ELECTRO VISION

APRIL-MAY 2020

QUOTE:

The real potential of electricity lies not in providing social amenities but in stimulating long-term economic development

Vision

- **Emerge as quality human resource provider for industry and society in the field of electrical &electronics engineering**

Mission

→ Providing Quality Education Through State Of Art Resources.

→To Develop Innovative, Proficient Electrical Engineers.

→Promoting Ethical And Moral Values Among The Students As To Make Them Responsible Professionals For The Society

Magazine Design Team:

FACULTY:

B.SANTHOSH KUMAR

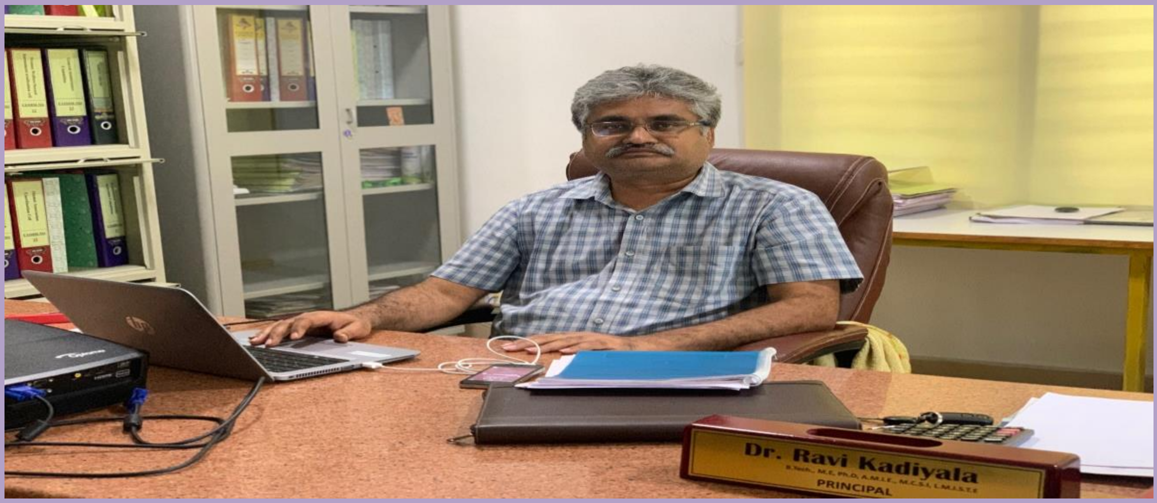
[Asst.Prof]

STUDENTS:

E.Sai Vardhan

III Year EEE

Principal's Message



Dear Parents and Students,

It is with great pleasure that I welcome you to our College **(DIET)** Newsletter. As a Principal I am hugely impressed by the commitment of the college and the staff in providing an excellent all-round education for our students with our state of the art facilities. We as a team working together, strongly promote the zeal towards academic achievement among our students. The cultural, sports and other successes of all our students and staff are also proudly celebrated together.

I congratulate the staff and students who brought latest technologies and concepts onto the day to day teaching learning platform. As long as our ideas are expressed and thoughts kindled we can be sure of learning, as everything begins with an idea.

I appreciate every student who shared the joy of participation in co-curricular and extracurricular activities along with their commitment to curriculum. That little extra we do, is the icing on the cake. 'Do more than belong – participate. Do more than care – help. Do more than believe – practice. Do more than be fair – be kind. Do more than forgive – forget. Do more than dream – work.

With a long and rewarding history of achievement in education behind us, our DIET community continues to move forward together with confidence, pride and enthusiasm.

I hope you enjoy your visit to the website and should you wish to contact us, please find details at the

college website www.diet.ac.in/

Yours in Education,

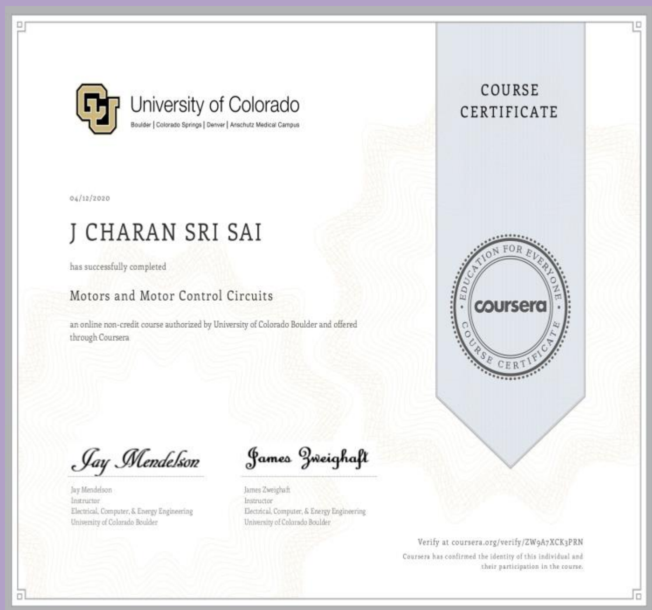
Dr. Ravi Kadiyala

Principal

Department activities:

The department of EEE has decided to utilize the period of lockdown in an effective and Fruitful way and to train and Strengthen students of the department in implementing various academic activities and also analyzed students performance

Some of the Certification Courses Done by Students are…………



University of Colorado
Boulder | Colorado Springs | Denver | Anschutz Medical Campus

COURSE CERTIFICATE

04/12/2020

J CHARAN SRI SAI

has successfully completed

Motors and Motor Control Circuits

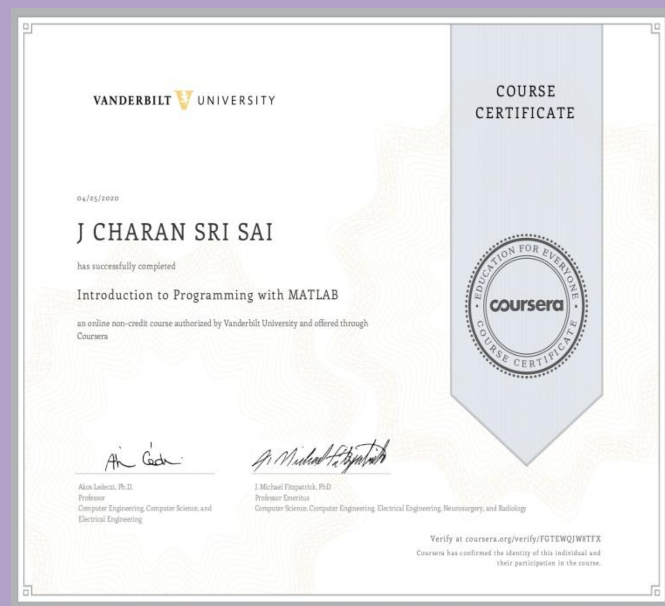
an online non-credit course authorized by University of Colorado Boulder and offered through Coursera

Jay Mendelson, Instructor, Electrical, Computer, & Energy Engineering, University of Colorado Boulder

James Zweighaft, Instructor, Electrical, Computer, & Energy Engineering, University of Colorado Boulder

Verify at coursera.org/verify/ZW9A7XCK3PRN

Coursera has confirmed the identity of this individual and their participation in the course.



VANDERBILT UNIVERSITY

COURSE CERTIFICATE

04/25/2020

J CHARAN SRI SAI

has successfully completed

Introduction to Programming with MATLAB

an online non-credit course authorized by Vanderbilt University and offered through Coursera

Akos Ledeczi, Ph.D., Professor, Computer Engineering, Computer Science, and Electrical Engineering

J. Michael Fitzpatrick, PhD, Professor Emeritus, Computer Science, Computer Engineering, Electrical Engineering, Neurosurgery, and Radiology

Verify at coursera.org/verify/FGTEWQJW8TFX

Coursera has confirmed the identity of this individual and their participation in the course.

VANDERBILT UNIVERSITY

COURSE CERTIFICATE

05/15/2020

MUSUKU SAI HARIKA

has successfully completed

Introduction to Programming with MATLAB

an online non-credit course authorized by Vanderbilt University and offered through Coursera

Akos Ledeczi, Professor, Computer Engineering

Mike Fitzpatrick, Professor Emeritus, Computer Science, Computer Engineering, Electrical Engineering, Neurosurgery, and Radiology

Verify at coursera.org/verify/UFSS4PBAYBYS

Coursera has confirmed the identity of this individual and their participation in the course.

University of Colorado
Boulder | Colorado Springs | Denver | Anschutz Medical Campus

COURSE CERTIFICATE

05/13/2020

MUSUKU SAI HARIKA

has successfully completed

Motors and Motor Control Circuits

an online non-credit course authorized by University of Colorado Boulder and offered through Coursera

Jay Mendelson, Instructor, Electrical, Computer, & Energy Engineering, University of Colorado Boulder

James Zweighaft, Instructor, Electrical, Computer, & Energy Engineering, University of Colorado Boulder

Verify at coursera.org/verify/BL2P4L5EFRAY

Coursera has confirmed the identity of this individual and their participation in the course.

University of Colorado
Boulder | Colorado Springs | Denver | Anschutz Medical Campus

COURSE CERTIFICATE

05/15/2020

NALLURI SINDHURA

has successfully completed

Motors and Motor Control Circuits

an online non-credit course authorized by University of Colorado Boulder and offered through Coursera

Jay Mendelson
Instructor
Electrical, Computer, & Energy Engineering
University of Colorado Boulder

James Zweighaft
Instructor
Electrical, Computer, & Energy Engineering
University of Colorado Boulder

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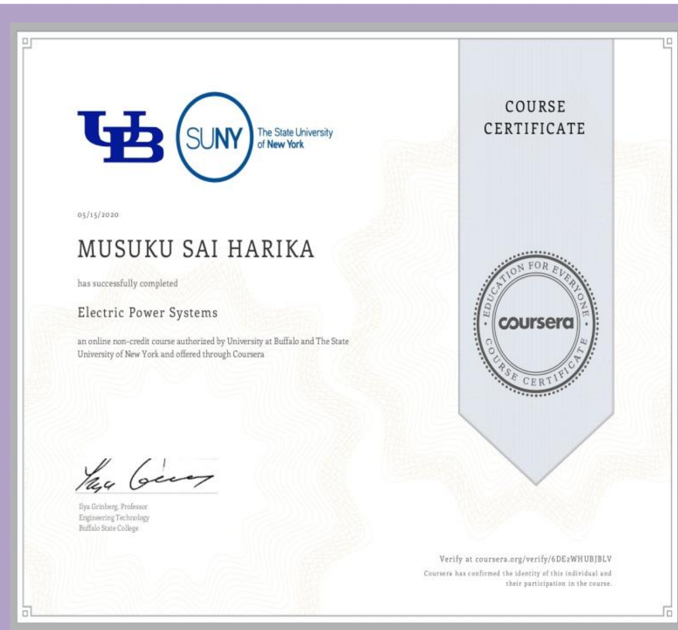


SUNY The State University of New York

COURSE CERTIFICATE

05/15/2020

MUSUKU SAI HARIKA

has successfully completed

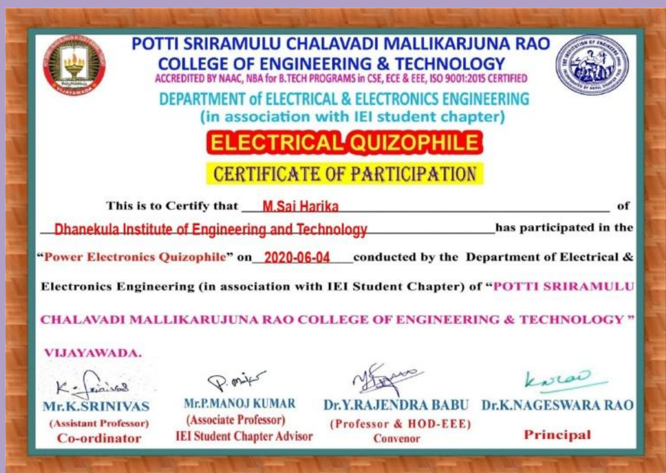
Electric Power Systems

an online non-credit course authorized by University at Buffalo and The State University of New York and offered through Coursera

Ilya Grinberg, Professor
Engineering Technology
Buffalo State College

Verify at coursera.org/verify/6DE2WHUBJBLV
Coursera has confirmed the identity of this individual and their participation in the course.

Also Some students Utilized this lockdown period to enhance and test their knowledge over subjects and achieved their certificates they are…………….



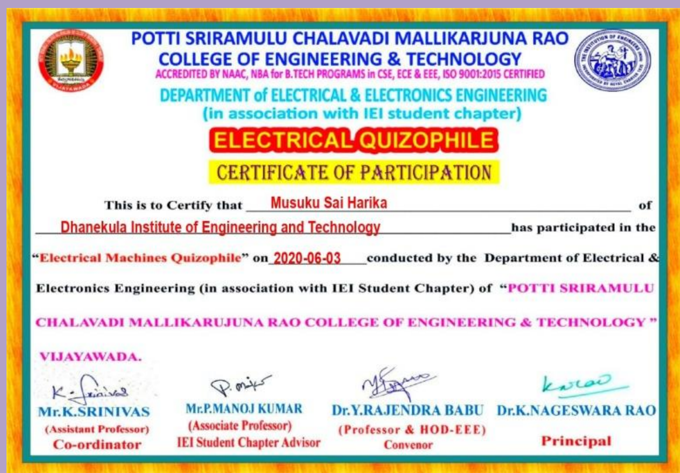
POTTI SRIRAMULU CHALAVADI MALLIKARJUNA RAO
COLLEGE OF ENGINEERING & TECHNOLOGY
ACCREDITED BY NAAC, NBA for B.TECH PROGRAMS in CSE, ECE & EEE, ISO 9001:2015 CERTIFIED
DEPARTMENT of ELECTRICAL & ELECTRONICS ENGINEERING
(in association with IEI student chapter)

ELECTRICAL QUIZOPHILE

CERTIFICATE OF PARTICIPATION

This is to Certify that M.Sai Harika of Dhanekula Institute of Engineering and Technology has participated in the "Power Electronics Quizophile" on 2020-06-04 conducted by the Department of Electrical & Electronics Engineering (in association with IEI Student Chapter) of "POTTI SRIRAMULU CHALAVADI MALLIKARUJUNA RAO COLLEGE OF ENGINEERING & TECHNOLOGY" VIJAYAWADA.

Mr.K.SRINIVAS (Assistant Professor) Co-ordinator
Mr.P.MANOJ KUMAR (Associate Professor) IEI Student Chapter Advisor
Dr.Y.RAJENDRA BABU (Professor & HOD-EEE) Convenor
Dr.K.NAGESWARA RAO Principal



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COLLEGE OF ENGINEERING & TECHNOLOGY
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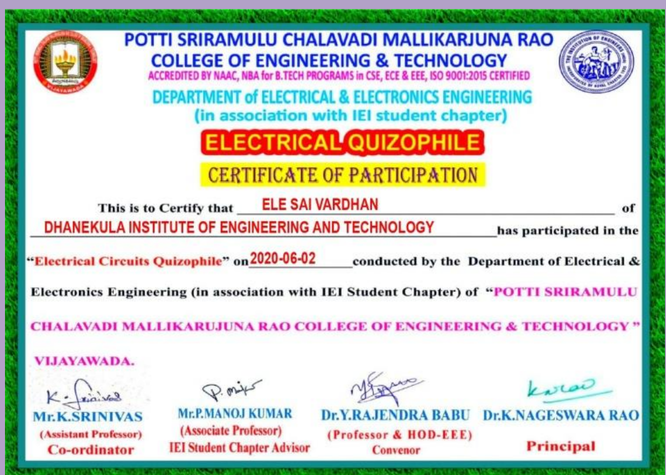
(in association with IEI student chapter)

ELECTRICAL QUIZOPHILE

CERTIFICATE OF PARTICIPATION

This is to Certify that Musuku Sai Harika of Dhanekula Institute of Engineering and Technology has participated in the "Electrical Machines Quizophile" on 2020-06-03 conducted by the Department of Electrical & Electronics Engineering (in association with IEI Student Chapter) of "POTTI SRIRAMULU CHALAVADI MALLIKARJUNA RAO COLLEGE OF ENGINEERING & TECHNOLOGY" VIJAYAWADA.

Mr.K.SRINIVAS (Assistant Professor) Co-ordinator
Mr.P.MANOJ KUMAR (Associate Professor) IEI Student Chapter Advisor
Dr.Y.RAJENDRA BABU (Professor & HOD-EEE) Convenor
Dr.K.NAGESWARA RAO Principal



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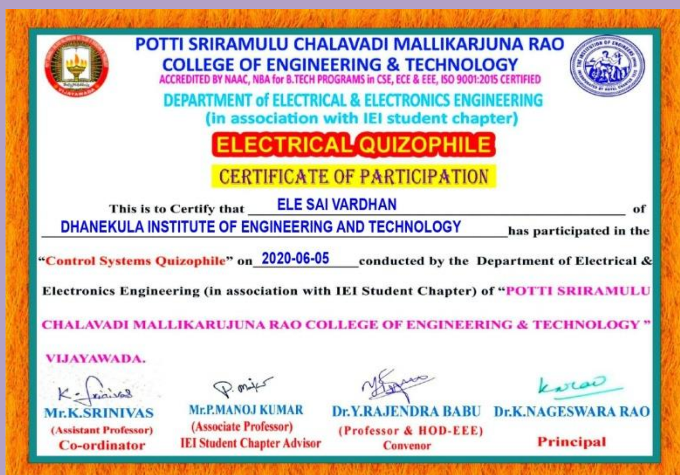
DEPARTMENT of ELECTRICAL & ELECTRONICS ENGINEERING
(in association with IEI student chapter)

ELECTRICAL QUIZOPHILE

CERTIFICATE OF PARTICIPATION

This is to Certify that ELE SAI VARDHAN of DHANEKULA INSTITUTE OF ENGINEERING AND TECHNOLOGY has participated in the "Electrical Circuits Quizophile" on 2020-06-02 conducted by the Department of Electrical & Electronics Engineering (in association with IEI Student Chapter) of "POTTI SRIRAMULU CHALAVADI MALLIKARJUNA RAO COLLEGE OF ENGINEERING & TECHNOLOGY" VIJAYAWADA.

Mr.K.SRINIVAS (Assistant Professor) Co-ordinator
Mr.P.MANOJ KUMAR (Associate Professor) IEI Student Chapter Advisor
Dr.Y.RAJENDRA BABU (Professor & HOD-EEE) Convenor
Dr.K.NAGESWARA RAO Principal



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DEPARTMENT of ELECTRICAL & ELECTRONICS ENGINEERING
(in association with IEI student chapter)

ELECTRICAL QUIZOPHILE

CERTIFICATE OF PARTICIPATION

This is to Certify that ELE SAI VARDHAN of DHANEKULA INSTITUTE OF ENGINEERING AND TECHNOLOGY has participated in the "Control Systems Quizophile" on 2020-06-05 conducted by the Department of Electrical & Electronics Engineering (in association with IEI Student Chapter) of "POTTI SRIRAMULU CHALAVADI MALLIKARJUNA RAO COLLEGE OF ENGINEERING & TECHNOLOGY" VIJAYAWADA.

Mr.K.SRINIVAS (Assistant Professor) Co-ordinator
Mr.P.MANOJ KUMAR (Associate Professor) IEI Student Chapter Advisor
Dr.Y.RAJENDRA BABU (Professor & HOD-EEE) Convenor
Dr.K.NAGESWARA RAO Principal

And Some of the Students have participated in some of the seminars conducted by various institutes and some of them are........

News Articles

Artificial Materials For More Efficient Electronics

We are surrounded by electronic devices. Transistors are used to power telephones, computers, televisions, hi-fi systems and game consoles as well as cars, airplanes and the like. Today's silicon-based electronics, however, consume a substantial and ever-increasing share of the world's energy.

A number of researchers are exploring the properties of materials that are more complex than silicon but that show promise for the electronic devices of tomorrow -- and that are less electricity-hungry. In keeping with this approach, scientists from the University of Geneva (UNIGE) have been working in collaboration with the Swiss Federal Institute of Technology in Lausanne (EPFL), the University of Zurich, the Flatiron Institute of New York and the University of Liège. The scientists have discovered a hitherto-unknown physical phenomenon in an artificial material made up of very thin layers of nickelates. This could be exploited to accurately control some of the material's electronic properties, such as the sudden transition from a conductive to an insulating state. It could also be used to develop new, more energy-efficient devices. This technological advance is detailed in the journal Nature Materials.

"Nickelates are known for a special characteristic: they suddenly switch from an insulating state to that of an electrical conductor when their temperature rises above a certain threshold," begins Jean-Marc Triscone, a professor in the Department of Quantum Matter Physics in UNIGE's Faculty of Science. "This transition temperature varies according to the composition of the material."
Nickelates are formed from a nickel oxide with the addition of an atom belonging to so-called "rare earth" elements (i.e. a set of 17 elements from the Periodic Table). When this rare earth is samarium (Sm), for

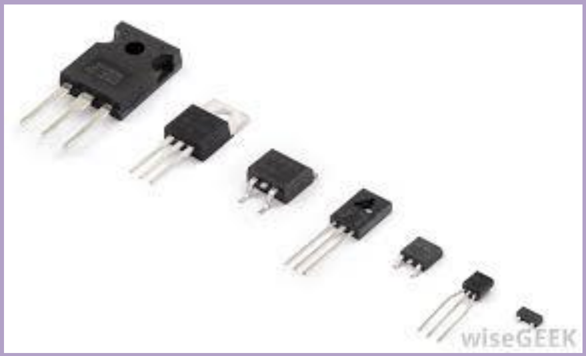
example, the metal-insulator jump takes place at around 130°C, while if it is neodymium (Nd), the threshold drops to -73°C. This difference is explained by the fact that when Sm is replaced by Nd, the compound's crystal structure is deformed -- and it is this deformation that controls the value of the transition temperature.
In their attempt to learn more about these materials, the Geneva-based scientists studied samples made up of repeated layers of samarium nickelate deposited on layers of neodymium nickelate -- a kind of "super sandwich" where all the atoms are perfectly arranged.

Behaving like a single material

Claribel Domínguez, a researcher in the Department of Quantum Matter Physics and the article's first author, explains: "When the layers are quite thick, they behave independently, with each one keeping its own transition temperature. Oddly enough, when we refined the layers until each one was no larger than eight atoms, the entire sample began behaving like a single material, with only one large jump in conductivity at an intermediate transition temperature."
A very detailed analysis performed by electron microscope at EPFL -- backed up by sophisticated theoretical developments undertaken by American and Belgian colleagues -- showed that the propagation of the deformations in the crystal structure at the interfaces between the materials only takes place in two or three atomic layers. Accordingly, it is not this distortion that explains the observed phenomenon. In reality, it is as though the furthest layers somehow know that they are very close to the interface but without being physically deformed.

It's not magic

"There's nothing magical about it," says Jennifer Fowlie, a researcher in the Department of Quantum Matter Physics and co-author of the article. "Our study shows that maintaining an interface between a conductive region and an insulating region, as is the case in our samples, is very expensive in terms of energy. So, when the two layers are thin enough, they are able to adopt much less energy-intensive behaviour, which consists of becoming a single material, either totally metallic or totally insulating, and with a common transition temperature. And all this happens without the crystal structure being changed. This effect, or coupling, is unprecedented."
This discovery was made possible thanks to the support provided by the Swiss National Science Foundation and the Q-MAC ERC Synergy Grant (Frontiers in Quantum Materials' Control). It provides a new way of controlling the properties of artificial electronic structures, which, in this instance, is the jump in conductivity obtained by the Geneva researchers in their composite nickelate, which represents an important step forward for developing new electronic devices. Nickelates could be used in applications such as piezoelectric transistors (reacting to pressure).
More generally, the Geneva work fits into a strategy for producing artificial materials "by design," i.e. with properties that meet a specific need. This path, which is being followed by many researchers around the world, holds promise for future energy-efficient electronics.



Article by

M.Sai Harika

178T1A0211

Article:2

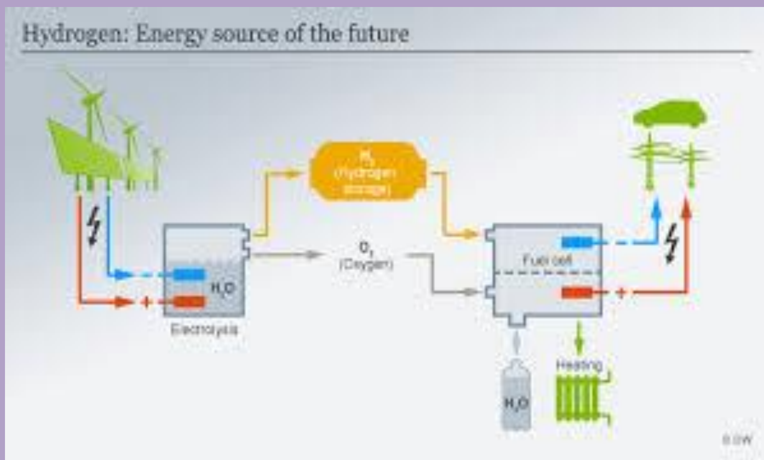
Converting Solar Energy To Hydrogen Fuel, With Help From Photosynthesis.

Global economic growth comes with increasing demand for energy, but stepping up energy production can be challenging. Recently, scientists have achieved record efficiency for solar-to-fuel conversion, and now they want to incorporate the machinery of photosynthesis to push it further.

"We want to fabricate a photo catalytic system that uses sunlight to drive chemical reactions of environmental importance," says Lilac Amirav, Ph.D., the project's principal investigator.Specifically, her group at the Israel Institute of Technology is designing a photocatalyst that can break down water into hydrogen fuel. "When we place our rod-shaped nanoparticles in water and shine light on them, they generate positive and negative electric charges," Amirav says. "The water molecules break; the negative charges produce hydrogen (reduction), and the positive charges produce oxygen (oxidation). The two reactions, involving the positive and negative charges, must take place simultaneously. Without taking advantage of the positive charges, the negative charges cannot be routed to produce the desired hydrogen."If the positive and negative charges, which are attracted to one another, manage to recombine, they cancel each other, and the energy is lost. So, to make sure the charges are far enough apart, the team has built unique heterostructures comprised of a combination of different semiconductors, together with metal and metal oxide catalysts. Using a model system, they studied the reduction and oxidation reactions separately and altered the heterostructure to optimize fuel production.

In 2016, the team designed a heterostructure with a spherical cadmium-selenide quantum dot embedded within a rod-shaped piece of cadmium sulfide. A platinum metallic particle was located at the tip. The cadmium-selenide particle attracted positive charges, while negative charges accumulated on the tip. "By adjusting the size of the quantum dot and the length of the rod, as well as other parameters, we achieved 100% conversion of sunlight to hydrogen from water reduction," Amirav says. A single photo catalyst nanoparticle can produce 360,000 molecules of hydrogen per hour, she notes.The group published their results in the ACS journal Nano Letters. But in these experiments, they studied only half of the reaction (the reduction). For proper function, the photo catalytic system must support both reduction and oxidation reactions. "We were not converting solar energy into fuel yet," Amirav says. "We still needed an oxidation reaction that would continually provide electrons to the quantum dot." The water oxidation reaction occurs in a multi-step process, and as a result remains a significant challenge. In addition, its byproducts seem to compromise the stability of the semiconductor. Together with collaborators, the group explored a new approach -- looking for different compounds that could be oxidized in lieu of water -- which led them to benzyl amine. The researchers found that they could produce hydrogen from water, while simultaneously transforming benzyl amine to benzaldehyde. "With this research, we have transformed the process from photo catalysis to photosynthesis, that is, genuine conversion of solar energy into fuel," Amirav says. The photo catalytic system performs true conversion of solar power into storable chemical bonds, with a maximum of 4.2% solar-to-chemical energy conversion efficiency. "This figure establishes a new world record in the field of photocatalysis, and doubles the previous record," she notes. "The U.S. Department of Energy defined 5-10% as the 'practical feasibility threshold' for generating hydrogen through photo catalysis. Hence, we are on the doorstep of economically viable solar-to-hydrogen conversion."

These impressive results have motivated the researchers to see if there are other compounds with high solar-to-chemical conversions. To do so, the team is using artificial intelligence. Through collaboration, the researchers are developing an algorithm to search chemical structures for an ideal fuel-producing compound. In addition, they are investigating ways to improve their photo system, and one way might be to draw inspiration from nature. A protein complex in plant cell membranes that comprises the electrical circuitry of photosynthesis was successfully combined with nano particles. Amirav says that this artificial system so far has proven fruitful, supporting water oxidation while providing photocurrent than is 100 times larger than that produced by other similar systems.



Article By:

E.SAI VARDHAN
(178T1A0211)

ARTICLE:3

EFFICIENT LOW-COST SYSTEM FOR PRODUCING POWER AT NIGHT

Researchers have designed an off-grid, low-cost modular energy source that can efficiently produce power at night. The system uses commercially available technology and could eventually help meet the need for nighttime lighting in urban areas or provide lighting in developing countries.Although solar power brings many benefits, its use depends heavily on the distribution of sunlight, which can be limited in many locations and is completely unavailable at night. Systems that store energy produced during the day are typically expensive, thus driving up the cost of using solar power.To find a less-expensive alternative, researchers led by Shanhui Fan from Stanford University looked to radiative cooling. This approach uses the temperature difference resulting from heat absorbed from the surrounding air and the radiant cooling effect of cold space to generate electricity.In The Optical Society (OSA) journal Optics Express, the researchers theoretically demonstrate an optimized radiative cooling approach that can generate 2.2 Watts per square meter with a rooftop device that doesn't require a battery or any external energy. This is about 120 times the amount of energy that has been experimentally demonstrated and enough to power modular sensors such as ones used in security or environmental applications.

"We are working to develop high-performance, sustainable lighting generation that can provide everyone -- including those in developing and rural areas -- access to reliable and sustainable low cost lighting energy sources," said Lingling Fan, first author of the paper. "A modular energy source could also power off-grid sensors used in a variety of applications and be used to convert waste heat from automobiles into usable power."

Maximizing power generation:One of the most efficient ways to generate electricity using radiative cooling is to use a thermoelectric power generator. These devices use thermoelectric materials to generate power by converting the temperature differences between a heat source and the device's cool side, or radiative cooler, into an electric voltage.In the new work, the researchers optimized each step of thermoelectric power generation to maximize nighttime power generation from a device that would be used on a rooftop. They improved the energy harvesting so that more heat flows into the system from the surrounding air and incorporate new commercially available thermoelectric materials that enhance how well that energy is used by the device. They also calculated that a thermoelectric power generator covering one square meter of a rooftop could achieve the best trade-off between heat loss and thermoelectric conversion."One of the most important innovations was designing a selective emitter that is attached to the cool side of the device," said Wei Li, a member of the research team. "This optimizes the radiative cooling process so that the power generator can more efficiently get rid of excessive heat."In addition to carrying out experiments, the researchers are also examining optimal designs for operating the system during the day, in addition to nighttime, which could expand the practical applications of the system.

Article By:

D.Kranthi (178T1A0219)

THE END