

# COSMO

*A newsletter of the department of Physics, Silapathar College*

*Issue Number:1, March 2022*



## WHAT'S IN THIS ISSUE

- *Profile of the faculty members and faculty activities*
- *Departmental Activities at a glance*
- *Student profile, activities and achievements*
- *Departmental visitors*
- *Future plans*

## EDITORIAL BOARD

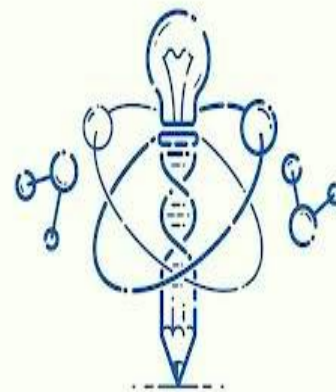
- **EDITOR:** Dr. Happy Borgohain, Assistant Professor and HoD, Department of Physics, Silapathar College
- **Sub-editors:**
  - Dr. Dilip Saikia, Assistant Professor, Department of Physics, Silapathar College
  - Mr. Kalyan Malakar, Assistant Professor, Department of Physics, Silapathar College
- **Student members:** Sri Lakhindra Borpatra Gohain, Sri Pranjal Karmakar, B.Sc. 1st semester.

## EDITORIAL

Our main objective is to create a niche for higher studies in Physics at Silapathar College. The department is now engaging in various activities towards the development of educational goals as well as achieving the full potential of students and teachers. The department has also foresight for transforming itself as per guidelines of the New Education Policy (NEP) 2020. We organize outreach programs at regular intervals at different schools to promote scientific curiosity and implement scientific thinking at an early age. The department tries to give the maximum exposure to the students so that they are not left behind in any area. This issue covers all the activities and achievements of the department since its introduction in Silapathar College.

## ABOUT THE DEPARTMENT

The department of Physics, Silapathar college was established in the year 2020 with three faculties specialized in different areas of Physics., the department offers B.Sc honours and generic elective course in Physics. From the expanding universe to the vibrating quarks, Physics is a fascinating branch of Science. With an aim to develop scientific temperament among the students in the vicinity of Silapathar, we the newly formed Department of Physics at Silapathar college are trying to create a fertilized base to aid the germination of young talents in the field of Physics. The department has an well-equipped laboratory with all the necessary instruments and apparatus for B.Sc and H.S courses. The college library has around 100-150 different books of Physics which covers the core as well as generic courses in Physics. I on behalf of the department of Physics, Silapathar College cordially invite you all in the arena of Physics.



—Dr. Happy Borgohain, HOD, Department of Physics, Silapathar College

## FACULTY PROFILE



Mr. Kalyan Malakar, CSIR NET

Assistant Professor (Joined in December 2020)

### EDUCATIONAL BACKGROUND

- BSc in PHYSICS, COTTON COLLEGE STATE UNIVERSITY, 2017
- MSc in HIGH ENERGY PHYSICS, COTTON UNIVERSITY, 2019
- PhD pursuing since 2022 in Dibrugarh University

**RESEARCH AREA:** Theoretical High Energy Physics, Black Hole Thermodynamics

## FACULTY PROFILE



**Dr. Happy Borgohain,**  
PhD, SLET

Assistant Professor (Joined in December 2020)

### EDUCATIONAL BACKGROUND

- BSc in Physics, Cotton College, 2011
- MSc in High Energy Physics, Tezpur University, 2013
- PhD: Tezpur University

**RESEARCH AREA:** High Energy Physics, Neutrino Physics

**RESEARCH EXPERIENCE:** Worked as research associate in IIT Guwahati from August 2019 to July 2020.

### RESEARCH PUBLICATIONS AND BOOK CHAPTERS: IN THIS SESSION:

- Happy Borgohain, Debasish Borah; Survey of Texture Zeros with Light Dirac Neutrinos, J.Phys.G, 48, 7, 075005, 2021.
- Happy Borgohain; Phenomenology of texture zeroes with light Dirac neutrinos in Advances in Physics and its Applications. (Accepted for publication)

### EARLIER:

- Happy Borgohain, Revisiting Majorana Neutrino Textures in the Light of Dark LMA, J.Phys.G 47, 12, 125002, 2020.
- Happy Borgohain, Mrinal Kumar Das, Debasish Borah, Phenomenological Study of Texture Zeros in Lepton Mass Matrices of Minimal Left-Right Symmetric Model, JHEP 06 (2019) 064.
- Happy Borgohain, Mrinal Kumar Das; Phenomenology of two texture zero neutrino mass in left-right symmetric model with  $Z_8 \times Z_2$ , JHEP 02 (2019) 129.
- Happy Borgohain, Mrinal Kumar Das, Lepton number violation, lepton flavor violation, and baryogenesis in left-right symmetric model, Phys.Rev.D 96 (2017) 7, 075021.
- Happy Borgohain (Tezpur U.), Mrinal Kumar Das, Neutrinoless double beta decay and lepton flavour violation in broken  $\mu - \tau$  symmetric neutrino mass models, Int.J.Theor.Phys. 56 (2017) 9, 2911-2934.
- Happy Borgohain, Mrinal Kumar Das, Debasish Borah; Phenomenological study of texture zeros of neutrino mass matrix in minimal left-right symmetric model, J.Phys.Conf.Ser. 1468 (2020) 1, 012191, Contribution to: TAUP 2019.
- Happy Borgohain, Mrinal Kumar Das, Lepton Number Violation and Lepton Flavour Violation in Left-Right Symmetric Model, Springer Proc.Phys. 203 (2018) 691-692.
- Happy Borgohain, Mrinal Kumar Das, Lepton number violation, lepton flavour violation and non-zero  $\theta_{13}$  in LRSM, Excel India Publishers, 2020.
- Happy Borgohain, Mrinal Kumar Das; Baryogenesis and neutrinoless double beta decay in left-right symmetric model, EBH Publishers, 2020.

## FACULTY PROFILE

Assistant Professor (Joined in January 2020)

### EDUCATIONAL BACKGROUND

- BSc in Physics, North Lakhimpur College, 2010
- MSc in Condensed Matter Physics, Tezpur University, 2013
- PhD:IASST, Gauhati University

**RESEARCH AREA:** Condensed Matter Physics, Computational Physics

**TEACHING EXPERIENCE:** January-2016 till date. Worked in Handique Girls' College, Dighali Pukhuri West, Panbazar, Guwahati, Pandit Deendayal Upadhyaya Adarsha Mahavidyalaya, Behali, Ratowa, Biswanath, Assam



**Dr. Dilip Saikia, PhD, SLET**

### RESEARCH PUBLICATIONS AND BOOK CHAPTERS:

#### EARLIER:

- D. Saikia, P. Dutta, N. S. Sarma, and N. C. Adhikary, CdTe/ZnS core/shell quantum dot-based ultrasensitive PET sensor for selective detection of Hg (II) in aqueous media; Sensors and Actuators B, 230, 149–156.
- D. Saikia, S. Chakravarty, N. S. Sarma, S. Bhattacharjee, P. Datta, and N. C. Adhikary, Aqueous synthesis of highly stable CdTe/ZnS Core/Shell quantum dots for bioimaging Luminescence; 32, 401-408.
- P. Dutta, D. Saikia, N. C. Adhikary, and N. S. Sarma, Macromolecular Systems with MSA Capped CdTe and CdTe ZnS Core Shell Quantum Dots as Superselective and Ultrasensitive Optical Sensors for Picric Acid Explosive, Appl. Mater. Interfaces, 7, 24778-24790.
- S. Chakravarty, D Saikia, P. Sharma, N. C. Adhikary, D. Thakur and N. S. Sarma, "A supramolecular nanobiological hybrid as a PET sensor for bacterial DNA isolated from Streptomyces sanglieri." Analyst, 139, 6502-6510.
- A. N. Dev, M. K. Deka, J. Sarma, D. Saikia, and N. C. Adhikary "K P Burgers equation in negative ion-rich relativistic dusty plasma including the effect of kinematic viscosity" Chin. Phys. B Vol. 25, No. 10, 105202.
- S. Thakur, D. Saikia, P. Sen, R. Khatoon, D. Saikia, N. C. Adhikary, Properties of transition metal doped carbon nanotubes: a theoretical study, Bulletin of Physics Projects, 2, 2017, 26-31.

## FACULTY ACTIVITIES

### ● Dr. Happy Borgohain

- She has been appointed as a supervising officer by SEBA for the ongoing HSLC examination 2022.
- She was invited as a resource person and judge of the Science model competition in Saraswati Vidya Mandir, Silapathar Assam on the occasion of National Science Day 2022.
- She has been actively involving in judging several events of the college like essay writing competition, extempore speech competitions, poem recitation competition etc.
- She is the faculty in-charge of the Girl's Common Room of the college for the session 2021-2022.
- She has hosted the three webinars organized by the department of Physics.
- She has prepared the course plans, class routines etc. of the sessions.
- She has attended three faculty development programmes and one orientation program in this session

### ● Dr. Dilip Saikia

- He led a team of students to attend a two days workshop on “Innovative Ecosystem in Academic Institution” organized by Technology Enabling Centre, Tezpur University in association with North Lakhimpur College funded by DST, Govt. of India.
- He guided a team of students in an innovative idea competition organized by Technology Enabling Centre, Tezpur University in association with North Lakhimpur College funded by DST, Govt. of India. They bagged the first prize in the event.
- He co-ordinated webinars on Intellectual Property Right with a view to spread awareness about IPR among the students of the area.
- He has attended three faculty development programmes in this session.

### ● Mr. Kalyan Malakar

- He on behalf of the department trained the students of the department on hands-on use of ICT tools.
- He co-coordinated the National Science Day 2022 programme held in Silapathar College.
- He has attended one faculty development programme in this session.

## DEPARTMENTAL ACTIVITIES AT A GLANCE

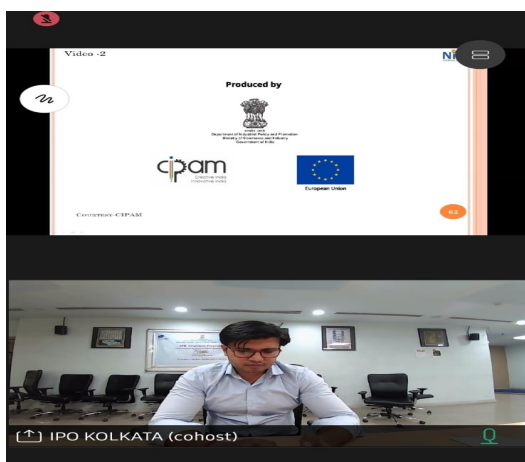


### WORKSHOP

A team of students of Silapathar College led by Dr. Dilip Saikia attended a two days workshop on “Innovative Ecosystem in Academic Institution” organized by Technology Enabling Centre, Tezpur University at North Lakhimpur College on 12th March 2022.

## Laboratory visit

A team of students guided by Dr. Dilip Saikia, Assistant Professor, department of Physics, Silapathar College visited the Physics laboratory in North Lakhimpur College (Autonomous) on 12 March 2022. The students got an exposure to learn the use of several laboratory apparatus and interact with the faculties of the department of Physics, North Lakhimpur College.

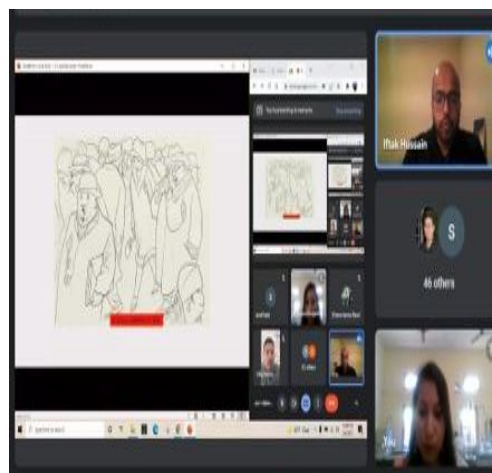


## Azadi Ka Amrit Mahotsav

The department of Physics, Silapathar College in collaboration with the department of promotion of Industry and Internal Trade (DPIIT), Ministry of Commerce and Industry, Govt. of India conducted an IPR awareness programme as part of the campaign "Azadi ka Amrit Mahotsav" for the celebration of 75th anniversary of India's Independence. The programme was held online on March 8, 2022

## Lecture series-I

The first lecture series on "Study of basic science in present scenario" was organized. The speaker Dr. Iftak Hussain, talked on "Lab on Smart phone to solve unmet social needs". He holds several accolades including the president award for his outstanding research and is currently a Postdoctoral Scholar in Department of Biomedical Engineering Institute, Vanderbilt University, Nashville, Tennessee, US. The program was hosted by Dr. Happy Borgohain



## FACULTY-EXCHANGE

The department has started a faculty exchange program with Moridhal College with whom the college has signed an MoU.



### USE OF FOLDSCOPE

A hands-on training on use of foldscope was organized by the department of Physics, Silapathar College. Dr. Dilip Saikia presented on the use of optical microscopy and its applications and then trained the students on how to use the foldscope. "



### SOFT-SKILL TRAINING

The department of Physics organized a training on soft-skill development on 05/03/2022. The training was given by Raju Pegu, Assistant Professor, Department of English, Co-ordinator, IPR cell, Silapathar College. The students were trained about several skills of communication which definitely would help them.

### ICT TOOLS TRAINING

A hands on training on use of ICT tools, mainly Microsoft office was being organized in the language laboratory of Silapathar College on 2nd March 2022. The training was conducted by Mr. Kalyan Malakar of Physics department.



### NATIONAL SCIENCE DAY 2022

The National Science Day 2022 was observed on 28th February 2022 in Silapathar College. The popular talk of the day was delivered by Dr. Dilip Saikia. An essay writing and a poster making competition was held in this connection.

## INNOVATIVE IDEA COMPETITION

An innovative idea competition was organized as a part of national science day 2022. The theme of the competition was "Energy generation and conservation for sustainable development". Miss Mira Dutta from HS 1st year (Science) was awarded the first prize.



## OUTREACH PROGRAM

An outreach program was organized by the department of Physics on "Career prospects of higher education in science, specifically Physics" at Kiran Academy, Dhemaji to popularize Science and its scope among the students of the area on February 26, 2022.

## MoU

An MoU was signed between department of Physics, Silapathar College and Dhemaji Polytechnic on February 22, 2022. The primary idea of the MoU is for assistance to the technical education, mainly the add-on course on "Domestic electrical wiring" and also for faculty and student exchange programs.



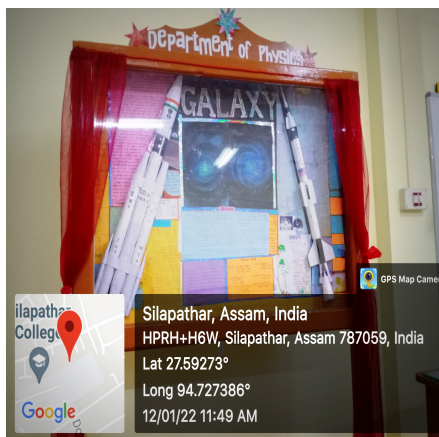
## OUTREACH PROGRAM

Department of Physics in collaboration with IQAC, Silapathar college organized an outreach program on "Popularization of science and its career prospects" on February 3, 2022 at Silapathar Senior Science Secondary School.



## INAUGURATION OF "GALAXY" the first edition

The first edition of the wall magazine of the department of Physics entitled " GALAXY' was inaugurated on January 12, 2022 by Mr. Lalit Chandra Doley, Vice-Principal Silapathar College.



## FRESHMEN SOCIAL

Freshmen Social of the first batch of the science stream was held in the Science building of Silapathar College in the presence of the faculty members, vice-principal and all the freshers. The programme was mainly to boost their morale and introduce themselves

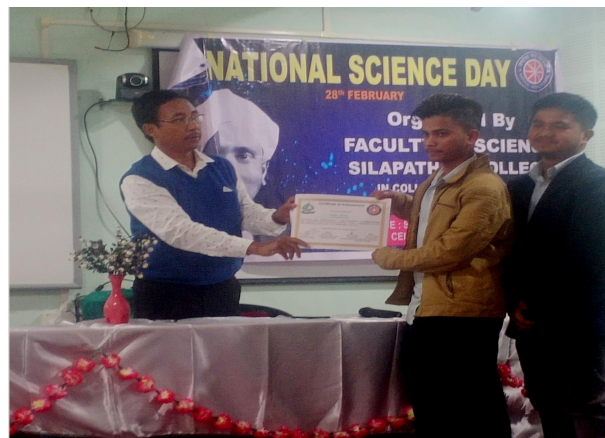


## SOIL DAY

World Soil Day was observed on 6th December 2021. The Popular talk of the event was delivered by Mr. Manash Pratim Dutta, Assistant Professor and HoD, department of Zoology. An extempore speech competition was also organized on the importance of the day in which Lakhindra Borpatra Gohain, B.Sc 1st sem, Dept. of Physics won the first prize.

## SCIENCE DAY 2021

The faculty of Science, Silapathar College observed the National Science Day 2021 (to be held on 28th February) on 1st of March 2021 in collaboration with NSS, Silapathar College. In this connection, a popular talk was delivered by Dr. Jiban Saikia, Department of Chemistry, Dibrugarh University and also a Quiz and Essay writing competition was held.



## ADVANCED WEBINAR ON IPR

An Advanced webinar on Intellectual Property Rights was organized by the department of Physics which was catalyzed and supported by Assam Science Technology and Environment Council (ASTEC). The resource persons of the webinar were Prof. Pritam Deb, DPIIT IPR Chair Professor, TUIPR Cell, Professor, Dept. of Physics, Tezpur University, Mr. Siddhartha Devnath Scientist-C, PI, ASTEC and Miss Dipamoni Baishya, Project Scientist, PIC, ASTEC. The program was hosted by Dr. Happy Borgohain.

## WEBINAR ON IPR

The department organized an webinar on IPR on 3rd July, 2021. Two experts on the area Dr. E. Muthu Kumaran, Associate Dean( Research and Innovation), Asst. Professor, Dept. of ECE, DBRAIT, Govt., Port Blair, Andaman and Nicobar Island and Prof. Pradeep Phukan, Professor, Department of Chemistry and Co-ordinator IPR Cell, Gauhati University delivered their valuable talks on IPR. It was attended by students, faculties of the college as well as from other colleges and institutes. The program was hosted by Dr. Happy Borgohain.



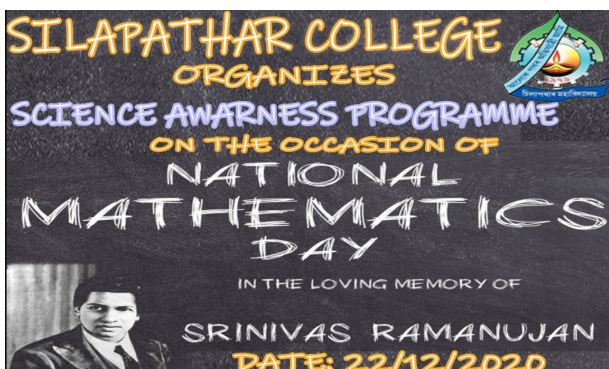
## WORLD WETLAND DAY

The world wetland day 2021 was observed by the faculty of Sciences, Silapathar College in collaboration with IQAC, NSS unit of Silapathar College at Gai Nadi wetland. The programme was supported by the department of environment and forest, govt. of Assam, Dhemaji division, Dhemaji.

## PLANTATION DRIVE

A plantation drive was organized on December 23, 2020 on the occasion of National Farmer's day in the honor of former Prime minister Choudhury Charan Singh. He was a premier Farmer's leader of his time. Coconut and varieties of orchids were being planted. This was a small step to create awareness among the students for a sustainable environment.





## MATHEMATICS DAY

National Mathematics day was observed on 22 December 2020 to commemorate the birth anniversary of the famous mathematician Srinivasan Ramanujan. In this context, a Quiz competition was held in the college with active participation from the students of the college.

### NEAR FUTURE PLANS

- The department will very soon start a free coaching program for the Physics part for the HS first and second year students who are willing to prepare well for the various entrance examinations like NEET, JEE, AIIMS, BOARD EXAMS etc. The enrollment for the first year students has already been done. The commencement of the classes will soon start after the end of the second year final exams.
- The department will organize innovative idea competitions at regular intervals to boost the young minds to think novel and come up with new ideas. The department has been working to promote "Intellectual property rights" awareness in the area.
- The department has planned to organize an awareness programme on health hazards and effects of cell-tower radiation very soon.
- The department has started an add-on course on "Domestic electrical wiring", the classes to be commenced very soon.
- The department has planned to invite guest lecturers of Physics from Dibrugarh and Tezpur university very soon.
- The lecture series-I which we have started will continue with two more lectures to be given by
  - **Dr. Tapan Barman**, Researcher in Plasma Physics in Prague, Czech Republic.
  - **Dr. Dipankar Chetia**, Assistant Professor, Department of Physics, North Lakhimpur College (Autonomous)
  - **Dr. Anjalu Ramchiary**, Assistant Professor, Department of Physics, Bodoland University
- The department has an ongoing process for an MoU with Pandit Deendayal Upadhyaya Adarsha Mahavidyalaya, Behali which will be completed very soon.



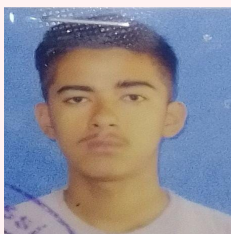
Figure: The evolution of the universe

## STUDENTS PROFILE

### NUMBER OF STUDENTS

- Total students in,
  - 1st sem (honours): 07
  - 1st sem (generic): 35
  - 3rd sem (generic): 14

The first batch (2021-2022) of students of Physics(honours) are



**Top:**Udit Missong, Monikanta Doley, Lakhindra Borpatra Gohain, Issak Mili

**Bottom:** Kartik Pegu, Pranjal Karmakar, Sachin Taid

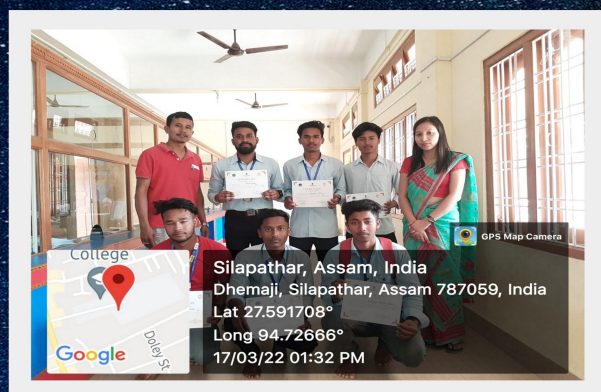
## RESULTS

### RESULTS OF THE SESSION 2020-2021

- The first semester exam of the session 2021 for Physics(generic):
  - Above 90 %: 02
  - (80-90) %: 04
  - (70-80) %: 04
  - (60-70) %: 02
  - Below 60 %:02

## ACHIEVEMENTS

- **Pranjal Karmakar, Lakhindra Borpatra Gohain and four others of B.Sc 1st year** led by Dr. Dilip Saikia won the 1st prize in "Innovative Idea competition" organized by Technology Enabling Centre, Tezpur University in association with North Lakhimpur College funded by DST, Govt. of India.
- **Lakhindra Borpatra Gohain of B.Sc 1st year** won the 1st Prize in Essay writing competition on the occasion of National Science Day 2022.
- **Lakhindra Borpatra Gohain of B.Sc 1st year** won the 2nd Prize in extempore speech competition in Annual College week, Silapathar College 2021.
- **Lakhindra Borpatra Gohain of B.Sc 1st year** won the 1st prize in extempore speech competition in National Soil Conservation day 2021.
- **Lakhindra Borpatra Gohain of B.Sc 1st year** won the 2nd Prize in Long Jump competition in Annual College week, Silapathar College 2021.
- **Udit Missong of B.Sc 1st year** won the 1st Prize in Marathan race competition in Annual College week, Silapathar College 2021.
- **Monikanta Doley of B.Sc 1st year** won the 1st Prize in Triple Jump competition in Annual College week, Silapathar College 2021.
- **Monikanta Doley of B.Sc 1st year** won the 2nd Prize in Javelin Throw Jump competition in Annual College week, Silapathar College 2021.
- **Monikanta Doley of B.Sc 1st year** won the 3rd Prize in High Jump competition in Annual College week, Silapathar College 2021.



## PRIZE DISTRIBUTION



## IN THE LABORATORY

### DEPARTMENT VISITORS

- DEPARTMENT VISITORS OF THE SESSION:
  - Dr. Prashanta Kumar Saikia, Associate Professor and Head of the department, Department of Physics, Dibrugarh University.
  - Dr. Jiban Saikia, Assistant Professor, Department of Chemistry, Dibrugarh University.
  - Dr. Surajit Bhuyan Associate Professor, Department of Physics and Principal, Lakhimpur Girl's College.
  - Dr. Mridul BuraGohain, Assistant Professor, Department of Chemistry, Lakhimpur Girl's college.
  - Dr. Ajoy Sharma, Assistant Professor, Department of Mathematics, Sadia College.
  - Dr. Rajiv Khatioda, Assistant Professor, Department of Chemistry, Sadia College.



SOLVAY CONFERENCE 1927

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	A. PICARD	E. HENRIOT	P. EHRENFEST	Ed. HERSEN	Th. DE DONDER	E. SCHRÖDINGER	E. VERSCHAFFELT	W. PAULI	W. HEISENBERG	R.H FOWLER	L. BRILLOUIN
P. DEBYE	M. KNUDSEN	W.L. BRAGG	H.A. KRAMERS	P.A.M. DIRAC	A.H. COMPTON	L. de BROGLIE	M. BORN	N. BOHR			
I. LANGMUIR	M. PLANCK	Mme CURIE	H.A. LORENTZ	A. EINSTEIN	P. LANGEVIN	Ch.E. GUYE	C.T.R. WILSON	O W, RICHARDSON			

Absents : Sir W.H. BRAGG, H. DESLANDRES et E. VAN AUBEL

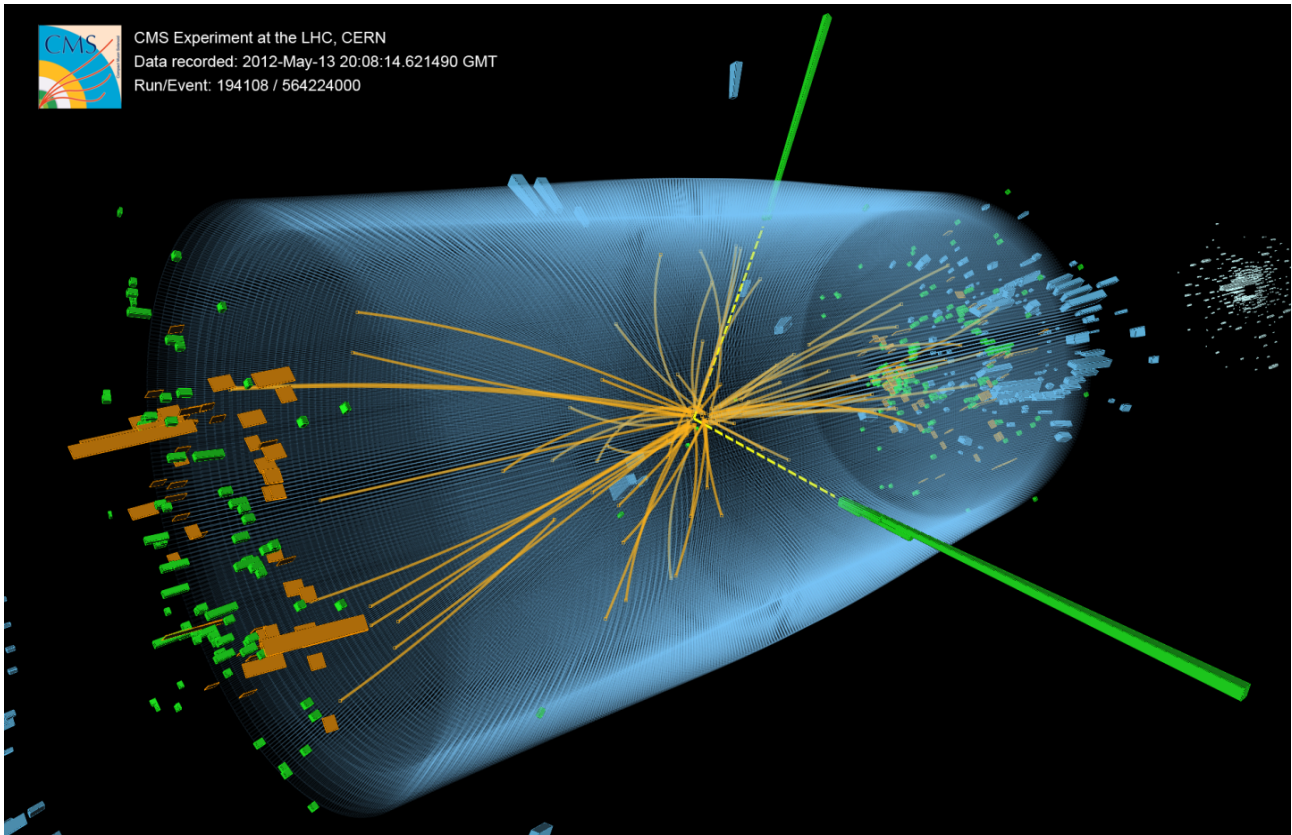


figure:(top) Physicists who attended the SOLVAY conference in 1927 with their names.  
 figure:(bottom) The Higgs Boson also known as the GOD PARTICLE.

*“So remember to look up at the stars  
and not down at your feet. Try to  
make sense of what you see and  
wonder about what makes a  
universe exist.*

*Be curious.*

*And however difficult life may  
seem, there is always something you  
can do and succeed at. It matters  
that you don't just give up.”*

Stephen Hawking



Physics, Silapathar College