



Vidya Prasarak Mandal

**Mungasaji Maharaj
Mahavidyalaya, Darwha**



Workshop on Physics Virtual Labs For UG & PG Physics Students

In the scenario of the Covid-19 pandemic, it became impossible for Physics students to have hands-on experience of experiments which helps to sharpen their understanding of fundamental concepts. The virtual labs are the effective alternative that we had in that situation.

About Workshop

- The participants were introduced to Online Physics Virtual Labs.
- The expert gave the demonstration and training of virtual lab experiments.

Objectives of the Workshop

- ✓ To save time spent for studying new laboratory experiments
- ✓ To work in an user friendly lab setup (on computers/mobiles)
- ✓ To learn concepts and good lab techniques by performing simulations
- ✓ To learn faster using step through animations
- ✓ To experience the anytime, anywhere access and repeatability features of online labs

Organizers

Department of Physics

Date

30th March 2021

Resource Person



Dr. P. A. Nagpure

Associate Professor in Physics
Nodal Coordinator Amrita Virtual Labs
Shri. Shivaji Science College,

How to Join ?

- ❖ More than 96 students attended the workshop.
- ❖ About 8-9 experiments of UG and PG are demonstrated by the guest.

meet.google.com/dcj-nfmb-sih?authuser=1

Pankaj Nagpure is presenting

Almas Jahan and 75 more

14:28

86

You

Physics Virtual Lab. Experiment

WhatsApp Image...jpeg

2:28 PM 3/30/2021

meet.google.com/dcj-nfmb-sih?authuser=1

Pankaj Nagpure is presenting

Alfiya Asna and 65 more

14:40

76

You

Physics Virtual Lab. Experiment

Moment of Inertia of Flywheel

VARIABLES

Choose Environment:

Length of axle: 10 cm

Mass of fly wheel: 5 kg

Diameter of fly wheel: 10 cm

Mass of rings: 200 gm

Diameter of axle: 2 cm

No. of wound of chord: 5

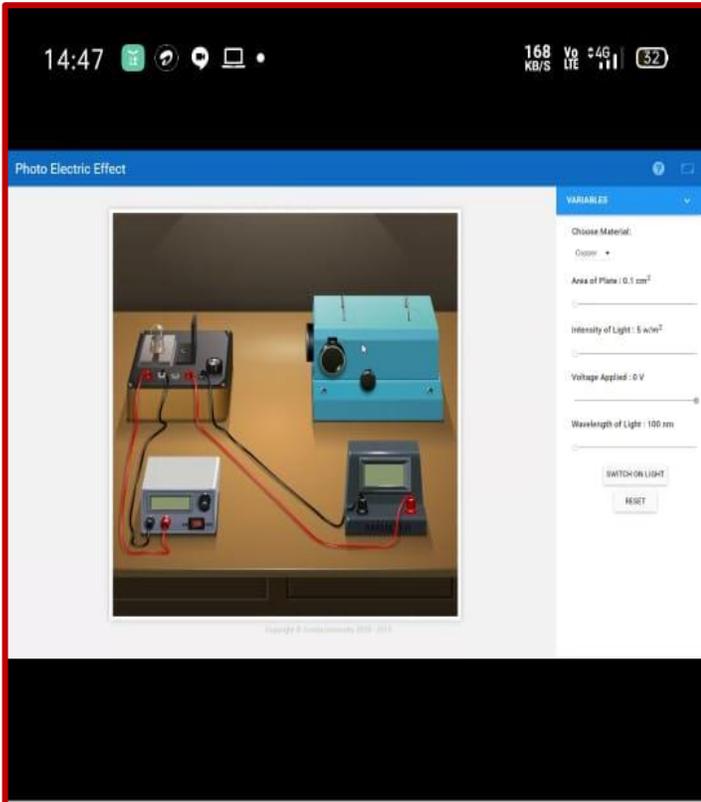
RELEASE FOR WHEEL

RESET

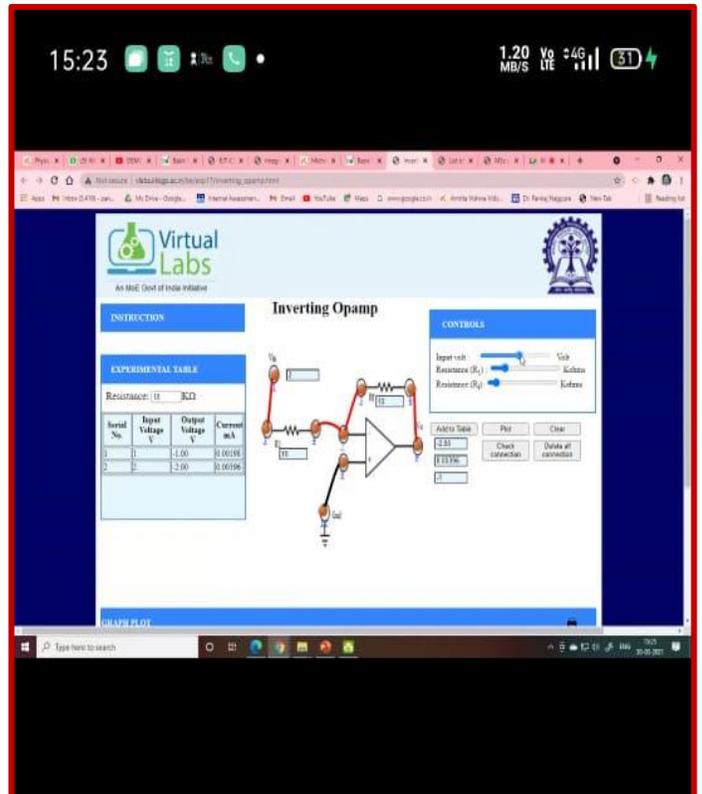
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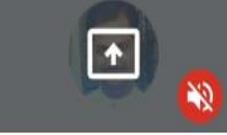
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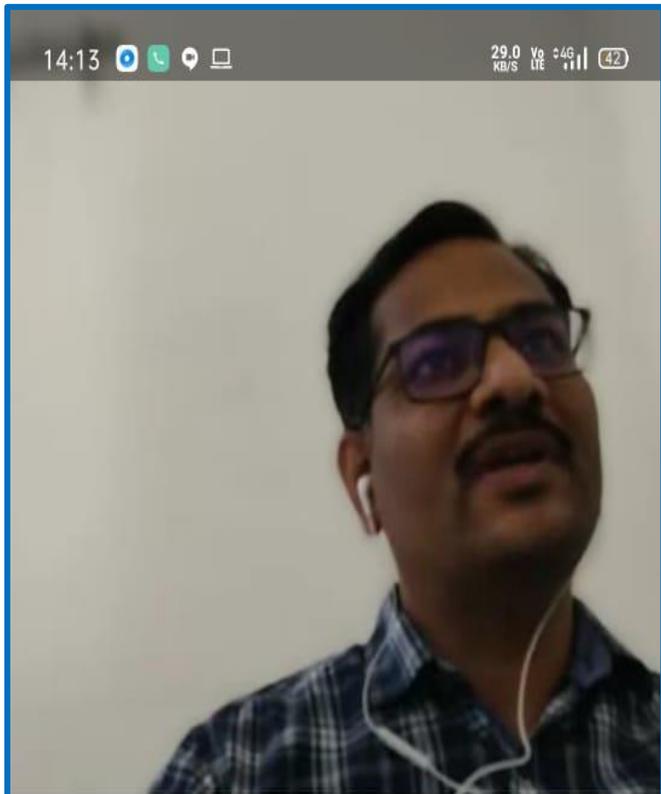
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- (70)
-  Pranita Thakare >
 -  prashant bageshwar >
 -  Prathamesh Deshmukh >
 -  PRATIKSHA ASWAR >
 -  Priya Jaiswal >



- (48)
-  quantum mechanics (You)
 -  Prof. Dhanshree Kothekar >
 -  Pankaj Nagpure >
 -  Pankaj Nagpure >
 - Also in the meeting (44)
 -  Aaliya Shaikh >



14:13

29.0 KB/S Vo LTE 4G (42)

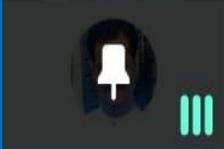
(87)



quantum mechanics (You)



Kishor Hurde



Pankaj Nagpure



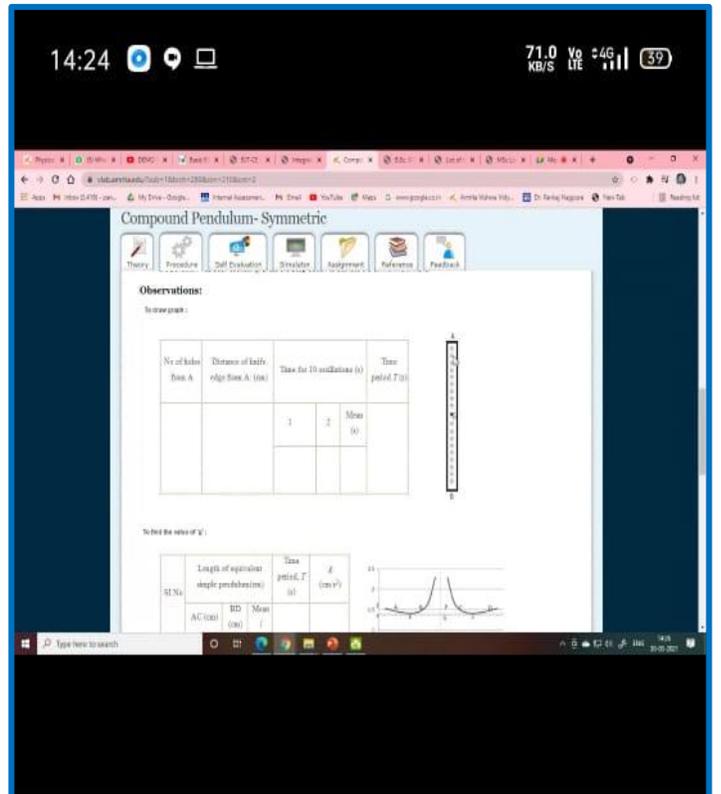
Prof. Dhanshree Kothekar



Also in the meeting (83)



Aaliya Shaikh



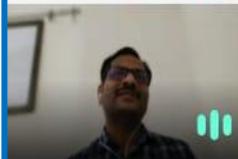
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71.0 KB/S Vo LTE 4G (39)

(86)



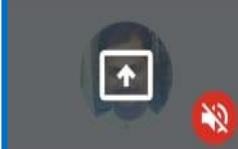
quantum mechanics (You)



Pankaj Nagpure



Abhay Tiwari



Pankaj Nagpure



Also in the meeting (82)



Aaliya Shaikh



14:11 11.0 KB/S Vo LTE 4G 43



Prof. Dhanshree Kothekar

(82)

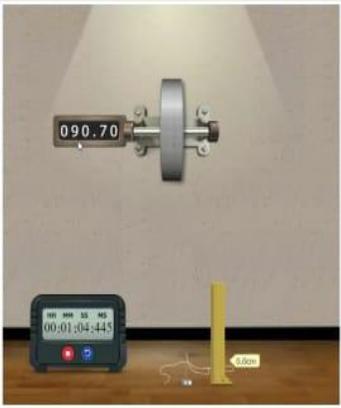
- quantum mechanics (You)
- Kishor Hurde >
- Dr. Vilas Raut >
- Prof. Dhanshree Kothekar >

Also in the meeting (78)

- Aaliya Shaikh >

14:41 61.0 KB/S Vo LTE 4G 34

Moment of Inertia of Flywheel



090.70

00:01:04.445

Variables

- Choose Environment:
- Mass of fly wheel: 5 kg
- Diameter of fly wheel: 10 cm
- Mass of rings: 200 gm
- Diameter of axle: 2 cm
- No. of wound of chord: 5

RELEASE FLY WHEEL

RESET

(75)

- quantum mechanics (You)
- Pankaj Nagpure >
- Kishor Hurde >
- Pankaj Nagpure >

Also in the meeting (71)

- Aaliya Shaikh >

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DEPARTMENT OF PHYSICS

List of the virtual experiments to be performed by the students of B.Sc. I Sem I

Sr. No.	Experiment	Link
1	<p>Use the screw gauge;</p> <ul style="list-style-type: none">To measure the diameter of the given lead shot.To measure the diameter of a given wire and find its volume.To measure the thickness of a given glass plate and find its volume.To measure the volume of an irregular lamina. <p>Use the Vernier Calipers.</p> <ul style="list-style-type: none">To measure the diameter of a small spherical / cylindrical body.To measure the length, width and height of the given rectangular block.To measure the internal diameter and depth of a given beaker/calorimeter and hence find its volume.	<p>http://amrita.olabs.edu.in/?sub=1&brch=5&sim=156&cnt=1</p> <p>http://amrita.olabs.edu.in/?sub=1&brch=5&sim=16&cnt=1</p>
2	To determine the surface tension of a liquid by capillary rise method.	http://amrita.olabs.edu.in/?sub=1&brch=5&sim=224&cnt=55 4
3	To determine the coefficient of viscosity of a given viscous liquid by measuring terminal velocity of a given spherical body.	http://amrita.olabs.edu.in/?sub=1&brch=5&sim=225&cnt=4
4	To determine the angular acceleration α and torque τ of flywheel.	https://vlab.amrita.edu/?sub=1&brch=74&sim=1517&cnt=1
5	The flywheel consists of a heavy circular disc or wheel with a strong axle mounted on ball bearings on two fixed supports. The wheel can be rotated in a vertical plane about the horizontal axle. It is used to determine the moment of inertia.	https://vlab.amrita.edu/?sub=1&brch=74&sim=571&cnt=1
6	To verify the momentum and kinetic energy conservation using collision balls.	https://vlab.amrita.edu/?sub=1&brch=74&sim=197&cnt=1
7	<ol style="list-style-type: none">The Elastic and Inelastic collision simulation will help to analyse the collision variations for different situations.Demonstration of collision behaviour for elastic and inelastic type.Variation of collision behavior in elastic and inelastic type.Study of variation of Momentum, Kinetic energy, Velocity of collision of the objects and the Center of Mass with different velocity and mass.	https://vlab.amrita.edu/?sub=1&brch=74&sim=189&cnt=1

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DEPARTMENT OF PHYSICS

List of the virtual experiments to be performed by the students of B.Sc. II. Sem III

Sr. No.	Experiment	Link
1	To study the variation of magnetic field with distance along the axis of a circular coil carrying current.	https://vlab.amrita.edu/?sub=1&brch=192&sim=972&cnt=1
2	To determine the Hall voltage developed across the sample material. To calculate the Hall coefficient and the carrier concentration of the sample material.	https://vlab.amrita.edu/?sub=1&brch=282&sim=879&cnt=1
3	To draw the static current-voltage (I-V) characteristics of a junction diode.	https://vlab.amrita.edu/?sub=1&brch=282&sim=1522&cnt=1
4	To study Half Wave Rectification To study Full Wave Rectification	http://vlabs.iitkgp.ac.in/be/exp6/index.html http://vlabs.iitkgp.ac.in/be/exp7/index.html
5	To study Capacitive Rectification	http://vlabs.iitkgp.ac.in/be/exp8/index.html
6	To study common emitter characteristics of transistor	http://vlabs.iitkgp.ac.in/be/exp11/index.html#
7	To study common base characteristics of transistor	http://vlabs.iitkgp.ac.in/be/exp12/index.html
8	Study of basic properties of Operational Amplifier: Inverting and Non-Inverting Amplifiers	http://vlabs.iitkgp.ac.in/be/index.html#
9	Study of Differentiator and Integrator using Operational Amplifier	http://vlabs.iitkgp.ac.in/be/exp18/index.html
10	To study Zener Diode-Voltage Regulator	http://vlabs.iitkgp.ac.in/be/exp10/index.html

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DEPARTMENT OF PHYSICS

List of the virtual experiments to be performed by the students of B.Sc. III Semester V

Sr. No.	Experiment	Link
1	To study Frequency response of Common Emitter Amplifier.	http://vlabs.iitkgp.ac.in/be/exp13/index.html
2	Design and setup an astable multivibrator and calculate the time period and duty cycle of the output waveform.	https://vlab.amrita.edu/?sub=1&brch=201&sim=1167&cnt=1
3	To construct a Colpitts oscillator and to measure its output frequency.	https://vlab.amrita.edu/?sub=1&brch=201&sim=1142&cnt=1
4	To design and construct a Hartley oscillator and to measure its output frequency.	https://vlab.amrita.edu/?sub=1&brch=201&sim=1137&cnt=1
5	A. To understand the phenomenon Photoelectric effect as a whole. B. To draw kinetic energy of photoelectrons as a function of frequency of incident radiation. C. To determine the Planck's constant from kinetic energy versus frequency graph. D. To plot a graph connecting photocurrent and applied potential. E. To determine the stopping	https://vlab.amrita.edu/?sub=1&brch=195&sim=840&cnt=1
6	To study the emission spectra of Hydrogen, Neon and mercury vapours.	https://vlab.amrita.edu/?sub=1&brch=195&sim=359&cnt=1
7	A. To experimentally demonstrate the concept of Millikan's oil drop experiment. B. To find the terminal velocity of the drop. C. To find the charge on a drop.	https://vlab.amrita.edu/?sub=1&brch=195&sim=357&cnt=1

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DEPARTMENT OF PHYSICS

List of the virtual experiments to be performed by the students of M.Sc. I

1.	To study photoelectric effect <ol style="list-style-type: none">To understand the phenomenon Photoelectric effect as a whole.To draw kinetic energy of photoelectrons as a function of frequency of incident radiation.To determine the Planck's constant from kinetic energy versus frequency graph.To plot a graph connecting photocurrent and applied potential.To determine the stopping potential from the photocurrent versus applied potential graph.
2.	Millikan's Oil Drop Experiment <ol style="list-style-type: none">To experimentally demonstrate the concept of Millikan's oil drop experiment.To find the terminal velocity of the drop.To find the charge on a drop.
3.	To determine the wavelength of a laser using the Michelson interferometer. To calculate the beam divergence and spot size of the given laser beam.
4.	To determine the refractive index of a thin glass plate using Michelson's Interferometer.
5.	Newton's ring experiment <ol style="list-style-type: none">To revise the concept of interference of light waves in general and thin-film interference in particular.To set up and observe Newton's rings.Find the refractive index of given liquid.
6.	To determine the refractive index of the material of a prism.
7.	To determine the number of lines per millimeter of the grating using the green line of the mercury spectrum.
8.	To calculate the wavelength of the other prominent lines of mercury by normal incidence method.

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DEPARTMENT OF PHYSICS

List of the virtual experiments to be performed by the students of M.Sc. II

1.	To determine the volume magnetic susceptibility of Manganese sulphate solution at different concentrations.
2.	To verify the relation between thermo emf of a thermocouple and temperature difference between two hot junctions.
3.	To calculate the velocity of ultrasonic sound through different liquid media using Ultrasonic Interferometer and to calculate the adiabatic compressibility of the given liquid.
4.	<ol style="list-style-type: none">1. To find refractive index of the given liquid samples using Abbe's refractometer.2. To study the variation of refractive index with<ol style="list-style-type: none">a. temperature of the liquid sample.b. wavelength of the light source.c. To determine the polarisability of the given liquid samples at a given temperature.
3.	To study the emission spectra of Hydrogen, Neon and mercury vapours.
4.	To plot the characteristics of thermistor and hence find the temperature coefficient of resistance.
5.	To determine the resistivity of semiconductors by Four probe Method.
6.	Hall effect experiment:- Determination of charge carrier density.
7.	To find the elastic constants of the Perspex beam using Cornus interference method. 1.Young's modulus (Y) 2. Poisons ratio (σ) 3. Bulk modulus (b)
8.	To study various crystals structures.

दारुहा येथे भौतिकशास्त्रावर व्हर्चुअल कार्यशाळा

लोकमत न्यूज नेटवर्क दारुहा : येथील मुंगसाजी महाराज महाविद्यालयात वर्कशॉप ऑन फिजिक्स व्हर्चुअल लॅब या विषयावरील कार्यशाळा झाली. कार्यशाळेत विद्यार्थ्यांना भौतिकशास्त्र विषयावर प्रात्यक्षिकाद्वारे मार्गदर्शन करण्यात आले.

कार्यशाळेत शिवाजी सायन्स कॉलेज अमरावतीचे डॉ. पंकज नागपुरे व्याख्याते होते. अध्यक्षस्थानी प्राचार्य

डॉ. विलास राऊत होते. डॉ. किशोर हुरडे, डॉ. अनंत वडतकर, आयक्यूएसी समन्वयक डॉ. प्रशांत बागेश्वर, नाशित खान, अर्फा इनामदार प्रामुख्याने उपस्थित होते. कोरोना महामारीच्या संकटामुळे वर्षभरापासून विद्यार्थी महाविद्यालयात येऊ शकले नाहीत. परिणामी त्यांचा शैक्षणिकदृष्ट्या तोटा झाला आहे. लेखी स्वरूपातला अभ्यासक्रम ऑनलाईन घेणे सुरु आहे. मात्र, प्रात्यक्षिक अभ्यासक्रम कसा

घ्यावा, हा प्रश्न निर्माण झाला होता. यामुळे वर्कशॉप ऑन फिजिक्स व्हर्चुअल लॅब कार्यशाळा घेण्यात आली. यावेळी डॉ. नागपुरे यांनी महाराष्ट्र सरकारने कार्यान्वित केलेल्या अमृता व्हर्चुअल लॅब या ॲपवर कंपाऊंड पेंडुलम, फोटो इलेक्ट्रिक इफेक्ट, कॉमन एम्पीटर अम्पलिफायर, टॉर्शनल पेंडुलम अशी जवळजवळ ८ ते ९ प्रात्यक्षिके विद्यार्थ्यांना समजावून सांगितली.

कार्यशाळेत १६ विद्यार्थ्यांनी सहभाग नोंदविला. अंतिम सत्रात बीएसी भाग-२ चा विद्यार्थी फुरकान अहमद खान याने कार्यशाळेबद्दल आपला अभिप्राय नोंदविला.

विद्या प्रसारक मंडळाचे अध्यक्ष वसंतराव घुईखेडकर, सचिव डॉ. संगीता घुईखेडकर यांच्या मार्गदर्शनात कार्यशाळा घेण्यात आली. सूत्रसंचालन भौतिकशास्त्र विभागाच्या प्रा. धनश्री कोठेकर यांनी केले.

दारव्हा येथे भौतिकशास्त्राची व्हर्च्युअल लॅब कार्यशाळा

सकाळ वृत्तसेवा

दारव्हा, ता. १२ : येथील एमएम महाविद्यालयात वर्कशॉप ऑन फिजिक्स व्हर्च्युअल लॅब या विषयावरील कार्यशाळा आयोजित करण्यात आली होती. या कार्यशाळेत विद्यार्थ्यांना भौतिकशास्त्र विषयावर प्रात्यक्षिकाद्वारे मार्गदर्शन करण्यात आले.

कार्यशाळेत शिवाजी सायन्स कॉलेज अमरावतीचे डॉ. पंकज नागपुरे आमंत्रित व्याख्याते होते. अध्यक्षस्थानी प्राचार्य डॉ. विलास राऊत होते. तर प्रमुख पाहुणे म्हणून डॉ. किशोर हुरडे, विनायक विज्ञान महाविद्यालय नांदगाव खंडेश्वरचे डॉ. अनंत वडतकर, डॉ. प्रशांत बागेश्वर, प्रा. धनश्री कोठेकर, पि. जि. टीचर्स म्हणून नेमलेले नाशित खान, अर्फा इनामदार आदींची उपस्थिती होती. कोरोना जागतिक महामारीच्या संकटामुळे वर्षभरापासून विद्यार्थी महाविद्यालयात येऊ शकले नाही. परिणामी, त्यांचा शैक्षणिकदृष्ट्या तोटा झाला आहे.

लेखी स्वरूपातला अभ्यासक्रम ऑनलाईनरित्या घेणे चालू आहे. परंतु प्रात्यक्षिक अभ्यासक्रम कसा घ्यावा, हा प्रश्न निर्माण झाला होता. त्यामुळे वर्कशॉप ऑन फिजिक्स व्हर्च्युअल लॅब कार्यशाळा घेण्यात आली. यावेळी डॉ. नागपुरे यांनी महाराष्ट्र सरकारने कार्यान्वित केलेल्या अमृता व्हर्च्युअल लॅब या ॲपवर कंपाउंड पेंडुलम, फोटो इलेक्ट्रिक इफेक्ट, कॉमन एम्मीटर ॲम्पलिफायर, टॉर्शनल पेंडुलम असे जवळजवळ ८ ते ९ प्रात्यक्षिक, विद्यार्थ्यांना समजावून सांगितले. कार्यशाळेत तब्बल ९६ विद्यार्थ्यांनी उत्स्फूर्तपणे सहभाग नोंदविला. अंतिम सत्रात बी. एस्सी. भाग २ चा विद्यार्थी फुरकान अहमद खान याने कार्यशाळेबद्दल आपला अभिप्राय नोंदविला.

विद्या प्रसारक मंडळाचे अध्यक्ष वसंत घुईखेडकर व सचिव डॉ. संगीता घुईखेडकर यांच्या मार्गदर्शनात कार्यशाळा घेण्यात आली. संचालन करून आभार भौतिकशास्त्र विभागाच्या प्रा. धनश्री कोठेकर यांनी मानले.