

Vidya Prasarak Mandal
Mungasaji Maharaj Mahavidyalaya, Darwaha
Department of Physics

Academic Guidance Talk

On

CRYSTALLOGRAPHY: Crystal Defects

At

Vinayak Vidnyan Mahavidyalaya, Nandgao Khandeshwar

Delivered by-

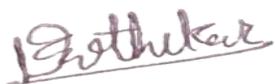
Asst. Prof. Miss. Dhanshree Dattatray Kothekar

C. V. Raman Lecture Series for B. Sc. Students

On the occasion of National Science Day 2021, Department of Physics, Vinayak Vidnyan Mahavidyalaya, Nandgao Khandeshwar had organized the Online Lecture Series for the UG students. Dr. A. S. Wadtkar, Head, Department of Physics, Vinayak Mahavidyalaya had invited me for the same. On the 17th day of the scheduled series I delivered the academic guidance talk on the topic "CRYSTALLOGRAPHY: Crystal Defects" dated 12th March 2021. The lecture was continued for about one and half hour. Last 15 min were given to the students to ask their queries on the delivered talk. I had witnessed the overwhelming response from the students. More than 70 students attended the lecture with good concentration.

It was really very wonderful organization in this pandemic situation. To be a part of the Raman Lecture Series was very incredible experience. I extend my sincere gratitude to the whole organizing team for giving me this great opportunity and appreciating me a lot. My best wishes will be always with the Department of Physics and Vinayak Mahavidyalaya. Hope the college will organize many more events every year. I would like to be a part of the future academic activities.

Special thanks to Dr. Anant Wadtkar, Dr. Prashant Kharat and Mr. Ajay Ambhore.



In-charge Teacher
(Asst. Prof. D. D. Kothekar)



Head of Department
(Dr. K. K. Hurde)



Principal
(Dr. V. B. Raut)

LEAFLET



SANT GADGE BABA AMRAVATI UNIVERSITY, AMRAVATI AFFILIATED

Pravin Khodke Memorial Trust Amravati's Vinayak Vidyan Mahavidyalaya

Tq. Nandgaon Khandeshwar, Dist. Amravati

DEPARTMENT OF PHYSICS

Organizes

C. V. Raman Lecture Series For B.Sc. Students (22 February – 11 March 2021)



About Lecture Series : National Science Day is celebrated on 28 February each year in India with the objectives of commemorating the first Nobel Prize in India for Science which was conferred on Sir C. V. Raman for his invention of Raman Effect. It is also celebrated to emphasize on the culture and the application of science for the welfare of people. As part of the National Science Day celebration, Department of Physics, Vinayak Vidyan Mahavidyalaya, Nandgaon Khandeshwar, Dist. Amravati organizing lecture series for the B.Sc. Students from various institutions and colleges.

About College : Pravin Khodke Memorial Trust Amravati's, Vinayak Vidyan Mahavidyalaya, Nandgaon Khandeshwar, Dist. Amravati, Maharashtra, India established in 2007 is a pioneering science institution spreading science education in the rural area Nandgaon Khandeshwar in the Vidarbha region. The institute is affiliated to Sant Gadge Baba Amravati University. Today the institution functions with more than 22 teaching faculties in Science and Commerce Streams and 500+ students. The teachers are highly motivated and have original, published academic and creative work, including journals and other print media articles and educational film making to their credit. We at Vinayak Vidyan Mahavidyalaya, Nandgaon Khandeshwar of Science and Commerce emphasize the holistic development of personality, meaningful exposure to the realworld, and inculcating practical skills amongst our students apart from ensuring academic excellence.

~~*~*~* Organizing Committee *~*~*~*~*

| | |
|--|--|
| Organizer Dr. Suchita P. Khodke Coordinator IQAC | Organizer Dr. Alka Bhise Principal |
| Coordinator Mr. Ajay V. Ambhore Assistant Professor | Convener Dr. Prashant B. Kharat Assistant Professor |
| | Organizing Secretary Dr. Anant S. Wadkar Head & Assistant Professor |

***** Instructions for Joining The Sessions *****

❖ Participants can register for the lecture series using Google form link

https://docs.google.com/forms/d/e/1FAIpQLScKbFwQs9a8NlaQUZ0TXvYdJ7E1qBb079_9DkCZzS1SoQVjwform

❖ After registration participants must join Telegram Group for the notification

<https://t.me/joinchat/IEPA3v0bSyH7-cr6>

❖ Lecture series is open to all participants from any institute they can attend all sessions.

❖ All the participants will be get the online certificate with percentage of their attendance during the Lecture series on their registered email.

~~*~*~* Guest Speakers / Resource Persons *~*~*~*~*



Prof. T. S. Wasnik
Professor & Head
Department of Physics,
Vidya Bharati Mahavidyalaya,
Amravati

Monday 22 February 2021

"Optics: Double Refraction"



Dr. Avinash S. Dive
Assistant Professor
Department of Physics,
Shri. R. G. Rathod Arts & Science College,
Murtizapur, Dist. Akola

Tuesday 23 February 2021

"Recent trends in Solar Cell: Working & Application"



Dr. Jitendra S. Kounsalye
Assistant Professor
Department of Physics,
Late Rajkumari Bharti Arts, Commerce and Smt.
Sushilabai R. Bharti Science College, Arni,
Dist. Yavatmal

Wednesday 24 February 2021

"Opportunities In Physics After Graduation"



Prof. Narendra B. Thakare
Assistant Professor & Head
Department of Physics,
Shri Shivaji Science and Arts College, Chikhali,
Dist. Buldana

Thursday 25 February 2021

"Need of Quantum Mechanics"



Dr. Pankaj P. Khirade
Assistant Professor
Department of Physics,
Shri Shivaji Science College,
Amravati

Friday 26 February 2021

"Nanotechnology & Nanoscience"



Dr. Ashok V. Humbe
Assistant Professor
Department of Electronics,
Dr. Babasaheb Ambedkar Marathwada
University, Aurangabad

Saturday 27 February 2021

"Sustainable Nanomaterials for Diverse Application"



Dr. Dhammajot K. Gaikwad
Assistant Professor
Department of Physics,
Art, Commerce And Science College,
Dharamgaon, Dist. Jalgaon

Monday 01 March 2021

"Learning of Physics : Through an Innovative Ideas"



Dr. Abhijit S. Bansod
Assistant Professor
Department of Mathematics,
Vinayak Vidyan Mahavidyalaya, Nandgaon
Khandeshwar, Dist. Amravati

Tuesday 02 March 2021

"Cosmology : The Evolution of the Universe"



Dr. Ifra Shaikh
Assistant Professor
Department of Physics,
Maulana Azad College of Arts, Science and
Commerce, Aurangabad

Wednesday 03 March 2021

"Conduction of Electromagnetic waves and Role of Dielectric media"



Dr. Priti B. Deshmukh
Assistant Professor & Head
Department of Physics,
Vinayak Vidyan Mahavidyalaya, Nandgaon
Khandeshwar, Dist. Amravati

Thursday 04 March 2021

"Useful Numerical Methods in Physics"



Dr. Kavita P. Kakde
Assistant Professor
Department of Chemistry,
Vinayak Vidyan Mahavidyalaya, Nandgaon
Khandeshwar, Dist. Amravati

Friday 05 March 2021

"Photoelectric and Compton Effect"



Prof. Nilesh S. Padole
Assistant Professor & Head
Department of Chemistry,
Vinayak Vidyan Mahavidyalaya, Nandgaon
Khandeshwar, Dist. Amravati

Saturday 06 March 2021

"Raman Effect"



Prof. Rohan K. Shirsath
Assistant Professor
Department of Physics,
Shankarlal Khandelal Arts, Science and
Commerce College, Akola

Monday 08 March 2021

"Quantum Mechanics"



Prof. Kalyani V. Atram
Assistant Professor
Department of Physics,
Anand Niketan College of Science Arts and
Commerce, Warora, Dist. Chandrapur

Tuesday 09 March 2021

"LASER : Types and Applications"



Dr. Naresh N. Sarkar
Assistant Professor
Department of Physics,
Shri Shivaji Science College,
Amravati

Wednesday 10 March 2021

"Magnetic Properties of Materials."



Prof. Dhanshree D. Kothekar
Assistant Professor
Department of Physics,
Munsciji Maharaj Mahavidyalaya,
Doraha, Dist. Yavatmal

Friday 12 March 2021

"Crystallography- Crystal Defects"

CIRCULAR



SANT GADGE BABA AMRAVATI UNIVERSITY, AMRAVATI AFFILIATED

Pravin Khodke Memorial Trust Amravati's **Vinayak Vidnyan Mahavidyalaya**

Tq. Nandgaon Khandeshwar, Dist. Amravati

DEPARTMENT OF PHYSICS

Organizes

C. V. Raman Lecture Series For B.Sc. Students

Day 17th - Friday 12 March 2021

Time : Afternoon 12:00 to 01:00

***** Guest Speaker *****



Prof. Dhanshree D. Kotheekar

Assistant Professor

Department of Physics,
Mungsaji Maharaj Mahavidyalaya,
Darwaha, Dist. Yavatmal

Topic :

“Crystallography: Crystal Detects”

Registration  <https://shorturl.at/jyFL4>

 <https://us02web.zoom.us/j/89356892874> Meeting ID: [893 5689 2874](https://us02web.zoom.us/j/89356892874)

You Tube https://www.youtube.com/channel/UCvGoOJfpD_YU106EWnSL7Tw

***** Organizing Committee *****

Organizer

Dr. Suchita P. Khodke
Coordinator IQAC

Organizer

Dr. Alka A. Bhise
Principal

Coordinator

Mr. Ajay V. Ambhore
Assistant Professor

Convener

Dr. Prashant B. Kharat
Assistant Professor

Organizing Secretary

Dr. Anant S. Wadatar
Head & Assistant Professor

POWER POINT SLIDES

C. V. Raman Lecture Series for B. Sc. Students



Success can come to you by courageous devotion to the task lying in front of you.



Remembering
Sir C. V. Raman

First Indian Nobel Laureate
in Physics



Organised by -

Department of Physics
Vinayak Vinvan Mahavidyalaya, Nandgaon Khandeshwar

Day 17th

Vidya Prasarak Mandal

MUNGASAJI MAHARAJ MAHAVIDYALAYA, DARWHA



Prof. Dhanshree D. Kothekar

Assistant Professor,
Department of Physics,
Mungasaji Maharaj Mahavidyalaya,
Darwha,
Dist. Yavatmal

**“CRYSTALLOGRAPHY :
Crystal Defects”**

CRYSTALS

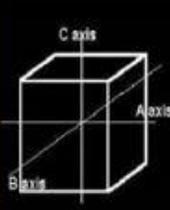
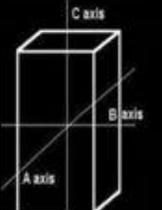
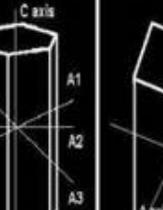
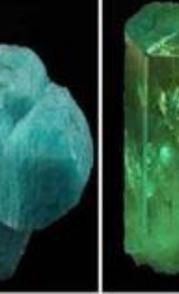


Asst. Prof. [Dhanstree Kothekar](#)

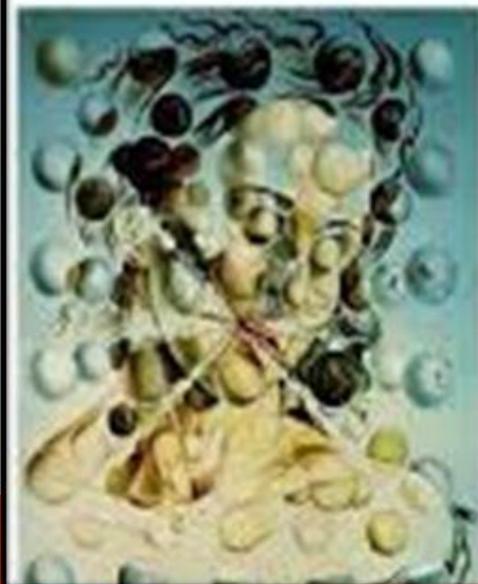
| | | | |
|---|---|---|---|
|  |  |  |  |
| January Garnet | February Amethyst | March Aquamarine | April Crystal |
|  |  |  |  |
| May Emerald | June Light Amethyst | July Ruby | August Peridot |
|  |  |  |  |
| September Sapphire | October Rose Quartz | November Topaz | December Blue Zircon |

Asst. Prof. [Dhanstree Kothekar](#)

Crystal Systems

| Isometric | Tetragonal | Orthorhombic | Monoclinic | Triclinic | Hexagonal | Trigonal |
|---|---|---|---|--|---|---|
|  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |
| Fluorite | Wulfenite | Tanzanite | Azurite | Amazonite | Emerald | Rhodochrosite |

"Defects" in Crystals (Solids)



"Solids are like people - imperfect!"

It's the defects that make them unique & interesting"

(J. Corish)

Types of Defects

Point Defects

Imperfect point-like regions in the crystal.

The deviation of the atomic arrangement in lattice is confined to a very small region.

Line Defects

One part of crystal shifts or slips relative to the rest part.

Defect is along a boundary line between slipped and unslipped portions.

Plane Defects

Defects have extension in area

Surface imperfections are two dimensional in geometrical sense.

Asst. Prof. Dhanshree Kothekar.

Point Defects

Vacancy

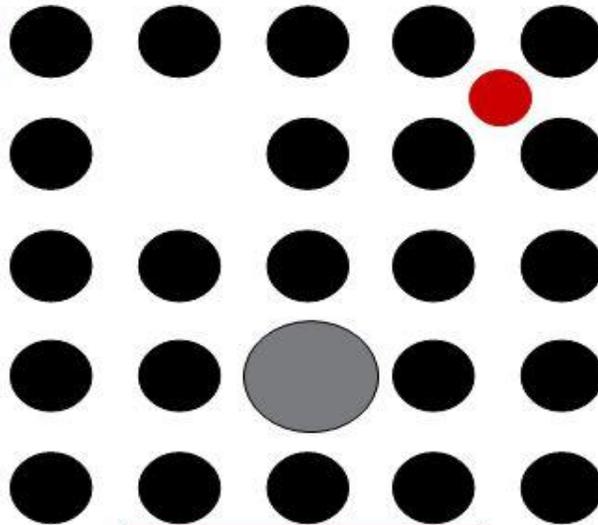
Interstitial atoms

Impurity atoms

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Point Defects

Vacancy

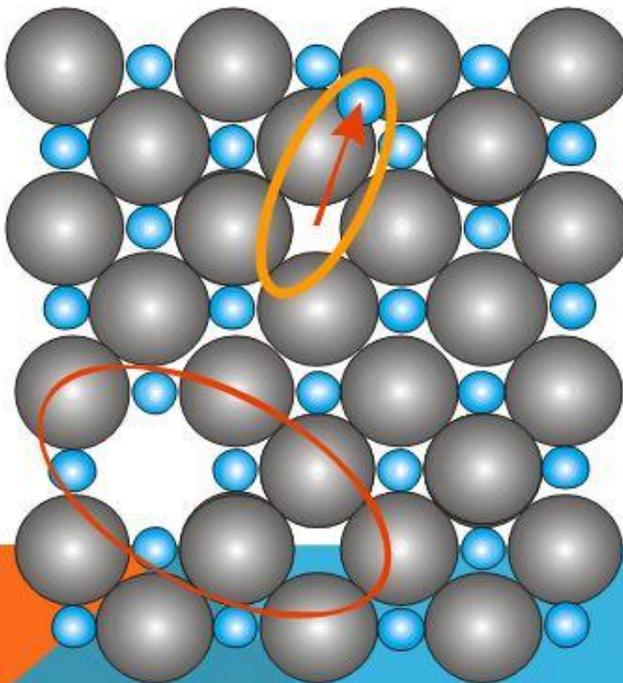


Interstitial impurity

Substitutional impurity

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Defects in ionic solids



Frenkel defect

Cation vacancy
+
cation interstitial

Cation vacancy
+
anion vacancy

Schottky defect

Asst. Prof. Dhanshree Kothekar

Burgers vector



Johannes Martinus
BURGERS

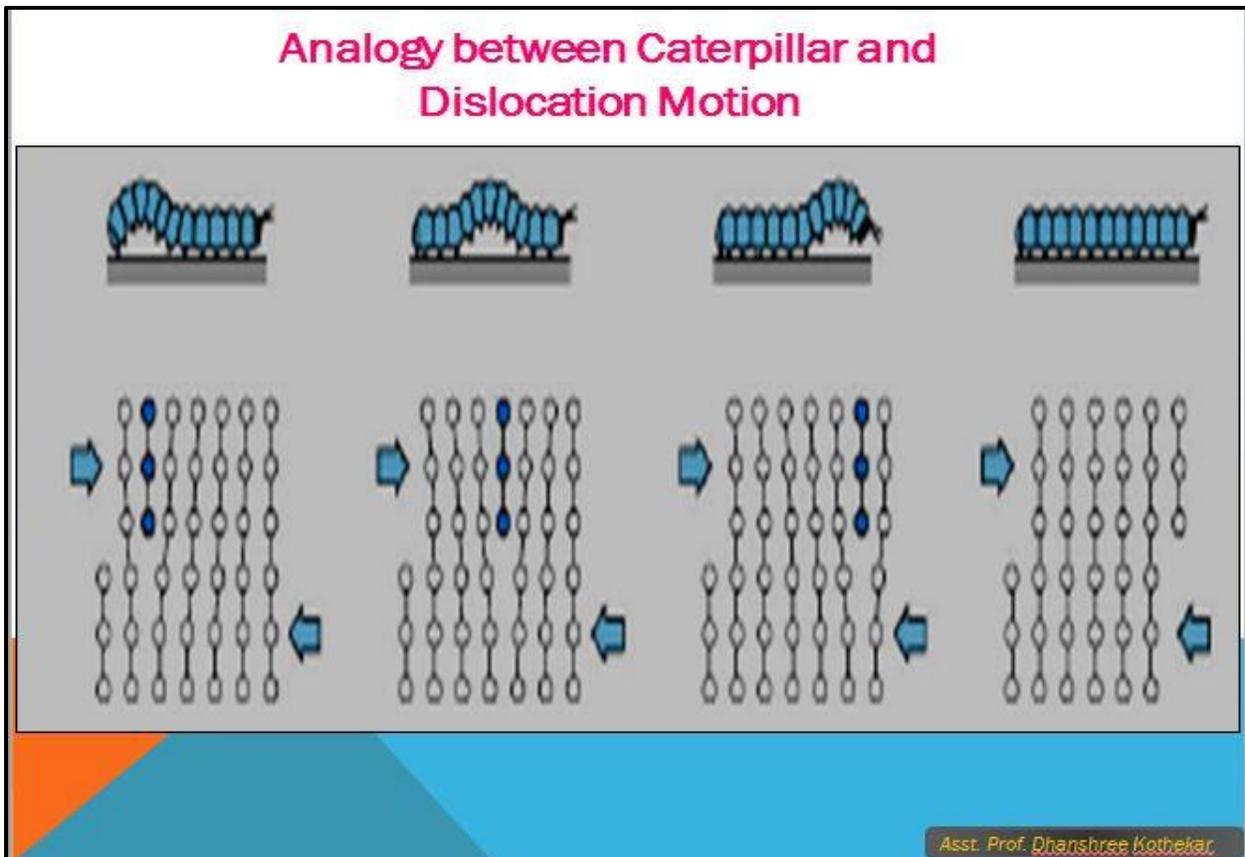
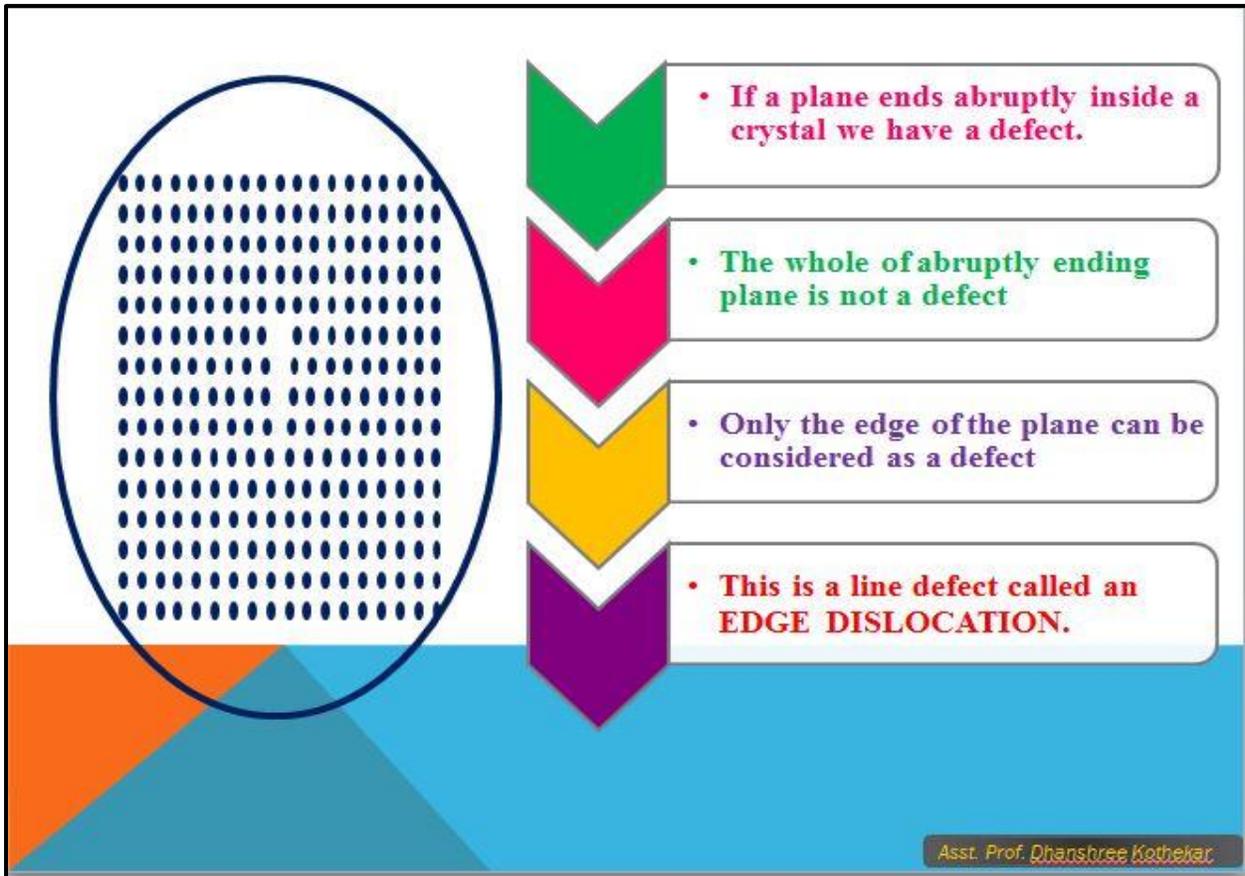
Burger's vector

Burgers vector

Asst. Prof. Dhanshree Kothekar

| | Positive | Negative |
|-------------------|--|---|
| Edge Dislocation | Extra half plane <i>above</i> the slip plane | Extra half plane <i>below</i> the slip plane |
| Screw Dislocation | Left-handed spiral ramp b parallel to t | Right-handed spiral ramp b antiparallel to t |

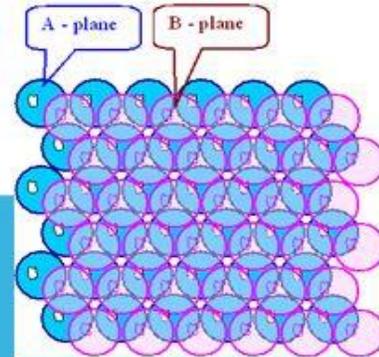
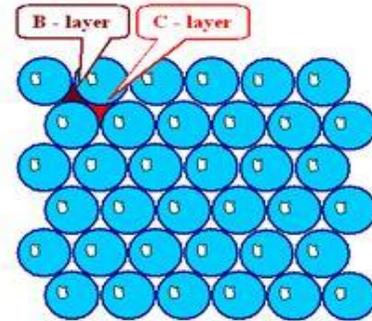
Asst. Prof. Dhanshree Kothekar



Stacking Faults

We take the blue atoms as the base plane for what we are going to built on it, we will call it the "A - plane".

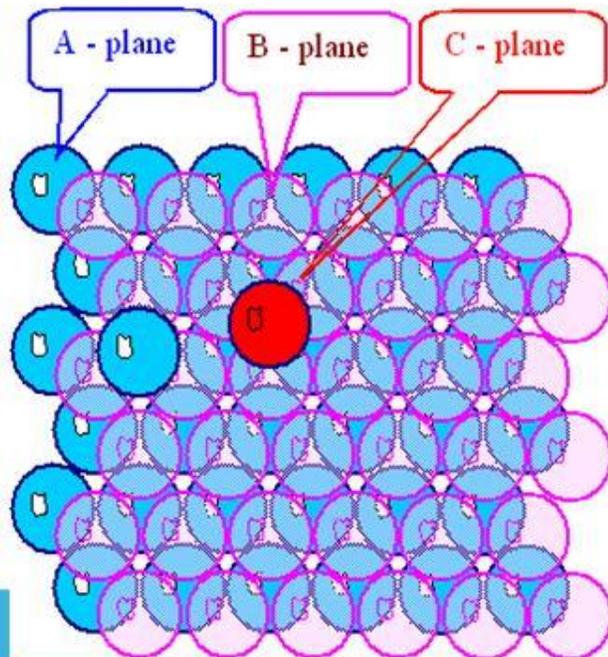
The next layer will have the center of the atoms right over the depressions of the A - plane; it could be either the B - or C - configuration. Here the pink layer is in the "B" position.



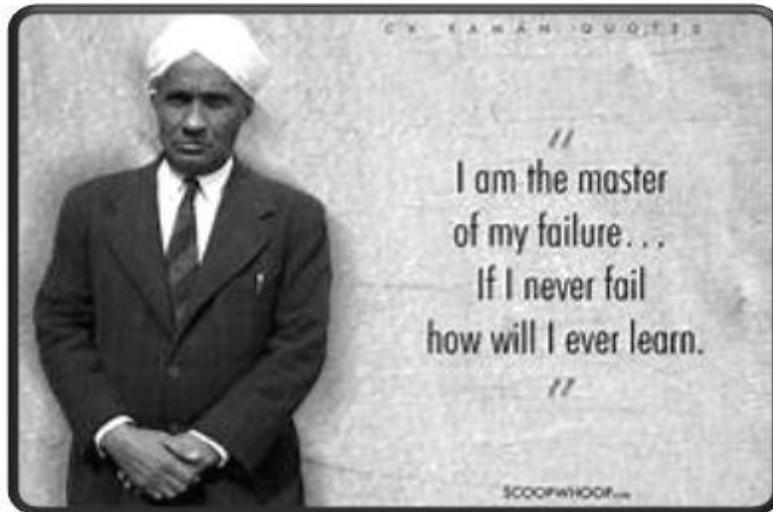
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If you pick the B - configuration (and whatever you pick at this stage, we can always call it the B - configuration), the third layer can either be directly over the A - plane and then is also an A - plane (shown for one atom), or in the C - configuration.

If you chose "A"; you obtain the **hexagonal close packed lattice (hcp)**, if you chose "C", you get the **face centered cubic lattice (fcc)**.



Asst. Prof. Dhanshree Kothekar



Asst. Prof. Dhanshree Kothekar.

END OF PRESENTATION

Thank you your attention

Now the ball is in your court
Time for your questions

*Thank
You!*



Asst. Prof. Dhanshree Kothekar.

Close

Participants (66)

- SG** Shubham Gulhane   >
- SJ** Shubhangi Jadhav    >
- SC** Shweta charpe   >
- SS** Shyam Shelke   >
- SV** Sneha vanjari   >
- SR** Srushti raut   >
- VG** Vaibhav Gulhane   >
- VG** Vaishnavi Gatule   >
- VR** Vaishnavi Raut   >
- VS** Vaishnavi Shelke   >
- VT** Vaishnavi Tarpe   >
-  Vaishnvi Bhadke   >
- W** wakib shaha   >
- RN** realme Narzo 10A  >

Invite

विज्ञान मानवी संस्कृति की प्रगति में वरदान



■ डॉ. अलका भिसे के कथन ■ राष्ट्रीय विज्ञान दिवस निमित्त व्याख्यान माला का आयोजन

प्रतिनिधि/ दि. १९

अमरावती- २८ फरवरी को राष्ट्रीय विज्ञान दिवस के अवसर पर भौतिकशास्त्र विभाग, विनायक विज्ञान महाविद्यालय नांदगांव खंडेश्वर की ओर से राष्ट्रीय विज्ञान दिवस उत्साह से मनाया गया. इसमें महाविद्यालय की ओर से ऑनलाइन व्याख्यान माला का आयोजन किया गया था. इस व्याख्यान माला का उद्घाटन समारोह २२ फरवरी को प्राचार्य डॉ. अलका भिसे के हाथों हुआ. इस समारोह के प्रमुख अतिथि के रूप में प्रा. डॉ. टी.एस. वासनिक, विद्याभारती महाविद्यालय अमरावती उपस्थित थे. विज्ञान मानवी

संस्कृति की प्रगति में वरदान रहा है. ऐसा मत उद्घाटन पर भाषण में व्यक्त किया.

इस अवसर पर महाविद्यालय के आयक्यूएसी समन्वयक डॉ. सुचिता खोडके, व्याख्यानमाला के आयोजन सचिव, प्रा. डॉ. अनंत वडतकर, संयोजक प्रा. डॉ. प्रशांत खरात, सहसंयोजक प्रा. अजय अंभोरे आदि उपस्थित थे. कार्यक्रम का संचालन डॉ. अनंत वडतकर ने किया.

आभार प्रदर्शन डॉ. प्रशांत खरात ने किया. इस व्याख्यान माला की शुरुआत डॉ. टी.एस. वासनिक के व्याख्यान से हुई. उसके बाद २२ फरवरी से १२ मार्च तक १७ दिन चलनेवाली इस व्याख्यान माला में रोज एक इस अनुसार कुल १७ व्याख्यान का आयोजन किया गया था. इस व्याख्यान माला में महाराष्ट्र के विविध जिले से विविध महाविद्यालय से प्रसिद्ध व्यक्ति सहभागी हुए थे. जिसमें डॉ.

टी.एस. वासनिक, विद्याभारती महाविद्यालय अमरावती, डॉ. अविनाश विवे, आर.जी. राठोड सायन्स कॉलेज मुर्तिजापुर, डॉ. जितेन्द्र कौसले, श्रीमती सुशीलाबाई भारती सायन्स कॉलेज, आर्णी, जिला यवतमाल, प्रा. नरेन्द्र ठाकरे, श्री शिवाजी सायन्स कॉलेज चिखली, जिला बुलढाणा, डॉ. पंकज खिराले, श्री शिवाजी सायन्स कॉलेज अमरावती, डॉ. अशोक हुंबे, डॉ. बाबासाहेब आंबेडकर मराठवाडा विद्यापीठ औरंगाबाद, डॉ. डी.के. गायकवाड, सायन्स कॉलेज धरणगांव, जि. जलगांव, डॉ. इफ्रा शेख मौलाना आजाद कॉलेज, औरंगाबाद, डॉ. डी.के. गायकवाड, सायन्स कॉलेज धरणगांव, जिला जलगांव, डॉ. इफ्रा शेख, मौलाना आजाद कॉलेज, औरंगाबाद, डॉ. अभिजीत बनसोड, डॉ. प्रीती देशमुख, डॉ. कविता काकडे व प्रा. निलेश पडोले विनायक विज्ञान महाविद्यालय नांदगांव खंडेश्वर, प्रा. रोहन शिरसाट, शंकरलाल

खंडेलवाल कॉलेज, अकोला, प्रा. कल्याणी आत्राम, आनंद निकेतन कॉलेज, वरोरा, जिला चंद्रपुर, डॉ. नरेश सरकार, श्री शिवाजी सायन्स कॉलेज अमरावती, प्रा. प्रेषित सिध्दभट्टी, भारत महाविद्यालय बुलढाणा, प्रा. धनश्री कोठेकर, श्री मुंगसाजी महाराज महाविद्यालय दारुवा, जिला यवतमाल आदि ने इस व्याख्यान माला में मार्गदर्शन किए.

इस व्याख्यान माला को राज्यभर से उत्तम प्रतिसाद मिला. इस व्याख्यान माला का लाभ राज्य के अनेक महाविद्यालयीन विद्यार्थियों ने लिया. इस कार्यक्रम को सफल बनाने के लिए व्याख्यान माला के आयोजक सचिव, प्रा. डॉ. वडतकर, संयोजक प्रा. डॉ. प्रशांत खरात, सह संयोजक प्रा. अजय अंभोरे ने अथक परिश्रम किए. उसी प्रकार ऑनलाइन आयोजन के लिए प्रा. डॉ. प्रशांत खरात का सहयोग रहा.

विज्ञान मानवी संस्कृतीच्या प्रगतीमध्ये वरदान



■ डॉ. अलका भिसे यांचे प्रतिपादन

प्रतिनिधी/ २० मार्च

अमरावती- विज्ञान हे मानवी संस्कृतीच्या प्रगतीमध्ये वरदान राहिल्याचे प्रतिपादन प्राचार्य डॉ. अलका भिसे यांनी केले आहे. राष्ट्रीय विज्ञान दिवसाच्या निमित्ताने नांदगाव खंडेश्वर येथील विनायक विज्ञान महाविद्यालयाच्या भौतिकशास्त्र विभागाच्या वतीने राष्ट्रीय विज्ञान

दिवस साजरा करण्यात आला. यात महाविद्यालयाच्या वतीने ऑनलाइन व्याख्यानमालेचे आयोजन करण्यात आले होते. या व्याख्यानमालेचे उद्घाटन प्राचार्य डॉ. अलका भिसे यांच्या हस्ते करण्यात आले होते, त्या वेळी त्या बोलत होत्या.

या समारंभाला प्रमुख पाहुणे स्थानिक विद्याभारती महाविद्यालयाचे प्राध्यापक डॉ. टी. एस. वासनिक उपस्थित होते. महाविद्यालयाच्या समन्वयक डॉ. सुचिता खोडके, सहसंयोजक प्रा. अजय अंभोरे आदी या वेळी उपस्थित होते. कार्यक्रम यांचे संचालन डॉ. अनंत वडतकर यांनी केले. आभार संयोजक प्रा. डॉ. प्रशांत खरात यांनी मानले.