



Department : Pure and Applied Physics		
Academic Year : 2023-24		
Sr. No.	Programme Code	Name of the Programme
01.		B.Sc. Electronics
02.		B.Sc. Physics
03.		M.Sc. Electronics
04.		M.Sc. Physics

Signature and Seal of the Head



**DEPARTMENT OF PURE AND APPLIED PHYSICS**  
**GURU GHASIDAS VISHWAVIDYALAYA, BILASPUR, (C.G.), INDIA**

**CERTIFICATE**

This is to certify that dissertation report on "HIGH-  $T_c$  SUPERCONDUCTIVITY" is an authentic record of study reviewed by Aakash Verma, a student of B.Sc. Physics VI semester, Department of Pure and Applied Physics of this university.

**Dr. H. S. TEWARI**

**Email: tewari.hs@gmail.com**

**Department Of Pure & Applied Physics**

**Date: 08-05-2024**

**Sign: [Signature]**

**Place: Bilaspur**

## DECLARATION

I hereby declare that the study of the dissertation report entitled "HIGH-  $T_c$  SUPERCONDUCTIVITY" submitted in partial fulfilment of B.Sc. Physics Hons. was carried out by me at Department of Pure and Applied Physics, Guru Ghasidas Vishwavidyalaya Koni, Bilaspur (C.G.).

The information presented in this dissertation report including data, figures & pictures is a review work. If any discrepancy, mistake and plagiarism is found in this report, the responsibility for the same will be solely mine.

*whishipatu*

AAKASH VERMA

B.Sc. Physics Hons. VI SEM.

Roll. No.: 21109101

Guru Ghasidas Vishwavidyalaya

Sign: Aakash

विभागाध्यक्ष/H.O.D.  
शुद्ध एवं अनुन्युक्त भौतिकी विभाग  
Dept. of Pure & Applied Physics  
गुरु गणेशदास विश्वविद्यालय  
Guru Ghasidas Vishwavidyalaya  
कोनी (छ.ग.)/Bilaspur (C.G.)

Date: 08-05-2024

Place: Bilaspur

# ENERGY STORAGE DEVICE: SUPERCAPACITOR



DEPARTMENT OF PURE AND APPLIED PHYSICS  
GURU GHASIDAS VISHWAVIDYALAYA, BILASPUR (C.G)

A

Project dissertation submitted

In partial fulfillment of the requirement for the degree of  
Bachelor of Science Honors in Physics  
(Session 2023-24)

Submitted By:

**Aastha Sahu**

Enrollment Number: GGV/21/07602

Roll No.: 21109102

Under the Supervision of:

**Dr. H. S. TEWARI**

Professor

Department of Pure and Applied Physics





**Department of Pure & Applied Physics**

**Guru Ghasidas Vishwavidyalaya, Bilaspur (C.G.), India**

(A Central University Established by the Central Universities Act 2009 No. 25 of 2009)

## **CERTIFICATE**

This is to certify that the project dissertation entitled as "ENERGY STORAGE DEVICE: SUPERCAPACITOR submitted by **Aastha Sahu** Department of Pure and Applied Physics, Guru Ghasidas Vishwavidyalaya, Bilaspur (C.G.) for the partial fulfillment for the requirement of the degree of Bachelor of Science Honors in Physics is an original work carried out by her under my supervision and guidance.

To the best of my knowledge, the matter embodied in the project dissertation has not been submitted to any other University/ Institute for award of any Degree.

Date: 08/05/2024

Place: Bilaspur

  
**Dr. H. S. Tewari**

Professor

Department of Pure and Applied Physics



**Department of Pure & Applied Physics**

**Guru Ghasidas Vishwavidyalaya, Bilaspur (C.G.), India**

(A Central University Established by the Central Universities Act 2009 No. 25 of 2009)

## **CERTIFICATE**

This is to certify that Aastha Sahu has carried out the project in the department of Pure and Applied Physics, Guru Ghasidas University, Bilaspur (C.G.). On the topic "ENERGY STORAGE DEVICE: SUPERCAPACITOR". This report is submitted for partial fulfillment of the requirement for the degree of B.Sc. in Physics and for Examiner's evaluation.

I wish every success in her life.

Date: .....

Place: Bilaspur

*M. N. Tripathi*

**Dr. M. N. Tripathi**

Head of the Department

Department of Pure and Applied Physics

विभागाध्यक्ष/H.O.D.  
शुद्ध एवं अनुप्रयुक्त भौतिकी विभाग  
Dept. of Pure & Applied Physics  
गुरु घासीदास विश्वविद्यालय  
Guru Ghasidas Vishwavidyalaya  
बिलासपुर (छ.ग.)/Bilaspur (C.G.)



**STUDY ON SUPERCAPACITORS: IT'S ADVANCEMENT  
BASED ON PAPER BASED SCs**

**DISSERTATION REPORT**



**GURU GHASIDAS VISHWAVIDYALAYA, BILASPUR (C.G)**

(A Central University Established By Central University Act 2009 No. 25 Of 2009)

**BY**

**ABHAY SHUKLA**

**Roll. No: 21109103**

**Enrollment No: GGV/21/07603**

**B.SC. 6<sup>TH</sup> SEM PHYSICS**

**Under the Supervision of**

**PROF. M.N. TRIPATHI**

**(Professor & Head)**

**Department of Pure and Applied Physics  
Guru Ghasidas Vishwavidyalaya, Bilaspur  
(C.G.), 495009, India**

**SESSION: 2023-24**



DEPARTMENT OF PURE AND APPLIED PHYSICS  
GURU GHASIDAS VISHWAVIDYALAYA, BILASPUR (C.G.)

**CERTIFICATE**

This is to certify that dissertation report on “REVIEW ON SUPERCAPACITORS: IT’S ADVANCEMENT BASED ON PAPER-BASED SUPERCAPACITOR” is an authentic record of study reviewed by **ABHAY SHUKLA**, a student of B.Sc. 6<sup>TH</sup> SEM PHYSICS, Department of Pure and Applied Physics of this university.

*mntripathi*

**DR. M.N. TRIPATHI**

Head Of Department

[DEPARTMENT OF PURE AND APPLIED PHYSICS]

**Email:** mntripathi.physics@gmail.com

**Contact No:** +91 9981401993

Date: 08/05/24

Signature: \_\_\_\_\_

*mntripathi*

Place: Bilaspur

विभागाध्यक्ष/H.O.D.  
शुद्ध एवं अनुप्रयुक्त भौतिकी विभाग  
Dept. of Pure & Applied Physics  
गुरु घासीदास विश्वविद्यालय  
Guru Ghasidas Vishwavidyalaya  
बिलासपुर (छ.ग.)/Bilaspur (C.G.)



## DECLARATION

I hereby declare that the study of the dissertation report entitled "REVIEW ON SUPERCAPACITORS: IT'S ADVANCEMENT BASED ON PAPER BASED SUPERCAPACITOR" submitted in partial fulfilment of B.Sc. Physics Hons. 6<sup>TH</sup> SEM was carried out by me at Department of Pure and Applied Physics, Guru Ghasidas Vishwavidyalaya Koni, Bilaspur (C.G.).

The information presented in this dissertation report including data, figures & pictures is a review work. If any discrepancy, mistake and plagiarism is found in this report, the responsibility for the same will be solely mine.

**ABHAY SHUKLA**

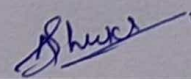
B.Sc. PHYSICS 6<sup>TH</sup> SEM

ROLL No: 21109103

ENROLLMENT No: GGV/21/07603

GURU GHASIDAS VISHWAVIDYALAYA

SIGNATURE: \_\_\_\_\_



Date : 08/05/24

Place: Bilaspur



गुरु घासीदास विश्वविद्यालय, बिलासपुर  
**Guru Ghasidas Vishwavidyalaya, Bilaspur**

A Central University established by the Central Universities Act 2009 No. 25 of 2009

**CERTIFICATE OF THE GUIDE**

This is to certify that Abhishek Singh Sidar a student of Bachelor of Science in Physics Honours (6th Semester, Enrollment No. GGV/21/07604), Department of Pure and Applied Physics, Guru Ghasidas Central University Bilaspur (C.G.) has successfully completed his project entitled **"IMAGING X-RAY POLARIMETRY EXPLORER"** under my guidance and supervision for the award of the Degree of **Bachelor of Science in Physics (Hons.)**.

This project is original, as it has not previously formed the basis for the award of any other degree.

(Signature of the Guide)

Prof. Parijat Thakur

Professor

(Dept. Pure and Applied Physics)

A  
PROJECT ON  
**THERMOELECTRIC GENERATOR**

Submitted In Partial Fulfilment Of The Requirements For The

Award Of The Degree Of B.Sc.

"Bachelor Of Science In Physics (Honors)"

Submitted By:

**AMAN MEHRA**

Roll No. – 21109105

Enrollment No. – GGV/21/07605

UNDER THE GUIDANCE OF:

**Prof. DR. K.N. SINGH**

(Professor of Department of Pure and Applied Physics)

Guru Ghasidas Central University, Bilaspur (C.G.)



DEPARTMENT OF PURE AND APPLIED PHYSICS

**GURU GHASIDAS VISHWAVIDYALAYA, BILASPUR (C.G.)**

(A Central University Established by Central University Act, 2009 No 25 of 2009)

(Session 2023-24)





गुरु घासीदास विश्वविद्यालय, बिलासपुर  
Guru Ghasidas Vishwavidyalaya, Bilaspur

A Central University established by the Central Universities Act 2009 No. 25 of 2009

### **CERTIFICATE OF APPROVAL**

This is to certify that **AMAN MEHRA** of B.Sc. 6th semester at Department of Pure and Applied Physics of Guru Ghasidas Vishwavidyalaya, Bilaspur (C.G.) bearing Roll no. 21109105, Enrollment no. GGV/21/07605 has developed project work entitled

### **"THERMOELECTRIC GENERATOR"**

is hereby approved as a credible work for the award of the degree of  
**Bachelor of Science in Physics (Hons.)**

**Prof. M.N. TRIPATHI**

Head of the Department

Department of Pure and Applied Physics

GGV, Bilaspur (C.G.)





गुरु घासीदास विश्वविद्यालय, बिलासपुर  
Guru Ghasidas Vishwavidyalaya, Bilaspur

A Central University established by the Central Universities Act 2009 No. 25 of 2009

**CERTIFICATE FROM THE EXAMINER**

This is to certified that the project work entitled "**THERMOELECTRIC GENERATOR**" submitted by Aman Mehra has complete dunder the guidance of Prof.DR. K.N SINGH, Department of Pure and Applied Physics, GGV Bilaspur (C.G.) has been examined by the undersigned as a part of the examination for the award of the **B.Sc. Physics Hons.** (Bachelor of Science in Physics honours) Degree in Department of "Pure and Applied Physics" in **Guru Ghasidas Central University, Koni, Bilaspur (C.G.)**.

Date :

---

Examiner

Aman Mehra

Pure and Applied Physics



**गुरु घासीदास विश्वविद्यालय, बिलासपुर**  
**Guru Ghasidas Vishwavidyalaya, Bilaspur**

A Central University established by the Central Universities Act 2009 No. 25 of 2009

**CERTIFICATE OF THE GUIDE**

This is to certify that Aman Mehra a student of Bachelor of Science in Physics Honours (6th Semester, Enrollment No. GGV/21/07605), Department of Pure and Applied Physics, Guru Ghasidas Central University Bilaspur (C.G.) has successfully completed his project entitled "THERMOELECTRIC GENERATOR" under my guidance and supervision for the award of the Degree of **Bachelor of Science in Physics (Hons.)**.

This project is original, as it has not previously formed the basis for the award of any other degree.

---

(Signature of the Guide)

**Prof.DR. K.N. SINGH**

Professor

(Dept. Pure and Applied Physics)

**SUPERCAPACITORS BASED ON 1D**  
**NANOMATERIALS**

**A**

**Project Dissertation submitted**

**In partial fulfilment of the requirement for the degree of**

**Bachelor of Science (B.Sc.) Honours in Physics**

**Supervisor**

**Dr. ARUN KUMAR SINGH**

**(Associate Professor )**

**Submitted by**

**ANSHITA AGRAHARI**

**B.Sc. Physics Hons VI Sem.**

**Roll no. 21109107**



**Department of Pure and Applied Physics,  
Guru Ghasidas Vishwavidyalaya, Bilaspur (C.G.),  
India**

**Session: 2023-2024**





Department of Pure & Applied Physics  
Guru Ghasidas Vishwavidyalaya, Bilaspur (C.G.), India  
(A Central University Established by the Central Universities Act 2009 No. 25 of 2009)

## CERTIFICATE

This is to certify that the project dissertation entitled as **“SUPERCAPACITORS BASED ON 1D NANOMATERIALS”** submitted by Miss Anshita Agrahari Department of Pure and Applied Physics, Guru Ghasidas Vishwavidyalaya, Bilaspur (C.G.) for the partial fulfilment of the requirement for the degree of Bachelor of Science in Physics is an original work carried out by her under my supervision and guidance.

To the best of my knowledge, the matter embodied in the project dissertation has not been submitted to any other University/ Institute for the award of any Degree or Diploma.

DATE .....

*Arun Kumar Singh*  
08/05/2024  
**DR. Arun Kumar Singh**  
Associate Professor  
Department of pure and  
applied physics





**Department of Pure & Applied Physics**  
**Guru Ghasidas Vishwavidyalaya, Bilaspur (C.G.), India**  
(A Central University Established by the Central Universities Act 2009 No.25 of 2009)

## **CERTIFICATE**

This is to certify that Anshita Agrahari has carried out the project in the department of Pure and Applied Physics, Guru Ghasidas University, Bilaspur (C.G.). On the topic “**Supercapacitors based on 1D Nanomaterials**”. This report is submitted for partial fulfillment of the requirement for the degree of B.Sc. in Physics and for Examiner’s evaluation.

I wish every success in his life.

Date: .....

Place: Bilaspur

**Dr. M.N. Tripathi**  
Head of the Department  
Department Of Pure and Applied Physics

विभागाध्यक्ष / H.O.D.  
शुद्ध एवं अनुप्रयुक्त भौतिकी विभाग  
Dept. of Pure & Applied Physics  
गुरु घासीदास विश्वविद्यालय  
Guru Ghasidas Vishwavidyalaya  
बिलासपुर (छ.ग.) / Bilaspur (C.G.)

# **UNDERSTANDING THE BANDGAP OF NANOMATERIALS**

## **Dissertation Report**

Submitted for partial fulfilment of the degree of

**B.Sc. Physics Honours**



**GURU GHASIDAS VISWAVIDYALAYA, BILASPUR (C.G.)**

(A Central university established by Central University Act 2009 No. 25 of 2009)

BY

**ANURAG KUMAR RATHOUR**

**Roll. No. 21109108**

**Enrolment No. GGV/21/07608**

Under the Supervision of

**Dr. JAI SINGH**

**(Associate Professor)**

**Department of Pure and Applied Physics**

**The School of Studies of Physical Sciences**

**Guru Ghasidas Vishwavidyalaya, Bilaspur (C.G.), 495009, India**



## **GURU GHASIDAS VISWAVIDYALAYA, BILASPUR (C.G.)**

(A Central university established by Central University Act 2009 No. 25 of 2009)

### **CERTIFICATE**

This is to certify that dissertation report on **UNDERSTANDING THE BANDGAP OF NANOMATERIALS** an authentic record of study reviewed by ANURAG KUMAR RATHOUR a student of B.Sc. Physics VI semester, Department of Pure and Applied Physics of this university.

**Dr. M.N. Tripathi**

**Email:** mntripathi.physics@gmail.com

Professor and Head of Department

**Mobile No:** +91 9981401993

Department of Pure and Applied Physics

Guru Ghasidas Vishwavidyalaya

विभागाध्यक्ष/H.O.D.  
शुद्ध एवं अनुप्रयुक्त भौतिकी विभाग  
Dept. of Pure & Applied Physics  
गुरु घासीदास विश्वविद्यालय  
Guru Ghasidas Vishwavidyalaya  
बिलासपुर (छ.ग.)/Bilaspur (C.G.)

Date: 08/05/24

Sign: \_\_\_\_\_

Place: Bilaspur





**DEPARTMENT OF PURE AND APPLIED PHYSICS**  
**GURU GHASIDAS VISHWAVIDYALAYA, BILASPUR, (C.G.)**

**CERTIFICATE**

This is to certify that dissertation report on “**Mid Infrared Quantum Cascade Lasers**” is an authentic record of study reviewed by Aradhana Baghel, a student of B.Sc. Physics VI semester, Department of Pure and Applied Physics of this University.

**Dr. M.N. Tripatathi**

**Email:** [mntripathi.physcs@gmail.com](mailto:mntripathi.physcs@gmail.com)

Professor and Head of Department.

**Mobile:** +919981401993

Department of Pure and Applied Physics

**Date:** \_\_\_\_\_

**Sign:** mntripathi

**Place:** Bilaspur

विभागाध्यक्ष/H.O.D.  
शुद्ध एवं अनुप्रयुक्त भौतिकी विभाग  
Dept. of Pure & Applied Physics  
गुरु घासीदास विश्वविद्यालय  
Guru Ghasidas Vishwavidyalaya  
बिलासपुर (छ.ग.)/Bilaspur (C.G.)





DEPARTMENT OF PURE AND APPLIED PHYSICS  
GURU GHASIDAS VISHWAVIDYALAYA,  
BILASPUR, (C.G)

**CERTIFICATE**

This is to certify that dissertation report on "[Mid Infrared Quantum Cascade Laser](#)" is an authentic record of study reviewed by Aradhana Baghel, a student of B.Sc. Physics VI semester, Department of Pure and Applied Physics of this university.

**Dr.Rajesh Sharma**

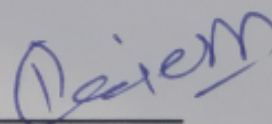
Associate Professor

**Email:** sharmarajesh1234@gmail.com

Department of Pure and Applied Physics

**Mobile:**+91 8894118606

**Date:** 8/5/24

**Sign:** 

**Place:** Bilaspur

# **STUDY ON MULTIFERROIC MATERIALS**

## **Dissertation Report**

Submitted for partial fulfilment of the degree of

**B.Sc. Physics Honours**



**GURU GHASIDAS VISWAVIDYALAYA, BILASPUR (C.G.)**

(A Central university established by Central University Act 2009 No. 25 of 2009)

By

**Asma Sao**

**Roll. No. 21109110**

**Enrollment No. GGV/21/07610**

Under the Supervision of

**Dr. T.G. Reddy**

**(Assistant Professor)**

**Department of Pure and Applied Physics**

**The School of Studies of Physical Science**

**Guru Ghasidas Vishwavidyalaya, Bilaspur**

**(C.G.), 495009, India**

**Session 2023-2024**





**DEPARTMENT OF PURE AND APPLIED PHYSICS**  
**GURU GHASIDAS VISHWAVIDYALAYA, BILASPUR, (C.G.), INDIA**

**CERTIFICATE**

This is to certify that dissertation report on "Study on Multiferroic Materials" is an authentic record of study reviewed by Asma Sao, a student of B.Sc. Physics VI semester, Department of Pure and Applied Physics of this university.

*mntripathi*

**Dr. M.N. Tripathi**

Professor and Head of Department  
Department of Pure and Applied Physics

Gmail: mntripathi.physics@gmail.com

Mobile Number:-91 9981401993

Date: \_\_\_\_\_

Place: Bilaspur

Sign: \_\_\_\_\_

विभागाध्यक्ष/H.O.D.  
शुद्ध एवं अनुप्रयुक्त भौतिकी विभाग  
Dept. of Pure & Applied Physics  
गुरु घासीदास विश्वविद्यालय  
Guru Ghasidas Vishwavidyalaya  
बिलासपुर (छ.ग.)/Bilaspur (C.G.)





**DEPARTMENT OF PURE AND APPLIED PHYSICS**  
**GURU GHASIDAS VISHWAVIDYALAYA, BILASPUR, (C.G.), INDIA**

**CERTIFICATE**

This is to certify that dissertation report on "Study on Multiferroic Materials" is an authentic record of study reviewed by Asma Sao, a student of B.Sc. Physics VI semester, Department of Pure and Applied Physics of this university.

**Dr. T.G. Reddy**

Associate Professor

Department of Pure and Applied Physics

Gmail: dr.tgreddy@gmail.com

Mobile no: 91 8963901321

Date:

08/05/2024

Sign:

Place: Bilaspur



**DEPARTMENT OF PURE AND APPLIED PHYSICS**  
**GURU GHASIDAS VISHWAVIDYALAYA, BILASPUR,(C.G.) INDIA**

**CERTIFICATE**

This is to certify that dissertation report on “**Hydrogen Production Via Water Splitting By Photocatalysis** ” is an authentic record of study reviewed by Bhishma Patel, a student of B.Sc. Physics VI semester, Department of Pure and Applied Physics of this university.

**Dr. R. K. Pandey**

Assistant Professor

Department of Pure and Applied Physics

MobileNo:+917909988117

Email: rkpandeyggv@gmail.com

Date:

8/5/2024

Sign:

Place: Bilaspur





DEPARTMENT OF PURE AND APPLIED PHYSICS  
GURU GHASIDAS VISHWAVIDYALAYA, BILASPUR, (C.G.), INDIA

**CERTIFICATE**

This is to certify that dissertation report on "FUTURE OF NANOPHYSICS AND CASE STUDY OF NEW RESEARCH UNVEILS GRAPHENE 'MOTH EYES' TO POWER FUTURE SMART TECHNOLOGIES" is an authentic record of study reviewed by Bhumika Singh Rathore, a student of B.Sc. Physics VI semester, Department of Pure and Applied Physics of this university.

**Dr. M P Sharma**

Assistant Professor

Department of Pure and Applied Physics

Email: mps.phy@gmail.com

Mobile No: +91-9479039965

Date: 08/05/2024

Sign: 

Place: Bilaspur





DEPARTMENT OF PURE AND APPLIED PHYSICS  
GURU GHASIDAS VISHWAVIDYALAYA, BILASPUR, (C.G.), INDIA

**CERTIFICATE**

This is to certify that dissertation report on "FUTURE OF NANOPHYSICS AND A CASE STUDY OF NEW RESEARCH UNVEILS GRAPHENE 'MOTH EYES' TO POWER FUTURE SMART TECHNOLOGIES" is an authentic record of study reviewed by Bhumika Singh Rathore, a student of B.Sc. Physics VI semester, Department of Pure and Applied Physics of this university.

*M.N. Tripathi*

**Prof. M.N. Tripathi**

Professor and Head of Department  
Department of Pure and Applied Physics

Email: mntripathi.physics@gmail.com

Mobile No: +91 9981401993

Date: \_\_\_\_\_

Place: Bilaspur

Sign: \_\_\_\_\_

विभागाध्यक्ष/H.O.D.  
शुद्ध एवं अनुप्रयुक्त भौतिकी विभाग  
Dept. of Pure & Applied Physics  
गुरु घासीदास विश्वविद्यालय  
Guru Ghasidas Vishwavidyalaya  
बिलासपुर (छ.ग.) / Bilaspur (C.G.)



### **Certificate from supervisor**

This is to be certify that the report entitled “**The approximation of graphene structure using Tight Binding Method**” carried out by **Bhupendra Kumar Azad** of **Department of Pure and Applied Physics, Guru Ghasidas Vishwavidyalaya, Bilaspur**, for the partial fulfillment of requirements for the degree **Bachelor of Science in Physics** at **GGV Bilaspur** is absolutely carried out by him under my supervision and guidance.

To best of our knowledge, these results have not been submitted by him for the award of any other degree of diploma.

**Dr. P. Rambabu**

Assistant Professor

Department of Pure and Applied Physics

**Guru Ghasidas Vishwavidyalaya, Bilaspur (C.G)**



## **Approval Certificate**

This is to certify that the report entitled “**The approximation of graphene structure using Tight Binding Method**” by **Bhupendra Kumar Azad** is approved for the degree of B.Sc. in Physics.

### **Examiner**

**Dr. M. N. Tripathi**

Head of department

**Department of Pure and Applied Physics,**

**Guru Ghasidas Vishwavidyalaya,**

**Bilaspur (C.G.) , 495009**



## CERTIFICATE

This is to certify that the project entitled **THEORETICAL STUDY ON HEAT CAPACITY** submitted by **CHANCHAL RATRE** in the partial fulfilment for the requirements for the award of Bachelor of Science Degree in Physics at department of Physics, Guru Ghasidas Vishwavidyalaya, Koni, Bilaspur (C.G.) is an authentic work carried out by her under my supervision and guidance.

Date: .....

Supervisor 

**DR. PRADIP DAS**

Department of Physics

**DR. M. N. Tripathi**

Department of Physics

# **PHOTOVOLTAIC CELL FOR SPACE APPLICATIONS**

## **Dissertation Report**

Submitted for partial fulfilment of the degree of

**B.Sc. Physics Honours**



**GURU GHASIDAS VISWAVIDYALAYA, BILASPUR (C.G.)**

(A Central university established by Central University Act 2009 No. 25 of 2009)

BY

**CHANDRASHEKHAR DEWANGAN**

**Roll. No. 21109115**

**Enrolment No. GGV/21/07615**

Under the Supervision of

**Dr. SHIV POOJAN PATEL**

**(Assistant Professor)**

**Department of Pure and Applied Physics**

**The School of Studies of Physical Science**

**Guru Ghasidas Vishwavidyalaya, Bilaspur**

**(C.G.), 495009, India**

**Session 2023-2024**



**DEPARTMENT OF PURE AND APPLIED PHYSICS  
GURU GHASIDAS VISHWAVIDYALAYA, BILASPUR, (C.G.), INDIA**

**CERTIFICATE**

This is to certify that dissertation report on **"PHOTOVOLTAIC CELL FOR SPACE APPLICATIONS"** is an authentic record of study reviewed by Chandrashekhar Dewangan, a student of B.Sc. Physics VI semester, Department of Pure and Applied Physics of this university.

*M.N. Tripathi*

**Dr. M.N. Tripathi**

Professor and Head of Department

Department of Pure and Applied Physics

Guru Ghasidas Vishwavidyalaya

**Email:** mntripathi.physics@gmail.com

**Mobile No:** +91 9981401993

Date: \_\_\_\_\_

Place: Bilaspur

विभागाध्यक्ष/H.O.D.  
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Dept. of Pure & Applied Physics  
गुरु घासीदास विश्वविद्यालय  
Guru Ghasidas Vishwavidyalaya  
बिलासपुर (छ.ग.)/Bilaspur (C.G.)

Sign: \_\_\_\_\_





**DEPARTMENT OF PURE AND APPLIED PHYSICS  
GURU GHASIDAS VISHWAVIDYALAYA, BILASPUR, (C.G.), INDIA**

**CERTIFICATE**

This is to certify that dissertation report on **“PHOTOVOLTAIC CELL FOR SPACE APPLICATIONS”** is an authentic record of study reviewed by Chandrashekhar Dewangan, a student of B.Sc. Physics VI semester, Department of Pure and Applied Physics of this university.

**Dr. SHIV POOJAN PATEL**

Assistant Professor

Department of Pure and Applied Physics

Guru Ghasidas Vishwavidyalaya

**Email:** shivpoojanbhola@gmail.com

**Mobile No:** +91 9479246120

Date: 10-05-2024

Sign: Shiv Poojan Patel

Place: Bilaspur

**A PRPJECT REPORT ON  
FOUR POINTS MAGNETIC STIRRER WITH  
HOTPLATE**

SUBMITTED FOR PARTIAL FULFILMENT FOR THE AWARD OF  
DEGREE OF

BACHELOR OF SCIENCE IN PHYSICS (HONOURS)

BY

DHARAMPAL RATHIA

BSC. PHYSICS (HONS.)

ENROLLMENT NO. GGV/21/07617

Under the Supervision of

**Dr. DINESH UTHRA**

Assistant Professor

Department of Pure & Applied Physics



Department of Pure and Applied Physics  
GURU GHASIDAS VISHWAVIDYALAYA BILASPUR  
(C.G.), INDIA - 495009

(SESION 2021 – 2024)




**DEPARTMENT OF PURE AND APPLIED PHYSICS**

**GURU GHASIDAS VISHWAVIDYALAYA, BILASPUR, (C.G.), INDIA**

**CERTIFICATE**

This is to certify that Dharampal Rathia a student of Bachelor of Science in Physics Hono.VI Semester, Enrollment No. GGV/21/0761 **Department of Pure and Applied Physics, Guru Ghasidas Central University Bilaspur (C.G.)** has successfully completed his project entitled **"FOUR POINTS MAGNETIC STIRRER WITH HOT PLATE"** under my guidance and supervision for the award of the Degree of **Bachelor of Science in Physics (Hons.)**.

This project is original, as it has not previously formed the basis for the award of any other degree.

  
Dr. DINESH UTHRA  
Assistant Professor-Physics  
Department of Pure and Applied Physics  
Mobile No: + 91 9406354309  
Email: dkuthra@rediffmail.com





**DEPARTMENT OF PURE AND APPLIED PHYSICS**

**GURU GHASIDAS VISHWAVIDYALAYA, BILASPUR, (C.G.), INDIA**

**CERTIFICATE**

This is to certify that Project report on “**A MAGNETIC STIRRER WITH HOT PLATE**” is an authentic record of study reviewed by Dharampal Rathia, a student of B.Sc. Physics VI Semester, Department of Pure and Applied Physics of this university.

Dr. M.N. TRIPATHI

Professor and Head of The Department  
Department of Pure and Applied Physics

Mobile No: +91 9981401993

Email: [ommadhav27@gmail.com](mailto:ommadhav27@gmail.com)

## DECLARATION

I hereby declare that the study of the project report entitled "FOUR POINTS MAGNETIC STIRRER WITH HOT PLATE" submitted in partial fulfilment of B.Sc. Physics Hons. was carried out by me at Department of Pure and Applied Physics, Guru Ghasidas Vishwavidyalaya Koni, Bilaspur (C.G.).

The information presented in this dissertation report including data, figures & pictures is a review work. If any discrepancy, mistake and plagiarism is found in this report, the responsibility for the same will be solely mine.

*whinipatu*

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शुद्ध एवं अनुप्रयुक्त भौतिकी विभाग  
Dept. of Pure & Applied Physics  
गुरु घासीदास विश्वविद्यालय  
Guru Ghasidas Vishwavidyalaya  
बिलासपुर (उ.प्र.)/Bilaspur (C.G.)

*धरमपाल*  
8/5/24  
DHARAMPAL RATHIA

BSc. Physics (Hons.) VI Semester

Roll. No. 21109117

Enrollment No. GGV/21/07617

Department of Pure and Applied Physics

# **SUPERCONDUCTIVITY**

A

Project report submitted  
in partial fulfillment for the degree of  
**BACHELOR OF SCIENCE IN PHYSICS**

By

**Diksha Beck**

ROLL NO. :21109117

ENROLLMENT NO. : GGV/21/07617

SESSION: 2021-2024

Under the guidance

Of

**Dr. Alka Singh**



**Department of Pure and Applied Physics**

**GURU GHASIDAS VISHWAVIDYALAY**

**BILASPUR- 495009 (C.G.), INDIA**

**May, 2024**




## CERTIFICATE FROM THE SUPERVISOR



This is to certify that the report entitled **“SUPERCONDUCTIVITY”** carried out by Diksha Beck, of Department of Pure and Applied Physics, Bilaspur, for the partial fulfillment of the requirements for the degree of BACHELOR OF SCIENCE IN PHYSICS, at GGV, Bilaspur, is absolutely carried out by her under my supervision and guidance.

To the best of our knowledge, these have not been submitted by her for the award of any other degree or diploma.

  
Dr. Alka Singh

Department of Pure and Applied Physics  
GURU GHASIDAS VISHWAVIDYALAYA  
Bilaspur (C.G.), 495009, INDIA

## APPROVAL CERTIFICATE

This is to certify that the report entitled "Superconductivity" by Diksha, is approved for the degree of B.Sc. in Physics.

*M.N. Tripathi*

Prof. M.N. Tripathi

Head of the department

Department of Pure and Applied Physics,

GURU GHASIDAS VISHWAVIDYALAY,

BILASPUR- 495009 (C.G.), INDIA

पाठ्यक्रम/हो.द.  
विश्वविद्यालय  
विभाग: शुद्ध एवं प्रयुक्त भौतिकी  
गुरु गhasिदास विश्वविद्यालय  
(C.G.)





Department of Pure & Applied Physics  
Guru Ghasidas Vishwavidyalaya, Bilaspur (C.G.),  
India

(A central University Established by the Central Universities Act 2009 No. 25 of 2009)

This is to certify that Mr . Fani has carried out the project in the department of Pure and Applied Physics, Guru Ghasidas Vishwavidyalaya, Bilaspur (C.G) on the topic "REVIEW ON CARBON NANOTUBES". This report is submitted for partial fulfilment of the requirement for the degree of B.Sc. in physics and for Examiner's evaluation.

I wish every success in his life.

A handwritten signature in purple ink, which appears to read "M.N. Tripathi".

Prof. M.N. Tripathi  
Head of Department

Department of Pure and Applied Physics

विभागाध्यक्ष/H.O.D.  
शुद्ध एवं अनुप्रयुक्त भौतिकी विभाग  
Dept. of Pure & Applied Physics  
गुरु घासीदास विश्वविद्यालय  
Guru Ghasidas Vishwavidyalaya  
बिलासपुर (छ.ग.)/Bilaspur (C.G.)



**A THEORETICAL STUDY ON**  
**CYCLIC VOLTAMMETRY**

**Dissertation Report**

Submitted for partial fulfilment of the degree of

**B.Sc. Physics Honours**



**GURU GHASIDASS VISWAVIDYALAYA, BILASPUR (C.G)**

**BY**

**FIZA BANO**

**Roll. No 21109121**

**Enrolment No. GGV/21/07621**

Under the supervision of

**DR. R. Vijaya KUMAR**

**(Assistant Professor)**

**Department of Pure and Applied Physics**



## CERTIFICATE

This is to certify that the project entitled **THEORETICAL STUDY ON CYCLIC VOLTAMMETRY** submitted by **FIZA BANOO** in the partial fulfilment for the requirements for the award of Bachelor of science Degree in Physics at department of Physics, Guru Ghasidas Vishwavidyalaya, Koni, Bilaspur (C.G.) is an authentic work carried out by her under my supervision and guidance.

Date: 08/05/24

Supervisor *R. Vijaya Kumar*

**DR. R. Vijaya KUMAR**

*M. N. Tripathi*

**DR. M. N Tripathi**

Department of physics

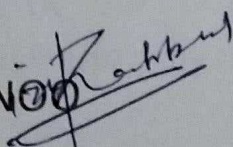
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Dept. of Pure & Applied Physics  
गुरु घासीदास विश्वविद्यालय  
Guru Ghasidas Vishwavidyalaya  
बिलासपुर (छ.ग.)/Bilaspur (C.G.)



## DECLARATION

I **FIZA BANOO**, do here by declare that the work presented in the project entitled **THEORETICAL STUDY ON CYCLIC VOLTAMMETRY** submitted to the partial fulfilment of Bachelor of Science in Physics has been performed in the Department of Physics, Guru Ghasidas Vishwavidyalaya Koni, Bilaspur (C.G.), 495009, India, under the Guidance of DR. R.V. KUMAR is truly carried out by me.

Date: 08/05/2024

FIZA BANOO 

B.Sc. (PHYSICS)

ROLL NO – 21109121

ENROLL. NO- GGV/21/0762



A  
PROJECT ON  
**"Self Avoiding Random Walk"**

Submitted In Partial Fulfilment Of The Requirements For The

Award Of The Degree Of B.Sc.

"Bachelor Of Science In Physics (Honors)"

**Submitted By:**

**Gajendra Singh Sidar**

Roll No. – 21109122

Enrollment No. – GGV/21/07622

**UNDER THE GUIDANCE OF:**

**Dr. Awadhesh K. Dubey**

(Assistant Professor of Department of Pure and Applied Physics)

Guru Ghasidas Central University, Bilaspur (C.G.)



DEPARTMENT OF PURE AND APPLIED PHYSICS

**GURU GHASIDAS VISHWAVIDYALAYA, BILASPUR (C.G.)**

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(Session 2023-24)



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Guru Ghasidas Vishwavidyalaya, Bilaspur

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**CERTIFICATE OF APPROVAL**

This is to certify that **Gajendra Singh Sidar** of B.Sc. 6th semester at Department of Pure and Applied Physics of Guru Ghasidas Vishwavidyalaya, Bilaspur (C.G.) bearing Roll no. 21109122, Enrollment no. GGV/21/07622 has developed project work entitled

**“Self Avoiding Random Walk”**

is hereby approved as a credible work for the award of the degree of **Bachelor of Science in Physics (Hons.)**

**Prof. M.N. TRIPATHI**

Head of the Department

Department of Pure and Applied Physics

GGV, Bilaspur (C.G.)

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Dept. of Pure & Applied Physics  
गुरु घासीदास विश्वविद्यालय  
Guru Ghasidas Vishwavidyalaya  
बिलासपुर (छ.ग.)/Bilaspur (C.G.)

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Guru Ghasidas Vishwavidyalaya, Bilaspur

A Central University established by the Central Universities Act 2009 No. 25 of 2009

**CERTIFICATE OF THE GUIDE**

This is to certify that Gajendra Singh Sidar a student of Bachelor of Science in Physics Honours (6th Semester, Enrollment No. GGV/21/07622), **Department of Pure and Applied Physics, Guru Ghasidas Central University Bilaspur (C.G.)** has successfully completed her project entitled **"Self Avoiding Random Walk"** under my guidance and supervision for the award of the Degree of **Bachelor of Science in Physics (Hons.)**.

This project is original, as it has not previously formed the basis for the award of any other degree.

Date - 08/05/24

(Signature of the Guide)

Dr. Awadhesh K. Dubey  
Assistant Professor

(Dept. Pure and Applied Physics)



# **Low Light Level Photo Detectors**

Dissertation Report

Submitted for partial fulfilment of the degree of  
**B.Sc. Physics Honours**



**GURU GHASIDAS VISWAVIDYALAYA, BILASPUR (C.G.)**  
(A Central university established by Central University Act 2009 No. 25 of 2009)

BY

**Gokul Singh**

Roll. No. 21109123

Enrollment No. GGV/21/07623

Under the Supervision of

**Dr. Suchita**

(Assistant Professor)

**Department of Pure and Applied Physics**

The School of Studies of Physical Science

**Guru Ghasidas Vishwavidyalaya,**

**Bilaspur (C.G.), 495009, India**

**Session 2023-2024**



DEPARTMENT OF PURE AND APPLIED  
PHYSICS

GURU GHASIDAS VISHWAVIDYALAYA, BILASPUR, (C.G.),  
INDIA

**CERTIFICATE**

This is to certify that dissertation report on "**LOW LIGHT LEVEL PHOTO DETECTORS**" is an authentic record of study reviewed by Gokul Singh, a student of B.Sc. Physics VI semester, Department of Pure and Applied Physics of this university,

*M.N. Tripathi*  
**Dr. M.N. Tripathi**

Professor and Head of Department  
Department of Pure and Applied Physics

Email: mntripathi.physics@gmail.com

Mobile No: +91 9981401993

Date: 08/05/24

Place: Bilaspur, Chhattisgarh

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शुद्ध एवं अनुप्रयोग भौतिकी विभाग  
Dept. of Pure & Applied Physics  
गुरु घासीदास विश्वविद्यालय  
Bilaspur (C.G.)  
Sign: Gokul Singh



DEPARTMENT OF PURE AND APPLIED PHYSICS  
GURU GHASIDAS VISHWAVIDYALAYA, BILASPUR, (C.G.),  
INDIA

### CERTIFICATE

This is to certify that dissertation report on "**LOW LIGHT LEVEL PHOTO DETECTORS**" is an authentic record of study reviewed by Gokul Singh, a student of B.Sc.

Physics VI semester, Department of Pure and Applied Physics of this university.

**Dr. Suchita**

**Email:** suchitay102@gmail.com

(Assistant Professor)

Department of Pure and Applied Physics

Date: 08/5/24

Place: Bilaspur, Chhattisgarh

Sign: Suchita  
08/5/24





गुरु घासीदास विश्वविद्यालय, बिलासपुर  
Guru Ghasidas Vishwavidyalaya, Bilaspur

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### CERTIFICATE OF APPROVAL

This is to certify that **Guleshwar Banjara** of B.Sc. 6th semester at Department of Pure and Applied Physics of Guru Ghasidas Vishwavidyalaya, Bilaspur (C.G.) bearing Roll no. 21109124, Enrollment no. GGV/21/07624 has developed project work entitled

**"FUEL FOR FUTURE : HYDROGEN"**

is hereby approved as a credible work for the award of the degree of **Bachelor of Science in Physics (Hons.)**

*M.N. Tripathi*

**Prof. M.N. TRIPATHI**

Head of the Department

Department of Pure and Applied Physics

GGV, Bilaspur (C.G.)

विभागाध्यक्ष/H.O.D.  
शुद्ध एवं अनुप्रयुक्त भौतिकी विभाग  
Dept. of Pure & Applied Physics  
गुरु घासीदास विश्वविद्यालय  
Guru Ghasidas Vishwavidyalaya  
बिलासपुर (छ.ग.)/Bilaspur (C.G.)

Page | 2

**History and science of fullerenes**

**Dissertation Report**

Submitted for partial fulfilment of the degree of

**B.Sc. Physics Honours**



**GURU GHASIDAS VISWAVIDYALAYA, BILASPUR (C.G.)**

**(A Central university established by Central University Act 2009 No. 25 of 2009)**

**BY**

**Ishu tarak**

**Roll. No. 20208017**

**Enrollment No. GGV/20/07617**

**Under the Supervision of**

**Dr. H. S. Tewari**

**(Dean of school of physical science)**

**Department of Pure and Applied Physics**

**Guru Ghasidas Vishwavidyalaya, Bilaspur**

**(C.G.), 495009, India**

**Session 2023-2024**



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**GURU GHASIDAS VISHWAVIDYALAYA, BILASPUR, (C.G.), INDIA**

**CERTIFICATE**

This is to certify that dissertation report on "History and science of fullerenes"  
is an authentic record of study reviewed by Ishu Tarak, a student of B.Sc.?  
Physics VI semester, Department of Pure and Applied Physics of this university

**Dr. H. S. Tewari**

Dean of school of physical science  
Department of Pure and Applied Physics

Email: tewari.hs@gmail.com

Date: 08-05-2024

Sign: \_\_\_\_\_

Place: Bilaspur



## DECLARATION

I hereby declare that the study of the dissertation report entitled "History and science of fullerenes" submitted in partial fulfilment of B.Sc. Physics Hons. was carried out by me at Department of Pure and Applied Physics, Guru Ghasidas Vishwavidyalaya Koni, Bilaspur (C.G.).

The information presented in this dissertation report including data, figures & pictures is a review work. If any discrepancy, mistake and plagiarism is found in this report, the responsibility for the same will be solely mine.

*Whitipath:*

ISHU TARAK

B.Sc. Physics Hons. VI SEM

Roll. No.: 21109125

Guru Ghasidas Vishwavidyalaya

विभागाध्यक्ष/H.O.D.  
शुद्ध एवं अनुप्रयोग भौतिकी विभाग  
Dept. of Pure & Applied Physics  
गुरु गणेश विश्वविद्यालय  
Guru Ghasidas Vishwavidyalaya  
कनी (ज.ग.), बिलासपुर (ज.ग.)

Date: 08-05-2024

Sign: Ishtutarak

Place: Bilaspur



## DEPARTMENT OF PURE AND APPLIED PHYSICS

**Guru Ghasidas Vishwavidyalaya Bilaspur C.G. India**

(A Central University Established by Central Universities Act 2009 No.25 of 2009)

### DECLARATION

I hereby declare that the project work entitled "**LIFE CYCLE OF STARS**" submitted to the **Department of Pure and Applied Physics, Guru Ghasidas Vishwavidyalaya Bilaspur C.G. India**, is a record of original work done by me under the guidance of Dr. PARIJAT THAKUR. This project is submitted in the partial fulfillment for the award of the degree of Bachelor of science in Physics. The results embodied in this thesis have not been submitted to any University or Institute for the award of any degree or diploma.

*W. N. Tripathi*

PROF. M N TRIPATHI  
HEAD  
DEPT. OF PURE AND APPLIED PHYSICS

*Karmveer Gajendra*

KARMVEER GAJENDRA  
(Name of Student)  
ROLL NO.- 21109127

विभागाध्यक्ष/H.O.D.  
शुद्ध एवं अनुप्रयुक्त भौतिकी विभाग  
Dept. of Pure & Applied Physics  
गुरु घासीदास विश्वविद्यालय  
Guru Ghasidas Vishwavidyalaya  
बिलासपुर (छ.ग.)/Bilaspur (C.G.)



# FERROMAGNETIC MATERIAL

**Dissertation Report**

Submitted for partial fulfilment of the degree of

**B.Sc. Physics Honours**



**GURU GHASIDAS VISWAVIDYALAYA, BILASPUR (C.G.)**

(A Central university established by Central University Act 2009 No. 25 of 2009)

**BY**

**KHUSHABOO GHRITLAHARE**

**Roll. No. 21109128**

**Enrollment No. GGV/21/07628**

Under the Supervision of

**PROF. K.N. SINGH**

**(Professor)**

**Department of Pure and Applied Physics**

The School of Studies of Physical Science

**GURU GHASIDAS VISHWAVIDYALAYA, BILASPUR**

**(C.G.), 495009, India**

**Session 2023-2024**





DEPARTMENT OF PURE AND APPLIED PHYSICS  
GURU GHASIDAS VISHWAVIDYALAYA, BILASPUR, (C.G.), INDIA

## CERTIFICATE

This is to certify that dissertation report on "FERROMAGNETIC MATERIALS" is an authentic

record of study reviewed by Khushaboo Ghritlehare, a student of B.Sc. Physics VI semester, Department of Pure and Applied Physics of this university.

*M.N. Tripathi*  
**Dr. M.N. Tripathi**

Email: mntripathi.physics@gmail.com

Professor and Head of Department

Mobile No: +91 9981401993

Department of Pure and Applied Physics

Date: \_\_\_\_\_

Place: Bilaspur

विभागाध्यक्ष/H.O.D.  
Sign: शुद्ध एवं अनुप्रयुक्त भौतिकी विभाग  
Dept. of Pure & Applied Physics  
गुरु घासीदास विश्वविद्यालय  
Guru Ghasidas Vishwavidyalaya  
बिलासपुर (छ.ग.)/Bilaspur (C.G.)





DEPARTMENT OF PURE AND APPLIED PHYSICS  
GURU GHASIDAS VISHWAVIDYALAYA, BILASPUR, (C.G.), INDIA

## CERTIFICATE

This is to certify that dissertation report on "FERROMAGNETIC MATERIALS" is an authentic record of study reviewed by Khushaboo Ghritlahare, a student of B.Sc. Physics VI semester, Department of Pure and Applied Physics of this university.

**PROF. K.N. SINGH**

Professor

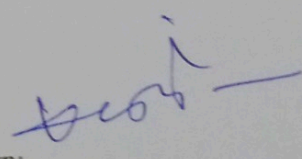
Department of Pure and Applied Physics

Email: knsingh.ggv@gmail.com

Mobile No: +91 9644783400

Date: \_\_\_\_\_

Place: Bilaspur

Sign:  \_\_\_\_\_