

## 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

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

2011 — 17 Associate Chair, 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  $\alpha$  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*

E. Kolmes \*21 Princeton, *Particle, Charge, and Energy Rearrangement in Rotating Magnetized Plasma*

I. Ochs \*21 Princeton, *Controlling and Exploiting Perpendicular Rotation in Magnetized Plasmas*

### Selected Recent Community Service

2021 — Member, National Academy of Science Committee on High Energy Density Plasma

2011 — Member, Z Facilities Fundamental Science Review Committee, Sandia National Laboratory

2010 — Member, Science on NIF Review Committee, Lawrence Livermore National Laboratory

2018 — Advisory Editor, Oxford Research Encyclopedia of Physics

2019 — Member, Visiting Committee, Laboratory for Laser Energetics, U. of Rochester

2019 Chair, Evaluation Panel for IBS Center for Relativistic Laser Science, Korea

2008 — 2019 Chair, International Advisory Committee, Center for Magnetic Fusion Theory, Hefei, China

2012 — 2017 Member, Board of Physics and Astronomy, National Research Council

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

2013 Member, Visiting Committee, Physics Department, University of MD

2011 — 2013 Member, Plasma Physics Division External Review Panel, Naval Research Laboratory

2012 Member, Fusion Energy Sciences Advisory Committee on Priorities, Department of Energy

2008 — 2012 Associate Editor, Journal of Plasma Physics

2011 Member, Visiting Committee, Institut de Recherche sur la Fusion Magnétique, Cadarache, France