

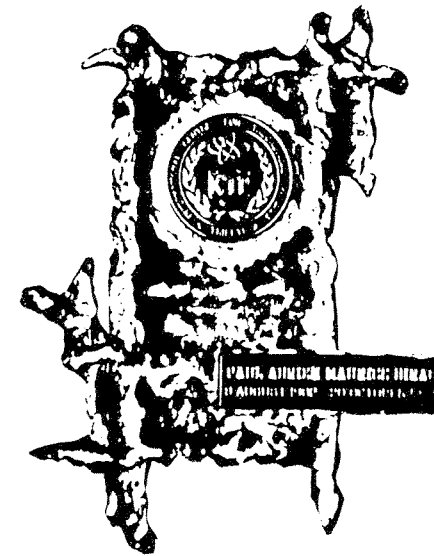
Professor Efim Samoilovich Fradkin was born in Belorussia (Chadrin), USSR, on 30 November 1924. He studied at the University of Minsk and then at the University of Lvov, where he graduated in 1948. Since 1948 he has been working in the Theoretical Department of the Lebedev Institute in Moscow. Here he obtained his doctorate in 1960 and became Professor and Leader of the Quantum Field Theory and Quantum Statistics Group in 1964. He was elected to the Soviet Academy of Science (Correspondent Member) in 1970 and nominated Foreign Member of the Accademia Pontaniana (Naples) in 1983. He has also been the recipient of two awards: the Soviet State Prize in 1953 and the Academy Tamm Prize in 1980. Among his recent works one can mention the supersymmetric model  $SU(5)$  and  $E_8$ ; the effective action for the fundamental fields in string theory; new conformal superalgebras for all higher spins and the S-matrix of dynamical systems with non-canonical (curved-phase-space) communication relations.

The other 1988 Dirac Medal was awarded to Prof. David Gross (Princeton University, New Jersey, USA) on 10 April 1989.

*International Centre for Theoretical Physics*

*P.A.M. Dirac Medals*

*Presentation Ceremony*



*11 July 1989*

*Strada Costiera, 11  
34136 Trieste*

The Dirac Medals of the International Centre for Theoretical Physics were instituted in 1985. These are awarded yearly, on Dirac's birthday - 8th August - for contributions to theoretical physics.

The 1985 Dirac Medals were awarded to Professor Yakov Zeldovich (Institute for Space Research, Moscow, USSR) and Professor Edward Witten (Princeton University, USA) and in 1986 to Professor Yoichiro Nambu (Enrico Fermi Institute for Nuclear Studies, Chicago University, USA) and Professor Alexander Polyakov (Landau Institute for Theoretical Physics, Moscow, USSR). In 1987, they were awarded to Professor Bryce DeWitt (University of Texas at Austin, USA) and Professor Bruno Zumino (University of California at Berkeley, USA). The recipients of the 1988 Medals are Professor David J. Gross (Princeton University, New Jersey, USA) and Professor Efim Samoilovich Fradkin (Lebedev Physical Institute, Moscow, USSR).

The Selection Committee includes Professors S. Lundqvist, R. Marshak, J. Schwinger, L. Van Hove, S. Weinberg and Abdus Salam. The Dirac Medals are not awarded to Nobel Laureates or Wolf Foundation Prize winners.

### ***P.A.M. Dirac (1902 - 1984)***

*Paul Adrien Maurice Dirac was born in Bristol in 1902. He studied engineering in his hometown, and obtained his degree in physics and mathematics at Cambridge University where he became professor in mathematics in 1932 in the Lucasian chair which was once of Sir Isaac Newton. After his retirement, Professor Dirac went to live in Tallahassee, Florida, where he taught at the University from 1971 until his death in 1984. A Member of the Royal Society since 1930, he won the Royal Medal in 1939 and the Copley Medal in 1952. He shared the Nobel Prize for Physics with E. Schrödinger in 1933.*

*Professor Dirac was an honoured guest at and a staunch friend of the International Centre for Theoretical Physics in Trieste.*

## *Dirac Medal 1988*

### *Efim Samoilovich Fradkin*

Professor Efim Samoilovich Fradkin is honoured:

*"for his many fruitful contributions to the development of quantum field theory and statistics. Among these are his early work on functional methods including his formal solution to the Schwinger-Dyson equations for the Green's functions of interacting systems. This result has become a standard part of modern quantum field theory. Independently of Takahashi he discovered the generalized Ward identities for electrodynamics. These identities and their generalizations for non Abelian gauge theories are basic to the understanding of local symmetries. In his work on the Schwinger-Dyson equations, Fradkin drew attention to the zero-charge problem, a potential inconsistency in Abelian gauge theories whose later resolution in the non-Abelian theories led to the discovery of asymptotic freedom. At the same time as Schwinger and Nakano, Fradkin constructed a Euclidean formulation of quantum field theory, a development which was to have far-reaching implications for the development of statistical physics and string theory. His contributions to the quantization of relativistic systems with constraints are widely recognized. This work culminated in the Batalin-Fradkin-Wilkovisky quantization method which is used both in quantum field theory and in the theory of extended objects such as strings and membranes."*