



Society Activity Report 2016-17

The Physics Society


❖ FLAGSHIP EVENTS OF PHYSICS SOCIETY (2016-17)

1) Ranjan Roy Memorial Lecture (2016-17)

Title: The Possibility of Time Travel

Speaker: Prof. Scott T. Dixon of Ashoka University

Date : 30 September, 2016

 **THE PHYSICS SOCIETY**
ST. STEPHEN'S COLLEGE
presents

The Ranjan Roy Memorial Lecture 2016
on
TIME TRAVEL

By
Dr. T. Scott Dixon from Ashoka University

Abstract:
Is time travel possible? There are a couple of things one might mean by this. First, one might be wondering whether time travel is possible according to our best physical theories. Second, one might be wondering whether the notion is even logically coherent. Third, one might be wondering whether it is metaphysically possible. A number of different time travel scenarios are considered, and each scenario is evaluated according to each of these characterizations of possibility. The talk will propose a constraint a scenario must meet if it is to be metaphysically possible.

30th September, 2016
N P L T
12:20 pm

Shubham : 7042611852 Rijul : 9811095696



2) Meera Memorial Paper Reading Competition (2020-21)

Date: 20th-21st October, 2016

Meera Memorial Paper Reading Competition

The prestigious annual competition where students from a scientific background present a paper on a topic of their choice. They may choose to present their research projects, term projects or their original insights into a particular subject. Students from both Bachelors and Masters programs are eligible.

Rules for the Competition

1. The presentation may be done by an individual or in a group of two
2. Participants will be given a slot of 15 minutes including set-up time and transition time
3. You can either choose to present using powerpoint or the black board
4. Presentations if by powerpoint must be emailed to the address given below by 16th evening

Judging Criteria

1. The Presentation
2. The Content
3. Ability to answer questions

20th and 21st October, 2016.
Venue: NPLT, Science Block, St. Stephen's College

The Physics Society, St. Stephen's College
physics.stephens@gmail.com

Contact organizers for your respective timing slots

Shubham Baisal : +91 7042611852

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3) Popli Memorial Lecture Series(2020-21)

Title: "The Physics and Astronomy of Gravitational Waves

Speaker: Prof. Parameswaran Ajith, ICTS

Date : 16-18th January 2017

The Physics Society, St. Stephen's College
presents
The 21st Annual Popli Memorial Lectures

On the Physics and Astronomy of
GRAVITATIONAL WAVES

A lecture series by Prof. P. Ajith
International Centre for Theoretical Sciences
Tata Institute of Fundamental Research
Bangalore

The existence of gravitational waves (tiny ripples in the fabric of spacetime) is one of the most intriguing predictions of Einstein's general theory of relativity. A century after their existence was predicted, gravitational waves were directly detected by the LIGO observatories recently. This discovery not only confirms a century-old prediction of Einstein's theory, but also opens up a fundamentally new observational window to the universe.

Jan 16 The first lecture in this series will introduce the basic theory of gravitational waves and survey the astrophysical sources.

Jan 17 The second lecture will tell the story of the quest for the direct detection of gravitational waves culminating in the recent discovery.

Jan 18 The third lecture will examine how this new branch of astronomy might enable us to address some fundamental questions in physics and astronomy.

Shubham
7042611852

12:20pm
New Physics Lecture Theatre

Rijul
9811095696

The Principal, St. Stephen's College
cordially invites you to
The 21st Annual Popli Memorial Lectures

On the Physics and Astronomy of
GRAVITATIONAL WAVES

A lecture series by Prof. P. Ajith
International Centre for Theoretical Sciences
Tata Institute of Fundamental Research
Bangalore

Jan 16

Jan 17
12:20PM
New Physics Lecture Theatre

Jan 18
St. Stephen's College
Delhi

Shubham
7042611852



❖ The Annual Popli Memorial Aptitude Test

➤ 13th April 2017

➤ 1 hour long aptitude test on Physics for students of all three years.



Physics Stephen's <physics.stephens@gmail.com>

REMINDER - Popli Memorial Aptitude Test - 2017.

1 message

Physics Society <physics.stephens@gmail.com> Thu, Apr 20, 2017 at 4:35 PM

To: Shubham Bansal <bansalshubham334@gmail.com>, Riju Sachdeva <sanrijsach@gmail.com>
Cc: Abhijith Paul <paublajith@gmail.com>, Aditya Singh Shekhawat <adishshekhawat@gmail.com>, Aiswarya Aju <aiswarya.aju@gmail.com>, Ananya George <ananyageorge1997@gmail.com>, Anuj Kumar Singh <kanuj195@gmail.com>, Arel Murnu <ri.murnu@gmail.com>, Arunima <arukundu319@gmail.com>, Chelsea Maria John <chelseamarijohn@gmail.com>, Chris Abraham <chris.phy98@gmail.com>, Danny Mathew <dannychennamkudy@gmail.com>, Divya Thomas <divya1231810@gmail.com>, Eleena Gupta <eleena.gupta@gmail.com>, Elma Joshy <elmajoshy981@gmail.com>, Evita Merin <merinrose1998@gmail.com>, Garvit Bajaj <bajaj.garvit@gmail.com>, Gourav Rawat <gauravrawat23898@gmail.com>, Grace Monica S Mehta <gracemonics96@gmail.com>, Gurprej Singh <sidhugurprej786@gmail.com>, Hanna Elsa <hannahelsa98@gmail.com>, Izabel Thomas <izabelth@gmail.com>, Kapil Goswami <kgoswami33@gmail.com>, Lalzara <lv0643@gmail.com>, Mephin Philip Alamcheril <mephinphilip@outlook.com>, Milton E Peter <miltonernestpeter@gmail.com>, Mona Kumari 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Dear All,

The Popli Memorial Aptitude Test will be conducted on **Friday, 21st April 2017 at 12:20 PM** in the NPLT. It will test your aptitude in different areas of Physics covered over the three years.

Students from all three years are eligible and encouraged to participate. All those who are willing to participate are requested to be there on time. Hope to see you there!

All the best!
The Physics Society

❖ Club sessions and talks under Physics Society

The Society consists of three clubs: the Feynman Club, Astronomy Club and Problem Solving Club. Lectures under the Feynman club (called Feynman Talks) are delivered by professors (and occasionally students) in Physics and related interdisciplinary fields.



Sessions in Astronomy and Problem solving Club are conducted by the student members of the society.

➤ **Feynman Club**

Date	Speaker	Title of Talk
29/07/2016	Prof. Sanjay Puri	Pattern Formation in the Kinetics of Phase Transitions
12/08/2016	Prof. Patrick Das Gupta	Quasars, Semi Massive Black Holes, Cosmology
27/08/2016	Saurabh Kumar(3rd Physics)	Study of Phase Transitions and Calculation of Entropy in Disordered System
02/09/2016	Mohammad Atif(3rd Physics)	Project update on General Relativity
09/09/2016	Dr. Tabish Qureshi	Quantum Erasers and Enigma of Wave Particle Duality
23/09/2016	Dr. AK Rastogi	Classical measurements and discoveries in Condensed matter Physics
06/01/2017	Akshit Goyal (NCBS, Bangalore)	Toy Model for living populations in equilibrium
13/01/2017	Archishman Raju (Cornell University)	Renormalisation Group and Information Theory
27/01/2017	Prof. Jerry T John	Baby Steps in Game Design
03/02/2017	Prof.Deshdeep Sahdev, Dr. Mani Chandra Morumpodi(Delhi)	Story of Quazar Tech, an Innovative Physics Start-up



17/02/2017	Captain Tinkle Gupta	Soft skills i.e communication and behaviour
03/03/2017	Prof. Ratnamala Chatterjee (IIT, Delhi)	Topological Insulators: The new spintronics materials
24/03/2017	Dr. Sabyasachi Bhattacharya (Ashoka University)	Perfectly reasonable approximations: Working with the physical world

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The Feynman Club

St. Stephen's College



invites you for a talk titled

Pattern Formation in the Kinetics Of Phase Transitions.

by

Prof. Sanjay Puri

School Of Physical Sciences, Jawaharlal Nehru University, Delhi.

Abstract

Consider a system which is rendered thermodynamically unstable by a sudden change of parameters, e.g., temperature, pressure, etc. The system evolves towards its new equilibrium state via the emergence and growth of domains enriched in the preferred phase. Problems in this area of "kinetics of phase transitions" have received much research attention. In this talk, we review our understanding of this area. We conclude by mentioning novel systems (e.g., phase-separating mixtures at a surface) where one observes a range of phase ordering phenomena.

Date: Friday, 29th July 2016.

Venue: NPLT

Time: 12:20 PM

The Feynman Club

St. Stephen's College



invites you for a talk titled

Quasars, Semi Massive Black Holes and Cosmology

by

Dr. Patrick Das Gupta

Department Of Physics and Astrophysics

Delhi University

Abstract

Discovery of the first quasi-stellar object (QSO) in 1963 left an indelible mark on cosmology. Those QSOs that were radio-loud and often exhibited bright radio-jets and radio-lobes were christened as quasars. The number distribution of quasars as a function of distance dealt a blow to Steady State Cosmology. After many years of research it turned out that QSOs are bright nuclei of distant galaxies. But working of QSOs/quasars requires existence of supermassive black holes. Subsequently it was discovered that most galaxies have supermassive black holes at their centers.

How did these monstrous black holes appear when the universe was barely few billion years old?

How will we determine whether these are truly black holes and not some other compact objects?

This lecture will address some of these issues.

Date: Friday, 12th August, 2016.

Venue: NPLT

Time: 12:20 PM



Physics Stephen's <physics.stephens@gmail.com>

Correction Mail:Feynman Club talk || September 23 || Dr. Ashok Kumar Rastogi
3 messages

Physics Society <physics.stephens@gmail.com>
To: Shubham Bansal <bansalshubham334@gmail.com>

Wed, Sep 21, 2016 at 10:37 PM

The Feynman Club

St. Stephen's College



invites you for a talk titled

"Classical Measurements and discoveries in the Condensed matter Physics"

by

Dr. Ashok Kumar Rastogi

School Of Physical Sciences, Jawaharlal Nehru University, Delhi.

Abstract

Materials have been used according to their BULK PROPERTIES – Mechanical strength, Electrical, Magnetic and Thermal properties. However, the PHYSICS OF MATERIALS concerns in understanding these properties in terms of constituent atoms and valence electrons. The remarkable progress in the understanding the physics of materials in the last century could only be made with the production of very low temperatures and measurement of electrical, magnetic and thermal properties, using Ohm's law, Faraday law of induction and specific heat of solids. These measurements are known since early nineteenth century. Many new discoveries are still being made by these classical measurements. Low temperature measurements not only revealed the complete failure of Newtonian mechanism in case of atoms and electrons in condensed matter, but also gave "Superconductivity"- a spectacular Electronic Phase transition in condensed matter. We will discuss few of the other remarkable discoveries at low temperatures.

Date: Friday, 23rd September, 2016.

Venue: NPLT

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The Feynman Club

St. Stephen's College



invites you for a talk titled

The Enigma of Wave-Particle Duality

by

Dr. Tabish Qureshi

Centre for Theoretical Physics, Jamia Millia Islamia, Delhi

Abstract

The ability of quantum object to display wave properties and particle properties in different situations is called wave-particle duality. This phenomenon is at the very foundation of quantum theory. In the context of a double-slit experiment with particles, Feynman said that this phenomenon "has in it the heart of quantum mechanics; in reality it contains the only mystery" of the theory. The idea of wave-particle duality in the context of double-slit experiment with which-path detection, will be explained in detail. How this phenomenon leads to the concept of a "quantum eraser" will also be dwelt upon.

Date: Friday, 9th September, 2016.

Venue: NPLT

Time: 12:20 PM



Physics Stephen's <physics.stephens@gmail.com>

(no subject)
1 message

Physics Society <physics.stephens@gmail.com>
To: Shubham Bansal <bansalshubham334@gmail.com>

Wed, Jan 11, 2017 at 8:12 PM

The Feynman Club

St. Stephen's College



invites you for a talk titled

Models in science: the renormalization group and information theory

by

Archishman Raju

Cornell University, New York, United States.

Abstract

Our ability to make predictions about how water flows without requiring any knowledge of quantum electrodynamics hides a deep truth about the way we make scientific models. In physics, this ability to make effective theories at long length scales is usually understood using the renormalization group. Information theory is a natural and more general framework in which to understand what it means to make effective theories. Having such a framework is important to be able to make simple models of complicated phenomena in pretty much any other scientific field. I will use the random walk as a simple example to explain and connect both these descriptions.

Date: Friday, 13th January, 2017.

Venue: NPLT

Time: 12:20 PM

The Feynman Club, St. Stephen's College

cordially invites you to a talk entitled:

A toy model for living populations in equilibrium

by Akshit Goyal, National Centre for Biological Sciences, Bangalore

Date and Time:
January 6, 2017
12:20 pm

Venue:
New Physics Lecture Theatre

Abstract

The term 'biophysics' often comes to mind when physics students think about studying interdisciplinary biology: this often means models of the thermodynamics or mechanics of molecules, or predator-prey like models of ecosystems.

The idea of 'building' models for evolution in populations doesn't really come out that often. In this talk, I will introduce the Hardy-Weinberg model: a simple, well-established toy model of a population in genetic equilibrium. I will later try and connect it with some ideas that students learn in undergraduate physics, in particular, how the model is similar to a Monte Carlo simulation.



<reubenyaqub@gmail.com>, rohit gahlot <gahlot77@gmail.com>, Sanjay Kalaria <sanjaykalaria1999@gmail.com>, Silpa Thampam <silpamariyathampam@gmail.com>, Tanmay Srivastava <tanmay2608@gmail.com>, Thangjam Rocket Singh <throcket007@gmail.com>, Thomas Francis <thomasfrancis96@gmail.com>, Vasudha Singh <vasudhasinghbarcelona@gmail.com>, vishy gusain <gusainvishy@gmail.com>, vivek tilus <vivek7tilus@gmail.com>, samridhi garg <samridhigarg6@gmail.com>, Sanil Unnikrishnan <sanil.unni@gmail.com>, Chinkhanlun Guile <ckguile@ststephens.edu>, Abhinav Gupta <fibrebundle@gmail.com>, Annu Malhotra <annu.malhotra@yahoo.com>, Bikram Phookun <bphookun@yahoo.com>, Geelarajali Sethi <getseethi@gmail.com>, Harish769@gmail.com <harish769@gmail.com>, Jacob Cherian <jacob1.cherian@gmail.com>, Sangesha Sachdeva <sangeeta.s21@gmail.com>, Sanjay Kumar <sanjaysudha98@yahoo.co.in>, Rjul Sachdeva <sanrjsach@gmail.com>, Saurabh kumar <saurabh97kum@gmail.com>

The Feynman Club

St. Stephen's College



invites you for a talk titled

The Story of QuazarTech, an Innovative Physics Start- Up

by

Prof. Deshdeep Sahdev and Dr. Mani Chandra Morumpudi

CEO and Group Leader, Quazar Technologies, New Delhi.

Abstract

It is an interesting and remarkable fact that every Nobel-prize winning piece of work in Experimental Physics has been carried out on apparatus which has been designed and developed by the physicist in question, be it Raman, Mossbauer or Binnig. This makes the question of how we build an instrumentational base for cutting-edge research in India relevant. The answer will be discussed in the context of 2 hi-tech instruments, which have been designed, developed and brought to internationally competitive levels by teams which the speakers represent:

1. Scanning Probe Microscopes for various applications
2. Physical Quantities Measurement Systems for research in nano-science, materials and condensed matter physics.

Some fascinating research problems, in fields as diverse as black-holes and graphene, which we, at Quazar Research, are trying to solve with the help of these instruments, will also be touched upon.

Date: Friday, 3rd February, 2017.

Venue: NPLT



Physics Stephen's <physics.stephens@gmail.com>

Feynman Club Talk || January 27 || Jerry T. John

3 messages

Physics Society <physics.stephens@gmail.com>
To: Shubham Bansal <bansalsatshubham334@gmail.com>

Thu, Jan 26, 2017 at 10:33 AM

The Feynman Club

St. Stephen's College



invites you for a talk titled

Baby Steps in Game Design

by

Jerry T. John

Carnegie Mellon University, Pittsburgh, Pennsylvania.

Abstract

This talk aims at shining a small beam of light through the fog that surrounds the process of Game Design and Development.

If you've ever played a game on a phone, tablet, console or PC and found yourself asking questions like, "How do they do it? Can I make one if I tried? What do I need to know? Where do I begin?", then look no further. Join the Physics Society of St. Stephen's College on Friday, the 27th of January at 12:20 pm in the NPLT as we crack open the door to the world of Game Development, and shed some light on these questions and many more.

Date: Friday, 27th January, 2017.

Venue: NPLT

Time: 12:20 PM



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The Feynman Club

St. Stephen's College



invites you for a talk titled

Dynamics of soft interfaces, real and imagined

by

Prof. Sabyasachi Bhattacharya

Ashoka University (formerly at TIFR)

Abstract

Interfaces are often imagined objects which conjure up different images in different contexts. They represent boundaries between real but dissimilar objects, have an identity of their own and typically 'live' in dimensions greater than their own. They are distinct from the objects they separate, but share some of their attributes. They become more dominant as physical systems become smaller or more inhomogeneous or environmentally more constrained. In this lecture I will discuss the usefulness of imparting reality to imagined interfaces in some natural phenomena, focusing on a simple system that might be called "minimally complex".

Date: Friday, 24th march, 2017

Time: 12:20 pm

Venue: NPLT

The Feynman Club

St. Stephen's College



invites you for a talk titled

Topological Insulators: The new Spintronics Materials

by

Prof. Ratnamala Chatterjee

I.I.T Delhi.

Abstract

Topological insulators (TIs) represent a new state of matter possessing an attractive surface spin texture with possible applications in quantum computation and spintronics. In simpler terms, these are solid-state materials that are insulators in the bulk but have intrinsic surface states that behave like metal, and are completely robust to any type of defects or disorder. In other words, when a surface electron wave in a TI encounters a defect, it simply goes around it without scattering, exhibiting – quite strikingly – perfect transmission. The conduction process being spin-selective in these materials, make them increasingly important for 'spintronics' and could prove to be a 'boom-material' for various applications related to spintronics, multiferrocity etc. The growth of prototypical TIs such as Bi_2Te_3 and Bi_2Se_3 still remains a major challenge, because of vacancies and defects leading to an unintentional doping of the crystals creating a parallel conduction channel in the bulk.

Date: Friday, 3rd March, 2017.

Venue: NPLT

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Dear all,

The Physics Society, St. Stephen's College cordially invites you for a session on soft skills i.e communication and behaviour titled as **"Know your communication style- Must for a successful life."** by **Captain. Tinkle Gupta** on 17th February, 2017.

Captain Tinkle is an image Consultant and a soft skill trainer and have taken many workshops for Delhi police, various corporates. She has also been a faculty member at NCU Gurgaon, and works for various NGOs .

She will be talking about how the soft skills play a significant role in professional and personal life, with regard to the hard skills.

Date : 17th Feb, 2017

Time- 12 :20 pm

Venue - NPLT.



❖ Other Events

21/08/2016	Astronomy Club	Visit of Nehru Planetarium(Astronomy Club)
17-18/9/16	Astronomy Club	Sky viewing session (Astronomy Club)
10/03/2017	JRG	Movie screening- Particle Fever-Documentary on CERN