Corresponding civilization have its own specifications, type 1 civilization which is called as planetary civilization in which we can use and store all of the energy which reaches its planet from its parent star. Type 2 civilization which is also called as stellar civilization whichcan harness the total energy of its planet's parent star (the most popular hypothetical concept being the Dyson sphere—a device which would encompass the entire star and transfer its energy to the planet(s).then comes to Type 3 civilizations which is called as galactic civilizations which can control energy on the scale of its entire host galaxy.

According to physicist and futurist Michio Kaku suggested that humans may attain type 1 status in 100-200 years. Type 2 status in a few thousand years and the type 3 status in 100000 to a million years. Carl Sagan suggested defining intermediate values by interpolating and extrapolating the values given for the type 1 is 10^{16} w, type 2 is 10^{26} w and type 3 is 10^{36}w then these values produces the formula

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$K = \log_{10}P - 6/10$

So, the scale is hypothetical and regards energy consumption on a cosmic scale and it was proposed in 1964 by soviet astronomer Nikolia Kardashev. As we go deep in studying the civilizations for type 1 the technological level of the civilization that can harness all energy that falls on the planet from its parent star this value is close to 7×10^{17} watt. Which are more than 5 orders of magnitude higher than the amount presently attend on the earth, with energy consumption at 4×10^{9} erg/sec (4×10^{12} watts). The astronomer Guillermo A. Lemarlhand stated this as a level near contemporary terrestrial civilization with an energy capability equivalent to the solar isolation on the earth, between 10^{16} and 10^{17} watts. For type 2 civilization a civilization is capable of harnessing the energy radiated by its own star. For example, the stage of successful construction of a Dyson Sphere with energy consumption at4×10^{36} erg/sec. Lemarlhand stated this as a civilization capable of utilizing and channeling the entire radiation output of its star. The energy utilization would be then comparable to the luminosity of our sun of about 4×10^{33}erg/watt. As we know type 3 civilization is in possession of energy consumption at 4×10^{44} erg/sec. Lemarlhand stated this as a civilization with access to the power capable to the luminosity of the entire milky way galaxy, about 4×10^{44} erg/sec.

III. SPECTACULATED FUTURE

Some time ago a postulate has been made that we can send the satellite to sun and have an orbit to them just like a planet revolves around the sun. Then the postulate is that the satellite which is revolving around the sun having solar panels will send the energy wirelessly on the earth. But this hypothesis explains what we can do to acquire type 2 civilization whereas we have not yet fulfilled all needs of the type 1 civilization. And as per the Kardasheva civilization's level of technology is inevitably tied to its energy consumption, and hence civilizations could be classified by the sheer magnitude of energy they generated. So, there is a need to think in the way we can achieve the type 1 civilization by using technique of type 2 civilizations. As The solar activity of our Sun is estimated to remain stable for the next five billion years; compared to the finite - and rapidly diminishing - resources on Earth, the Sun would appear to be a limitless supply of energy that we have barely begun to tap into. Currently, most of solar radiation is blasted uselessly into space; of the total energy output by the Sun each second, less than a billionth of it reaches the face of the Earth.If we could harness but one part in a millionth of that energy, in one second we would have the
Energy equivalent of the total energy consumption of the modern world for an entire year.The thinking should go in sucha way that we can serve before and after the non-renewable resources will vanishes as the global demand for energy only increases, while the Earth's supply of non-renewable resources such as coal and oil can only dwindle.

This concludes that the non-renewable energy is the future for the world so the idea is to have an efficient energy resource that can strive for the long lasting future and ultimately it goes towards the solar energy and wind energy but in some areas there is no rain i.e. no mansoon and no winter only summer so there we can plant the solar power plant but the thing is that the system should be that much strong , as solar energy is based on the conversion efficiency i.e. light energy should convert in the electricity that should give the more and more power to the society for the energy need.

So to think in that way we hypotheses one experiment to acquire the type 1 civilization instead of going to type 2 is that we can make the solar panels of the material which can give the conversion efficiency of more than 70% and the material that can give or that can allow to incident the invisible rays that have the intensity more than the visible light such as ultraviolet, infrared, etc.,

IV. RESULTS AND DISCUSSION

The material found out to be a compound of Titanium called as Titanium Dioxide or ` (IV) oxide(TiO_2). This substance is having the property of absorbing the light moreover this substance or compound is radially used in photosensitive experiment in the chemistry related topics. This material is very good absorber of light and if we are going to use this material as solar energy resource by making the solar cell and also this material useful with his own special property as it is n-type semiconducting material and with that it can give the conversion efficiency more than 70 to 80% of light or sun rays incident on it. So the stuff is to make the solar cells of the TitaniumDioxide (TiO_2) in

such a way that it should give the conversion efficiency upto our minimal limit. For this we have made some assumptions such as we are going to apply the TitaniumDioxide(TiO_2) layer on the surface of the conducting polymer such as polyaniline,polyacetylene; polyphenylene vinylene; polypyrrole (X = NH) and polythiophene (X = S), etc., so that we get a one conducting medium for better conductivity as well as conversion efficiency. Although the question is the output voltage which will be given by these cells will be how much? So accordingly the calculations are made by taking the silicon based solar cells as the reference.

The calculations are as follows:
Conversion efficiency shows a tanø of 0.08 which is 3 times smaller as compared to that of used for a –Si:H. An efficiency of 9.4% (Voc=0.526 V, Isc=25.3mA/cm^2, FF=0.710) is obtained at a deposition temperature of 140^0C using the optimized morphology that

Efficiency		Output Voltage
9.4%	⟶	0.526 V
80%	⟶	4.47 V

Now if we multiply 4.47 by 10 assuming the losses we can get
4.47×10= 44.7 V of Output voltage as mentioned above if we consider the losses maximum of the 40 V Output voltage per panel. By assuming this phenomenon and applying some electrical engineering concept of HVDC that we can build the 10 panels of each output voltage of 40 V so that we can make the power station or we can call it as generating station of 400 V HVDC which is a very big achievement in Electrical Engineering.

V. CONCLUSION

This is the hypothesis based on the concept of Dyson Sphere to achieve a type 1 civilization by using the techniques of type 2 civilizations. We have tried to figure out the future energy needs which can go very high; may be, beyond the imagination limit of a human being but that can be recovered as early as possible if we are going to take an initiative to go with the non-renewable energy resources for the fulfillment of our energy needs that too with better technology and worth investment like in making the solar cells using Titanium Dioxide(TiO_2) for the better efficiency and better future.

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