The National Solar Cell Project which will introduce the latest technology to manufacture solar panels locally through the placement of solar cells on a thin membrane has been launched. The project will also conduct training courses in the universities of Colombo, Ruhuna, Jaffna and Kelaniya to train individuals on solar cell technology. The Ministry of Science, Technology and Research has received cabinet approval to fund the project.

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Minister of Science, Technology and Research together with the Sri Lankan delegation participated in the first joint conference agreed to in the MoU signed to promote scientific corporation between the National Science Foundation of Sri Lanka and the National Natural Science Foundation of China.

The National Undergraduate Research Symposium organized by the National Science and Technology Commission was held under the patronage of Minister of Science, Technology and Research, Susil Premajayantha at the Hector Kobekaduwa Agrarian Research and Training Institute. The Ministry of Science, Technology and Research and the National Science and Technology Commission have identified that the National Research and Development Plan needs to focus and act on 10 key development sectors of the country.

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The solar eclipse experienced by North Americans on 21 August was a memorable event. The reason being that the solar eclipse was one where North America experienced a total eclipse of the sun. This is a very rare astronomical event. Day turns into night and as you see stars shining during the day, even you would be surprised at such a sight. It would be an event you will not forget in a lifetime. Such an event was experienced by Sri Lankans in 1955. Our grandparents recall it thus, “As I remember, it was on 20 June that it took place. It was around 7.00 in the morning, and the sky began to darken little by little. After an hour, it was as if it was 6 or 7 at night, and stars began to show. The animals panicked and birds flew away. Many young women believed in a myth that if you consumed a certain Ayurvedic Preparation at that time, they would get prettier and had to be admitted to hospital”. The science behind the solar eclipse is astronomical events. Those on Earth witness one Celestial Object partially or completely covering another Celestial Object. There are two main eclipses important to those on Earth. They are the solar and lunar eclipses. Many of you would have experienced the lunar eclipse which took place on Full Moon Poya Day this August. Each year on average we have around four eclipses. They are made up of two solar and two lunar eclipses. On a rare occasion, we would have five eclipses happening in a year. There are four types of solar eclipses. They are; the total solar eclipse, partial solar eclipse, hybrid eclipse and annular eclipse. When a solar eclipse takes place, the manner in which it is witnessed by a certain country is depended on the country’s geographical location on the world map. A total solar eclipse witnessed by one country might just be seen as a partial solar eclipse by another.

At the time of a solar eclipse, the moon casts two types of shadows on the Earth:

- Umbra- this is the dark center portion of a small shadow.
- Penumbra- the lighter outer part of the shadow.

If you are within the Moon’s umbra and look into the direction of the Sun, you will see a total solar eclipse as the Moon blocks the all of the Sun and if you are within the penumbra, you will notice a partial eclipse. The distance of the sun to the Earth is 400 times that of the moon to the Earth. The sun’s diameter is 400 times larger than that of the moon. But for those on Earth, we see the sun and moon to be of similar size. Thus we see the face of the moon completely covering the face of the sun. Thus as light from the sun is blocked from reaching the Earth, we experience a few minutes of night.

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The State Ministry of Science, Technology and Research recently organized a Science and Technology Assistance Programme at the Industrial Technology Institute with the aim of using science to help resolve issues faced by entrepreneurs. The State Ministry of Science, Technology and Research which functions under the Ministry of Science, Technology and Research coordinates the ‘Vidatha’ programme which seeks to transfer scientific knowledge to villages. Vidatha Resource Centres have been established in around 270 divisional secretariats around the country, encompassing all districts. This national programme has thus far created close to 3000 small and medium enterprises in various sectors. Among these are successful entrepreneurs who have developed direct links with major supermarket chains and have even managed to export their goods to the international market.

The Ministry through its evalu-
We have stepped into the most competitive hi-tech world. As the world pursues continuous technological advancement, research and development, technology and engineering bring with it a bundle of value to this endeavor. The National Engineering Research and Development Centre is responsible to look into new inventions, new products that could be used one day and to pioneer engineers with ultra modern techniques.

Establishment
The National Engineering Research and Development has its roots in knowledge ideas and dates back to 1974. It was the first unit established in Sri Lanka to handle all subjects related to engineering. In 1974, in the presence of Professor K.K.W. Perera the Centre was started at the Moratuwa University. As there were space issues, the Centre was shifted to the Eka vista Industrial Estate on 14 August 1977.

Research
The Centre which consists of engineers, researchers and technicians, is today engaged in research related to civil engineering, renewable energy, electrical & electronics, mechatronics and agriculture. It handles into new, innovative initiatives and provides necessary assistance to innovators. The Centre renders a great service to the community which has established the aim of developing technology in the engineering sector. Accordingly, the services rendered by NERDC should be appreciated and they support the country to develop socially and economically.

Technology Transfers
One of the major tasks of NERDC is to transfer the technologies & other inventions to the people who are interested to start up their own businesses as entrepreneurs. Although the research is very vital for the development of the country, the real development measures are evaluated on how the research outcomes are being used & implemented in real life situations. In this scenario, technology transfers, providing required training at a time, is a must to emerging entrepreneurs in the technological issues are successfully handled by Techno Marketing Department at the moment.

Technology Park and Museum
Technology Park and Engineering Museum which belong to NERDC do provide more valuable opportunity for school students & university students to grab practical experience on their theory lessons. The Technology Park was established to commemorate the 20th year of NERDC, whilst the Engineering Museum was established during year 2013. Apart from students, lots of self employees and people who are interested in startup small scale business can grasp ideas & technology from NERDC technology park. Further the general public has got the chance of visiting these places to get exposure for NERDC developed technologies as well as technology transformation cross section throughout the history.

NERDC provides opportunities for research development

Development of a country is assessed by the developments in the research and technology. This factor is ranked clearly in the profiles of developed countries. But in countries like ours, the biggest issue is in carrying out research activities and real prototype is formed. Not being able to go forward is a real issue. There are plenty of people in our country with the level of abilities and talents and they do conduct many research and innovations. However, taking their novel inventions to the market, as a user friendly product is an economical value is not an easy task. And also regret to mention that a lot of new ideas and ideas are stuck within universities due to this factor. Therefore, as NERDC, we have always stepped in to several initiatives to combat the issue. We have started to make the universities to get use of the research and new innovations, which are initiated in universities, to make sure that they get the due place. We are also very happy to mention that we have initiated a new initiative, called Technology Incubator at NERDC, to assist the people with innovations and ideas who are looking for assistance to develop it into a prototype. The Technology Incubator has been established in collaboration with several hi tech equipments and all other necessary facilities. Hopefully this would be opened for innovations & entrepreneurship by next year.

NERDC leads on international technology transfers, provides consultancy on NERDC cost effective building technology, research and development related to engineering, provides detailed audit reports and supports on industry related technological assistance, consultancies on electronics & electrical fields, training of professionals offering through various training programs. In addition, NERDC leads on international technology transfers, quality auditing of solar panels & issuing reports. Furthermore, the NERDC also assists in disseminating the novel technology in the different geographical areas.

NERDC helps to provide all necessary support for the engineers to conduct their researches. When we look back, the most number of researches conducted in NERDC were based on civil engineering. Since its inception, NERDC pioneered research related to electrical engineering. I am very glad to say that the “Prashakthi Lamp” (“Prashak- thipandana”) was innovated by NERDC. That helped to provide electricity to several rural areas. For example, street lights in rural areas carry an unsafe electric current. At present, research is very vital for the advancements, research and engineering. Technology Incubator at NERDC to assist the people with innovations and ideas who are looking for assistance to develop it into a prototype. The Technology Incubator has been established to provide all necessary support for the engineers to conduct their researches. When we look back, the most number of researches conducted in NERDC were based on civil engineering. Since its inception, NERDC pioneered research related to electrical engineering. We expect make a success of this. That will be a huge step to back the technology and equipment and to establish required facilities. It can be stated that we are taking the lead is providing assistance to bring any research project to achieve level and creating its prototype. However, our path goes beyond creating an invention. We have a challenging path of generating a usable product some day. But, we are taking the lead is providing assistance to bring any research project to achieve level. An invention is a new idea. In other words, what happens is that they face greater challenges when they need to be manufactured commercially. The reason could be the lack of potential investment, which is not a success at all. Therefore, we have to be careful in selecting the invention. However, our path goes beyond creating an invention. We have a challenging path of generating a useful product some day. But, we can assist the inventors in the future.

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This article would help all those who have dreams to build their own houses and settle down. The price and technical methods used to build these houses are the results of research conducted by the National Engineering and Research Development Centre of Sri Lanka (NERDC). Construction of similar houses would suit the economic condition of our people as well. All the methods and technology used in the construction are internationally approved methods. The use of raw materials would be reduced under this method. This would lead to self-occupations and the time taken to complete the construction of a house would be reduced.

Planning for the building
As economically sustainable buildings are to be constructed, the methods going to be used have to be clearly stated. When planning the money allocated for the construction, the size of the building and the infrastructure need to be decided considering the land area. A quality building can be constructed if the methods and measures are very well planned. A house that economically suits you can be constructed. According to the will of the owner, single unit houses or double storied houses can be built.

Foundation
The foundation is the most important aspect when building a house. Before laying the foundation for the building, one has to take good notice of the soil of the land. Usually rubble of 6” into 9’ is used, yet more time and money has to be spent on that method. In order to do away with the above-mentioned method, NERDC has found a novel method. The following is the method carried out by NERDC:

- Foundation for Columns
- Foundation for Walls
- Plinth Beam
- Plinth Wall

Nearly 40 percent of the money spent on the usual methods can be saved through the above method and when laying the foundation.

Precast Concrete Components
Precast Concrete Components introduced by NERDC. The Precast Concrete Components are used for the following purposes:

- Concrete door frame
- Concrete window frame
- Concrete louvers
- Balcony handrails and
- Ferro-cement canopies.

NERDC Concrete Slabs
NERDC has introduced a very effective way to reduce the costs involved in building multi-storied buildings.

Following are the benefits of using NERDC concrete slabs:

- As the weight of concrete is less, the expenditure on the foundation is less
- There is no need for support props thus the first floor can be inhabited quicker
- Soffit Plastering not necessary
- Use of timber reduced
- Less use of tor steel
- The construction process will be quickened
- Compared to normal construction, the cost involved can be reduced by 30 percent.

When constructing the slab, the precast concrete purling needs to be placed at a width of 2” – 0” and on top of that either ferrocement shuttering or plywood shuttering is used and on that 10 2” T.D. square wire mesh is placed and covered with a 2” thick concrete layer. When constructing a wall, because brick walls and plastering use a lot of sand, instead of this method new environment-friendly methodology has been introduced. They are mainly,

- Slip Form Walls
- Cement Stabilized Compressed Soil Blocks.

Slip Form Walls
Cement and quarry dust at a 1:10 ratio has to be mixed and can be used as a paste. The walls can be built with 4”, 5” and 6” widths. The walls can be painted after applying ‘putty’ (poly) on them. Therefore the cost will be reduced by 30 percent than normally constructed walls.

Cement Stabilized Compressed Soil Blocks
These soil cement blocks can be used instead of normal clay bricks.

Hand machines and hydraulic machines can be used to manufacture Cement Stabilized Compressed Soil Blocks and that would ensure the sustainability of walls build using them. There is no need for plastering afterwards. The Chemifix mixture will give a beautiful finish.

Construction of roofs
The roof is one of the most important parts of the house. Normally, timber or concrete would be used to construct the roof. The components used by NERDC’s cost-effective building technology would reduce the usage of timber and the cost involved also would be reduced by 30 percent. The use of NERDC cost-effective building technology to build houses will greatly benefit the social and economic development of the country.
Two new moons to

I've space unmanned at University of Texas, USA. This has been discovered as a moon of Saturn in the future. There are lakes on Titan, the largest moon in the solar system with an atmosphere and it is believed that life could generate on Titan because of the raw material on that moon.

American astronomer Scott S. Sheppard has discovered two Moons of Jupiter and with those two Moons the total number of Moons of Jupiter is 69.

What's new about Astronomy?

An unmanned Space Probe to Titan

- It is believed that unmanned space vehicles could be landed on liquid methane lakes on Titan, the largest moon of Saturn in the future. This has been discovered as a result of a research conducted at University of Texas, USA. The reason for expressing this idea of landing unmanned space ve-

hicles on these lakes is the calm environment prevailing on those lakes as the waves on those lakes rise only up to a very short height of 1 cm. Furthermore, this is the only Moon in the solar system with an atmosphere and it is believed that life could generate on Titan because of the raw material on that moon.

Two new moons to planet Jupiter

- American astronomer Scott S. Sheppard has discovered two Moons of Jupiter and with those two Moons the total number of Moons of Jupiter is 69.

A total solar eclipse can be clearly seen only in a smaller area on Earth. Some countries on the other hand see the same as a partial solar eclipse. A partial solar eclipse can be seen when the sun, the moon and the Earth are a little deviated from a linear position. An annular eclipse will be seen when the moon is far from the Earth and the Moon does not fully cover the Sun. As seen in the Picture 03, the sun will be seen as a ring in the middle of darkness and that is known as an Annular Solar Eclipse. When people from some parts of the Earth watch an annular solar eclipse, in some other areas people will see it as a partial solar eclipse. The recent solar eclipse on 21st August was seen as a total solar eclipse in Northern America and Western Europe while some parts of Asia, South America and some parts of Africa saw a partial solar eclipse. The next solar eclipse will be visible on 2nd July 2019 and will be seen only in South America. But on 26th December 2019, people in Sri Lanka will be able to see the annular solar eclipse very well. This will be seen very clearly in the Trincomalee area and Colombo would witness a partial solar eclipse. Sri Lanka would witness another solar eclipse on 4th November 2070. It has been revealed that human beings will never be able to witness a solar eclipse in the years to come. The moon is annually drifting 3.8 cm apart from the Earth and therefore the moon will not be able to totally cover the sun in the future.

As looking at a solar eclipse would affect sight, it is recommended to use appropriate glasses to observe the same.

01. Total Solar Eclipse
02. Partial Solar Eclipse
03. Annular Solar Eclipse
04. Hybrid Solar Eclipse

Continued from page 02... An Unforgettable Solar Eclipse...
Our Research

- Research on Civil Engineering
- Research on Renewable Energy
- Research on Mechatronics
- Research on Agricultural Engineering and Post-harvest Technology

Our Services

- Introduction of new technology
- Technology transfers
- Consultancy services on NERDC Cost-effective Building Technology
- Provision of Energy Audit Reports
- Consultancy services on environmental management systems for industries
- Industry-related technical assistance
- Coordination of national and international change of technology transfers
- Testing of Solar Panels and other components.
- Consultancy services in electrical and electronic fields
- Provision of training through various training programmes
- Technology Park and Engineering Museum

Our Service Sectors

- Techno Marketing Department
- Technology Incubator
- Energy and Environment Management Centre

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