

**HOLY CROSS COLLEGE (AUTONOMOUS), TIRUCHIRAPPALLI**

**PG & RESEARCH DEPARTMENT OF PHYSICS**

**A LONG REPORT-2021-2022**

The PG & Research Department of Physics , inaugurated the Department Association Activity for the academic Year 2021-2022. Dr.Maria Bernadette Leena and Ms.Mercy Jennifer ,Assistant professors of Physics were the staff secretaries of the Physics Association.

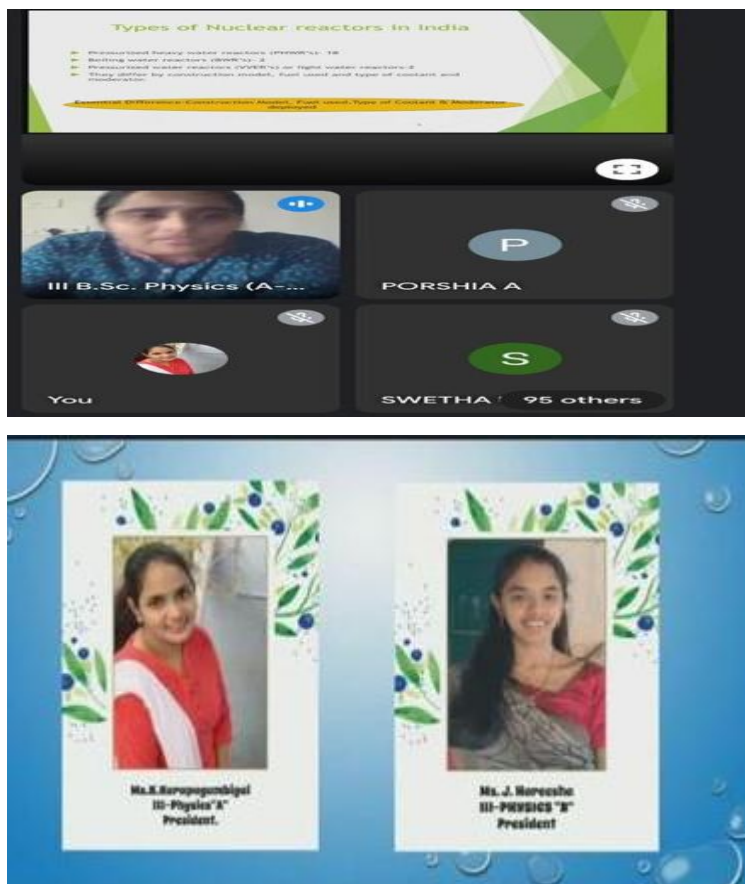
**Date: 12<sup>th</sup> July, 2021 Topic: Charting budding student's path of success**

**Resource Person: Ms. Iswarya.P, Scientific Officer. D, Nuclear Power Corporation of India (NPCIL), Mumbai**

The webinar on “charting budding student's path of success”, was organized by the PG & Research Department of Physics, Holy Cross College, Trichy on 12<sup>th</sup> July, 2021.

Ms.Iswarya.P, Scientific Officer.D, Nuclear power Corporation of India (NPCIL), Mumbai and Our prominent alumnae of Physics, 2008 batch was the resource person. The session was started with the prayer song. Dr. Pauline Edwidge Mary, Head of the Department welcomed our gathering and introduced the speaker to the participants. The Speaker started her speech by quotation of C.V.Raman's. She shared her knowledge on nuclear energy and nuclear reactor. She shared some career opportunities after UG Physics. At the end of the lecture, the participants raised interesting questions which were answered by the speaker. Totally 200 participants attended the webinar and submitted the online feedback form. The meeting was ended with the vote of the thanks.The student leaders of the Physics Association were selected .

Ms.A.Harresha as President,Ms.Joseeng as Vice President and Ms..Kiruthiga as Secretary were chosen.

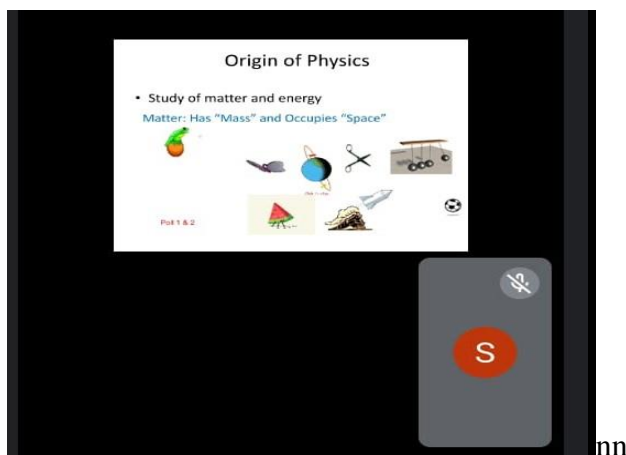


**Date: 25<sup>th</sup> August, 2021 Topic: “The Fascinating Physics of everyday life”**

**Resource Person: . Mr. R .Nirmal Kumar, Assistant Professor of Srimad Andavan Arts & Science College, Tiruchirappalli**

The webinar on “The Fascinating Physics of everyday life” was organized by the PG & Research Department of Physics , Holy Cross College , Tiruchirappalli on 25 th August 2021 . Mr. R . Nirmal Kumar, Assistant Professor of Srimad Andavan Arts & Science College, Tiruchirappalli was our resource person. The session was started with the prayer song. The speaker started his speech on the topic Origin of Physics, then he started to share the presentation continued by the

everyday usage and life hacks in Physics. And sir discussed about physics rules involved in sports as well. At the end of the lecture, the participants raised interesting questions which were answered by the speaker. More than 200 participants attended the webinar and submitted the online feedback form. The Meeting was ended with the vote of thanks.



**Date: 27<sup>th</sup> September to 1<sup>st</sup> October**

**Topic: “Advanced Characterization Techniques and Computational Modelling”**

**The Five Days International FDP on “Advanced Characterization Techniques and Computational Modelling” was organized by Dr. A.Pauline Edwidge Mary , Head of the Department of Physics, Assistant Professors of Physics, PG and Research Department of Physics, Holy Cross College (Autonomous), Tiruchirappalli from 27<sup>th</sup> September to 1<sup>st</sup> October.**

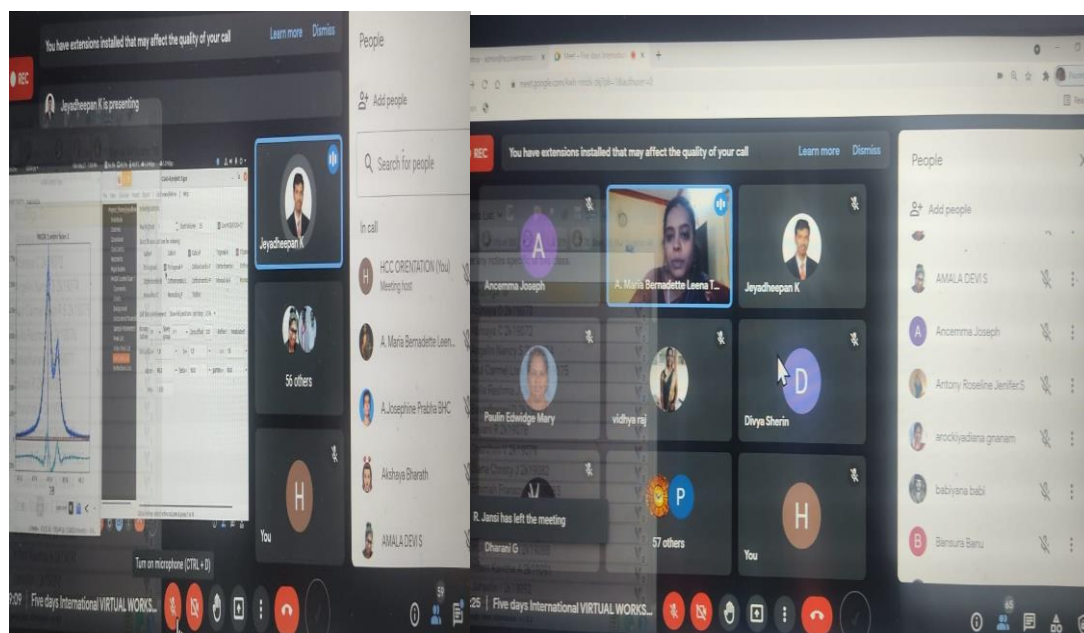
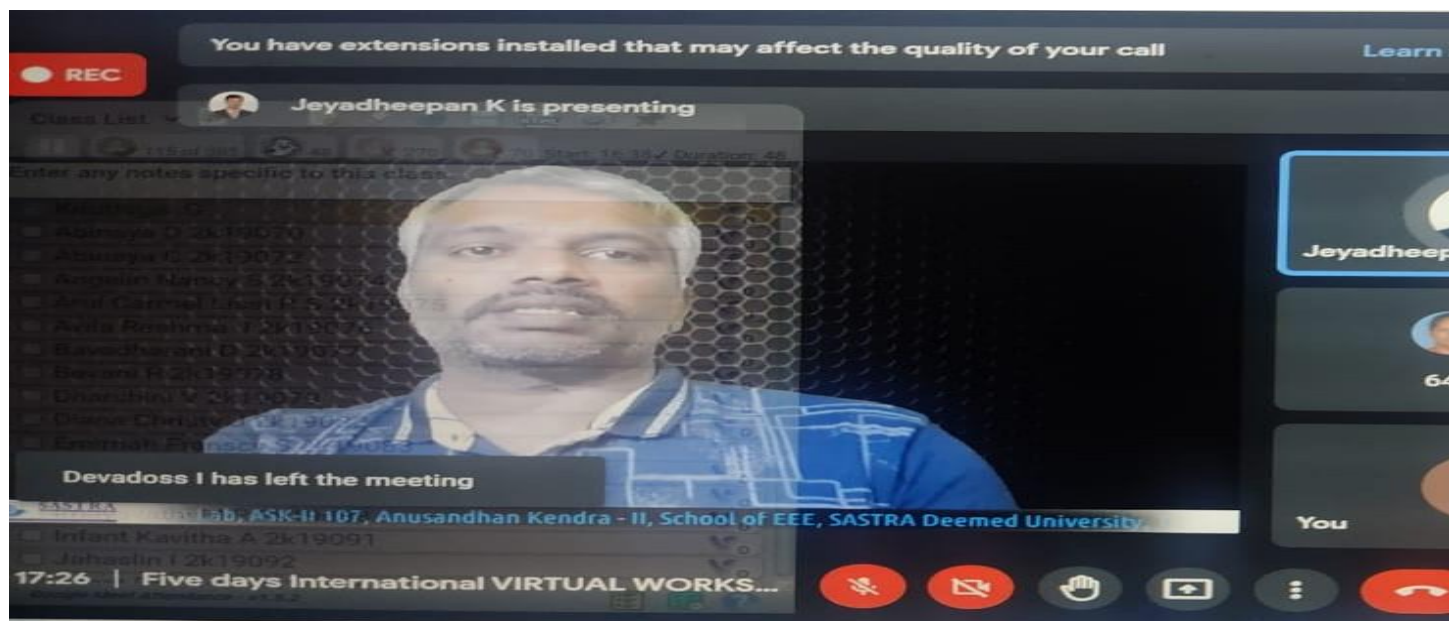
**FDP-DAY 1: Analysis of X-ray Diffraction - Dr. K. Jeyadheepan**

Assistant professor (Research) in School of Electrical & Electronics Engineering, SASTRA University, India.

**DATE:27.09.21**

Resource Person discussed about XRD studies and its importance using an open software GSAS-II.sir began the session with the introduction to crystallography, the importance of sample preparation and scan parameters. Then he discussed about the identification of

compounds, Powder XRD strategy, Indexing approach, all available software, thickness determination.



DAY 2:

**FDP-DAY 2: Introduction to Chem Informatics - Dr. R. Vijay Solomon**

**Assistant Professor ,Department of chemistry,MCC,Chennai.**

**DATE:27.09.21**


The Resource person started the session with introduction to Periodic Table, sir discussed about the available website such Molcal//Org and showed the demo to the participants. sir taught about so many online websites such as Online Smile Translator and structure File Generator, all his demo were interesting and new for the participants. The session ended with the doubt clarification from all.

### FILE FORMATS








Programs that perform quantum chemistry calculations typically require an input file that specifies the molecular geometry and contains keyword that tell the program what type of calculation is requested. Here, we will see the different types of file formats that are used in describing the geometry of a molecule.


#### SYBYL Line Notation

SYBYL Line Notation (SLN) is a chemical line notation. Based on SMILES, it incorporates a complete syntax for specifying relative stereochemistry. SLN has a rich query syntax that allows for the specification of Markush queries. The syntax also supports the specification of combinatorial libraries of CD.



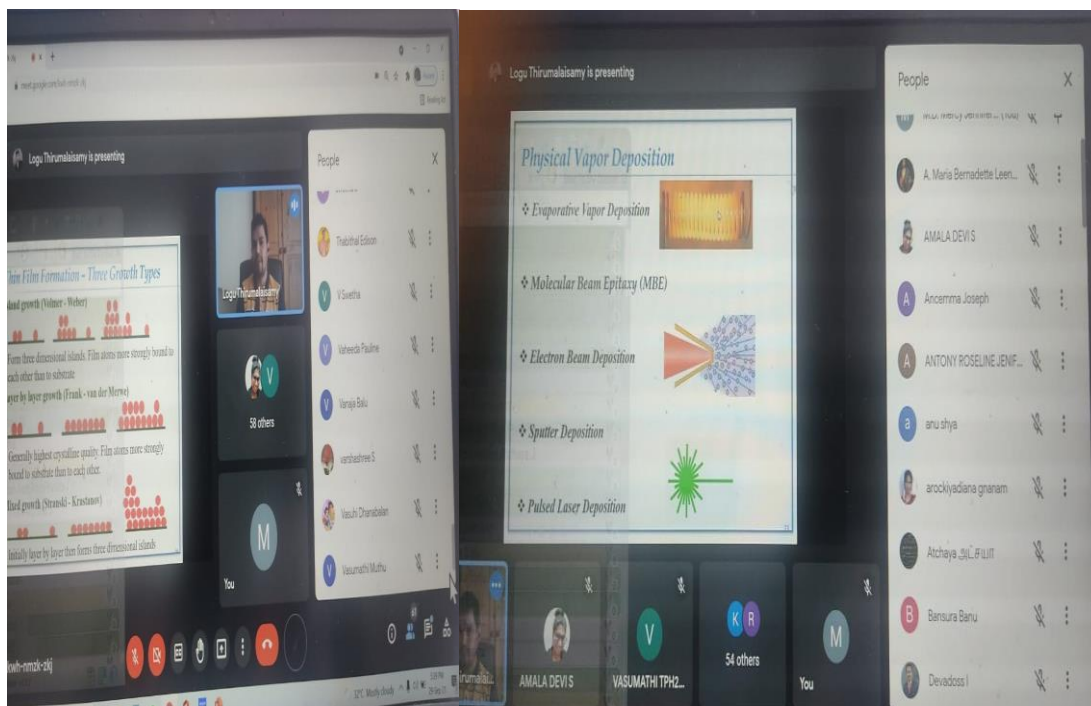
### HISTORICAL DEVELOPMENT OF THE PERIODIC TABLE

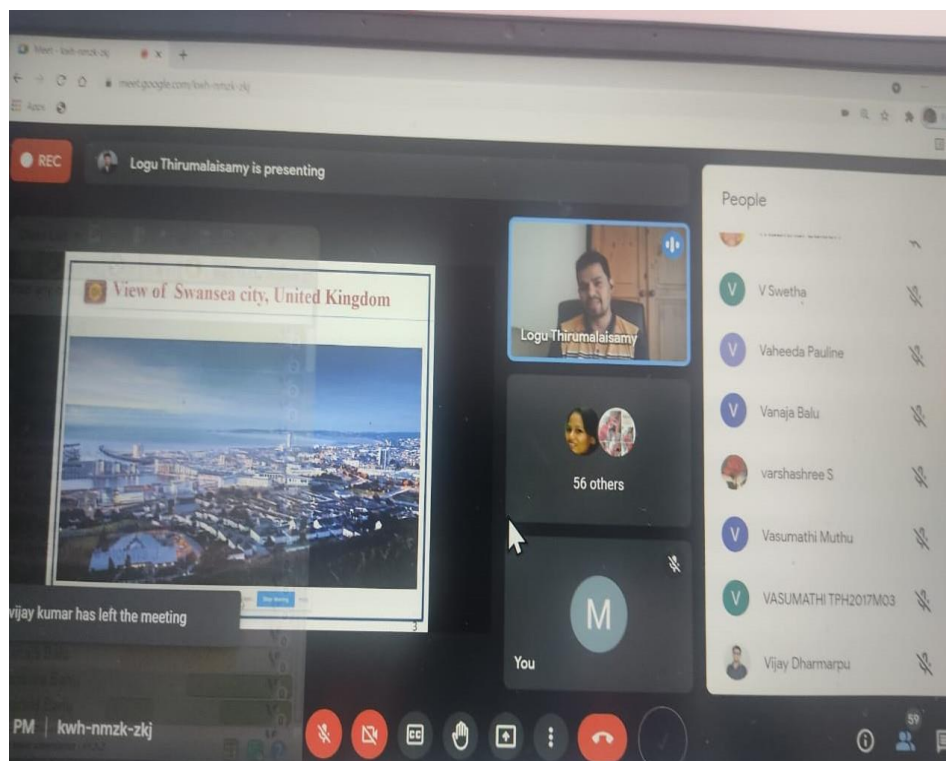
	Antoine Lavoisier (1743-1794)	
	Johann W. Dobereiner (1780-1849)	
	John Newlands (1837-1898)	
	Lothar Meyer (1830-1895)	
	Dmitri Mendeleev (1839-1907)	
	H. J. G. Moseley (1887-1915)	



**FDP-DAY 3: Photo electron Journey from Valence band to Conduction band -  
Dr. Logu Thirumalaisamy** Newton International Fellow at Swansea University,UK

Sir started the session with introduction to thin Films , different methods for preparation,electro magnetic Interaction with matter,Mechanism of sputtering ,magnetron sputter deposition the session ended with the clarification of doubts.

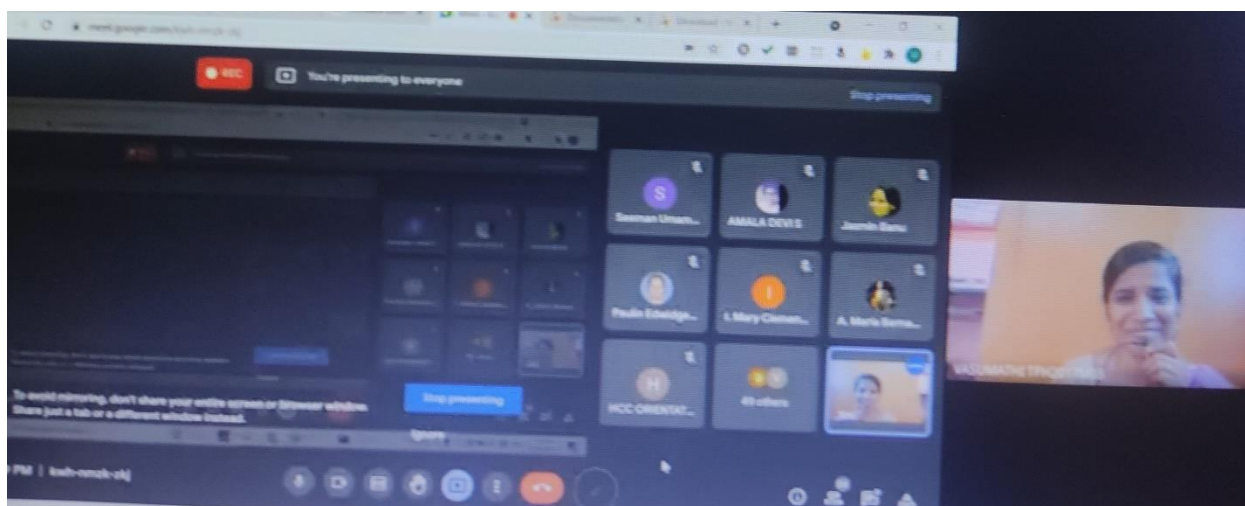
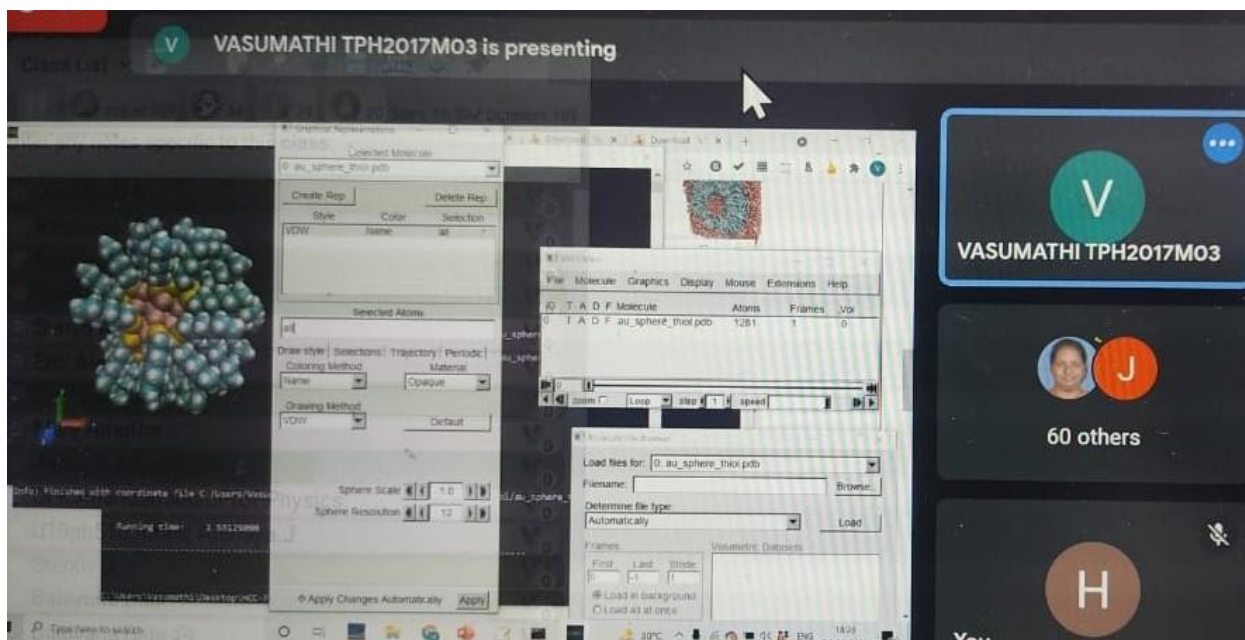




## **FDP - DAY 4: Molecular Modelling and Simulation Techniques - Dr. V. Vasumathi**

**Assistant Professor ,Department of Physics,Holy cross college ,Trichy.**

The session started with the introduction on Molecular Dynamics,difference between Experimental and theoretical ideas, mam discussed about molecular modelling tools, stimulation Techniques and characterization tools, mam also taught about software such as Vesta.The session ended with vote of thanks with clarification of doubts.



## FDP - DAY 5: Morphological and Cyclic Voltammetric Analysis for Nanocomposites –

**Dr. Dhanabal Rengasamy.**

**CSIR-Research Associate**

**Department of Materials Science and Metallurgical Engineering**

**Indian Institute of Technology, Hyderabad-**

**Telangana, India.**



Sir started the session with introduction about semiconductor, difference about different material classification ,then he started the discussion about morphological studies using the Origin software , sir explained about supercapacitor and their electrochemical studies by CV and EIS .

**Quantum confinement on nanostructured materials**

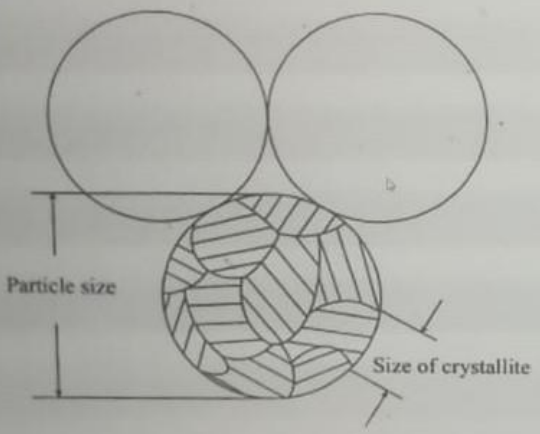
Quantum	Electron direction	Confinement direction
bulk materials	Three (x,y,z)	No confinement
2 D or Quantum Well	Two (x,y)	One (z)
1D or Quantum wire	One (x)	Two (x,y)
0 D or Quantum dot	No Direction	Three (x,y,z)

You have extensions installed that may affect the quality of your call

Learn more Dismiss

R Dhanabal is presenting

### Crystallite Size and Particle Size ?

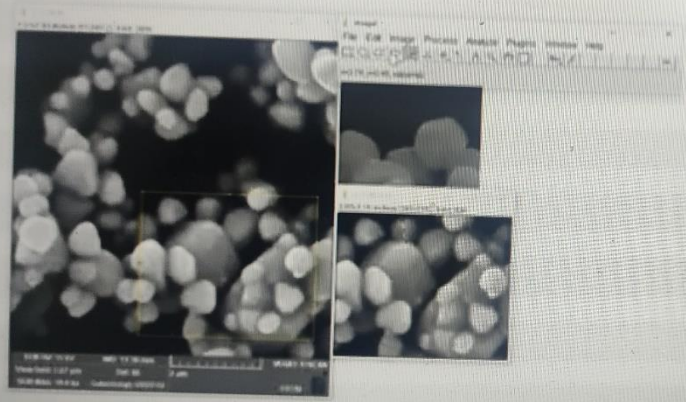


R Dhanabal

R  
61 others

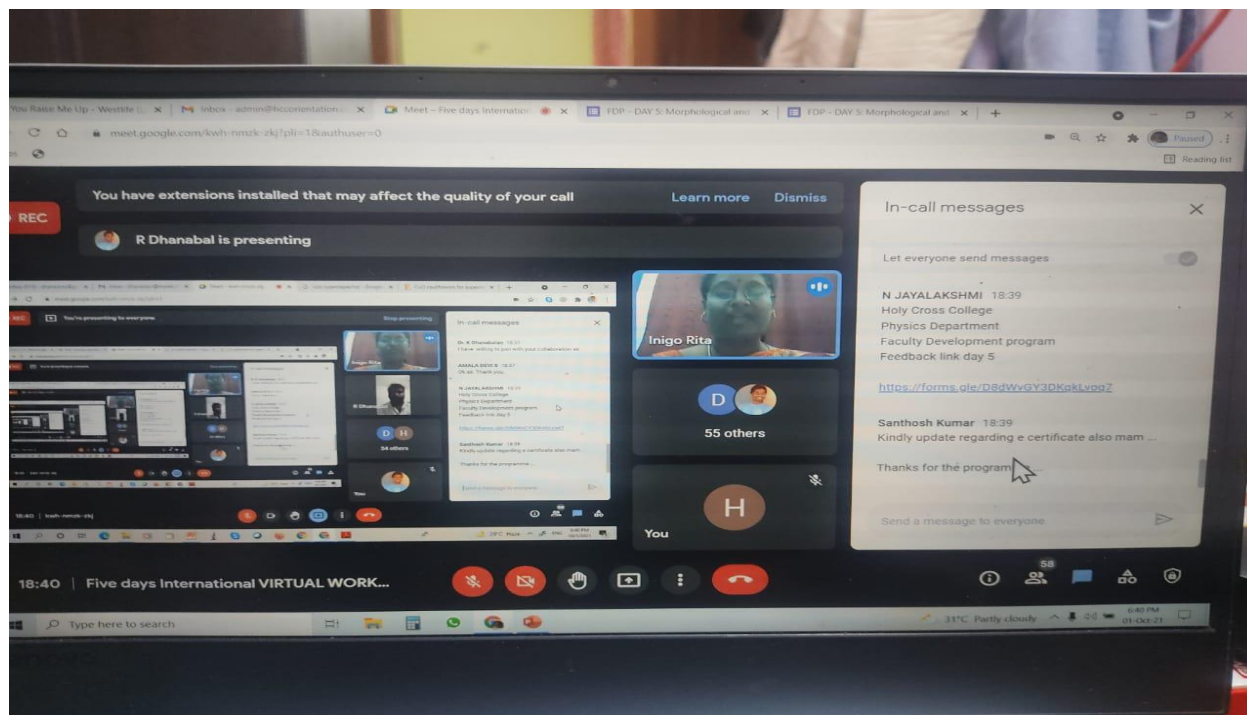
You

### Step:4 Measurements



R Dhanabal

Conclusion:



Five days FDP ended with feedback from the participants , finally the session ended with the vote thanks.

**Date:** October 23, 2021 **Topic:** “Basics of Astronomy and its futuristic applications”

**Resource Person:** Mr. J. Manohar , Founder Secretary , Trichy, Astroclub and Mr. B. Srikumar, State Co-ordinator, VIGYAN PRACHAR / Ariviyal Palagai , Chennai

**The Astronomy club was inaugurated on October 23, 2021 by Mr. J. Manohar , Founder Secretary , Trichy Astroclub and Mr. B. Srikumar, State Co-ordinator, VIGYAN PRACHAR / Ariviyal Palagai , Chennai.** The speaker started his speech on the topic “Basics of Astronomy and its futuristic applications” Then he started to share the interesting facts and science beyond Astronomy. He also shared some upcoming events in Astronomy. At the end of the lecture, the participants raised the interesting questions and the questions were answered by the speaker. Totally around 150 participants attended the meet. The meet was ended with the vote of thanks.

**In commemoration of Dr. APJ Abdul Kalam's Birthday, we organized an Essay Writing Competition on the titles. 1. Science & Environment 2. Indians on Science Growth.**

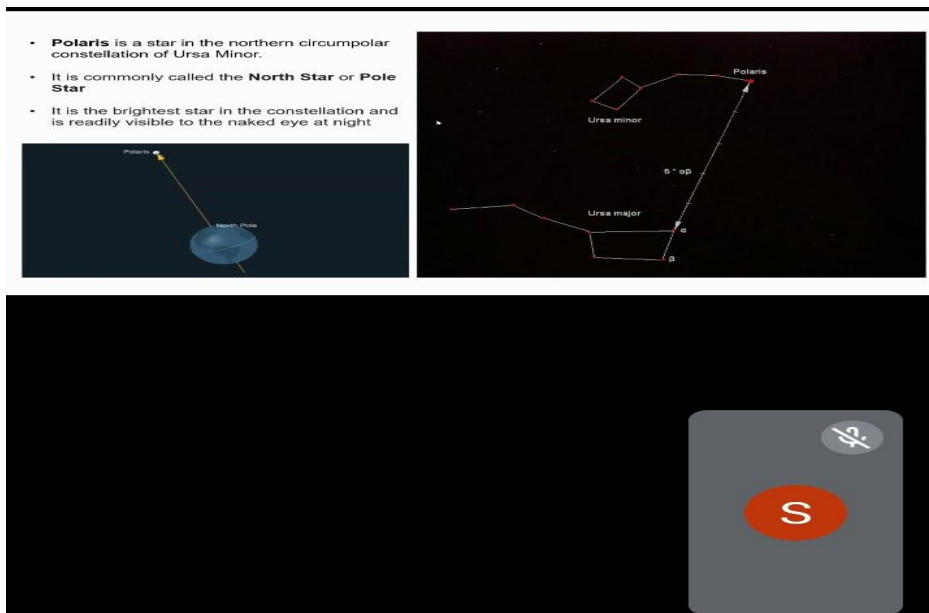
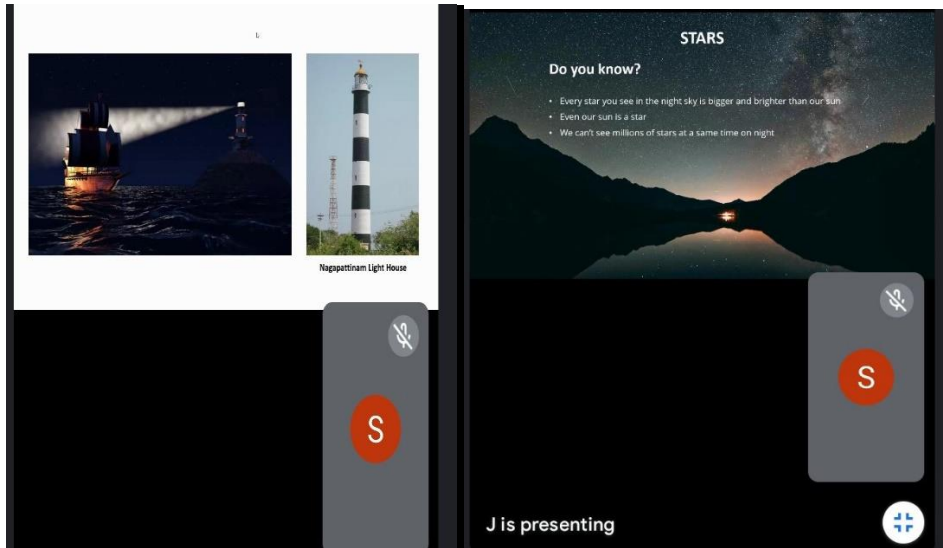
Date:15.10.2021. 28 Students actively participated in the event.Three prizes were given for each title. The list is attached.

**I. INDIANS ON SCIENCE GROWTH**

<b>S.NO</b>	<b>NAME OF THE STUDENT</b>	<b>CLASS</b>
1.	JOSELINE NISHA	III B.Sc Physics -A
2.	S.LAVANYA	I B.Sc Physics B
3.	A.SURIYA	II M.Sc

**II.SCIENCE &ENVIRONMENT**

<b>S.NO</b>	<b>NAME OF THE STUDENT</b>	<b>CLASS</b>
1.	J.FLORENCE	II M.Sc
2.	SHERLINE SHEELA	II B.Sc-A
3.	JERLIN DELCY.S	I M.Sc Physics



**Date:11<sup>th</sup>November, 2021 Topic: “Habits Of Resilience”.**

**Resource Person: Dr.Anne Rosario, Positive Psychology Practitioner, Mindfulness Teacher, Minnesota,USA**

The Session started with Prayer service & Welcome address. Dr. Anne Rosario shared her Experience and discussed about the different types of Emotions and gave ideas to reduce the stress, and steps to enhance positive psychology to handle life joyfully. Students asked doubts about the ways to avoid exam fear. The meeting ended with vote thanks.

A screenshot of a Zoom meeting grid showing 9 participants. The participants are arranged in a 3x3 grid. The top row includes SIVANI T S (purple circle with 'S'), Anne Tony Phd (video feed), and Magdalin Sherina (orange vest, video feed). The middle row includes REFINA S 2K19122 (quote: 'Work hard in silence, and let the success be the noise.'), PAULIN EDWIDGE MARY TPH1995... (blue circle with 'P'), and SIVASRI SFE20092 (video feed). The bottom row includes DHARSHNA SHERLI E 2K19080 (blue circle), a notification 'DHARSHNA SHERLI E 2K19080 has left the meeting' (grey bar), INDHUMATHI C 2K19089 (blue circle), SRIJANANI K 2K19141 (pink circle with 'S'), and 'You' (teal circle with 'M').

SIVANI T S	Anne Tony Phd	Magdalin Sherina
REFINA S 2K19122 <i>Work hard in silence, and let the success be the noise.</i>	PAULIN EDWIDGE MARY TPH1995...	SIVASRI SFE20092
DHARSHNA SHERLI E 2K19080 has left the meeting	SRIJANANI K 2K19141	You

**Date:24<sup>th</sup> February, 2022 Topic: “Aspects Of Physics”.**

**Resource Person: Dr.M.Kumaresavanji, Assistant Professor ,Department of Physics,  
National college, Trichy.**

A lecture was organized on the topic Aspects of Physics ,Dr.M.Kumaresavanji, Assistant Professor ,Department of Physics,National college, Trichy, was the Resource person. Sir discussed about the basic concepts of Physics, and gave different ideas about the stimulation software available for the graduate students. The session was interactive and the students were interested to see the working of the stimulation software and cleared their doubts with the resource person. Sir listed the PG programs available after graduation.





**Date:4<sup>th</sup> March, 2022 Topic: “Applied Physics for Underwater Systems”.**

The PG and research department of Physics organized One day seminar on APPLIED PHYSICS FOR UNDERWEAR SYSTEMS on 4/03/2022 .

The first session was taken by R.Abisekraj, Scientist-E, Naval sciences and technological laboratory, Defense Research and Development Organization, Vigyan nagar, Visakhapatnam on the topic Sonar-A known acronym and unknown phenomena. Sir shared about the history of underwater accoustics and he also shared some key properties about its application and various shapes of piezoceramics.

The second session was taken by S.Sathiya kumar, Scientist-D, Naval science and technological laboratory, Defence Research and Development Organization, Vigyan nagar, Visakhapatnam on topic Battery technologies for underwater systems. He shared his knowledge about the major properties of various battery and electric network used in underwater systems.

The third session was taken by Satyajit Barman, Scientist-C, Naval science and technological laboratory, Defence Research and Development Organization, Vigyan nagar, Visakhapatnam on topic Transducers for underwater systems. He shared the basics of properties, types and applications of transducers. And also he shared about the scope of physics in underwater systems.



Microsoft Teams Meeting Interface

Participants in the meeting:

- BAVADHARANI D 2K19077
- PAULIN EDWIDGE MARY TP...
- Regiva Abisekaraj (Presenting)
- INFANT JENCY D 2K19090
- REBECASUMILL SF211266
- PIYO LJORA J SFE19134
- JOESENG SHERAL MARIYA T ...
- HCC Physics
- MERINA J 2K19109
- PREETHI VINCY A SF211265
- PUNITHA R 2K19119
- ANUSHEYA A SFE19110
- SAGAYA JENIFER J SFE19144 has left the meeting
- SUJITHA S SFE19151
- U19PH536 Srinisha.S
- 72 others
- You

People Panel (Right):

Search for people

In call:

- Maria Leena (You)
- ABINAYA R 2K19071
- ANGEL VARSHA.C SF2112...
- ANGELIN NANCY S 2K190...
- ANUSHEYA A SFE19110
- ARUL CARMEL LISSI R S 2...
- Arul Iara M SF211250
- BAVADHARANI D 2K19077
- BRUNDHA R SFE19113

hdj-hipc-yuy

Regiva Abisekaraj is presenting

### Typical Underwater Warfare Scenario

The diagram illustrates an underwater warfare scenario. A submarine is positioned below the surface, launching torpedoes towards a surface ship. The surface ship is also launching torpedoes towards the submarine. Other elements include a helicopter, a jet, and various sensors and weapons like Depth Sear, Sonar, VDS, and Lightweight Torpedoes.

Participants in the meeting:

- Regiva Abisekaraj (Presenting)
- REBECASUMILL ...
- PIYO LJORA J S...
- INFANT JENCY D ...
- 82 others
- You

People Panel (Right):

Search for people

In call:

- Maria Leena (You)
- AARTHY A SFE19108
- ABINAYA R 2K19071
- ANGEL VARSHA.C SF2112...
- ANGELIN NANCY S 2K190...
- ANUSHEYA A SFE19110
- ARUL CARMEL LISSI R S 2...
- Arul Iara M SF211250
- BRUNDHA R SFE19113

hdj-hipc-yuy

SONY

The **Valediction of Physics Association** was conducted on 22<sup>nd</sup> April 2022. The Chief guest was Mr. Manohar, President, Trichy Astro club. He gave a talk on Night sky watching.

The second issue of our Department magazine “MAGPHY” was released by the Chief guest and the first copy of the same was received by our HOD and the event continued with the distribution of prizes for the winners of the Inter Departmental Documentary Film competition on the topic ‘Life history of Indian Scientists’ which was conducted on 28<sup>th</sup> Feb, 2022.

#### **ASTRO CLUB ACTIVITIES:**

**Date:** October 23, 2021 Inauguration of the “**Astro Club**” in Association with **VIGYAN PRACHAR / Ariviyal Palagai , Chennai**

**Resource Persons:** Mr. J. Manohar , Founder Secretary , Trichy, Astroclub and Mr. B. Srikumar, State Co-ordinator, VIGYAN PRACHAR / Ariviyal Palagai , Chennai

**Topic:** “**Basics of Astronomy and its futuristic applications**”

**On the Eve of the Celebration of the 50<sup>th</sup> Anniversary of the of PG and Research Department of Physics, “The Astro club” was Inaugurated on 23<sup>rd</sup> October , 2021 by Mr. J. Manohar , Founder Secretary, Trichy Astroclub and Mr. B. Srikumar, State Co-ordinator, VIGYAN PRACHAR / Ariviyal Palagai , Chennai.** The speaker started his speech on the topic “Basics of Astronomy and its futuristic applications” Then he started to share the interesting facts and science beyond Astronomy, and some upcoming events in Astronomy. At the end of the lecture, the participants raised interesting questions which were answered by the speaker. Totally around 150 participants attended the meet.

The World Space week was celebrated from **4<sup>th</sup> to 9<sup>th</sup> March, 2022** . The Astro Club of PG and Research Department of Physics has participated in this workshop which was organized in association with VIGNAN PRACHAR/ Ariviyal Palagai, Trichy Astro club. Dr. Mayilsamy Annadurai former director of ISRO, Inaugurated the function and gave a talk on Historical Achievements of Chandrayan and its future. This space week ended with the “Night sky watching “ under the guidance of Mr. Bala Bharathy, President, Astroclub, Trichy.

விஞ்ஞான பிரச்சார்  
( மத்திய தொழில்நுட்ப அமைதி )  
தமிழ்நாடு அறிவியல் தொழில்நுட்ப அமைதி  
( தமிழ்நாடு அரசு )  
அறிவியல் பலகை  
திருச்சி ஆஸ்ட்ரோ கிளப்  
எய்ட் இந்தியா, சென்னை  
பள்ளிக்கல்வி பாதுகாப்பு இயக்கம்  
மற்றும் மேக்நாத் சாகா சயின்ஸ் சென்டர் இணைந்து நடத்தும்  
**நிலவில் கால் பதித்த மனிதன்**  
— திரையரங்கு கருத்தரங்கம் —  
20.07.2021  
மாலை 5 மணி  
ZOOM Talk ID: 6189428554 Password: AID123

முனைவர். சே.மகாலட்சுமி  
திரு. வெந்திக்குமார், சென்னை  
திரு. V. ராஜசேகர்  
திரு. முனைவர். R. ராமமூர்த்தி  
திரு. முனைவர். M. கவிசா  
திரு. V. டயானா ப்ரிண்டி  
திரு. T.V. வெங்கடேசுவரன்  
திரு. M. மோகனா  
திரு. P. பாலகிருஷ்ணன்  
திரு. T. ச. சங்கர்

சுதந்திர இந்தியாவின் வைரவிழா கொண்டாட்ட தொடர் சுருத்தரங்கம்

Two students M.Kaviya, and V. Dyana Princy from III B.Sc Physics.B, have participated and received certificates, in a two day (02.04.2022 and 03.04.2022) ‘Regional work shop on Zero Shadow day’ organised by the ‘Vignaprachar, Department of Science and Technology, Government of India, Ariviyal Palagai, Tamil Nadu Science and Technology Centre, Tamil Nadu Astronomical Science Society held at Bishop Heber College,Trichy.

I. The first day was divided into 4 sessions, In the Introductory class the students have learnt about the Constellation of stars, poles, and their identification. They had activity sessions and Nigh sky watching under the guidance of Prof. Mohana.She had also explained about the Orion stars

II The second day (03.04.2022)

The second day started with experiments and activities. The students made the ball mirror for seeing the Zero Shadow day. They also made a CD spectroscope to see different colours. Dr. Ravikumar explained the Solar system with a role play. This workshop came to an end with the allocation of Zone camp at different places and the valedictory session.

