

## P.A.M. DIRAC (1902-1984)

Paul Adrien Maurice Dirac was born in Bristol, England, on 8 August 1902. He studied engineering in his hometown, and obtained his degree in physics and mathematics at Cambridge University, where in 1932 he became professor of mathematics in the Lucasian Chair, which had been held by Sir Isaac Newton two centuries earlier. After his retirement, Professor Dirac went to live in Tallahassee, Florida, where he taught at Florida State University from 1971 until his death on 20 October 1984.

A member of the Royal Society since 1930, he won the Royal Medal in 1939 and the Copley Medal in 1952. Professor Dirac shared the Nobel Prize for Physics with Erwin Schrödinger in 1933. He invented the well-known relativistic wave equation predicting the existence of spin and of the positron when he was only 23 years old. His further work includes his formulations of quantum field theory, statistics of fields and particles, gravitational waves and the prediction of magnetic monopoles.

Dirac first came to Trieste in June 1968 on the occasion of the International Symposium on Contemporary Physics, at which he delivered a lecture on the methods of theoretical physics. After this symposium, Dirac was a guest of honour at the Centre for a month or so nearly every year. In 1972, at a symposium on The Physicists' Conception of Nature organized in honour of Dirac on the occasion of his 70th birthday, he gave a lecture on Fundamental Constants and their Development in Time. Dirac also attended the Marcel Grossman Meeting held at the Centre on the centennial of the birth of Albert Einstein in 1979.

Abdus Salam, who proposed the institution of the Dirac Medal, was Dirac's student at Cambridge and it was after having listened to Dirac's lectures that he decided to devote his life to research rather than becoming a civil servant in his country. He remained in touch with his master and became his friend.

# DIRAC MEDAL



Abdus Salam with P.A.M. Dirac  
Cambridge University, 1968



The Abdus Salam  
International Centre  
for Theoretical Physics



## 2016 DIRAC MEDAL CEREMONY

22 March 2017  
ICTP Budinich Lecture Hall  
14:30

### Program



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## THE 2016 DIRAC MEDAL AND PRIZE

The 2016 Dirac Medal is awarded to three physicists for their important contributions to a better understanding of field theories in the non-perturbative regime and in particular for exact results in supersymmetric field theories.

**Nathan Seiberg** (Institute for Advanced Study, Princeton)

**Mikhail Shifman** (University of Minnesota)

**Arkady Vainshtein** (University of Minnesota)

## CEREMONY PROGRAM

**14:30** Welcome by Fernando Quevedo, Director, ICTP

Introduction to Dirac Medal Lectures, Daniele Amati, SISSA

**15:00** **Nathan Seiberg: Symmetries, Duality, and the Unity of Physics**

Global symmetries and gauge symmetries have played a crucial role in physics. The idea of duality demonstrates that gauge symmetries can be emergent and might not be fundamental. During the past decades it became clear that the circle of ideas about emergent gauge symmetries and duality is central in different branches of physics including Condensed Matter Physics, Quantum Field Theory, and Quantum Gravity. We will review these developments, which highlight the unity of physics.

**15:45** **Mikhail Shifman: Supersymmetric tools in four-dimensional super-Yang-Mills Theories at Strong Coupling: the Beginning of a Long Journey**

Development of holomorphy-based methods in super-Yang-Mills theories started in the early 1980s and lead to a number of breakthrough results. I review some results in which I participated. The discovery of Seiberg's duality and the Seiberg-Witten solution of  $N=2$  Yang-Mills were the milestones in the long journey of which, I assume, much will be said in Seiberg's talk. I will focus on the discovery (2003) of non-Abelian vortex strings with various degrees of supersymmetry, supported in some four-dimensional models and their intriguing implications.

**16:30** **Arkady Vainshtein: Uses of Wilson Operator Expansion in Gauge Theories**

Different applications of Wilson Operator Expansion, such as a penguin mechanism in weak interaction, hadronic QCD sum rules and the ultraviolet behavior in supersymmetric gauge theories, are reviewed.

## ABOUT THE DIRAC MEDAL

*The Abdus Salam International Centre for Theoretical Physics awarded its first Dirac Medal in 1985. The Medal is given in honour of P.A.M. Dirac, one of the greatest physicists of the 20th century and a staunch friend of the Centre. It is awarded annually on Dirac's birthday, 8 August, to an individual or individuals who have made significant contributions to physics.*