



# VINAYAKA MISSIONS SIKKIM UNIVERSITY

(A state private University under Act 11 of 2008 of Govt of Sikkim)

NH31-A, TADONG, EAST SIKKIM-737102

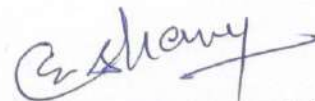
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Phone: 03592-232417/232588

## Half-Yearly Progress Report of Ph.D. Research Scholar

1. Name (in Capital Letters) : **NOMULA VENKATESHAM**
2. Degrees for which, he/she has registered : **PHD PHYSICS**
3. Registration No. with date of registration : **PHD/2017-18/0004**
4. Name of the Supervisor : **Dr. Vipin Kumar**
5. Title of the research project : **A STUDY OF MATHEMATICAL MODELING OF SOLAR ENERGY POTENTIAL AND SOLAR RADIATION MAPPING**
6. Period of Progress Report : **apr-2018 TO oct-2018**
7. Books/journals consulted :  
If more space required, please attach a separate sheet
8. Experimental work done :
9. Field work done, if any :  
If more space required, please attach a separate sheet
10. Percentage of research work completed : **20%**  
(As per your assessment)
11. Whether writing of thesis started? : **YES**
12. Whether presented any Seminar on your Research Work? :
13. Courses, as required passed :
14. Any other matter you may like to report :

Date of submission:



Signature of the Research Scholar

For Supervisor/s

Forwarded with comments

The equations of the r.sun model were utilized to develop software for evaluating the various components of solar irradiation, including direct irradiation, diffuse irradiation, global irradiation, and direct normal irradiation. The software was developed in the C programming language and will assist in determining the solar irradiation of any location. This software will be of great assistance in determining the parameters that must be determined prior to constructing a solar plant, such as the link turbidity factor, solar irradiation, sun shine hours, etc. India's solar atlas was created using the software that was developed. Comparing measured and calculated values for various types of irradiation from 2006 to 2013 served as an additional validation step. From 2006 to 2013, IMD values were regarded as the measured value. The r.sun model devised in this study was used to design a 1 MW solar photovoltaic (PV) and solar thermal power plant for Udaipur. The designed plant's techno-economic performance was also evaluated in terms of LCOE, repayment period, and internal rate of return. This chapter discusses the specific outcomes of mathematical modeling for assessing solar irradiance, the design of solar plants, and the techno-economic evaluation of the designed system.

Vepin Kumar

Signature of the Supervisor

Signature of the HoD

Signature of the Chairman, DC





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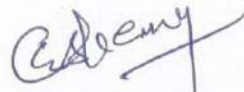
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4. Name of the Supervisor : **Dr. Vipin Kumar**
5. Title of the research project : **A STUDY OF MATHEMATICAL MODELING OF SOLAR ENERGY POTENTIAL AND SOLAR RADIATION MAPPING**
6. Period of Progress Report : **nov-2018 TO may-2019**
7. Books/journals consulted :  
If more space required, please attach a separate sheet
8. Experimental work done :
9. Field work done, if any :  
If more space required, please attach a separate sheet
10. Percentage of research work completed : **40%**  
(As per your assessment)
11. Whether writing of thesis started? : **YES**
12. Whether presented any Seminar on your Research :  
Work?
13. Courses, as required passed :
14. Any other matter you may like to report :

Date of submission:



Signature of the Research Scholar

For Supervisor/s

Forwarded with comments

The primary and fundamental essential for sun powered energy establishments in any spot inside the state is sun based radiation information. Subsequently, inspecting the climatic variables that influence sun oriented radiation on an overall scale is likewise fundamental. In light of varieties in geographic points like scope and longitude as well as other climatic elements like breeze, dust, air temperature, and gaseous tension, the sun powered radiation force at any site shifts over time.

How much sun powered energy that arrives at the world's surface relies upon its area, direction, season of day, season, and air cosmetics . Accordingly, there are enormous transient and spatial varieties in sun oriented radiation. The world's pivot around its own hub, which modifies the place where sun based radiation strikes the surface, causes the diurnal cycle.

Vijay Kumar

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2. Degrees for which, he/she has registered : **PHD PHYSICS**
3. Registration No. with date of registration : **PHD/2017-18/0004**
4. Name of the Supervisor : **Dr. Vipin Kumar**
5. Title of the research project : **A STUDY OF MATHEMATICAL MODELING OF SOLAR ENERGY POTENTIAL AND SOLAR RADIATION MAPPING**
6. Period of Progress Report : **june-2019 TO dec-2019**
7. Books/journals consulted :  
If more space required, please attach a separate sheet
8. Experimental work done :
9. Field work done, if any :  
If more space required, please attach a separate sheet
10. Percentage of research work completed : **60%**  
(As per your assessment)
11. Whether writing of thesis started? : **YES**
12. Whether presented any Seminar on your Research Work? :
13. Courses, as required passed :
14. Any other matter you may like to report :



Date of submission:



Signature of the Research Scholar

For Supervisor/s

Forwarded with comments

A device that monitors how much daylight at a specific region is known as a daylight recorder. The results offer insights regarding a locale's temperature as well as its climate and environment. Notwithstanding different disciplines, meteorology, science, horticulture, and the travel industry all advantage from this information. A heliograph has likewise been utilized to allude to it .

Daylight recorders come in two unique classifications. One sort estimates the daylight estimations involving the sun's own cycle as a time span. The other uses a clock or some likeness thereof as a period scale. More established recorders required a human onlooker to decipher the information since various spectators' translations of the information could contrast. For precise information that isn't reliant upon a human interpreter, present day daylight recorders use gadgets and PCs. Current recorders are additionally fit for estimating diffuse and worldwide radiation .



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### Half-Yearly Progress Report of Ph.D. Research Scholar

1. Name (in Capital Letters) : **NOMULA VENKATESHAM**
2. Degrees for which, he/she has registered : PHD Physics
3. Registration No. with date of registration : **PHD/2017-18/0004**
4. Name of the Supervisor : **Dr. Vipin kumar**
5. Title of the research project : **A STUDY OF MATHEMATICAL MODELING OF SOLAR ENERGY POTENTIAL AND SOLAR RADIATION MAPPING**
6. Period of Progress Report : jan-2020 TO jul-2020
7. Books/journals consulted :  
If more space required, please attach a separate sheet
8. Experimental work done :
9. Field work done, if any :  
If more space required, please attach a separate sheet
10. Percentage of research work completed : 100%  
(As per your assessment)
11. Whether writing of thesis started? : YES
12. Whether presented any Seminar on your Research Work? :
13. Courses, as required passed :
14. Any other matter you may like to report :

Date of submission:



Signature of the Research Scholar

For Supervisor/s

Forwarded with comments

In their report, A. Asnaghi et al. propose building Iran's most memorable public sun based fireplace power plant (SCPP) in the country's focal districts. The DLR Prescription CSP venture's examinations show that Iran can add to the Mediterranean sun oriented power age bind in 2050 to address Europe's issue for power. For the warm and electrical creation of energy for different purposes, Iran's high immediate sun based radiation and available desert regions are qualities that favor the total improvement of sun oriented power plants like sun based fireplace power plants. Iran's middle district, where sun powered radiation and worldwide insolation are fundamentally better compared to in different areas, is the area of concentration. Notwithstanding, 12 unique locales across Iran are considered while surveying SCPP execution and power age.

*Supun Kumar*  
Signature of the Supervisor

Signature of the HoD

Signature of the Chairman, DC