Nathaniel Joseph Fisch

Current Professional Interests

Plasma physics with applications to nuclear fusion, lasers, propulsion, waste remediation, and astrophysics.

University Education

MIT Department of Electrical Engineering and Computer Science (BS '72; MS '75; Ph.D. '78)

Academic Honors and Prizes

Distinguished Career Award, Fusion Power Associates (2018)
Batsheva Fellow, Israel Academy of Sciences and Humanities (2017)
Hannes Alfvén Prize, European Physical Society (2015)
Weston Visiting Professorship, Department of Particle Physics and Astrophysics, Weizmann Institute (2013)
James Clerk Maxwell Prize for Plasma Physics, American Physical Society (2005)
EO Lawrence Award, United States Department of Energy (2004)
Gold Medal, United States Department of Energy (2004)
Fellow of NASA Institute for Advanced Concepts (2003)
Bronze Medal, US Department of Energy, Outstanding Mentor in Undergraduate Research Programs (2002)
American Physical Society Award for Excellence in Plasma Physics (1992)
Fellow of American Physical Society (1987)
John Simon Guggenheim Memorial Foundation Fellow (1985)
MIT National Scholar (1968—1972)

Employment

2011— 2017	Associate Chair, Department of Astrophysical Sciences, Princeton University
2000 —	Associated Faculty, Department of Mechanical and Aerospace Engineering, Princeton Univ.
1993 —	Associate Director for Academic Affairs, Princeton Plasma Physics Laboratory
1991 —	Director, Program in Plasma Physics, Princeton University
1991 —	Professor, Department of Astrophysical Sciences, Princeton University
1986	Visiting Scientist, IBM T. J. Watson Research Center
1981 — 86	Consultant, Exxon Research and Engineering Co.
1978 — 91	Research Positions, Princeton Plasma Physics Laboratory

Ph.D. Students Supervised

M. Herrmann *98	LLNL, *Cooling Alpha Particles with Waves*; APS Thesis Prize Winner
M. Malyshev *98	Lucent, *Advanced Plasma Diagnostics for Plasma Processing* (co-advisor)
V. Savchenko *99	Polymath Research, *Quantum and Radiation Effects in Plasmas*
R. Heeter *99	LLNL, *AE and IBW Studies for Controlling Fusion α Particles* (co-advisor)
D. Clark *03	LLNL, *Raman Laser Amplification in Preformed and Ionizing Plasmas*
I. Dodin *05	Princeton, *Nonlinear Dynamics of Plasmas under Intense Electromagnetic Radiation*
S. Son *05	LANL, *Reaction Rates and other Processes in a Dense Plasma*
A. Smirnov *06	TAE Technologies, *Experimental and Theoretical Studies of Cylindrical Hall Thrusters (*co-advisor)
N. Yampolsky *09	LANL, *Plasma Waves in Parametric Interactions*
A. Fetterman *12	Lightsail, *Wave-Driven Rotation and Mass Separation in Rotating Magnetic Mirrors*
A. Zhmoginov *12	LBNL, *Resonant Wave-Particle Manipulation Techniques*
P. Schmit *12	Sandia National Laboratory, *Wave-particle interactions in nonstationary plasma*
M. Griswold *13	TAE Technologies, *Acceleration and Focusing of Plasma Flows (*co-advisor)
Z. Toroker *15	Intel, *Light Amplification in Ionized or Excited Medium* (co-advisor, Technion degree)
M. Hay *16	Volant, *On the Utility of Nonthermal Plasmas*
V. Geyko *17	LLNL, *Physics of spinning gases and plasmas*
S. Davidovits *17	LLNL, *Understanding turbulence in compressing plasmas and its exploitation or prevention;* APS Thesis Prize Winner
Y. Shi*18	LLNL, *Plasma Physics in Strong Field Regimes* (co-advisor); APS Thesis Prize Winner
V. Munirov *20	UC Berkeley, *Radiative Processes in Astrophysical and Laboratory Plasmas*

Selected Recent Community Service

2016	Member, External Review Panel, Institute for Basic Science, Gwangju, Korea
2015	Member, External Advisory Board, Optics for Space Technology & Applied Research, DSU
2014	Member, Space Research and Space Technology Focus Area External Review Panel, NRL
2012 —	Member, Board of Physics and Astronomy, National Research Council
2012	Member, Fusion Energy Sciences Advisory Committee on Priorities, Department of Energy
2011 —	Member, Z Facilities Fundamental Science Review Committee, Sandia National Laboratory
2010 —	Member, Science on NIF Review Committee, Lawrence Livermore National Laboratory
2008 — 2012	Associate Editor, Journal of Plasma Physics
2008 —	Chair, International Advisory Committee, Center for Magnetic Fusion Theory, Hefei, China
2013	Member, Visiting Committee, Physics Department, University of MD
2011	Member, Visiting Committee, Institut de Recherche sur la Fusion Magnétique, Cadarache, France
2011— 2013	Member, Plasma Physics Division External Review Panel, Naval Research Laboratory