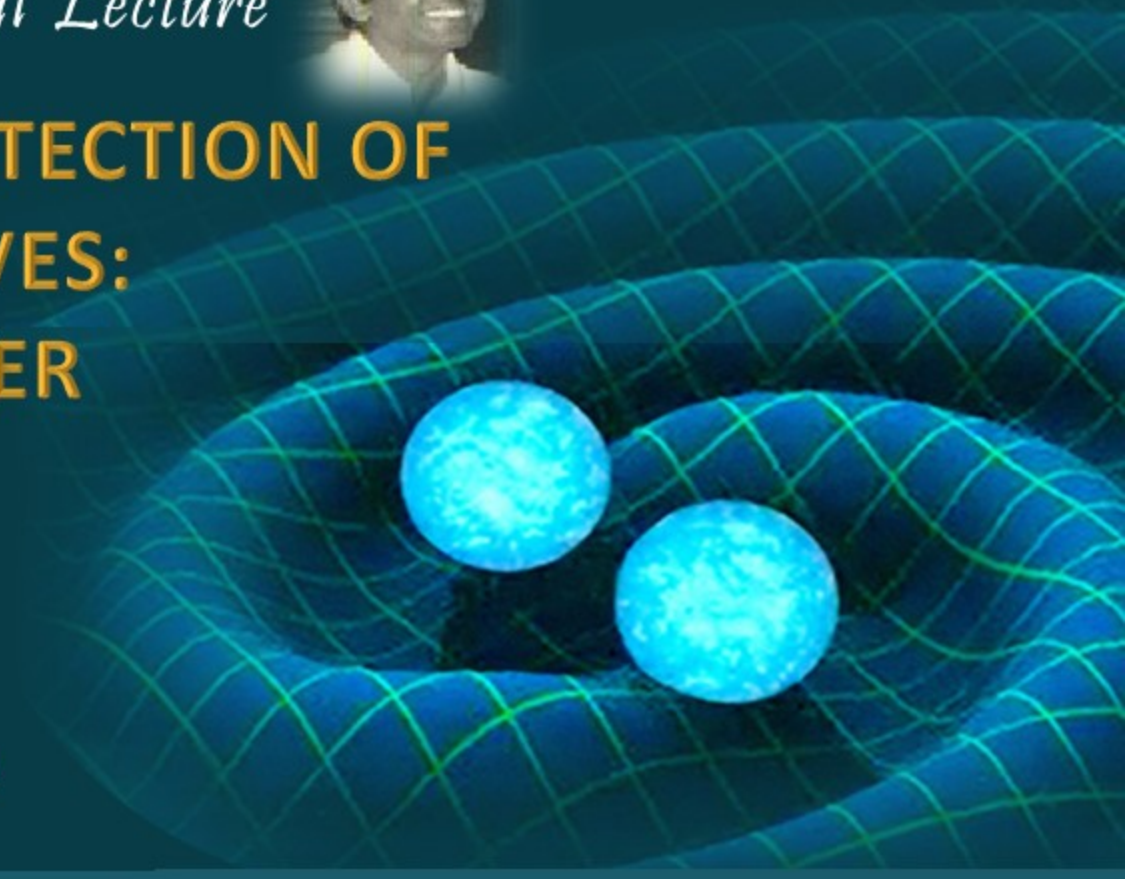
University of Mumbai

DEPARTMENT OF PHYSICS (AUTONOMOUS)
LOKMANYA TILAK BHAVAN
VIDYANAGARI

Prof. M. C. Joshi Memorial Lecture

THE FIRST DIRECT DETECTION OF GRAVITATIONAL WAVES: NOT WITH A WHIMPER BUT A BANG



By

Prof. Bala Iyer

ICTS-TIFR, Bangalore
Chair, IndIGO Consortium

ABSTRACT

Predicted by Einstein almost a century before, Gravitational waves (GW) have eluded direct detection till recently. The first two detections of GW by Advanced LIGO and the remarkable success in reconstructing the black hole binary source are but a brief preview of what is possible in the future. When GW detections become routine, inaugurating GW astronomy requires extension of the current network to provide good sky localization of the GW sources. LIGO-India will play a key role in better localizing the GW sources and make possible improved multi-messenger follow-up. This has implications not only for astrophysics and cosmology but eventually fundamental physics.

WEDNESDAY, 19 OCTOBER, 2016
3.30 PM
PHIROZESHAH MEHTA AUDITORIUM,
Civil & Politics Department,
Kalina Campus, University of Mumbai

ABOUT THE SPEAKER

Dr. Bala Iyer has been involved in leading the activities of the Indian Initiative in Gravitational-wave Observations (IndIGO) Consortium, as Chair of Council and PI of IndIGO participation in the LSC. He is the Editor-in-Chief and Subject Editor for Gravitational Waves for Living Reviews in Relativity. Over the last fifteen years, he has been involved in the Research Education Advancement Program (REAP) for undergraduate teaching in Physics at the Jawaharlal Nehru Planetarium, Bangalore.

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Science Academies' Refresher Course on
Mathematical Methods in Physics & their Applications

SPECIAL LECTURE

BY
PROF. DEEPAK DHAR
Distinguished Professor, TIFR

THE CURIOUS RELATIONSHIP BETWEEN PHYSICS AND MATHEMATICS

ABSTRACT

The relation between Mathematics and Natural sciences has puzzled philosophers and scientists alike, and there are disagreements. Galileo said that the laws of nature are expressed in the language of mathematics. Wigner discussed, what he called the "unreasonable effectiveness" of Mathematics in natural sciences. More recent philosophers have argued that Mathematics is useful only in a limited domain, and made a case for its "reasonable ineffectiveness". This talk will critically discuss these different positions

ABOUT THE SPEAKER

Prof. Deepak Dhar is a Distinguished Professor in the Department of Theoretical Physics at Tata Institute of Fundamental Research (TIFR), Mumbai. His research has been in the area of Statistical Physics, especially nonequilibrium systems; self organized criticality, structure of linear and branched polymers, fractals, the glassy state. Prof. Dhar's most significant contribution has been his studies of the Abelian sandpile model of self-organized criticality.

Prof. Dhar is a member of all the three Science Academies and has been passionately involved in science popularization activities of the Science Education Panel of Indian Academy of Sciences. He has made invaluable contribution to the Department of Physics as a member of Academic Board and as the Director of Science Academies' Refresher Courses organized by the department.

Prof. Dhar is a recipient of a number of awards and honours including INSA Young Scientist Award(1983), S. S. Bhatnagar award in Physical Sciences(1991), JR Schrieffer Prize in Condensed Matter Physics(1993) and S. N. Bose Medal of INSA(2001).

FRIDAY, 21 OCTOBER 2016
3.30 PM

PHIROZESHAH MEHTA AUDITORIUM,
Civil & Politics Department,
Kalina Campus,
University of Mumbai

Science Academies' Refresher Course on

Mathematical Methods in Physics & their Applications

In Collaboration with

Department of Physics (Autonomous), University of Mumbai

October 17- 29, 2016

Sponsored by

Indian Academy of Sciences, Bangalore
Indian National Science Academy, New Delhi
The National Academy of Sciences, India, Allahabad

University of Mumbai

Participation:

The two-week refresher course is primarily aimed at college teachers of Physics at the UG / PG level. It will cover basics of the subject through lectures and tutorials.

Students pursuing Ph.D. degree in Physics may also apply. College/ university teachers of Physics will be given preference.

Resource Persons:

Prof. Abbas Rangwala (University of Mumbai)

Prof. Sreerup Raychaudhuri (T.I.F.R., Mumbai)

Prof. Amol Dighe (T.I.F.R., Mumbai)

Prof. Kedar Damle (T.I.F.R., Mumbai)

Prof. Dibyendu Das (I.I.T., Bombay)

Prof. Amita Das (IPR, Gandhinagar)

Course:

The course will consist of six modules. In addition, there will be interactive sessions and tutorials aimed at clarifying basic concepts and improving the pedagogical skills of participants.

Module 1: Vectors & Tensors

Module 2: Linear Vector Spaces

Module 3: Complex Analysis

Module 4:Introduction to Group Theory

Module 5: Ordinary differential equations & their applications in Physics

Module 6 : Partial differential equations & their applications in Physics

Course Director:

Prof. Amita Das
Institute of Plasma Research,
Gandhinagar-382428
Gujarat - INDIA

Course Coordinator:

Prof. Anuradha Misra.
Department of Physics,
University of Mumbai,
Santa Cruz (E), Mumbai-400098, India
Phone: +912226526250
E-mail: misra@physics.mu.ac.in

Use following link to send your application: http://web-japps.ias.ac.in:8080/Refreshcourse/RMMPA.jsp

Alternatively, application in the prescribed format may be sent by email to:rcmm2016@mu.ac.in

Please note that participants have to attend the full duration of the course. Selected participants will be provided with local hospitality and round trip bus/train (III A/C)fare by the shortest route.

Last date for receiving applications: 5th September 2016.

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Science Academies' Refresher Course on
Mathematical Methods in Physics & their Applications

SPECIAL LECTURE

BY
PROF. SAHANA MURTHY
IIT Bombay

ACTIVE LEARNING STRATEGIES FOR IMPROVING STUDENT LEARNING AND ENGAGEMENT

ABSTRACT

Active learning strategies are known to improve student learning and address problems of student disinterest. During active learning strategies, students go beyond listening and copying notes, and the instructor goes beyond lecturing and clarifying questions. The instructor creates carefully designed activities that requires students to talk, write, draw, reflect and express their thinking. In this talk I will focus on two classroom-based active learning strategies - peer-instruction and think-pair-share, and discuss the why-what-how of using these strategies in a course. I will show results of research studies on the effectiveness of these strategies for student learning and engagement.

ABOUT THE SPEAKER

Sahana Murthy is a faculty member at the Inter-Disciplinary Program in Educational Technology at IIT Bombay. Prior to that she worked as a post-doctoral researcher in Physics Education Research at MIT and Rutgers University, USA. She got her Ph.D. in physics from Rutgers University, M.Sc in physics from IIT Bombay and B.Sc from Mumbai University. Her current research interests are in students' development of thinking skills through technology enhanced learning environments, and teacher use of educational technology tools and strategies. She has conducted a number of teacher professional development workshops on effective teaching strategies and research methods in education.

TUESDAY, 18 OCTOBER 2016
3.30 PM
LC 17, Lecture Complex,
Kalina Campus, University of Mumbai

REFRESHER COURSE IN MATHEMATICAL PHYSICS
PROGRAM

Start time / End time	08:30 09:00	09:00 09:30	09:30 10:00	10:00 10:30	10:30 11:00	11:00 11:30	11:30 12:00	12:00 12:30	12:30 13:00	13:00 13:30	13:30 14:00	14:00 14:30	14:30 15:15	15:15 15:30	15:30 16:00	16:00 16:30	16:30 17:00	17:00 17:30	17:30 18:00
Mon 17	Registration		A.A. Rangwala (L)			Tea		Amol Dighe (L)			Lunch	Orientation		Tea	S. Raychaudhuri (L)				
Tue 18		A.A. Rangwala (L)			Tea		Amol Dighe (L)			Lunch		Amol Dighe (T)		Tea	Spl. Lec.: Sahana Murthy*				
Wed 19		A.A. Rangwala (L)			Tea		S. Raychaudhuri (L)			Lunch		A.A. Rangwala (T)		Tea	Spl. Lec. : Bala R. Iyer				
Thu 20		Amol Dighe (L)			Tea		S. Raychaudhuri (L)			Lunch		S. Raychaudhuri (T)		Tea	Campus Visits				
Fri 21		Amol Dighe (L)			Tea		Kedar Damle (L)			Lunch		Amol Dighe (T)			Spl. Lec. : D. Dhar		Tea	Discussion	
Sat 22		A.A. Rangwala (L)			Tea		S. Raychaudhuri (L)			Lunch		S. Raychaudhuri (T)			Tea	Teaching Presentations			
Sun 23		EXCURSION																	
Mon 24		Amita Das (L)			Tea		Kedar Damle (L)			Lunch		Amita Das (L)			Tea	Teaching Presentations			
Tue 25		Amita Das (L)			Tea		A.A. Rangwala (T)			Lunch		Visit to IIT Bombay							
Wed 26		Dibyendu Das (L)			Tea		Kedar Damle (L)			Lunch		Kedar Damle (T)		Tea	Amita Das (T)				
Thu 27		Dibyendu Das (L)			Tea		Amita Das (L)			Lunch		Amita Das (T)			Tea	Teaching Presentations			
Fri 28		Kedar Damle (L)			Tea		Dibyendu Das (L)			Lunch		Kedar Damle (T)			Tea	Dibyendu Das (T)			
Sat 29		Dibyendu Das (L)			Tea		Dibyendu Das (T)			Lunch		Feedback		High Tea		Valedictory			

(L) denotes a **Lecture**; **(T)** denotes a **Tutorial**

TOPICS:

Abbas A. Rangwala : Vectors and Tensors
Amol Dighe : Complex Analysis
Sreerup Raychaudhuri ; Linear Vector Spaces

Kedar Damle : Group Theory
Dibyendu Das : Ordinary Differential Equations
Amita Das : Partial Differential Equations

SPECIAL LECTURES

Sahana Murthy : Active learning strategies for improving student learning and engagement
Bala R. Iyer : The first direct detection of gravitational waves: Not with a whimper but with a bang
Deepak Dhar : The curious relationship between Physics and Mathematics