



AUTHORS — MARCH 1984

PLASMA ENGINEERING

HIGH-ENERGY TRITIUM BEAMS AS CURRENT DRIVERS IN TOKAMAK REACTORS

David R. Mikkelsen (top) (PhD, physics, University of Washington) has been a physicist at the Princeton Plasma Physics Laboratory (PPPL) since 1977. He developed computational models of neutral beam injection and fast ion orbits in tokamaks. **Larry R. Grisham** (PhD, physics, Oxford University) has been a physicist at PPPL since 1974. He has worked mainly in the application and development of neutral beam heating for magnetically confined plasmas.

*David R. Mikkelsen
Larry R. Grisham*



MONTE CARLO STUDIES OF THE ION CYCLOTRON RANGE OF FREQUENCIES IN TANDEM MIRRORS

Alan M. M. Todd (BSC, aeronautical engineering, Bristol University, England, 1970; MS, mechanical engineering, 1971, M. Phil., 1973, and PhD, plasma physics, 1974, Columbia University) is a staff scientist at the Research and Development Center of Grumman Aerospace Corporation. Previously, he spent five years at Princeton Plasma Physics Laboratory, working primarily in magnetohydrodynamic (MHD) plasma theory and fusion reactor studies. His present research interests include MHD stability and ion cyclotron range of frequencies wave interactions in plasmas.

Alan M. M. Todd



BLANKET ENGINEERING

IMPLICATIONS OF POLARIZED DEUTERIUM-TRITIUM PLASMAS FOR TOROIDAL FUSION REACTORS

B. J. Micklich (top) [BS, engineering physics, University of Tulsa; MA, astrophysical sciences, Princeton University (PU)] is currently a research assistant and PhD student at the Princeton University Plasma Physics Laboratory (PPPL). His research interests are in the area of fusion blanket neutronics. **D. L. Jassby** (BS, physics, McGill University; PhD, astrophysical sciences, PU) served as assistant professor in the University of California, Los Angeles electrical sciences department from 1970 to 1973. He is now a principal research physicist at PPPL. His research activities include the heating of toroidal plasmas, the design of magnetic confinement fusion devices, and the production and application of fusion neutrons.

*B. J. Micklich
D. L. Jassby*



CERAMIC LITHIUM COMPOUNDS FOR SOLID BREEDER CONCEPTS FOR FUSION REACTORS

Peter Groner (top) [diploma, chemistry, Swiss Federal Institute of Technology (ETH), Zürich, 1967; Doctor of Technical Sciences, ETH, 1974] received postdoctoral fellowships at the University of South Carolina and at ETH. From 1978, he was engaged in research on chemical aspects of plasma/wall interactions and tritium breeding with the Fusion Technology Group at the Swiss Federal Institute for Reactor Research (EIR) in Würenlingen. He is currently in the Department of Chemistry at the University of South Carolina in Columbia. **Walter Seifritz** (diploma, physics, 1964, and PhD, nuclear engineering, 1969, Technical University Karlsruhe, Federal Republic of Germany) received the degree of a Privatdozent in 1972 and became a professor at the Technical University in Hanover. Since 1973 he has worked at EIR, where he is head of the Reactor Physics Division. His present research interest lies in the field of advanced reactor and energy systems based on both fusion and fission.

*Peter Groner
Walter Seifritz*



A FEASIBILITY STUDY OF THE CATALYTIC REDUCTION METHOD FOR TRITIUM RECOVERY FROM TRITIATED WATER

Hiroshi Yoshida (top right) (PhD, nuclear engineering, Tokyo Institute of Technology, 1971) is a research engineer at the Tritium Engineering Laboratory of the Japan Atomic Energy Research Institute (JAERI). He has been engaged in nuclear technology research relative to uranium enrichment by gaseous diffusion, spent fuel off-gas treatment, and the fusion fuel cycle since 1971 at JAERI. His present interests include developmental work on tritium processing technologies for fusion fuel cycles and blankets. **Hidefumi Takeshita** (top left) (PhD, nuclear engineering, Osaka University, 1979) is on the staff of the Fuel Property Laboratory. He has been engaged in research on lithium-oxide in its application to tritium breeding blankets for fusion reactors. **Satoshi Konishi** (second from top right) (MS, nuclear engineering, University of Tokyo, 1981) is a research engineer at the Tritium Engineering Laboratory. He has been working on the development of tritium processing technology related to palladium diffusers and electrolyzers for the fusion fuel cycle. He is also interested in the property of breeding blanket materials. **Hideo Ohno** (center left) (PhD, chemistry, Kyoto University, Japan, 1971) has worked in physical chemistry on molten salts at JAERI since 1970. He studied the high-temperature lithium battery between 1979 and 1980 at Argonne National Laboratory. His research interests include structural analysis by x-ray and neutron diffraction and transport phenomena of molten salts and solid electrolytes. **Toshimasa Kurasawa** (second from bottom right) (PhD, nuclear engineering, Nagoya University, 1978) is on the staff of the Fuel Property Laboratory and has worked in the field of the nuclear fuel properties since 1969. His present work includes R&D of tritium breeding materials for fusion reactors. **Hitoshi Watanabe** (bottom left) (BS, metallurgy, Tohoku University, 1956) is chief of the Fuel Property Laboratory. He has worked in the area of plutonium fuel for 15 years. His present work is a feasibility study of lithium-based ceramics for fusion reactor blankets. **Yuji Naruse** (bottom right) (BS, chemical engineering, Kyoto University,

*Hiroshi Yoshida
Hidefumi Takeshita
Satoshi Konishi
Hideo Ohno
Toshimasa Kurasawa
Hitoshi Watanabe
Yuji Naruse*



1959) is chief of the Tritium Engineering Laboratory. He has been engaged in engineering work relative to fuel reprocessing and uranium enrichment. He is now involved in the design and construction of tritium facilities.

BLANKET DESIGN AND CALCULATED PERFORMANCE FOR THE LOTUS FUSION-FISSION HYBRID TEST FACILITY

S. I. Abdel-Khalik (top) [PhD, mechanical engineering, University of Wisconsin-Madison (UW), 1973] is a professor of nuclear engineering at UW. He joined the UW faculty in 1976 after two years of postdoctoral work in chemical engineering and one year with the nuclear industry. His current research interests are in the areas of reactor safety and fusion technology. **Pierre-André Haldy** (center) (diploma, nuclear physics, Technical Highschool, Geneva, Switzerland, 1966; diploma, physics, 1971, and PhD, physics, 1980, Federal Institute of Technology, Lausanne, Switzerland) has been working mainly in the fields of neutron noise analysis and inertial confinement fusion. His current research interests are centered on theoretical and experimental studies on fusion-fission hybrids. **Anil Kumar** (bottom) (PhD, physics, Bombay University, India, 1981) has been working as a senior research scientist in the Nuclear Engineering Laboratory of the Federal Institute of Technology since January 1982. He is on leave from Bhabha Atomic Research Centre, Bombay, India. He has worked on the neutronics of fission reactors and fusion-fission hybrids since 1974. His current research interests include fusion-fission hybrids, muon catalyzed fusion reactors, and inertial confinement fusion.

*S. I. Abdel-Khalik
Pierre-André Haldy
Anil Kumar*



INVESTIGATIONS OF HIGH-ENERGY DEUTERONS IN A DENSE PLASMA FOCUS DEVICE BY MEANS OF NEUTRONS EMITTED IN THE ${}^7\text{Li} + \text{D}$ PROCESS

Jan S. Brzosko (top) [MSc, 1962; PhD, 1968; and DSc, 1971, nuclear physics, Warsaw University (WU)] is assistant professor at the Physics Institute, dean of the science faculty, and head deputy for science and research at the Bialystok Division of WU. He has worked in the areas of neutron physics (in particular, on nuclear reactions induced by fast neutrons) and gas discharge physics (in particular, on surface discharge problems). He is currently on sabbatical from the Frascati Center, ENEA. **H. Conrads** (center) (MSc, 1962, and PhD, 1966, RWTH-Aachen) had a postdoctoral fellowship at the U.S. National Academy of Sciences from 1967 to 1969. His previous scientific activities include development of new intensive light sources and vacuum ultraviolet spectrometers, generation of visible solar corona lines in a laboratory plasma, and development of a plasma neutron source. From 1977 to 1978 he was a lecturer on tokamak technology at the Physics Institute University of Düsseldorf. He has been head of the Kernforschungsanlage Jülich Textor/Tokamak Project since 1974, after having been first head of the planning group, then head of the project during construction. **Jean Pierre Rager** (bottom) (graduate, Ecole National Supérieure Ingénieur Arts et Métiers, France, 1964; Doctorat de Spécialité, Paris University, 1967), after one year at Centre National d'Etudes Sociales in planning and programming activities, returned to basic research and moved to the Association

*Jan S. Brzosko
H. Conrads
Jean Pierre Rager
B. V. Robouch
Karl Steinmetz*



Euratom-CNEN at Frascati, Italy, where his long acquaintance with plasma focus research began. With the launching of the 1-MJ plasma focus device, he became responsible for the experimental activities on this device and then group leader in 1978. He is currently working at the fusion program headquarters of the CEE in Brussels, Belgium. **B. V. Robouch** (top) (Des Sc, nuclear physics, University of Lyon, France) has been with the ENEA Frascati Center since 1962, first in the area of plasma physics research. He is currently responsible for the Fusion Reactor Blanket Program. Prior to that, he was with the Alcator Research Group at CERN-Geneva. His scientific activity has centered on plasma focus physics and numerical methods applied to fusion plasmas. **Karl Steinmetz** (bottom) (PhD, physics, University of Heidelberg, Federal Republic of Germany, 1980) has worked in the area of plasma physics related to neutron and ion beam production in the plasma focus project since 1977, mainly at the facilities at Heidelberg and Frascati, Italy where he joined the CNEN/ENEA in 1979. Postdoctoral work at Heidelberg University was related to neutron diagnostics for high-temperature fusion plasmas. Currently, he is engaged in the physics of neutron production and detailed energy balance in ASDEX plasmas at the Max-Planck-Institut für Plasmaphysik.



FISSION REACTORS

UTILITY EVALUATION OF FUSION-FISSION HYBRIDS

Betty K. Jensen (top) (PhD, physics, Columbia University, 1976; MBA, finance, St. John's University, 1981) is principal physicist at Public Service Electric and Gas Company (PSE&G) where she directs R&D activities in the nuclear area. **Norman E. Nour** (center) (PhD, electrical engineering, University of Pittsburgh) has been with the Division of Electric System Technology-System Planning at PSE&G since 1979. Previous to that, he spent five years as a manager of computer operations and applications in a consulting firm and five years with the Computer Applications Division at New York Power Pool. **Thomas M. Piascik** (bottom) (BSEE, New Jersey Institute of Technology; ME, electric power engineering, Rensselaer Polytechnic Institute) has been with the planning department of PSE&G since 1973. His present responsibilities include the technical, economic, and financial analysis of all types of generating technologies. From 1973 to 1979, he was responsible for the planning and coordination of a portion of PSE&G's high-voltage transmission system.

*Betty K. Jensen
Norman E. Nour
Thomas M. Piascik*



SAFETY/ENVIRONMENTAL ASPECTS

NONRADIOLOGICAL OCCUPATIONAL HAZARDS AT A FUSION POWER STATION: PART I. CHEMICAL HAZARDS

NONRADIOLOGICAL OCCUPATIONAL HAZARDS AT A FUSION POWER STATION: PART II. NONIONIZING ELECTROMAGNETIC FIELDS

Clay E. Easterly (BS, physics, University of Mississippi, 1966; PhD, physics, University of Tennessee, 1972) is a research associate in the Health Effects and Epidemiology Group of the

Clay E. Easterly



Health and Safety Research Division at Oak Ridge National Laboratory (ORNL). He has worked at ORNL since 1973. Current activities include preparation of a technical basis document for a generic environmental impact statement (GEIS) for magnetic fusion energy and work on that GEIS. He was recently selected to participate in the U.S.-Japan science exchange program on tritium radiobiology and health physics.