

## AUTHORS — JANUARY 1994

### FUSION REACTORS

**HYLIFE-II: A MOLTEN-SALT INERTIAL FUSION ENERGY POWER PLANT DESIGN—FINAL REPORT** / *R. W. Moir, R. L. Bieri, X. M. Chen, T. J. Dolan, M. A. Hoffman, P. A. House, R. L. Leber, J. D. Lee, Y. T. Lee, J. C. Liu, G. R. Longhurst, W. R. Meier, P. F. Peterson, R. W. Petzoldt, V. E. Schrock, M. T. Tobin, W. H. Williams*

**R. W. Moir** (top right) [ScD, nuclear engineering, Massachusetts Institute of Technology (MIT), 1967] joined Lawrence Livermore National Laboratory (LLNL) in 1968. He has specialized in magnet design (yin-yang magnet concept), development of direct conversion of fusion plasma energy to electrical energy, and power plant design. He is currently project leader for the HYLIFE-II inertial fusion energy (IFE) production project. **R. L. Bieri** (top left) (BS, physics, 1986, and PhD, nuclear engineering, 1991, MIT) is a scientist in the San Francisco office of W. J. Schafer Associates. His current research interests include modeling of heavy-ion fusion drivers and superconducting magnetic energy storage systems. **X. M. Chen** (center right) [PhD, nuclear engineering, University of California, Berkeley (UCB), 1992] is a postdoctoral researcher at UCB working on laser-ignition-related gas dynamics. His current research interests include thermal-hydraulic phenomena in inertial confinement fusion (ICF) and gas dynamics computation models. He is a co-author of the TSUNAMI code used for computing the hydrodynamics inside the central cavity of HYLIFE. **T. J. Dolan** (center left) (PhD, nuclear engineering, University of Illinois, 1970) is now in the EG&G Idaho Fusion Safety Program at Idaho National Engineering Laboratory (INEL). His research interests include fusion reactor studies, stellarators, magnetic electrostatic plasma confinement, and plasma diagnostics. **M. A. Hoffman** (bottom right) (ScD, MIT, 1955) joined the Department of Mechanical and Aeronautical Engineering at the University of California in 1968. His research interests are in fusion power plant conceptual design (in collaboration with LLNL) and convective subcooled boiling heat transfer. **P. A. House** (bottom left) (BS, mechanical engineering, UCB, 1957) joined LLNL in 1961. His work has included design of high-speed closures for underground nuclear events, pressure and



vacuum vessels, steam turbines for geothermal application, magnetic fusion plasma diagnostics, electron accelerators, IFE power plant design, and detectors for high-energy accelerators. **R. L. Leber** (top right) has been a member of the Mechanical Engineering Department of LLNL since 1954. He has participated in most of LLNL's plasma confinement programs. He is currently employed by Kaiser Engineers. **J. D. Lee** (top left) (BSEE, Duke University, 1961; MS, nuclear engineering, University of New Mexico, 1966) has been involved in LLNL's fusion programs since 1968. His work has included nucleonics analysis and design as well as design and system analysis of fusion and fusion-fission reactor studies for both magnetic confinement fusion and ICF. **Y. T. Lee** (second from top right) [BS, physics, 1989, and MS, mechanical engineering, 1991, University of California, Davis (UCD)] is currently working on his PhD, studying high-heat-flux cooling using convective sub-cooled boiling heat transfer. He also worked on the economic study of the HYLIFE-II concept. **J. C. Liu** (second from top left) (BS, nuclear engineering, UCB, 1988) is a PhD candidate in nuclear engineering at UCB. He is the primary author of the TSUNAMI code, and his interest is in gas continuous two-phase flow modeling. **G. R. Longhurst** (third from top right) (BS, 1968, and MS, 1970, mechanical engineering, Utah State University; PhD, Colorado State University, 1978) is manager of the Fusion Safety Program at INEL, where he is involved in research on tritium and beryllium safety issues for fusion reactors. **W. R. Meier** (third from top left) (BS, physics, Western Illinois University, 1974; MS, nuclear engineering, University of Illinois, 1976; PhD, nuclear engineering, UCB, 1984) is a senior scientist and manager of the Energy Systems Group in the San Francisco office of W. J. Schafer Associates. He has been involved in ICF research for 17 years and has extensive experience in reactor design, neutronics, activation analysis, and economic systems analysis. **P. F. Peterson** (fourth from top right) (BS, mechanical engineering, University of Nevada, Reno, 1982; MS, 1986, and PhD, 1988, mechanical engineering, UCB) is an assistant professor in the Department of Nuclear Engineering at UCB. He has worked on problems in energy and environmental systems, including ICF reactors, advanced light water reactors, and processing of high-level nuclear waste. He is a co-author of the TSUNAMI code. **R. W. Petzoldt** (fourth from top left) (BA, physics, St. Cloud State University, 1981; MS, engineering applied science, UCD, 1991) is a PhD candidate in engineering applied science at UCD, doing research at LLNL. His topic is IFE target injection, tracking, and beam pointing. **V. E. Schrock** (bottom right) (BS, 1946, and MS, 1948, mechanical engineering, University of Wisconsin; mechanical engineering, UCB, 1952) is a professor emeritus of nuclear engineering at UCB, where he continues to pursue research and supervise graduate students. He has contributed extensively to the literature on heat transfer and fluid mechanics and the thermal hydraulics of nuclear power systems. A biography and photograph of **M. T. Tobin** were unavailable. **W. H. Williams** (bottom left) (BS, chemical engineering, Brigham Young University, 1983; MS, 1990, and PhD, 1991, University of Illinois) has been a member of the ICF Applications Group at LLNL since 1992. His work has included IFE reactor and systems studies and laser design for the National Ignition Facility.



**ENERGY FLOWS IN A QUASI-ISOBARIC FUSION REACTOR: PART I, MAGNETOHYDRODYNAMIC EQUILIBRIA / S. Chaturvedi, R. G. Mills**

**S. Chaturvedi** (right) (B. Tech., chemical engineering, Indian Institute of Technology, India, 1985; PhD, chemical engineering, Princeton University, 1989) is currently working at the Institute for Plasma Research in Gandhinagar, India. His current research interests include tokamak system studies, numerical modeling of breakdowns and disruptions in tokamaks, and radiation hydrodynamics simulations for inertial confinement fusion. A biography and photograph of **R. G. Mills** were not available.



**IMPACT OF AD HOC IMPROVEMENT OF DECAY AND CROSS-SECTION DATA ON THE PREDICTION OF FUSION-NEUTRON-INDUCED RADIOACTIVITY IN ZIRCONIUM AND TUNGSTEN / Insoo Jun, Mohamed A. Abdou, Anil Kumar**

**Insoo Jun** (no photograph available) [PhD, University of California, Los Angeles (UCLA), 1993] is a research engineer in the Radiation Safety Research Department at the Korea Electric Power Corporation Research Center. His research interest is mainly in the area of fusion neutronics. **Mohamed A. Abdou** (top) (PhD, University of Wisconsin, 1973) is a professor in the Department of Mechanical, Aerospace, and Nuclear Engineering at UCLA. He is also the leader of the Fusion Engineering Program. His research interests include fusion neutronics, thermal hydraulics, blanket technology, fusion reactor design, and system studies. **Anil Kumar** (bottom) [MS, physics, Agra University, India; PhD, physics (nuclear engineering), University of Bombay, India, 1981] is currently senior development engineer at UCLA. His current research activities are in the area of fusion reactor nucleonics experiments and analysis and in technique development for prompt and decay nuclear heat measurements.



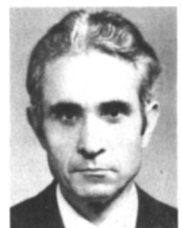
**INVESTIGATION OF IGNITION CONDITIONS AND THERMALLY UNSTABLE BURN IN PLASMA / Ya. I. Kolesnichenko, V. V. Lutsenko, S. N. Reznik**

**Ya. I. Kolesnichenko** (top) [DSc, 1969, and Professor Degree, 1978, physics, Kiev Institute for Nuclear Research (KINR), Ukraine] is head of the Fusion Theory Division of the Department of Nuclear Power Problems at KINR. His current research interest is the theoretical study of physical processes in tokamaks with high-energy ions produced by fusion reactions (alpha particles), neutral beam injection, and radio-frequency fields. **V. V. Lutsenko** (center) (DSc, physics, KINR, Ukraine, 1992) is a scientist in the Fusion Theory Division of the Department of Nuclear Power Problems at KINR. His current research interests include noninductive current drive, thermonuclear burn, and alpha-particle physics in tokamaks. **S. N. Reznik** (bottom) (DSc, physics, KINR, Ukraine, 1979) is senior scientist in the Fusion Theory Division of the Department of Nuclear Power Problems at KINR. His current research interests include the stability of thermonuclear burn, current drive, and alpha-particle physics in tokamaks.



**INITIATION OF NUCLEAR FUSION REACTIONS IN METAL-DEUTERIUM AND METAL-DEUTERIUM + TRITIUM SYSTEMS BY BOMBARDMENT WITH NOBLE GAS IONS / Victor F. Zelensky, Victor F. Rybalko, Galina D. Tolstolutskaaya, Sergej V. Pistryak, Igor E. Kopanets, Alexander N. Morozov**

**Victor F. Zelensky** (right) (PhD, solid-state physics, Kharkov University, Ukraine, 1951) is the director of the Kharkov Institute of Physics and Technology (KIPT). His research activities are in the fields of nuclear materials

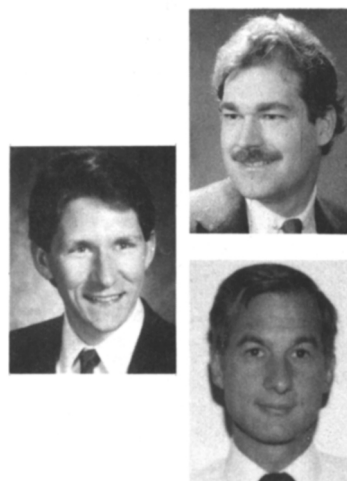


science, pure metal technologies, and superconductivity. **Victor F. Rybalko** (top right) (PhD, solid-state physics, Kharkov University, Ukraine, 1959) is head of the research laboratory at KIPT. He is engaged in research on ion beam interaction with solid surfaces, including secondary ion mass spectrometry, radiation damage of first-wall materials, ion beam modification of materials, and ion probe analysis of solids. **Galina D. Tolstolutsckaya** (top left) (PhD, solid-state physics, Kharkov University, Ukraine, 1969) is a senior research associate at KIPT. She is involved in research on radiation damage of solid surfaces under ion bombardment and the development of analysis methods for solids, particularly the ion probe method. **Sergej V. Pistryak** (center right) (Kharkov University, Ukraine, 1983) is a research associate at KIPT. He is engaged in research on ion implantation processes. **Igor E. Kopanets** (bottom left) (Kharkov University, Ukraine, 1988) is a junior research associate at KIPT. His research interests lie in ion probe methods. **Alexander N. Morozov** (bottom right) (PhD, solid-state physics, Kharkov University, Ukraine, 1971) is a senior research associate at KIPT. He is interested in gas ion implantation into metals, structure and phase transitions under ion implantation, and thermo-activated desorption of implanted gases.



**DIHYDRINO MOLECULE IDENTIFICATION** / *Randell L. Mills, William R. Good, Robert M. Shaubach*

**Randell L. Mills** (top) (BA, chemistry, Franklin and Marshall College, 1982; MD, Harvard University, 1986) developed magnetic susceptibility imaging for high-resolution internal vascular images, the MIRAGE cancer therapy, and the Luminide drug delivery molecule. He is founder of Mills Technology, HydroCatalysis Power Corporation, and Luminide Pharmaceutical Corporation. **William R. Good** (center) (BS, chemistry, Franklin and Marshall College) has been studying hydrogen emission by catalytic thermal electronic relaxation. He is currently research director at HydroCatalysis Power Corporation. **Robert M. Shaubach** (bottom) (BS, electrical engineering, Union College, 1967) is manager of development operations at Thermacore, Inc., responsible for contract and in-house development in the heat transfer field.



**SCREENING OF THE COULOMB POTENTIAL IN A NONDEGENERATE HYDROGEN ISOTOPE GAS** / *Gennady V. Fedorovich*

**Gennady V. Fedorovich** (MSc, Engineering-Physical Institute, USSR, 1965; PhD, Institute of Applied Mathematics, USSR, 1970; PhD, physical and mathematical sciences, Higher Attestation Commission, USSR, 1975) is head of the Applied Physics Laboratory in the Theoretical Problems Department of the Russian Academy of Sciences. His principal interest is in the field of controlled nuclear fusion in solids.

