the Abdus Salam ICTP # Dirac Medal Nomination

Information about the candidate

First Name:	Nathan
Last Name:	Seiberg
Affiliation:	School of Natural Sciences, The Institute for Advanced Study, Einstein Drive Princeton, NJ 08540 USA
Address:	Princeton, New Jersey 08540
Phone:	(609) 734-8237
FAX:	(609) 951-4489
Email:	seiberg@ias.edu

Candidate's qualifications

Proposed citation: For fundamental contributions to the understanding of quantum field theory, string theory, and quantum theories of gravity, as well as important contributions to mathematics.

Scientific achievements: Seiberg's research focuses on various aspects of string theory, quantum field theory and particle physics. His work has shed light on the world-sheet description of string theory as a two-dimensional conformal field theory and its space-time manifestations. Seiberg has contributed to the understanding of the dynamics of quantum field theories, especially supersymmetric quantum field theories. His exact solutions of such theories have uncovered many new and unexpected insights, including the fundamental role of electric-magnetic duality in these theories. These exact solutions have also led to many applications in physics and in mathematics. He has also clarified how supersymmetry can be dynamically broken, and has explored the phenomenological consequences of supersymmetry breaking. Recently, he has been exploring supersymmetric field theories in different dimensions and on various spaces, thus uncovering new properties of these theories.

Particularly well known is his work on ``Seiberg Witten theory'', which has provided insights into many questions of quantum field theory, as well as into Donaldson theory His work on exact solutions of supersymmetric field theories and his discovery and elucidation of certain very surprising dualities has had a profound impact. He has provided many deep insights into different aspects of string theory -- world sheet issues, dualities, as well as basic foundational and conceptual questions. He has done notable research on issues of supersymmetric models of particle physics (he was one of the first to discover dynamical breaking of supersymmetry), of ideas for understanding the masses of quarks and leptons, and for work in lattice gauge theory and other aspects of the Standard Model.

Education: B.Sc. Tel Aviv University 1977
PhD Weizmann Institute 1982

Main positions held:	Long Term Member, Institute for Advanced Study 1982-1985 Professor, Weizmann Institute 1985-1989 Professor, Rutgers University 1989-1997 Professor, Institute for Advanced Study 1997-
Major honours and awards:	MacCarthur Fellow Heinemann Prize of the American Physical Society Fundamental Physics Prize Fellow of the National Academy of Sciences Fellow of the American Academy of Arts and Sciences
Principal publications:	1) N.Seiberg and E.Witten, ``String theory and noncommutative geometry,'' JHEP 9909, 032 (1999)[hep-th/9908142]. 2) N.Seiberg, ``Electric - magnetic duality in supersymmetric nonAbelian gauge theories,''Nucl. Phys. B 435, 129 (1995)[hep-th/9411149]. 3) N.Seiberg and E.Witten, ``Monopoles, duality and chiral symmetry breaking in N=2 supersymmetric QCD,'' Nucl. Phys. B 431, 484 (1994) [hep-th/9408099]. 4) N.Seiberg and E.Witten, ``Electric - magnetic duality, monopole condensation, and confinement in N=2 supersymmetric Yang-Mills theory,''Nucl. Phys. B 426, 19 (1994) 5) N.Seiberg, ``Exact results on the space of vacua of four-dimensional SUSY gauge theories,'' Phys. Rev. D49, 6857 (1994) [hep-th/9402044].
Grounds for nomination:	For over two decades, Seiberg's insights into quantum field theory and string theory have played a pivotal role in shaping the quest for a deeper understanding of nature both on the microscopic level and in the cosmos.
Additional comments:	
CV file:	seiberg_cv.pdf

Information about the nominator

First Name:	Michael
Last Name:	Dine
Affiliation:	Physics Department, University of California, Santa Cruz
Address:	1156 High Street, Santa Cruz, CA 95064 USA
Phone:	8314593033
FAX:	8314595265
Email:	mdine@ucsc.edu
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