

AUTHORS — MARCH 1994

ENERGY CONVERSION

DIRECT ENERGY CONVERSION BEAM DUMP FOR A 1.6-MeV NEUTRAL BEAM FOR THE INTERNATIONAL THERMONUCLEAR EXPERIMENTAL REACTOR / R. W. Moir

R. W. Moir (ScD, nuclear engineering, Massachusetts Institute of Technology, 1967) joined Lawrence Livermore National Laboratory 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 production project.



FIRST-WALL TECHNOLOGY

DEUTERIUM PLASMA-DRIVEN PERMEATION IN HELIOTRON E DURING DISCHARGE CLEANING AND IN A SMALL PLASMA DEVICE / Ikuji Takagi, Kouta Kodama, Kazuo Shin, Kunio Higashi, Hideki Zushi, Tohru Mizuuchi, Tohru Senjyu, Masahiro Wakatani, Tokuhiko Obiki

Ikuji Takagi (top right) is an assistant professor of nuclear engineering at Kyoto University (KU), Japan. He is interested in thermal behaviors of hydrogen isotopes in and on metals. **Kouta Kodama** (top left) (M. Eng., KU, 1993) is a graduate student in nuclear engineering and a researcher in the Toyota Motor Corporation Component and System Development Center Metallic Material Department. He is currently working on surface modification technology. **Kazuo Shin** (bottom right) (BS, MS, and PhD, nuclear engineering, KU) is an associate professor of nuclear engineering at KU. His main fields of research include nuclear materials and radiation shielding. He is interested in radiation physics, radiation effects on materials, and radiation transport. **Kunio Higashi** (bottom left) (Dr. Eng., KU, 1967) is a professor of



nuclear engineering at KU. His current interests are plasma-facing materials and tritium technology. **Hideki Zushi** (top right) is a member of the KU Plasma Physics Laboratory (KUPPL) research staff. He has done experimental work on magnetohydrodynamic (MHD) instabilities. **Tohru Mizuuchi** (top left) (D. Eng., electrical engineering, KU, 1983) is a member of the KUPPL research staff. He is currently working on edge plasma physics in helical systems. **Tohru Senjyu** (center right) is a mechanical engineer at KUPPL. His interests are in high-vacuum technology and mechanical design. **Masahiro Wakatani** (bottom left) has worked in MHD theory, diamagnetic drift effects, and applications to stellarators and heliotrons. **Tokuhiro Obiki** (bottom right) (Dr. Eng., KU, 1973) is director of the KUPPL. He is involved in the heliotron program and in neutral beam injection heating, divertor physics, and design studies for the Large Helical Device.



PLASMA HEATING SYSTEMS

ANALYSIS OF NEUTRAL BEAM CURRENT DRIVE FOR THE INTERNATIONAL THERMONUCLEAR EXPERIMENTAL REACTOR / *Cheng Zhang, Francesco Romanelli*

Cheng Zhang (top) (Graduate, physics, Peking University, China, 1968) is an associate research professor at the University of Washington, Seattle. Her current research interests are plasma physics theory and computer simulation. **Francesco Romanelli** (Graduate, physics, Universita' di Firenze, Italy, 1980) is a researcher in the Comitato Nazionale per l'Energia Nucleare e Alternativa Fusion Department. His research interests are in linear theory of small-scale electrostatic instabilities, theory of ideal and resistive magnetohydrodynamic instabilities in the presence of energetic particles, and anomalous transport modeling.



FUSION REACTORS

ENERGY FLOWS IN A QUASI-ISOBARIC FUSION REACTOR: PART II, INELASTIC, RADIATION, AND ALPHA-PARTICLE TERMS / *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.



SUBIGNITED, ITER-LIKE DESIGNS—A QUESTION OF CONFINEMENT MARGIN / *J. D. Galambos, L. John Perkins*

J. D. Galambos (top) (PhD, nuclear engineering, University of Illinois, 1983) is a member of the Computing Applications Division at Oak Ridge National Laboratory (ORNL) and works at the Fusion Engineering Design Center. His interests include systems analysis of tokamaks, plasma edge modeling, and advanced fuel fusion. **L. John Perkins** (bottom) (BS, physics, 1974; MS, nuclear engineering, 1975; and PhD, physics, 1978, University of Birmingham, United Kingdom) is a physicist in the Magnetic Fusion Energy Division at Lawrence Livermore National Laboratory. His primary interests include plasma engineering, fusion reactor design, advanced fusion energy conversion concepts, advanced tokamak fueling methods, and physics and engineering scoping studies of tokamak engineering test reactors.



FIGURES OF MERIT AND ATTRIBUTES FOR SPACE FUSION PROPULSION / *Norman R. Schulze*

Norman R. Schulze (BS, physics, University of Chicago, 1958) works for the National Aeronautics and Space Administration (NASA). He performed propulsion research at the NASA Langley Research Center, and he was one of the early staff members at the Manned Spacecraft Center in Houston, where he was responsible for the management of the Gemini spacecraft's propulsion system. He has performed systems analysis on many of NASA's advanced spacecraft programs, including the space shuttle. A current interest is the development of fusion energy for space missions and the application of advanced technologies to enhance space mission capabilities including safety and mission success.



**NUCLEAR REACTIONS
IN SOLIDS**

THE POSSIBLE HOT NATURE OF COLD FUSION / *Rainer W. Kühne*

Rainer W. Kühne (no photograph available) studied astronomy at the University of Bonn.

"ABNORMAL" NUCLEAR PHENOMENA AND POSSIBLE NUCLEAR PROCESS / *Jiefu Yang, Dexiu Chen, Guanghui Zhou, Qiangsheng Wu, Jianping Huang, Lijun Tang, Xiaomei Cheng, Dongzhu Xie, Liming Gu*

Jiefu Yang (right) studied at Hunan Normal University; Qing Hua University, Peking; and Beijing University, Peking from 1953 to 1963. His areas of interest are theoretical, experimental, nuclear, engineering, and particle physics. Photographs and biographies for **Dexiu Chen, Guanghui Zhou, Qiangsheng Wu, Jianping Huang, Lijun Tang, Xiaomei Cheng, Dongzhu Xie, and Liming Gu** were not available.



HYDROCARBON OIL FOUND IN THE INTERIOR OF A "COLD FUSION" ELECTROLYSIS CELL AFTER FATAL EXPLOSION / *Patrick M. Grant, Richard E. Whipple, Armando Alcaraz, Jeffrey S. Haas, Brian D. Andresen*

Patrick M. Grant (top right) (PhD, nuclear and radiochemistry, University of California-Irvine, 1973) is the deputy director of the Lawrence Livermore National Laboratory (LLNL) Forensic Science Center. His current activities entail analytic work in counterterrorism, the nonproliferation of weapons of mass destruction, and criminalistics. Research interests include forensic science, applications of nuclear science, and analytical chemistry. **Richard E. Whipple** (top left) (BA, biology, Willamette University, 1972) is an analytical chemist and explosives specialist in the LLNL Forensic Science Center. His current activities focus on explosives analyses and characterization. His research interests are pre- and post-blast explosives investigations, nuclear medicine, and radiochemistry. **Armando Alcaraz** (center right) (MS, chemistry, San Jose State University, 1984) is an analytical chemist in the LLNL Forensic Science Center. His current activities involve instrumentation design and methods development in the areas of nonproliferation, drug analysis, and criminalistics. His primary research interests are gas chromatography and mass spectrometry for the detection of trace organic compounds. **Jeffrey S. Haas** (bottom left) (MS, chemistry, San Jose State University, 1991) is an analytical chemist in the LLNL Forensic Science Center. His current activities include chemical separations and methods development in the nonproliferation, counternarcotic, and criminalistics regimes. His primary research interest is general forensic science, particularly the analysis of trace organic, biologic, and inorganic evidence by gas chromatography and mass spectrometry. **Brian D. Andresen** (bottom right) (PhD, organic chemistry and mass spectrometry, Massachusetts Institute of Technology, 1974) is the director of the LLNL Forensic Science Center. His current work involves national law enforcement and international forensic science aimed at arms control and nonproliferation, analytical instrumentation development for on-site measurements of chemical and biological warfare agents, and new ultratrace techniques for target compound identification. His research interests are portable mass spectrometers, field DNA analyses, and general forensic science.

