



Second year completion report of DBT STAR college fund given to the Department of Physics, RKMVC College, Rahara, Year 21-22.

BY DR. KALYAN BRATA CHATTERJEE

Plan of Report

- ▶ New experiments incorporated in Physics supported under the DBT STAR college Scheme.
- ▶ Equipment procured by the Department under the scheme.
- ▶ Interdisciplinary/ Interdepartmental projects executed by the students of the Department .
- ▶ Workshops and Seminars organized by the Department under the Scheme.
- ▶ Faculty improvement programmes initiated for the faculties.
- ▶ Visit to industry and Important Labs of National Eminence.
- ▶ Lectures delivered by Experts/Speakers in relevant areas of Physics.
- ▶ Outreach Programme taken under the DBT Star College Scheme.
- ▶ Training of Lab Manpower
- ▶ Impact of the DBT STAR college Scheme on the Students Outgoing.
- ▶ Budget expenditure in the last financial year.
- ▶ Future Activities Planed.

New experiments incorporated in Physics supported under the DBT STAR college Scheme.

10 of new experiments prescribed in the new CBCS curriculum() in Physics which was implemented from the academic year 2017, has been procured under the scheme of DBT Star College.

After the COVID-19 situation we have done full offline demonstrations of those practicals what we previously intend to cover previously through YouTube.
(<https://www.youtube.com/c/KalyanChatterjeesinp/videos>)

Shortage of instruments was an real issue for us. According to the new syllabus we don't have sufficient amount of every instruments which is a basic need for a physics Practical Lab to run smoothly.

We have on an average around 50 students in each semester and to provide sufficient number of instruments to the students for performing the practical well, was a challenge for us.

The grant under the DBT STAR college Scheme has helped us to purchase a multiple number of copies of the existing instruments to run the lab smoothly.

Equipment procured by the Department under the DBT STAR college Scheme.

Experimental setup Procured with only 5% of GST as our college is enlisted with SIRO certification (20-21)

Number of equipment purchased this year is twenty four.

Central Tax (rate) / Integrated Tax (Rate) Exemption Certificate in terms of notification No. 45/2017-Central Tax (Rate) and No. 47/2017 - Integrated Tax (Rate) dated 14.11.2017 issued by Ministry of Finance, Department of revenue of Government of India.

Sl. No.	Name and Address of the Institute	Details
1.	Name and address of the Institute	RAMAKRISHNA MISSION VIVEKANANDA CENTENARY COLLEGE, P.O. RAHARA, KOLKATA- 700118
2.	Scientific Research	Basic Science and Social Science
3.	GST Registration No.	19AAAR1077P8ZT
4.	PAN No.	AAAR1077P
5.	Brief description of the item	As per Annexure-1
6.	Name and address of the supplier	RAMAKRISHNA LAB SUPPLIER, VILL - Makrar, P.O. - Ramnarayanpur, P.S. - Tarakeswar, Dist. - Hooghly, Pin - 712401
7.	Purchase Invoice No./ Indent No.	Qs. No: QUR/S/19/20-21, Dt: 13-01-2021
8.	Cost of the material as per quotation	Rs. 603,427/- (Including 5% GST)
9.	Purpose of which the item is purchase	Research & Development purpose only

Certified that the goods in respect of which exemption from Central Tax (Rate) / Integrated Tax (Rate) is claimed under the Notification is required for research purpose only.
Regards,

Yours sincerely
Sri. Karmakar



List of Equipment procured by the Department under the DBT STAR college Scheme.(in Year 2020-21)

Serial No.	Measurements of Planck's Constant	2
2.	Boiling point Determination with Platinum Resistance thermometer	1
3.	Determination of Dispersive Power of a material	1
4.	Susceptibility of paramagnetic solution	1
5.	Dielectric constant measurement	1
6.	Band Gap measurement by four probe method	1
7.	Hall coefficient measurement	1
8.	Frequency determination by Meldees method	1
9.	I-V characteristic of Tunnel Diode	1
10.	Electron Spin Resonance measurement	1
10.	Electron Spin Resonance measurement	1

List of new Experiments demonstrated and implemented by the Department under the DBT STAR college Scheme(in 2021-22)(offline)

Serial No.	Experiments	In core courses for different semesters
1.	Measurements of Planck's Constant	CC9
2.	Suseptibility measurement by Quink's method	CC12
3.	Michelson's interferometer	CC4
4.	Conductivity measurement of a good conductor	CC6
5.	Determination of Boltzmann constant	CC13
6.	Digital trainer kit	CC10
7.	Determination of velocity of ultrasound via liquid grating	CC11
8.	I-V characteristic of Tunnel Diode	CC9
9.	Electron Spin Resonance measurement	CC11

List of new Experiments demonstrated and implemented by the Department under the DBT STAR college Scheme(in 2021-22)(offline)

Serial No.	Experiments	In core courses for different semesters
10.	Laser sources to observe interference and diffraction pattern	CC9
11.	Verification of Mallas's law	CC13
12.	Babinet's compensator	CC13
13.	Callender Barns method for determination of J(Joule constant)	CC6
14.	Use of Thermocouple as thermometer	CC6

Interdisciplinary/ Interdepartmental projects executed by the Department for our college students .

We are very happy to announce that all our 50 students of the 6th semester batch have successfully completed one minor project work under the DBT STAR college scheme in their fifth semester and those project topics covers a vast areas of physics as well as interdisciplinary subjects. Here I am mentioning some few,

1. Thermoelectric generators(Thermal Physics)
2. Birth and death of Stars(Astrophysics)
3. Predator Pray model(Non linear dynamics in Ecosystem)
4. COVID-19 and it's spread(Pandemic disease dynamics in society)
5. Magnetic field and it's applications
6. Bachistochrone and totochrone problems etc.

Interdisciplinary/ Interdepartmental projects executed by the Department for our college students .

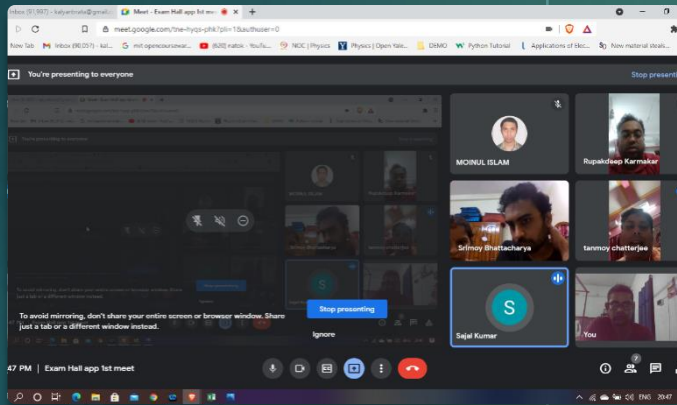
Series of Hands on experiment and demonstration conducted for the Botany students about usages of different measuring instruments held by the department



Enrichment Programme and joint project has been conducted with the department of Zoology about Magnetic fields and its influences on germination and plant growth.



Workshops and Seminars organized by the Department under the Scheme.



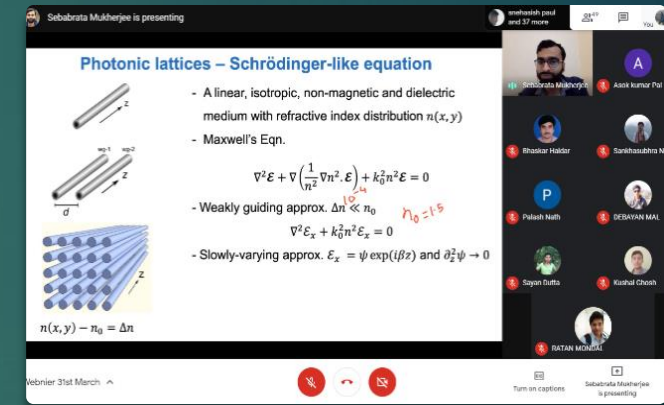
23/07/2021

webinar on “Recent trends in High energy Physics”. This webinar has been designed to introduce all to a new dimension of frontier discoveries in High energy physics. Dr. Srimoy Bhattacharya from IIT Delhi gave a wonderful webinar.



2/03/2022-7/03/2022

Workshop on PYTHON Programming for GIS students have been held by the department of Physics.



17/11/2021

Webinar on Topological Insulator and its applications

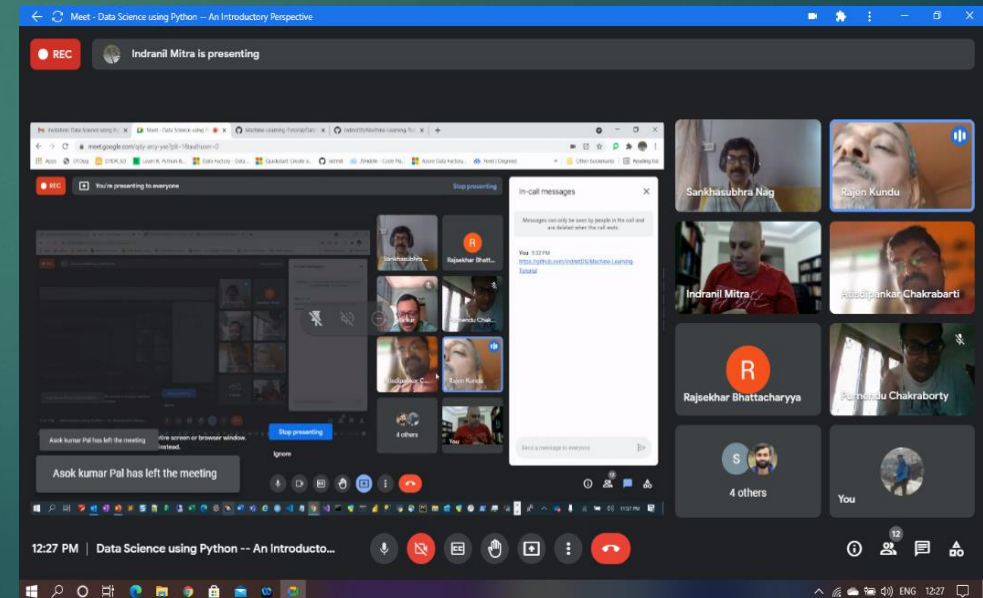
By Dr. Seababrata Mukherjee, IISc, Bangalore

Workshops and Seminars organized by the Department under the Scheme.

Two days workshop on Telescope making, 23 & 24/03/2022



Webinar on Data science with Python by Dr. Indranil Mitra, 13/01/2022



Faculty improvement programmes initiated for the faculties.

- ▶ **Mathamatica Softwear** was purchased for the department and a one day workshop on **mathematica** was conducted on 25th February,2022.
- ▶ **Dr. Indranil Mitra** of Intel corporation,USA, gave a series of lecture on **Physics and Data Science** to the faculties of the Department from 19/09/2021.
- ▶ we have already approached the Computer Science Department of JU to conduct a workshop on **Data Science and its Applications in AI** in our department and they have agreed to do so.

REC Indranil Mitra is presenting

PHYSICS AND DATA SCIENCE

PHYSICIST	DATA SCIENTIST
Primarily driven by problems of nature	Primarily driven by business problems (till date)
Collect data from experiments	Collect data from data sources/experiments
Primarily applied on quantitative data	Applied on quantitative as well as categorical data
Analyze the collected data	Analyze the collected data
Build models to explain observed data	Build models to explain observed data
Predictive power of models on new data	Predictive analytics & power of models on new data
Methodologies rely on creating exact models/theories	Methodologies are mostly based on developing algorithms and minimizing model errors.
	Train Machine to Learn -> AI Let Data do the talk

9/18/2021

meet.google.com is sharing your screen. Stop sharing Hide

Participants:

- Sankhasubhra Nag
- Indranil Mitra
- Pratip Bhattacharyya
- Asok kumar Pal
- Atisidipankar Chakra...
- subrata sur
- Purnendu Chakrabor...
- You

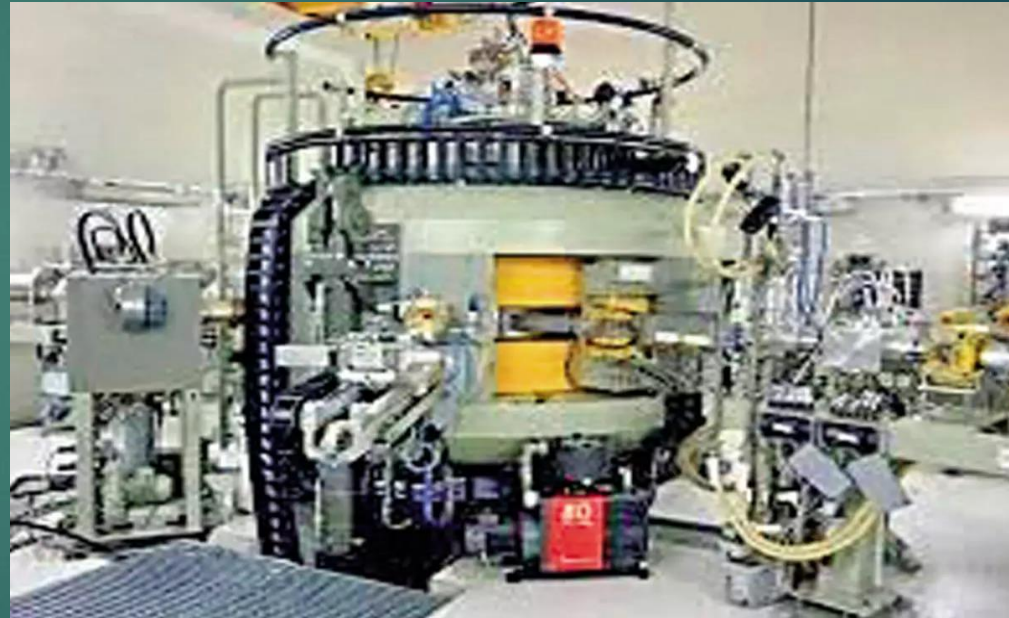
10:19 AM | Data Science using Python -- An Introducto...

Visit to industry and Important Labs of National Eminence.



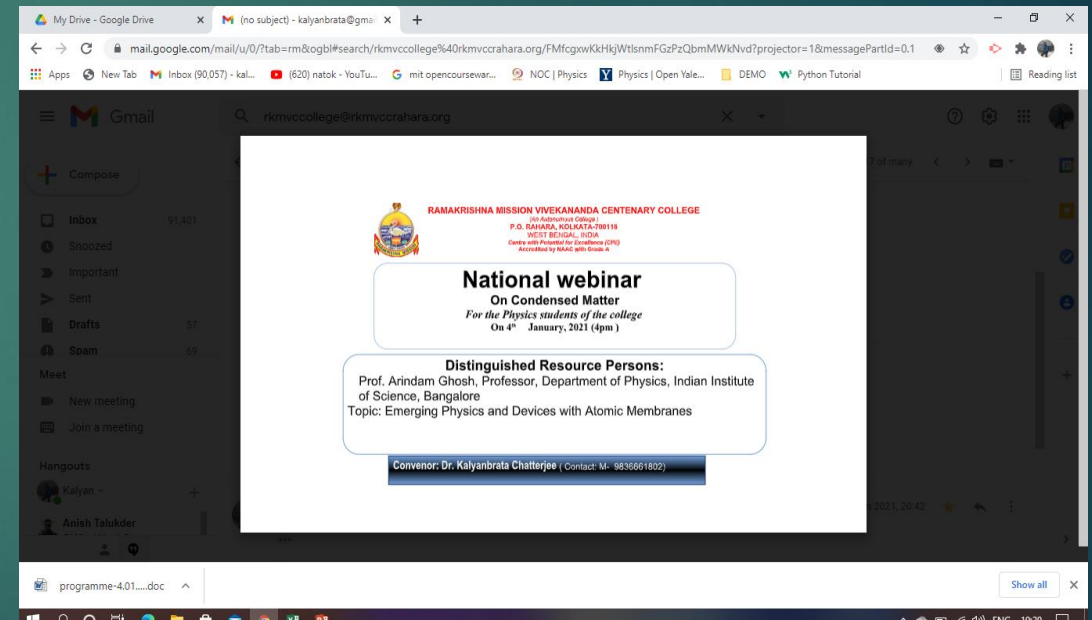
We have talked to the Authorities of the Prestigious institutes like Saha Institute of Nuclear Physics, VECC Kolkata, IISER Kolkata to allow our students to visit their labs and various research instruments and they have happily agreed to give us the scope while maintaining all the protocols. Already we have visited VECC, Kolkata and others are in queue.

Visit to industry and Important Labs of National Eminence.



Our students along with faculty members are in front of Superconducting Cyclotron facility, VECC Kolkata during one day visit at VECC Kolkata.

Lectures delivered by Experts/Speakers in relevant areas of Physics.

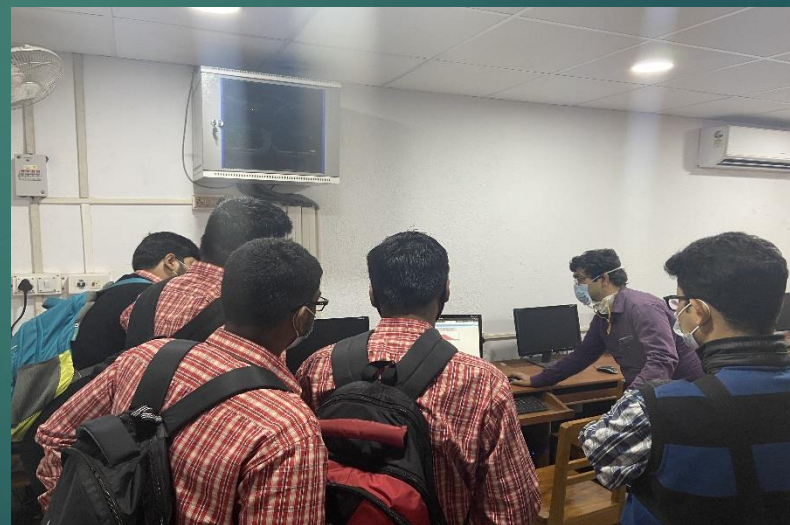
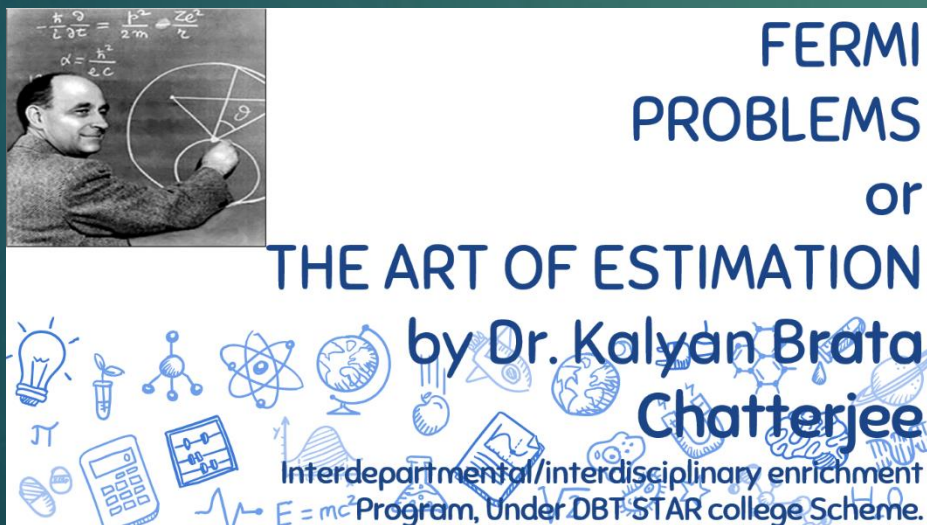


Lectures Delivered in Physics Department, by Dr. Indranil Mitra, Prof. Arindam Ghosh, Prof Seababrata Mukherjee and Dr. Srimoy Bhattacharya. The webinars were very much interactive and informative on some recent developments in physics and both was very enriching from the point of view of the students as well as the Teachers.

Outreach Programme taken under the DBT Star College Scheme.

Interactive Talk Delivered on behalf of The Physics Department.

One Day Science Outreach Programme, 23/02/2022 (5 different schools took part in this event)



Outreach Programme taken under the DBT Star College Scheme.

One Day Science Outreach Programme, 23/02/2022



A series of Lectures were delivered to the students of RKSMVV college on PYTHON for Geographical Information System



Training of Lab Manpower under DBT Star college Scheme.



Mr. Jagadish Samanta and Mr. Tapan Chatterjee are presently working as the Lab Attendant in the Physics Department. A training Session was conducted by the department to give him an hands on experience.



Training session was conducted on 25/03/2022 by Prof. Asok Kr.Pal and Prof.P.Nath



Hands on training on electronic circuit design and maintenance of some delicate instruments was performed successfully.

Impact of the DBT STAR college Scheme on the Students Outgoing.

No.Of Students	Passing Year	Percentage of Pass out candidates	No. of Successful candidates in JAM(IIT,M.Sc . entrance)	Success in JEST/TIFR/IIS C/HRI/ICTS	No.of Students Doing Higher Study(M.Sc.) in various central and State Universities	No. of Students Joined Different Jobs like CDS, Indian Army,others
51	2020	100%	21	6	18	6
50	2021	100%	18	8	20	4

Budget expenditure in the last financial year

Items Purchased	In Rs.
Consumable items(IC, Resistances, wires, LED) and lab renovation,workshops and lab Visits,Projects , Seminars and outreach programs	300000
Total	300000

Here is the allocation of the Recurring fund utilized by the Department of Physics for the financial year 2021-22.

- We have utilised our non-recurring funds(Rs. 10 lakhs) in the previous financial year fully and in this financial year 2021-22 we have utilised our recurring funds allotted for the physics department as per the needs for the students and Faculties both.
- Some renovation of electrical connections in our labs were also done with the recurring fund provided under the DBT STAR college Scheme.

Future Activities Planed.

- ▶ We will conduct 2 Seminars and 2 Workshops in our Department for both students and faculties under the DBT STAR college Scheme in the coming year.
- ▶ We will Visit the national level institutes and Labs (IISER,IACS,CGCRI) with our students to give them the exposure of frontier research and developments in the various branches of Physics.
- ▶ In future at least 2 lab man power training program will be performed throughout the year.
- ▶ This year we were able to invite Students from 5 different schools and in the coming year we are looking for inviting at least 2 more schools to the out reach programme in the future.
- ▶ Minor projects for all the students of final semester will be conducted. Also we will try to implement and make our students aware of the IPR issues in Lab.
- ▶ Students from the department can borrow books for their own academic enrichment from the department which are already purchased under the scheme.



For helping us with the fund under the DBT STAR college scheme
to support us in going ahead