

AUTHORS — MAY 1992

BURNING PLASMA EXPERIMENT SPECIAL

BURNING PLASMA EXPERIMENT PHYSICS DESIGN DESCRIPTION

R. J. Goldston (top right) (PhD, physics, Princeton University, 1977) is head of the research council at Princeton Plasma Physics Laboratory (PPPL). His interests include magnetic confinement fusion, particularly tokamak physics, confinement scaling laws, and neutral beam injection. **G. H. Neilson** (top left) (PhD, physics, University of Tennessee, 1979) is a senior research staff member at Oak Ridge National Laboratory (ORNL) and deputy head of the Burning Plasma Experiment (BPX) Project Physics Group. His interests include tokamak and stellarator magnetics and fusion machine design. **D. B. Batchelor** (second from top right) (PhD, University of Maryland, 1976) has been with ORNL since 1976, working primarily on the theory of plasma wave propagation and absorption at frequencies ranging from ion cyclotron to electron cyclotron. **G. Bateman** (center left) (BA, Yale University, 1965; PhD, Princeton University, 1970) is a research physicist at PPPL working on transport and instabilities in tokamaks. **M. G. Bell** (no photograph available) (BSc, physics, University of Sydney, Australia, 1969; PhD, University of Cambridge, United Kingdom, 1974) has worked at PPPL since 1980, initially on the Poloidal Divertor Experiment (PDX) and, since 1983, on the Tokamak Fusion Test Reactor (TFTR). His areas of interest include magnetic diagnostics for tokamak plasmas, general issues of tokamak confinement, high-beta operation of tokamaks, and optimizing the fusion performance of tokamaks with strong auxiliary heating. **D. N. Hill** (third from top right) (BA, physics, 1976, and PhD, plasma physics, 1983, University of California-Irvine) has worked at Lawrence Livermore National Laboratory (LLNL) since 1983. He is currently on assignment at General Atomics, working on the DIII-D tokamak as the coordinator of the Divertor Physics Group. **W. A. Houlberg** (bottom left) (PhD, nuclear engineering, University of Wisconsin, 1977) is a staff member in the Fusion Energy Division at ORNL. His primary research interest is in the development of physics and computational models for toroidal plasmas and the extension of these models to reactor conditions. **S. C. Jardin** (bottom right) [BS, engineering physics, University of California, 1970; MS, physics and nuclear engineering, Massachusetts Institute of Technology (MIT), 1973; PhD, astrophysical sciences, Princeton University, 1976] is deputy head of the physics department at PPPL and lecturer with the rank of professor in the astrophysical sciences department at Princeton University. His present research

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concerns equilibria, stability, and transport in toroidal plasmas. **S. S. Medley** (top right) (PhD, physics, University of British Columbia, Canada, 1968) is branch head of particle diagnostics on TFTR at PPPL. His experimental work includes application of laser interferometry, ion spectrometry, magnetic probe, infrared thermography, fusion gamma, and charge-exchange diagnostics. **N. Pumphrey** (top left) (BSc, chemical physics, Edinburgh University, United Kingdom, 1972; PhD, applied mathematics, University of London, United Kingdom, 1975) is a research physicist at PPPL. His current interests in plasma physics include magnetohydrodynamic (MHD) theory and simulation. **M. Porkolab** (no photograph available) (PhD, Stanford University, 1967) is the associate director for research at the MIT Plasma Fusion Center. His research interests include experimental and theoretical studies on wave phenomena in plasma as well as radio-frequency (rf) heating and confinement of magnetic fusion plasmas. **R. O. Sayer** (second from top right) (BS, physics, Furman University, 1962; PhD, nuclear physics, University of Tennessee, 1968) is a member of the ORNL Computing and Telecommunications Division assigned to the Fusion Energy Division. His research interests include heavy-ion physics, charge state distributions of energetic ions in gases and solids, interactive graphics computing, ion optics, and magnetic spectrograph detector software. **D. J. Sigmar** (second from top left) is an adjunct professor of engineering at MIT and research staff member of the MIT Plasma Fusion Center. He specializes in the theory of magnetically confined tokamak plasmas. **D. P. Stotler** (third from top right) (BA, physics, Rice University, 1981; PhD, physics, University of Texas-Austin, 1986) is a research physicist at PPPL. He is primarily interested in tokamak edge modeling and global reactor performance calculations. **D. J. Strickler** (third from top left) (BA, mathematics, Berea College, 1971; MA, mathematics, University of Kentucky, 1973) is in the Computing and Telecommunications Division at ORNL. He works in the fusion program, and his interests are in the areas of MHD equilibrium and stability applied to tokamak plasma magnetics and poloidal field coil design. **M. Ulrickson** (fourth from top right) (PhD, nuclear physics, Rutgers University) is a research physicist at PPPL. He has been involved in the design of neutral beam inner-wall armor, a scoop limiter, an inner bumper limiter, and outer protective plate as well as infrared temperature measurements and energy control and particle removal studies. **R. E. Waltz** (fourth from top left) (BS, physics and mathematics, Purdue University, 1966; PhD, physics, University of Chicago, 1970) is a senior technical advisor in the Fusion Group at General Atomics. His recent research has involved the development of large-scale computer codes treating two- and three-dimensional nonlinear mode coupling equations. **P. T. Bonoli** (no photograph available) (PhD, electrical engineering, Cornell University, 1981) is a principal research scientist at the MIT Plasma Fusion Center. He specializes in theoretical and computational plasma physics in the areas of rf heating and current drive in toroidal confinement systems (tokamaks). **B. Braams** (fifth from top right) (PhD, University of Utrecht, The Netherlands, 1986) is a research scientist at the Courant Institute at New York University. He was previously employed at PPPL. His interest is computational modeling in plasma physics. He has devoted most of his time to simulations of the tokamak edge plasma and plasma/wall interaction. **J. Brooks** (bottom left) (PhD, electrical engineering, New York University, 1972) is a senior engineer in the fusion program at Argonne National Laboratory. His interests include the analysis of plasma materials interactions in fusion devices, development of helium removal methods, and overall fusion reactor design. **M. D. Carter** (bottom right) (PhD, University of Wisconsin-Madison, 1985) works in computational plasma physics at ORNL. He is currently

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developing three-dimensional computer models for ion cyclotron wave launchers and for Fokker-Planck models to study high-temperature tokamak plasmas. Photograph and biography are not available for **H. F. Dylla**. **R. C. Englade** (no photograph available) has been a research scientist at MIT since 1976. He has been involved in theoretical investigations in high-energy plasma physics, with particular emphasis on anomalous transport processes for electron and ion thermal energy, the effects of externally launched rf power, and the attainment of ignition in toroidal devices. **R. H. Goulding** (top right) (PhD, nuclear engineering and engineering physics, University of Wisconsin-Madison, 1987) is employed in the Fusion Energy Division at ORNL. His current interest is in technology development for ion cyclotron range of frequency (ICRF) heating and current drive. Photograph and biography are not available for **J. R. Haines**. **D. J. Hoffman** (top left) (BS, electrical engineering, University of Pennsylvania, 1975; MS, 1976, and PhD, 1982, electrical engineering, University of Wisconsin-Madison) joined the Fusion Energy Division at ORNL in 1982 and has been working on the development of rf technology for fusion. Photograph and biography are not available for **J. C. Hosea**. **E. F. Jaeger** (second from top right) (PhD, University of California-Berkeley, 1970) has worked in computational plasma physics at the National Center for Atmospheric Research, the Joint Institute for Laboratory Astrophysics, and ORNL. He is currently developing two- and three-dimensional computer models for ion cyclotron wave propagation, heating, and current drive in high-temperature tokamak plasmas. **J. L. Johnson** (second from top left) (BS, Montana State University, 1949; MS, 1950, and PhD, 1954, Yale University) is a principal research physicist at PPPL. His interest is in the effects of configuration shape and pressure and rotational transform profiles on plasma confinement. **S. M. Kaye** (third from top right) [BA, physics and mathematics, Hamilton College, 1974; MSc, geophysics, University of Washington, 1976; PhD, space plasma physics, University of California-Los Angeles (UCLA), 1979] has been with PPPL since 1980. His main research interests are confinement, transport, and MHD. **C. Kessel** (third from top left) (BS, physics, University of California-Santa Barbara, 1982; MS, 1984, and PhD, 1987, fusion engineering and applied plasma physics, UCLA) is a nuclear analyst/plasma engineer at PPPL. His primary areas of interest include plasma equilibrium and dynamic simulation, equilibrium reconstruction from measurements, and classical and optimal control of tokamak plasmas. **J. Kinsey** (fourth from top right) (MS, nuclear engineering, University of Illinois, 1991) is a graduate student in the Department of Nuclear Engineering at the University of Illinois, currently studying tokamak plasma transport and rf current drive. **A. Kritz** (fourth from top left) (ScB, physics, Brown University, 1956; MS, 1957, and PhD, 1961, physics, Yale University) is a professor and chairman of the Lehigh University Physics Department. His research interests include electron cyclotron and lower hybrid heating and current drive in toroidal plasmas, transport in tokamaks subject to supplementary rf heating, and the use of transient synchrotron radiation as a new diagnostic. **R. J. LaHaye** (fifth from top right) (PhD, physics, City University of New York, 1975) joined General Atomics in 1975 and has conducted plasma physics research on a wide range of experimental devices. **R. A. Langley** (bottom left) (PhD, Georgia Institute of Technology, 1963) is a member of the ORNL staff. He has worked in the fields of atomic and molecular physics, materials science, and plasma physics. He currently works on vacuum, wall conditioning, and plasma/wall interactions. **J. Manickam** (bottom right) (BSc, physics, Osmania University, India, 1966; MSc, nuclear physics, Andhra University, India, 1968; PhD, plasma physics, Stevens Institute of Technology, 1975) is

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J. Manickam*



a principal research physicist at PPPL. His principal interests are in the areas of MHD equilibrium and stability studies. **T. K. Mau** (top right) (PhD, electrical engineering, University of Wisconsin, 1977) is a principal institute scientist in the Institute of Plasma and Fusion Research at UCLA. He is a member of the ARIES tokamak reactor design project, where he oversees activities in the areas of current drive and plasma operations. **J. Milovich** (top left) (Licenciado, physics, Instituto Balseiro Republica Argentina, 1979; Argentina; MS, 1982, and PhD, 1987, physics, UCLA) is currently with the National Energy Research Supercomputer Center. His research interests include plasma transport, fluid and plasma turbulence, and plasma accelerators. Photograph and biography are not available for **W. A. Peebles**. **C. K. Phillips** (second from top right) (BS, physics, MIT, 1976; MA, 1977, and PhD, 1982, physics, University of Wisconsin-Madison) is a staff research physicist at PPPL. Her interests include ICRF wave propagation and damping in tokamaks and analysis of the transport and MHD stability properties of ICRF-heated tokamaks. **R. Pillsbury** (second from top left) (BS, 1971, and PhD, 1976, aerospace engineering, University of Texas-Austin) is a research engineer at the MIT Plasma Fusion Center. His main interest is in the design of magnetic systems for a wide range of applications, including fusion, magnetic resonance imaging, and magnetically levitated ground transportation. **R. Prater** (no photograph available) (BA, physics, University of California, 1966; PhD, physics, University of Wisconsin, 1971) is employed at General Atomics, where he performs experimental work on rf heating of plasmas. **A. Reiman** (third from top right) (PhD, physics, Princeton University, 1977) is a principal research physicist in the theory group at PPPL. He has worked in various areas, including nonlinear waves, ion beam instabilities, turbulent relaxation, spheromaks, rf-driven currents, nonaxisymmetric MHD, and numerical algorithm development. His current research interests are in the area of three-dimensional MHD effects. **T. Rognlien** (third from top left) (BEE, electrical engineering, University of Minnesota, 1967; MS, 1969, and PhD, 1973, electrical engineering, Stanford University) has been a physicist with the magnetic fusion energy program at LLNL since 1975. His research interests include plasma transport, numerical simulations, plasma processing, and nonlinear wave/particle interaction. **P. M. Ryan** (fourth from top right) (MS, University of Wisconsin-Madison; PhD, University of Tennessee-Knoxville) is employed in the Fusion Energy Division at ORNL. His research interest is the design of plasma heating systems. **J. E. Scharer** (no photograph available) (PhD, electrical engineering, University of California-Berkeley) is a professor in the Department of Electrical and Computer Engineering at the University of Wisconsin-Madison. His experience includes theoretical, computational, and experimental work on fusion reactor designs, wave propagation, heating, backscattering, and mode conversion in fusion and simulated space plasmas. **C. E. Singer** (fourth from top left) (PhD, University of California-Berkeley) has worked on the theory and applied physics of plasma transport in tokamak experiments at PPPL and the University of Illinois since 1977. **G. R. Smith** (fifth from top right) (BS, physics, Oberlin College, 1970; PhD, physics, University of California-Berkeley, 1977) is a physicist in the Magnetic Fusion Energy Department at LLNL. His recent work has included ray-tracing studies of electron cyclotron heating and current drive for various tokamak devices. **R. D. Stambaugh** (bottom left) (PhD, physics, Yale University, 1975) is director of the Boundary Physics and Technology Division at General Atomics. His research interests are plasma stability, confinement, and boundary control. **D. W. Swain** (bottom right) (PhD, physics, MIT) is employed in the Fusion Energy Division at ORNL. His research interests are heating and current drive in tokamaks. Photograph

*T. K. Mau
J. Milovich
W. A. Peebles
C. K. Phillips
R. Pillsbury
R. Prater
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T. Rognlien
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D. W. Swain*



and biography are not available for **J. S. Tolliver**. **J. R. Wilson** (no photograph available) (BS, physics, University of Michigan, 1974; MA, 1977, and PhD, 1980, astrophysical sciences, Princeton University) is employed at PPPL, where he has worked on the Princeton Large Torus (PLT) and the TFTR. Photograph and biography are not available for **K. L. Wilson**. **S. M. Wolfe** (top) (SB and PhD, physics, MIT) is leader of the Plasma Section of the Toroidal Confinement Division of the MIT Plasma Fusion Center. His current research involves tokamak transport and control problems. He has also worked on plasma diagnostics, millimeter and submillimeter wave generation, and electron cyclotron heating of plasmas. **K. M. Young** (center) (MA, physics, Aberdeen University, United Kingdom; PhD, astrophysical sciences, Princeton University) is head of the Plasma Diagnostics Division of PPPL. He has been involved with the instrumentation for the measurement of plasma parameters in tokamaks. **J. J. Yugo** (bottom) (BS, 1978, and MS, 1980, electrical engineering, University of Wisconsin-Madison) has worked at the Fusion Engineering Design Center at ORNL since 1984. His research interests include design of plasma heating systems from rf to millimeter wave frequencies.

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