

# Program Timetable

## The Jnan Chandra Ghosh Memorial Lecture

Speaker: Nobel Laureate Prof. Bernard L. Feringa

Title: The Art of Building Small, from Molecular Switches to Motors  
[Title is Tentative]

Chairpersons: The Director, Prof. Partha Pratim Chakraborty, and the  
HOD, Chemistry, Prof. Manish Bhattacharjee

Time: 5.00 – 6.30 pm

Venue: Kalidas Auditorium

Audience: Science and Engineering background



Upcoming New Building  
Department of Chemistry  
IIT Kharagpur

## Sir Jnan Chandra Ghosh Memorial Lecture

- by the Nobel Laureate Prof. Bernard L. Feringa

18<sup>th</sup> March 2019

IIT Kharagpur

### THE EVENT

The Indian Academy of Sciences, Bangalore has sponsored a visit of Prof. Bernard L. Feringa (Nobel Prize in Chemistry 2016) to the Indian Institute of Technology Kharagpur. As a part of his trip to IIT Kharagpur, Prof. Feringa will deliver the honourable Jnan Chandra Ghosh Memorial Lecture on 18<sup>th</sup> March, 2019 (5.00 pm, at Kalidas Auditorium) organized by the Department of Organic Chemistry, IIT Kharagpur. Prof. Feringa received Nobel Prize in Chemistry for his cutting-age, ground-breaking discovery on the design and synthesis of molecular machines.

### THE DEPARTMENT

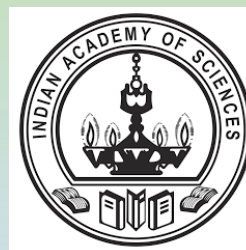
Sir J.C. Ghosh, the first director of the institute inaugurated the chemistry department in 1952. Ever since the inception, the department has established the tradition of excellence in teaching and research in various corridors of chemistry. The multifaceted research activities and state-of-the-art facilities, the department offers one of the best academic environments in the country.

The prime focus on the research activities is on basic and traditional areas of chemistry, relevant to the societal needs. In 2011, the department was ranked by DST as one of the top six chemistry departments in the country. Today, the department is served by 34 faculty members, 17 non-teaching staff, with a strength of 150 masters' students and 170 doctoral students.

Department of Chemistry  
Indian Institute of Technology  
Kharagpur, WB, India - 721302  
Phone No. +91-3222-82252  
hodchem@chem.iitkgp.ac.in



Sponsored by



<http://www.chemistry.iitkgp.ac.in/>



# Sir Jnan Chandra Ghosh

and IIT Kharagpur



Sir Jnan Chandra Ghosh  
(14 Sep 1894 - 21 Jan 1959)

First Director of IIT Kharagpur  
(1951-1954)

Jnan Chandra Ghosh (14 September 1894 – 21 January 1959) was born in Giridih near Purulia District, British India. Sir Jnan Chandra Ghosh has an immense contribution to the development of scientific research, industrial development and technology education in India. He is known for his development of anomaly of strong electrolytes and the ionization theory. His scientific research drew appreciation from many famous scientists such as Max Planck, William Bragg and Walther Nernst. In 1918, he was awarded D.Sc. for his research on strong electrolytes. Sir J. C. Ghosh's other important contributions include his extensive study of photocatalysts under the influence of polarised light and developments of Fischer–Tropsch reaction for the synthesis of liquid fuel from carbon-monoxide and hydrogen. Dr. Ghosh made contributions in the field of application of Differential Thermal Application (D.T.A) as a tool to the systematic study of solid catalysts. He also successfully

guided research work on technical problems relating to the production from Indian raw materials of phosphatic fertilisers, ammonium sulphate, formaldehyde, potassium chlorate etc. During his active career in building scientific research, technical education and industrial development, he was the Head of Department of Chemistry at Dacca University, the Director of Indian Institute of Science at Bangalore, the Director of Indian Institute of Technology, Kharagpur, the Vice Chancellor of Calcutta University, and the Director-general of Industries and Supplies, Government of India.

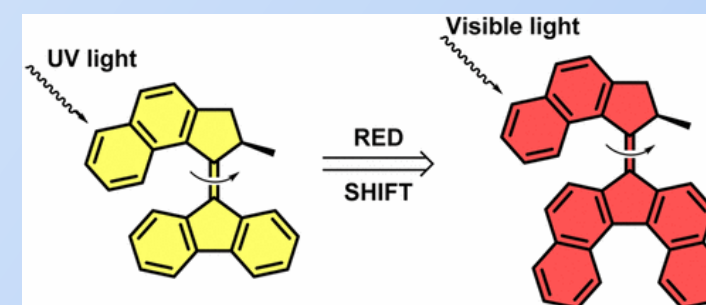


Main Building: IIT Kharagpur

# Nobel Prize in Chemistry (2016)

Prof. Bernard L. Feringa

Ben L. Feringa obtained his PhD degree at the University of Groningen in the Netherlands under the guidance of Professor Hans Wynberg. After working as a research scientist at Shell in the Netherlands and the UK, he was appointed as lecturer and in 1988 full professor at the University of Groningen. He was elected Foreign Honorary member of the American Academy of Arts and Sciences and member and vice-president of the Royal Netherlands Academy of Sciences. Ben Feringa is member of Council of the RSC. In 2008 he was appointed as Academy Professor and was knighted by Her Majesty the Queen of the Netherlands. Feringa's research has been recognized with a number of awards including the Koerber European Science Award (2003), the Spinoza Award (2004), the Prelog gold medal (2005), the Norrish Award of the ACS (2007), the Paracelsus medal (2008), the Chirality medal (2009), the RSC Organic Stereochemistry Award (2011), Humboldt award (2012), the Nagoya gold medal (2013), ACS Cope Scholar Award 2015, Chemistry for the Future Solvay Prize (2015), the August-Wilhelm-von-Hoffman Medal (2016), The 2016 Nobel prize in Chemistry and the Tetrahedron Prize 2017. Feringa's research interest includes stereochemistry, organic synthesis, asymmetric catalysis, molecular switches and motors, self-assembly, molecular nanosystems and photopharmacology.



Molecular Motor

In 1999 Feringa and collaborators announced that they had created the first “molecular motor”—that is, a molecule that can be made to spin in one direction. Usually, when molecules rotate, they are as equally likely to spin one way as the other. The molecular motor was made of two “blades,” in which one blade would spin 180 degrees when exposed to ultraviolet light. This rotation would set up a “tension” in the bond that connects the two blades that would cause the other blade to rotate. Each blade had a methyl group connected to it that acted as a ratchet so rotation could only happen in one direction. The Feringa group built molecular motors that rotated faster and faster, which culminated in 2013 with the development of one that rotated with a frequency of 12 MHz.



Prof. Ben L. Feringa  
University of Groningen  
The Netherlands

Sir Jnan Chandra Ghosh  
Memorial Lecture:

**The Art of Building Small,  
from Molecular Switches  
to Motors**

18<sup>th</sup> March 2019  
Kalidas Auditorium  
5.00 pm