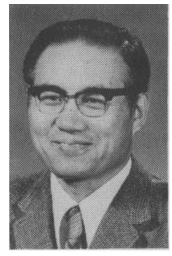
nuclear technology®

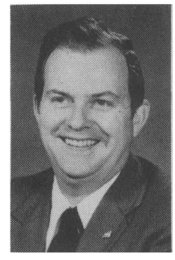
AUTHORS — JUNE 1974

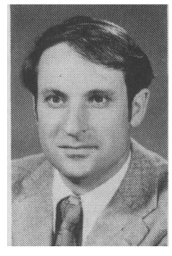
REACTORS

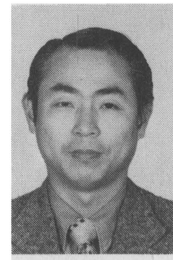
PRODUCTION OF FISSIONING URANIUM PLASMA TO APPROXIMATE GAS-CORE REACTOR CONDITIONS

J. H. Lee
D. R. McFarland
F. Hohl
K. H. Kim





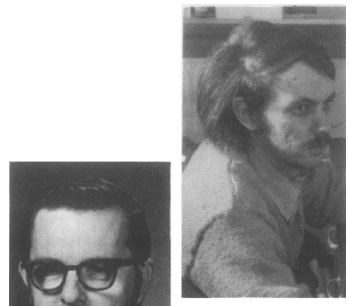


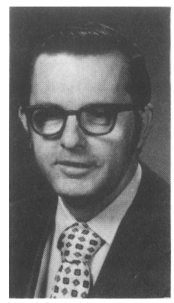


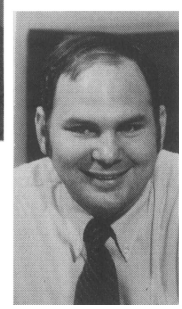
J. H. Lee (top left) (PhD, Vanderbilt University, 1964) is a research associate professor, Department of Physics and Astronomy, Vanderbilt University. Since 1967 he has been instrumental in developing the plasma-focus experiment at the NASA Langley Research Center. Currently he is investigating fissioning uranium plasmas, laser-plasma interactions, and plasma-focus-produced neutrons. D. R. McFarland (top right) (BME, Clarkson College of Technology, 1952) joined NASA Langley Research Center in 1952, working in the field of unsteady flow research using shock tubes and spherical blast waves. Since 1962 he has been involved in MHD research and the development of cross-field plasma accelerators. His present work is concerned with experimental research on the plasma focus apparatus. F. Hohl (bottom left) (PhD, College of William and Mary, 1967) is head of the Astrophysics Section at NASA's Langley Research Center. In the past he has been involved in systems engineering research as a member of the technical staff of Bell Telephone Laboratories. Since joining NASA he has worked on satellite-ionosphere interactions, galactic dynamics, and plasma physics problems. Ki-Hyon Kim (bottom right) (PhD, physics, University of Vienna, Austria, 1963) is currently professor of physics, North Carolina Central University. From 1963 to 1966 he was a research scientist at the Atomic Energy Research Institute, Seoul, Korea, and from 1966 to 1968 he was a National Academy of Sciences Resident Research Associate at the Langley Research Center. His current interests are biomedical applications of computer interfaced nuclear electronics.

STATISTICAL ERRORS IN SUBCRITICAL REACTIVITY INFERRED FROM INVERSE KINETICS ROD DROP MEASUREMENTS USING THE THREE-POINT METHOD

J. W. Allen
J. C. Robinson
N. J. Ackermann, Jr.



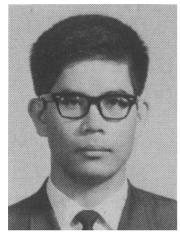




J. W. Allen (top) (BA, physics, Albion College, 1972; MS, physics, University of Tennessee, 1974) is currently in the nuclear engineering doctoral program at the University of Tennessee. His research involves subcritical reactor kinetics pertaining to LMFBR systems. James C. Robinson (center) (PhD, University of Tennessee, 1966) is a professor in the Nuclear Engineering Department of the University of Tennessee and a consultant to the Instrumentation and Controls Division at the Oak Ridge National Laboratory. His principal research interests are in the theoretical aspects of reactor kinetics and dynamics. Norbert J. Ackermann, Jr. (bottom) (PhD, University of Tennessee, 1971) is a nuclear engineer in the Instrumentation and Controls Division at the Oak Ridge National Laboratory. At ORNL he is involved in the development of a subcriticality measurement system for LMFBRs. His main interests are theoretical and experimental reactor kinetics and dynamics and the development of nuclear instrumentation.

INVERSE KINETICS DETERMINATION OF SUBCRITICALITY

C. Y. Yang
R. W. Albrecht

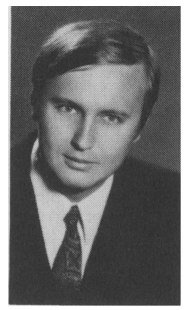


Chao-Yie Yang (left) (PhD, University of Washington, 1973) is a staff researcher at the Institute of Nuclear Energy Research, Taiwan, Republic of China. His current interests include reactor noise analysis and the development of a nuclear power plant. Bob Albrecht (PhD, nuclear engineering, University of Michigan, 1961) has been teaching and doing research in nuclear reactor dynamics and reactor noise since 1961 at the University of Washington. He spent a year at the Kernforschungszentrum-Karlsruhe in 1967-68 studying reactor noise and returned there in 1974 to study the application of reactor noise techniques to the detection of sodium boiling in LMFBR.

FUEL CYCLES

POWER PROFILE MANIPULATION IN BLOCK-FUEL HTGRs

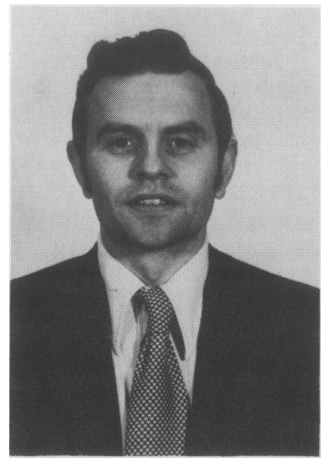
V. Maly
E. Teuchert



V. Maly (left) (PhD, Technische Hochschule Aachen, 1973) has been employed as research engineer by the Kernforschungsanlage Jülich since 1970. He is working on the HTR core design, especially for the OTTO reactor. His current technical interests are reactors for high conversion, reactor simulation methods, and burnup physics. E. Teuchert (PhD, theoretical physics, University of Cologne) joined Kernforschungsanlage Jülich in 1964. His current technical interests are computer code system development and analysis of HWRs and HTRs, preferably of the pebble bed OTTO-type.

DENSIFICATION IN MIXED OXIDE FUEL DURING FAST REACTOR IRRADIATION

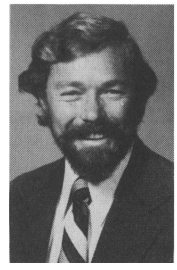
M. C. J. Carlson



Michael C. J. Carlson (PhD, Iowa State University, 1968) is manager of Process Development and Demonstration at the Hanford Engineering Development Laboratory. He previously worked four years as a senior engineer on development and application of microstructural and microcomposition analysis techniques. He is currently involved in fabrication and characterization of materials and components for LMFBR fuel system irradiation testing.

LASER-CONTROLLED THERMONUCLEAR-REACTOR MATERIALS REQUIREMENTS

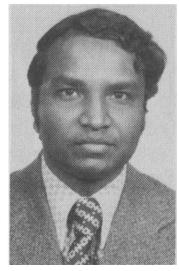
James M. Williams
T. G. Frank



James M. Williams (left) (MS, nuclear engineering, University of New Mexico, 1964) is presently in the Laser Systems and Applications Group at the Los Alamos Scientific Laboratory. He was previously associated with the U.S. Atomic Energy Commission in international and domestic safeguards systems analysis, and prior to that at Los Alamos he worked on reactor fuels and materials, reactor analysis, and nuclear power fuel cycle economics. Thurman Frank (PhD, numerical analysis, University of Texas, Austin, 1966) is presently working in the Laser Systems and Applications Group at the Los Alamos Scientific Laboratory. He was previously active in the nuclear space power supply program at Los Alamos.

EFFECT OF TEMPERATURE ON FIRST-WALL EROSION BY RADIATION BLISTERING

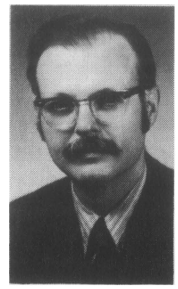
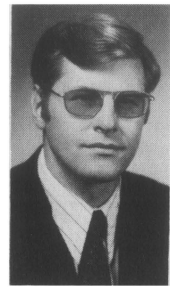
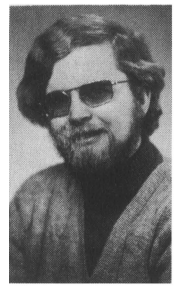
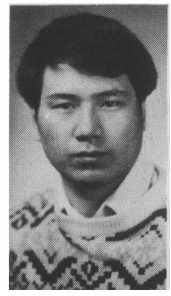
M. Kaminsky
S. K. Das



Manfred Kaminsky (left) (PhD, physics, University of Marburg, Germany, 1957) is a senior scientist at Argonne National Laboratory. His current research interests are particle and photon impact phenomena on solids and surface science in connection with controlled thermonuclear fusion research. S. K. Das (PhD, materials science, University of California, Berkeley, 1971) is an assistant scientist at Argonne National Laboratory. His current research interest is surface phenomena in connection with controlled thermonuclear fusion research.

TRANSMUTATIONS, RADIOACTIVITY, AND AFTERHEAT IN A DEUTERIUM-TRITIUM TOKAMAK FUSION REACTOR

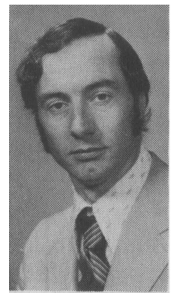
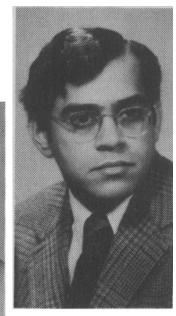
W. F. Vogelsang
G. L. Kulcinski
R. G. Lott
T. Y. Sung

William F. Vogelsang (top left) (PhD, physics, University of Pittsburgh) is an associate professor of nuclear engineering at the University of Wisconsin. He has worked with critical assemblies and neutron defraction. His current research interests are the tritium handling and safety problems of fusion reactors and the nondestructive assay of nuclear fuels. Gerald L. Kulcinski (top right) (PhD, nuclear engineering, University of Wisconsin, 1965) is an associate professor of nuclear engineering at the University of Wisconsin and the director of the Wisconsin Fusion Reactor Design Study Project. He has conducted research on the effects of radiation on metals at Battelle Northwest Laboratories from 1965 to 1971 and his current interests lie with the technological problems associated with the production of power from thermonuclear fusion reactions. Randy G. Lott (bottom left) (MS, nuclear engineering, University of Michigan, 1972) is a graduate student in nuclear engineering at Wisconsin and is engaged in high-energy heavy-ion simulation of neutron damage in pure metals. Tak Y. Sung (bottom right) (MS, nuclear engineering, University of Wisconsin) is a graduate student in nuclear engineering at Wisconsin and is engaged in the study of fusion reactors.

INFLUENCE OF NONMETALLIC IMPURITY ELEMENTS ON THE COMPATIBILITY OF LIQUID LITHIUM WITH POTENTIAL CTR CONTAINMENT MATERIALS

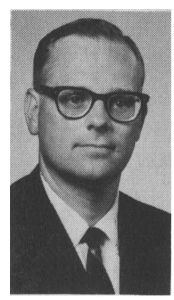
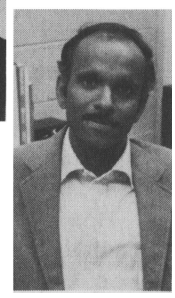
D. L. Smith
K. Natesan

D. L. Smith (left) (PhD, nuclear engineering, Iowa State University, 1966) and K. Natesan (PhD, metallurgy and materials science, Carnegie-Mellon University, 1969) are in the Materials Science Division at Argonne National Laboratory. The authors are presently involved in various aspects of the corrosion and mechanical behavior of liquid metal fast breeder reactor materials in a sodium environment.

TRITIUM RELEASE FROM NIOBIUM

C. W. Pennington
T. S. Elleman
K. Verghese

Charles W. Pennington (not pictured) (BA, mathematics, Duke University and the U.S. Navy Nuclear Power Program; M.S., nuclear engineering, North Carolina State University) is currently employed by Combustion Engineering Corporation in Windsor, Connecticut. Thomas Elleman (left) (PhD, physical chemistry, Iowa State University, 1957) is currently professor of nuclear engineering at North Carolina State University. His research interests include reactor chemistry, radiation effects, and diffusion in reactor materials. Kuruvilla Verghese (PhD, nuclear engineering, Iowa State University, 1963) is currently associate professor in the Nuclear Engineering Department at North Carolina State University, Raleigh, North Carolina. His current research interests include diffusion in reactor materials and radioisotopes applications.