

Need an Expert?



**Fusion. Energy. Plasma. Physics. Tokamaks. Stellarators.
Radioactivity. Nanotechnology. Astrophysics.
Computational simulations. Vacuum technology.
Materials Science. Electronics. STEM education.**

These are some of the areas of expertise of staff at the Princeton Plasma Physics Laboratory. PPPL is devoted to creating new knowledge about the physics of plasmas – ultra-hot, charged gases – and to developing practical solutions for the creation of fusion energy. In addition, results of PPPL research have ranged from a portable nuclear materials detector for anti-terrorist use to universally employed computer codes for analyzing and predicting the outcome of fusion experiments. The Laboratory is managed by Princeton University for the U.S. Department of Energy's Office of Science.

**To reach any of these experts, please contact Larry Bernard
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Ronald C. Davidson

Expert Topics: Nonlinear collective processes, Ion-beam-driven high energy density physics, Particle beam dynamics

Ronald Davidson has made numerous fundamental theoretical contributions to pure and applied plasma physics, including nonlinear plasma dynamics and collective interactions; physics of non-neutral plasmas; kinetic equilibrium and stability properties; and intense charged particle beam propagation in high energy accelerators. Professor Davidson served as director of PPPL from 1991 to 1996 and as director of the MIT Plasma Fusion Center from 1978 to 1988, and is author or co-author of more than 500 journal articles and four graduate-level textbooks. He has chaired the American Physical Society's Division of Plasma Physics and Division of Particle Beams, and has participated in numerous national and international advisory and review committees on plasma physics and fusion research.



John W. DeLooper

Expert Topics: Education, Emergency planning, Fusion energy, Quality assurance

John DeLooper has more than 40 years of experience in quality, environment, safety, health, security and emergency preparedness management. He is the Head of Best Practices and Outreach at PPPL. As part of his responsibilities he regularly talks to students and visitors to the Laboratory regarding fusion energy and plasma science. Prior to his employment at Princeton, he was employed by Burns and Roe, an architect/engineer for large power plants.



Ahmed Diallo

Expert Topics: Laser diagnostics, Plasma physics

Ahmed Diallo is leader of the pedestal structure and control tropical science group of the National Spherical Torus Experiment-Upgrade (NSTX-U) and is a recipient of a DOE Early Career award. He is developing a fast burst laser system to investigate the dynamics of the pedestal as well as to control it. He has contributed to the upgrade of the Thomson scattering diagnostic system in preparation for the NSTX-U, and has participated in the operation of the NSTX and the Thomson scattering system prior to their upgrades. He has more than 15 years of experience in laser-aided plasma diagnostics, has authored many scientific papers and given more than 10 talks at national and international scientific meetings.



Fatima Ebrahimi

Expert Topics: Theory and computational extended MHD, Plasma physics

Fatima Ebrahimi is the topical science group leader for theory/modeling of solenoid-free startup & ramp-up in NSTX-U. She has many years of experience in theoretical and global computational extended (magnetohydrodynamic) MHD with wide applications to astrophysical, laboratory and fusion plasmas. Studies of MHD stability in fusion plasmas, momentum transport, dynamo, and magnetic reconnection in fusion/laboratory and astrophysical plasmas constitute her main research interests. She has more than 35 publications in peer-reviewed journals. She is an elected member of APS-DPP Executive Committee (2013-2016) and a member of the executive committee for International Fusion Theory Sherwood Conference (2014-2017).



David A. Gates

Expert Topics: Stellarators, Tokamaks

David Gates is a principal research physicist for the advanced projects division of PPPL, and the stellarator physics leader at the Laboratory. In the latter capacity he leads collaborative efforts with the Wendelstein 7-X and Large Helical Device stellarator projects in Germany and Japan, respectively.



Charles A. Gentile

Expert Topics: Tritium handling technology

Charles Gentile is head of the Tritium Systems Group at PPPL. He led a team at PPPL to create a Miniature Integrated Nuclear Detection System, called MINDS, which can be used to scan moving vehicles, luggage, cargo vessels, and the like for specific nuclear signatures associated with materials employed in radiological weapons. MINDS could be employed at workplace entrances, post offices, tollbooths, airports, commercial shipping ports, and in police cruisers to detect the transportation of unauthorized nuclear materials.



Stefan Gerhardt

Expert Topics: Fusion energy, Plasma diagnostics, Plasma physics, Stellarators, Tokamaks

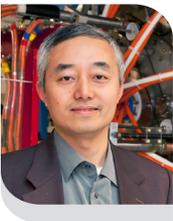
Stefan Gerhardt is head of Experimental Research Operations for the National Spherical Torus Experiment-Upgrade (NSTX-U). He operates numerous diagnostics on NSTX-U, along with designing plasma control schemes and running physics experiments. He has previously worked on a wide variety of fusion machines, including spherical tokamaks, stellarators, and field reversed configurations.



Robert J. Goldston

Expert Topics: Fusion energy, Plasma physics, Plasma exhaust, Tokamaks, Non-proliferation and arms control

Robert Goldston is a professor of Astrophysical Sciences at Princeton University and an international leader in the fields of plasma physics and magnetic fusion energy. From 1997 to 2009 he served as Director of PPPL. He is the author of 220 papers in journals and conference proceedings, and in 1995 co-authored with Paul Rutherford the textbook "Introduction to Plasma Physics." He is a contributing author to five other books. In 1988, he was awarded the American Physical Society Prize for Excellence in Plasma Physics. Goldston is a fellow of the American Physical Society. He received a 2014 Leading Global Thinker award from Foreign Policy magazine for his work on arms control.



Hantao Ji

Expert Topics: Plasma astrophysics, Magnetic reconnection, Magnetorotational instability, Dynamo effects and magnetic self-organization, Free-surface liquid metal flows across strong magnetic fields

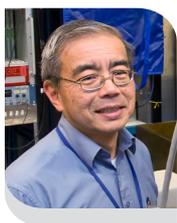
Hantao Ji is a professor of Astrophysical Sciences at Princeton University and a Distinguished Research Fellow at PPPL. For more than 20 years he has been interested in the growing fields of plasma physics and astrophysics, and has dedicated his career to bringing them closer together.



David W. Johnson

Expert Topics: ITER, Plasma diagnostics

David Johnson is a principal research physicist with broad experience in techniques and instrumentation for measuring the characteristics of magnetic fusion plasmas. He has specific expertise in laser Thomson scattering systems, and has installed and operated such systems on many fusion devices around the world. He managed a division of plasma diagnostic experts for the Tokamak Fusion Test Reactor (TFTR) and National Spherical Torus Experiment (NSTX) projects, and was the Work Breakdown Structure Team Leader for US ITER Diagnostics.



Robert Kaita

Expert Topics: Fusion energy, Lithium, Plasma diagnostics

Robert (Bob) Kaita is head of boundary physics operations for the National Spherical Torus Experiment-Upgrade (NSTX-U) and deputy head of research operations. Kaita is also a co-principal investigator of the Lithium Tokamak Experiment (LTX). He is a fellow of the American Physical Society and a recipient of the Kaul Foundation Prize for Excellence in Plasma Physics Research. He has supervised the research of many students in the PPPL Program in Plasma Physics in the Department of Astrophysical Sciences at Princeton University.



Bruce E. Koel

Expert Topics: Surface science, Tokamaks

Bruce Koel is professor of chemical and biological engineering at Princeton University. He is associated faculty in Chemistry, the Princeton Institute for the Science and Technology of Materials (PRISM), The Department of Mechanical and Aerospace Engineering, the Andlinger Center for Energy and the Environment, and a collaborator on the National Spherical Torus Experiment - Upgrade at PPPL. Koel is a fellow of the American Association for the Advancement of Science, the American Physical Society and the American Vacuum Society.



Jerry D. Levine

Expert Topics: Nuclear energy, Nuclear safety

Jerry Levine has more than 35 years experience in managing, coordinating and reviewing licensing, safety and environmental matters for fusion-energy research activities and the nuclear waste program. Levine directs a department of more than 40 professionals responsible for oversight and support of activities ranging from radiation protection and electrical safety to emergency preparedness, environmental protection and security.



Jonathan E. Menard

Expert Topics: Fusion energy, NSTX-U, Plasma physics, Tokamaks

Jonathan Menard is program director for the National Spherical Torus Experiment-Upgrade (NSTX-U) and is responsible for guiding the scientific research program of NSTX-U working with an international research team. His research interests include the magnetohydrodynamic (MHD) equilibrium and stability properties of spherical torus (ST) and tokamak plasmas, advanced operating scenarios in the ST, and the development of next-step ST options for fusion energy.



George H. Neilson

Expert topics: Stellarators, Fusion reactor design, Fusion strategic planning

George “Hutch” Neilson manages PPPL’s stellarator programs and advanced design activities. He is program manager and national point-of-contact for U.S. collaborations with the Wendelstein 7-X stellarator experiment in Germany. Advanced design activities overseen by Neilson include technical studies for next-generation experimental fusion facilities, including the U.S. system studies program and collaborations with South Korea and China on studies of DEMO machines, which would precede commercial fusion power plants.



Charles L. Neumeyer

Expert Topics: ITER, Power systems

Charles Neumeyer is a registered professional engineer with more than 30 years experience in advanced technology research and project management. His experience covers functions ranging from design to procurement and commissioning. Neumeyer has managerial roles in activities associated with ITER and the National Spherical Torus Experiment Upgrade (NSTX-U). He is responsible for U.S. equipment contributions for the ITER Steady State Electrical Network, which will supply AC power to all ITER plant systems.



Masayuki Ono

Expert Topics: Fusion energy, NSTX-U

Masa Ono is project director of the National Spherical Torus Experiment-Upgrade (NSTX-U). Ono has led a number of PPPL research teams including those involved in the Advanced Concept Torus (ACT-1), the Current Drive Experiment (CDX), the Current Drive Experiment Upgrade (CDX-U) and the NSTX. He is a fellow of the American Physical Society and the author of more than 250 scientific papers.



Francesca Poli

Expert Topics: Integrated tokamak modeling

Francesca Poli's expertise is in simulating the evolution of tokamak plasma discharges. She uses waves and neutral beams to modify the plasma current profile and to optimize the plasma performance. She applies her expertise to interpret existing experiments, to predict and design new experiments, and to predict plasma performance in ITER, the international demonstration fusion reactor being built in the south of France.



Stewart Prager

Expert Topics: Fusion energy, Fusion roadmapping, Plasma astrophysics, Plasma physics

Stewart Prager is the sixth director of PPPL. He joined the Laboratory in 2009 after a long career at the University of Wisconsin in Madison. At Wisconsin, he led research on the “Madison Symmetric Torus” (MST) experiment and headed a center that studied plasmas in both the laboratory and the cosmos.



Masaaki Yamada

Expert Topics: Magnetic reconnection, Tokamaks

Masaaki Yamada is a Distinguished Laboratory Research Fellow and the Head of the Magnetic Reconnection Experiment (MRX) research program. He is also a co-principal investigator of the Center for Magnetic Self-Organization in Laboratory and Astrophysical Plasmas, a Physics Frontier Center established by the National Science Foundation (NSF).



Michael C. Zarnstorff

Expert Topics: Fusion energy, Fusion reactor design, International collaborations, Plasma physics, Stellarators, Tokamaks

Michael Zarnstorff is the deputy director for research at PPPL, where he oversees research that ranges from testing ideas for harnessing fusion to developing rockets for space flight. His job encompasses keeping projects aligned with DOE goals and envisioning new research opportunities for PPPL. An award-winning physicist and a co-discoverer of the bootstrap current, he joined PPPL in 1984 and has been deputy director for research since 2009.



Andrew P. Zwicker

Expert Topics: Education, Science literacy, STEM

Andrew Zwicker is a physicist and science educator. A fellow of the American Physical Society, The American Association of Physics Teachers has named him to its list of 75 leading contributors to physics education. He is the Editor of the APS Forum on Physics and Society’s newsletter and a past chair of that Forum. Additionally, he is a past member of the APS Committee on Education. At Princeton University he is a lecturer in the Writing Program and a faculty advisor for freshmen and sophomores.