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HENRY BAKER COLLEGE MELUKAVU

DEPARTMENT OF PHYSICS

ACADEMIC
YEAR

2022-23

FROM DARKNESS INTO MARVELLOUS LIGHT

Henry Baker College, Melukavu, a Christian, Minority, Co-Educational, Government-aided Arts and Science College Established In 1981, affiliated to Mahatma Gandhi University, Kottayam, Kerala, Accredited by NAAC with 'A' Grade and An ISO 9001:2015 certified Institution.

DEPARTMENT OF PHYSICS
HENRY BAKER COLLEGE, MELUKAVU
ANNUAL REPORT 2022-23

1. Introduction:

Department of Physics at Henry Baker College, Melukavu endeavors to cultivate a strong theoretical and experimental physics foundation among its students by training young minds to think. The department offers an undergraduate programme in Physics following the curriculum of the B.Sc Physics (Model I) Core programme of Mahatma Gandhi University, Kottayam. Chemistry and Mathematics are the complementary courses offered by the college. In addition to rigorous academic programmes and practical laboratory sessions, the department offers a range of activities aimed at the overall development of its students. This report is a summary of the activities of the Department of Physics during the academic year 2022-23.

2. Certificate courses:

The department offered a certificate course in ‘Mathematics for Competitive Exams’ during the academic year 2022-23. The aim of this course was to enhance the speed and accuracy in problem-solving so as to help the student to excel in competitive exams. All first- and second-year B.Sc degree programme students enrolled and successfully completed this course. By undertaking this certificate course, the students gained the mathematical skills necessary to save time, maximize their scores, and ace competitive exams.

3. Results- 2023:

The department obtained 100% pass during the academic year 2022-2023 with Adikiran Johny and Amal Jacob of 2020-23 batch emerging as high achievers of the department securing CCPA 8.68 and 8.13, respectively. All students secured CCPA greater than 6.4 during the academic year 2022-23.

4. Department Programmes:

4.1 World Environment Day Celebrations -2022

On June 1, 2022, an interdepartmental *online* poster making competition was held for the students of Henry Baker College in Melukavu. The competition was held in celebration of Environmental Day and aimed to raise awareness about environmental issues among the student community. The theme for Environmental Day 2022 was "Protect, Restore, and Promote Sustainable Use of Terrestrial Ecosystems, Forest and Biodiversity." Participants were asked to create posters that conveyed messages related to this theme.

The competition was held entirely online and received three entries. The posters were judged based on their creativity, originality, and effectiveness in conveying the message about environmental protection. Adikiran Johny, IIIrd B.Sc Physics, and Jominimol Johny, IIIrd B.Sc Physics, won the first and second prizes respectively. Irrespective of the smaller number of participants, the online poster-making competition could effectively engage students of the whole college in discussions about environmental issues and environment preservation.



Brochure

Winning Entry by Adikiran Johny

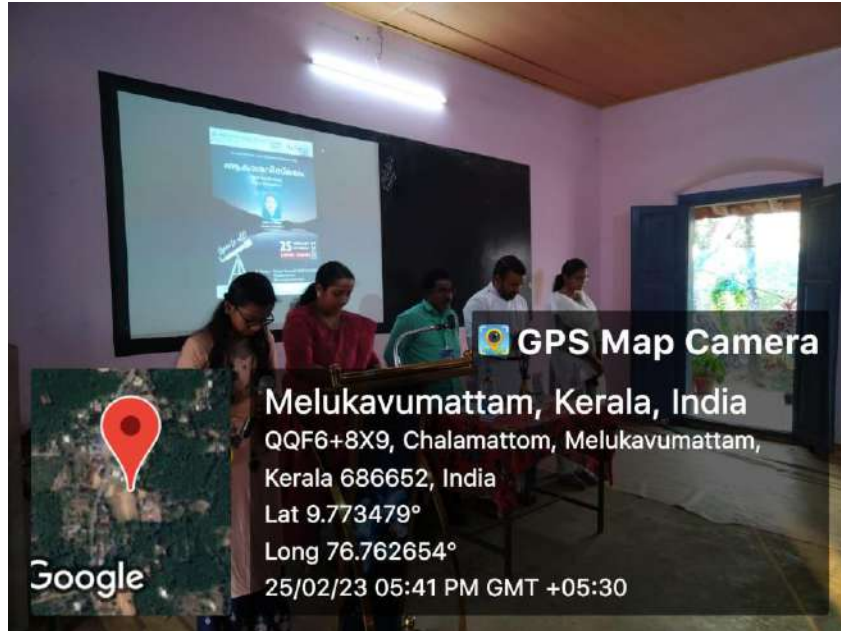
4.2 National Science Day Celebrations- 2023

The Department of Physics, Henry Baker College, Melukavu, celebrated National Science Day 2023 by organizing events within and outside the college on 25th and 28th February 2023. The events included a community-inclusive programme (Night Sky Watch), a Science talk and Scientific Demonstration. The events were aimed at promoting scientific temper among students and creating awareness among the public regarding astronomy.

a) **Night Skywatch Programme:** A Night Skywatch Programme was organized at M.D.C.M.S. high school ground, Erumapramattom, on 25th February, 2023 from 4 p.m. to 10 p.m. 243 people from the public attended the event. The attendees were able to watch, with the help of a giant telescope, Jupiter and its satellites, Venus, and the Moon in the night sky. The formal meeting was presided over by Dr. Soumya Paul, Staff Secretary, HBC. Dr. Jincy Devasia delivered the welcome speech and Dr. Sneha Susan Mathew delivered the Vote of Thanks. A class was taken by Mr. Binoy. P. Johny of AASTRO Kerala Kottayam Chapter on “Vananireekshanam” regarding the various constellations visible to the naked eye in the night sky. The attendees were delighted with the experience, and the event was a grand success with a total participation of 243 members from the public and the college.



Brochure



Formal meeting of Akshavismayam night sky watch programme



Talk on Vananireekshanam by Mr. Binoy P. Johny, AASTRO Kerala



Talk on Vananireekshanam by Mr. Binoy P. Johny, AASTRO Kerala



Class on constellation watch by Binoy P. Johny, AASTRO Kerala




Public watching stellar bodies using giant Newtonian telescope

b) **Science Talk:** As part of the National Science Day celebrations, the Department of Physics conducted a science talk on 28th February, 2023 at the college seminar hall from 12.00pm to 1.00 pm. The talk was conducted by the students of the department, and the theme was "*The Science of the Movie Interstellar.*" The talk was aimed at discussing the scientific concepts and principles portrayed in the movie. The students explained various concepts such as time dilation, wormholes, and black holes, and their relevance to modern physics. The talk was well received, and the audience appreciated the effort put in by the students. The formal meeting was presided over by Dr. Gireesh Kumar G.S, Principal. Dr. Sneha Susan Mathew delivered the welcome speech and Dr. Jincy Devasisa delivered the Vote of Thanks. 46 members from various departments of the college attended the meeting.

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Department of Physics
celebrates

National Science Day 2023
'Global Science for Global Wellbeing'



"Success can come to you by courageous devotion to the task in front of you"
Sir C. V Raman

Events : Science talk
Science model demonstration

28 FEBRUARY
TUESDAY
12.20 PM - 2.00 PM **2023**

Venue : Seminar Hall, Henry Baker College, Melukavu

For more details contact:
Dr.Jincy Devasia(HOD) : 9447776251 | Dr.Sneha Susan Mathew : 9496370682 | Adikiran Johny : 9495550410

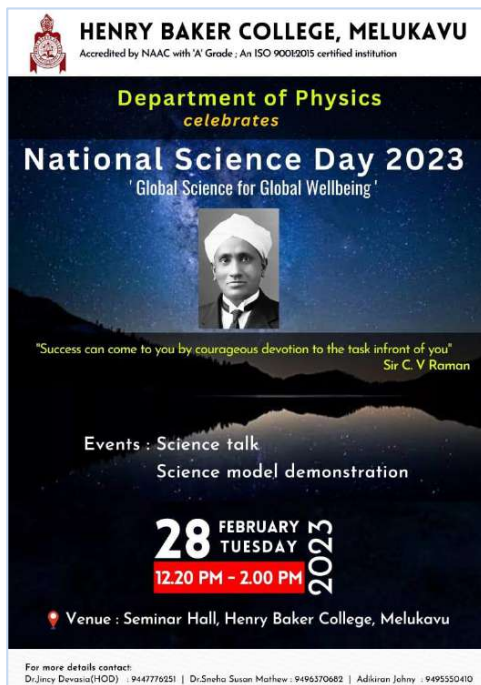


Science talk by Adikiran Johny, IIIrd B. Sc. Physics



c) **Scientific Demonstration:** In addition to the science talk, the Department of Physics also conducted a demonstration of LI-FI technology on 28th February, 2023 at the college seminar hall from 1.00 p.m. to 2.00 p.m. LI-FI technology is a wireless communication technology that uses light to transmit data. The students explained the working principle of the technology and demonstrated its use. The demonstration was well received, and the audience was amazed by the potential of the technology.

The formal meeting of the National Science Day celebrations at the college was presided over by Dr. Gireesh Kumar G.S, Principal. Dr. Sneha Susan Mathew delivered the welcome speech and Dr. Jincy Devasisa delivered the Vote of Thanks. 46 members from various departments of the college attended the meeting and the science talk and scientific demonstration that followed.



Brochure for science talk and science demonstration held at the college



Demonstration of the LI-FI technology by Amal Jacob, IIIrd B.Sc Physics

5. Public Outreach Events:

The Department of Physics conducts regular public outreach events so as to create scientific awareness among the public and to inspire young learners into STEM. During the academic year 2022-23, the department organized a Night Skywatch Programme entitled *Akasavismayam* in association with AASTRO Kerala at M.D.C.M.S. high school ground, Erumapramattom, on 25th February, 2023 from 4 p.m to 10 p.m. Details of the event are given in the previous section. The event was a grand success with the participation of 243 members. The event was able to promote scientific temper, create awareness among the public regarding astronomy, and inspire the young generation of learners to pursue science.



Public interaction on the class “Vananireekshanam” by Binoy.P. Johny, AASTRO Kerala



Public watching stellar bodies using giant Newtonian telescope

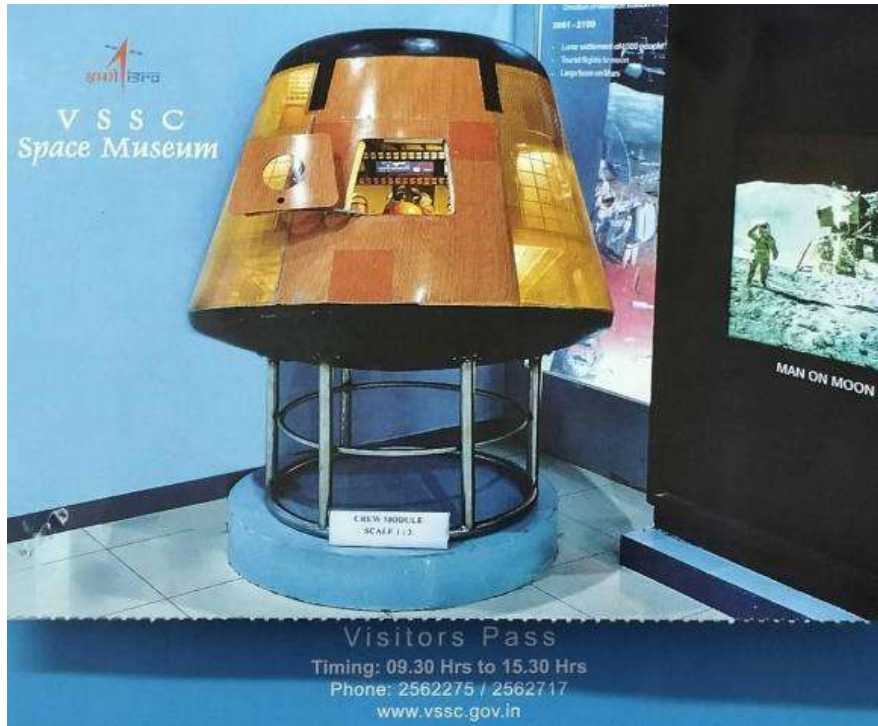
6. Industrial Visit:

An industrial visit to VSSC, Thiruvananthapuram, was conducted for the students and staff (13 members) of the Department of Physics, Henry Baker College, Melukavu on 15.02.2023 Wednesday. VSSC is one of the major centers of the Indian Space Research Organization (ISRO) and is responsible for the design and development of satellite launch vehicles and associate technologies. Students visited the VSSC space museum to gain information on the genesis, evolution and the current scenario of Indian space program and to witness the launch of 'RH-200' Rohini sounding rocket, the data from which is used for atmospheric probing.

The students were able to understand the history of VSSC through a short video lecture given at the VSSC space museum. Exhibition models of Polar and Geosynchronous satellites, launch vehicles SLV, ASLV, PSLV, GSLV and GSLV- MKIII, and various rocket parts helped the students to know and understand the various technical details involved in the process of a rocket launch. The students could also understand that the Rohini rockets are two stage solid propellant rockets that can carry a payload of up to 100 kg to an altitude of around 470 km. The RH-200 can carry payloads that measure various properties of the Earth's upper atmosphere such as temperature, density, and composition. The students also witnessed the launch of 'RH-200' sounding rocket, and were able to understand how the data from the payload is used for atmospheric probing and space research.



Photo from VSSC entrance



Sounding rocket launch as portrayed on the VSSC visitor's pass

IMPORTANT INSTRUCTIONS

Only visitors holding valid entry pass will be allowed inside the Space Museum. Entry passes can be obtained on request from the Administrative Officer, Public Relations, VSSC. Request should contain information like visitors' name, age, address, occupation etc. Requests for passes may be sent well in advance directly by ordinary post or Speed post. Online registration is available in the website www.vssc.gov.in. There is NO ENTRY FEE to visit VSSC Space Museum.

Visitors of Foreign Nations should obtain the Special entry permit directly from Public Relations, subject to the approval of the Director, VSSC.

Space Museum visitors are requested to enter / exit through Canal Gate near Stationkadavu only. Limited number of vehicles may be allowed up to Space Museum. Mobile phones, Cameras, CDs, pen drives & other Electronics Gadgets etc, are strictly prohibited inside the campus.

A visit to the Space Museum will take more than one hour. Entry will be allowed from 09:30 hrs to 15:30 hrs on all VSSC working days and Saturdays. There will be regular film shows on all days. Special shows will be arranged for groups with not less than 40 visitors, if required.

VSSC will not be responsible for any loss / damage or accident to the visitors during their visit to VSSC or to any of its facilities or while witnessing the rocket launch.

For further details and entry passes, please contact:

Administrative Officer,
Public Relations,
VSSC, ISRO P.O.,
Thiruvananthapuram 695 022

Telephone Numbers:
Public Relations : 0471-256 42 92, 256 42 64
Space Museum : 0471-256 22 75, 256 27 17
E-mail : ao_pro@vssc.gov.in

Government of India
Department of Space
Vikram Sarabhai Space Centre
Thiruvananthapuram - 695 022
SPACE MUSEUM / WITNESSING ROCKET LAUNCH
(Entry through Canal Gate)

Bsu
15/02
15.02.2023

Pass No. 302201 Date: 15-02-2023

Name Mr. Adikiran Johny

Name Kallukattu, Pala

Address Vallichira, Kottayam

Kerala 686575

13

No. of Persons

Vehicle No if any 15-02-2023 9:30 AM

Date of visit

Holder's signature

(Seal)

This is a system generated entry pass.
Valid with out signature of the approving authority.

Administrative Officer
Public Relations

Can be retained by the visitor

Visitors Pass
Timing: 09.30 Hrs to 15.30 Hrs
Phone: 2562275 / 2562717

Visitor's pass to VSSC for the 13 participants from Physics department on 15.02.2023

7. Student Achievements:

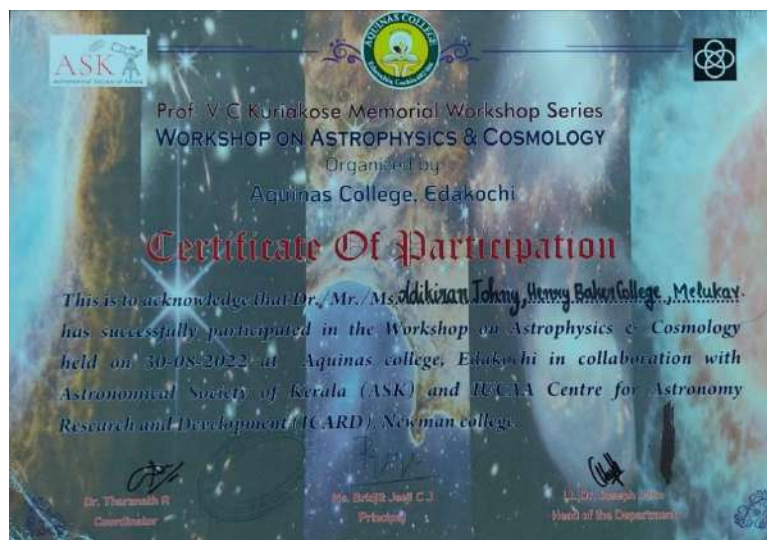
a) Best Outgoing Student 2021-2022 Award:

Merlin Juliet of 2019-21 batch bagged the cash award instituted by department of Physics for the best outgoing student 2021-22.

b) Workshop participation:

Adikiran Johny of 3rd year B.Sc Physics participated in a Workshop on Astrophysics and Cosmology held on 30th August, 2022 at Aquinas College, Edakochi in collaboration with

Astronomical Society of Kerala, IUCAA Centre for Astronomy Research and Development, Newman College.



c) Demonstration at Exhibition:

Amal Jacob of 3rd year B. Sc. Physics participated in the exhibition INNOVICS-2023 organized by the Entrepreneurship Development Club, Henry Baker College Melukavu on 2nd March, 2023. The student exhibited a working model that uses the Li-Fi technology in this exhibition.

d) Special Achievement Award 2023

Adikiran Johny of 3rd year B.Sc Physics secured the Special Achievement Award-2023 instituted by the Department of English for securing the highest marks in Common Course (English) of first and second semesters.

e) Photography Contest:

Neseem V.S. of 2nd year B.Sc Physics secured first prize in the photography contest jointly organized by NSS, Cultural Club and Women's Cell, Henry Baker College Melukavu, on 2nd September, 2022 as part of Onam Celebrations 2022.

f) Tableau Competition:

Department of Physics secured second prize in the tableau competition organized by Cultural Club and Women's Cell, Henry Baker College Melukavu, on 22nd August 2022 as part of Independence Day celebrations 2022.

8. Seminars/Conference Presentations:

1. Invited talk, Dr. Jincy Devasia, HoD (Physics), “*Space Debris- an imminent threat to active and future space missions?*”, Association Inauguration, St. Thomas College, Ranni, 11th November, 2022.
2. Lecture, Dr. Sneha Susan Mathew, “*Artificial Intelligence and Machine Learning*”, Gurukulam Plus-two Workshop, Henry Baker College, Melukavu, 19th May, 2023.

9. Research Publications:

1. **Sneha Susan Mathew** and Karanam Kishore Kumar, “Hadley circulation dynamics in the IITM-Earth System Model simulations: evaluation and future projections”, *Theoretical and Applied Climatology (Springer)*, Volume 152, Pages 213–226 (2023). DOI: <https://doi.org/10.1007/s00704-023-04397-1> (Journal Impact factor 2021 : 3.410)
2. U. Anjana, **Sneha Susan Mathew**, Karanam Kishore Kumar, “A rare episode of minor circulation embedded in the northern hemispheric zonal mean hadley cell”, *Journal of Atmospheric and Solar-Terrestrial Physics (Elsevier)*, Volume 243,106017,ISSN 1364-6826, <https://doi.org/10.1016/j.jastp.2023.106017> (Journal Impact factor 2021 : 2.119).

10. Faculty Development Programmes attended by Teachers:

1. Dr. Sneha Susan Mathew, Faculty Induction/Orientation Programme for “ Faculty in Universities/ Colleges/ Institutes of Higher Education from 20/07/2022- 18/08/2022 by Teaching Learning Centre, Ramanujan College, Delhi
2. Dr. Disha V. J., One week Faculty Development Programme on 'E-Content Development' by Teaching Learning Centre, Ramanujan College, Delhi from 19-25 April 2023
3. Dr. Disha V. J., ‘7 day National level FDP on Outcome Based Education’ by S E S College Sreekandapuram in association with Kerala State Higher Education Council from 18 to 25 January 2023

11. Conclusion:

The Department of Physics at Henry Baker College Melukavu is committed to providing a nurturing environment for the study of physics and promoting scientific awareness. Through its academic programmes, student support activities, outreach activities, and research initiatives, the department continues to empower our students, equip them with the necessary skills and knowledge, and contribute to society in a fruitful manner.