

AUTHORS — DECEMBER 1989

OVERVIEW

DYNAMIC ELECTRIC FIELDS AND DOUBLE LAYERS IN LASER-PRODUCED PLASMAS

*Shalom Eliezer
Heinrich Hora*

Shalom Eliezer (top) (BS, 1965, MS, 1967, and PhD, 1971, physics, Technion-Israel Institute of Technology, Israel) is a professor at the SOREQ Nuclear Research Center, Department of Plasma Physics. His research interests are in high-energy physics (first prediction of the neutrino mass in 1974) and in laser-produced plasmas, plasma physics, nuclear fusion, and muonic catalyzed fusion. **Heinrich Hora** [Dipl.-Phys., Martin Luther University, Federal Republic of Germany (FRG), 1956; Dr. Rer. Nat., Friedrich Schiller University, FRG; D.Sc., University of New South Wales, Australia, 1981] is professor and head of the Department of Theoretical Physics at the University of New South Wales. His research interests include laser/plasma interaction theory (nonlinear forces, absorption, particle acceleration, first self-focusing theories), photodetectors, semiconductor lasers, and extreme states of matter.



BLANKET ENGINEERING

THE PRODUCTION OF LITHIUM OXIDE MICROSpheres FROM THE DISINTEGRATION OF A LIQUID JET

*Muthar R. Al-Ubaidi
James N. Anno*

Muthar R. Al-Ubaidi (top) [BS, Baghdad University, Iraq; MS, nuclear engineering, London University, United Kingdom; PhD, nuclear engineering, University of Cincinnati (UC)] is presently an assistant professor of mechanical engineering technology at the OMI College of Applied Science, UC. He has worked as a field engineer for the Iraqi National Oil Company and as a reactor engineer for the Nuclear Institute of Iraq. **James N. Anno** (BS, MS, and PhD, physics, Ohio State University) is professor emeritus of nuclear engineering at UC, where he has taught and performed research in various areas of nuclear technology since 1970. He was actively engaged in nuclear research at Battelle Columbus Laboratories for 15 years prior to joining the faculty at UC. He has conducted numerous studies in several aspects of first-wall phenomena.



AN ALTERNATIVE APPROACH TO MAJOR TRITIUM PRODUCTION

Terry Kammash (top) [BS, aeronautical engineering, Pennsylvania State University, 1952; PhD, nuclear engineering, University of Michigan (UM), 1958] served as a consultant on controlled fusion research at Lawrence Livermore National Laboratory, Argonne National Laboratory, Oak Ridge National Laboratory, and Battelle Pacific Northwest Laboratories. **David L. Galbraith** (BS, engineering physics, Cornell University, 1957; MS, 1959, and PhD, 1977, nuclear engineering, UM) is currently an assistant research scientist at UM. His areas of interest include theoretical analysis of fusion reactors and computer programming.

*Terry Kammash
David L. Galbraith*

**PROGRESS IN THE STUDIES OF PASSIVE HEAT REMOVAL IN THE NEXT EUROPEAN TORUS UNDER ACCIDENT CONDITIONS**

Antonio Soria (top right) (degree, energy engineering, Universidad Politecnica de Valencia, Spain, 1986) worked on probabilistic risk assessment and accidental sequences in nuclear power plants at Junta de Energia Nuclear. He currently works at the Joint Research Center (JRC), Ispra, while he prepares his PhD dissertation for the ETSII-Universidad Politecnica de Madrid, on passive heat removal mechanisms from the plasma-facing components of the Next European Torus (NET). **Vito Renda** (top left) (degree, nuclear engineering, Politecnico di Torino, Italy, 1971) worked on the design and structural analysis of the Superphénix liquid-metal fast breeder reactor. He is now head of the structural integrity and safety group at the Commission of European Communities, JRC, Ispra, engaged in the fusion technology and safety program. **Loris Papa** (bottom right) (high school diploma, nuclear technology) has 9 years' experience in fission reactor technology and 6 years' experience in fusion safety. **Franco Fenoglio** (bottom left) (degree, nuclear engineering, Politecnico di Torino, Italy, 1988) worked on the design of the NET first wall and on thermohydraulic transients after a sudden pump failure.

*Antonio Soria
Vito Renda
Loris Papa
Franco Fenoglio*

**MIXED DEUTERIUM-TRITIUM NEUTRAL BEAM INJECTION: AN ALTERNATIVE HEATING METHOD FOR FUSION REACTORS**

Lawrence Ruby (right) (AB, 1945; MA, 1947; and PhD, 1951, physics, University of California-Los Angeles) is a professor of nuclear science at Reed College. His interests include reactor physics, nuclear instrumentation, and accelerator design. A photograph and a biography for **Michael S. Lewis** were not available at publication time.

*Lawrence Ruby
Michael S. Lewis*



CREEP COMPARISON BETWEEN TYPE 316 STAINLESS STEEL AND NIMONIC PE-16 USED AS THE FIRST WALL IN A FUSION REACTOR

M. Salvioni (top right) (nuclear engineering, University of Rome, Italy, 1988) is a project engineer at SICIET SpA. He worked at the ENEA Casaccia Nuclear Research Center during 1988. **M. Petilli** (top left) (PhD, nuclear physics, University of Rome, Italy, 1960) is a senior scientist at the ENEA Casaccia Nuclear Research Center, working in health physics, reactor physics, and reactor dosimetry. Her interests are in shielding, burnup and fuel shuffling, plutonium fuel cycle, and complex experiment analysis. She has developed calculation methods and codes in these fields. **L. Tondinelli** (bottom right) (reactor engineering, University of Rome, Italy, 1960) is head of the Fast Reactor Department Neutronics Laboratory at ENEA Casaccia Nuclear Research Center. His primary interests are in the neutronics aspects of core design and burnup calculations. **G. Sacerdoti** (bottom left) (electrical engineering, Bologna University, Italy, 1953) is a professor of electrical measurements at the University of Rome. He has worked on superconductivity physics and its applications and instruments for electrical measurements.

*M. Salvioni
M. Petilli
L. Tondinelli
G. Sacerdoti*



SIMULATION OF THE REMOVAL OF NET INTERNAL COMPONENTS WITH DYNAMIC MODELING SOFTWARE

Marc Becquet (top) [master's, electromechanical engineering, 1983, and PhD, 1987, University of Brussels (ULB), Belgium] is a project manager for a research program in robotics at ULB and is also an expert and consultant for the Joint Research Center (JRC) at Ispra. **Yves Robert Crutzen** (center) (master's, civil engineering, 1973, and PhD, applied sciences, 1979, ULB, Belgium) has been a lecturer in finite element method based non-linear dynamics since 1983. He has been at the Polytechnic School of Milan and has been involved as an expert and consultant in computing services in design activities related to the safety assessment of civil and nuclear building structures. In 1985, he joined the JRC at Ispra as scientific officer responsible for conceptual reactor studies in computational electromagnetics/mechanics within the framework of the European fusion technology and safety research program. **Flaviano Farfaletti-Casali** (bottom) (doctorate, engineering, Polytechnic School of Milan, Italy) has been involved, since 1971, in conceptual studies and design activity in the field of fusion reactors. A sector head in the Systems Engineering and Reliability Division at the JRC at Ispra, he is responsible, as research area coordinator, for the activities on reactor studies in the framework of the fusion technology and safety program. A member of the European delegation at the International Tokamak Reactor Workshop, he is directly involved in the Next European Torus design for the problems of configuration and maintenance.

*Marc Becquet
Yves Robert Crutzen
Flaviano Farfaletti-Casal*



ELECTROMAGNETIC COMPUTATIONS ON FUSION DEVICES: VARIOUS STRUCTURE SCHEMATIZATIONS IN THE NEXT EUROPEAN TORUS

Enzo Coccoresse (top) (degree, electrical engineering, University of Naples, Italy, 1972) is a full professor of electrotechnics at the University of Reggio Calabria, Italy. A former member of the Joint European Torus team during the design phase, he is now a part-time member of the Next European Torus team, where his main interest is plasma position control and eddy currents effects. **Raffaele Martone** (degree, electrical engineering, University of Naples, Italy, 1974) is a full professor of electrotechnics at the University of Salerno, Italy. His research interests are mainly in electromagnetics, with particular reference to the design of magnetic fusion devices.

*Enzo Coccoresse
Raffaele Martone*



COLD FUSION

DEUTERIUM CONCENTRATION AND COLD FUSION RATE DISTRIBUTIONS IN PALLADIUM

Vern C. Rogers (top) [PhD, Massachusetts Institute of Technology (MIT), 1968] is the president of Rogers and Associates Engineering Corporation, which he founded in 1980. He is a certified health physicist. **Gary M. Sandquist** (center) has been a professor and director of nuclear engineering at the University of Utah since 1964. He was a National Science Foundation postdoctoral fellow in fusion at MIT in 1969–1970. **Kirk K. Nielson** (bottom) (PhD, physical chemistry, Brigham Young University, 1975) is vice president of Rogers and Associates Engineering Corporation. He conducts theoretical and experimental research on radiation interactions in solids and on gas transport in porous media.

*Vern C. Rogers
Gary M. Sandquist
Kirk K. Nielson*



A SEARCH FOR ANOMALIES IN THE PALLADIUM-DEUTERIUM SYSTEM

D. J. Gillespie (top) (PhD, physics, The American University, 1977) first joined the U.S. Naval Research Laboratory (NRL) as a summer student aide in 1957. His research interests are metal-hydrogen systems and electronic transport in metals and semi-metals. **George N. Kamm** (center) (PhD, physics, Wayne State University, 1963) has been a research physicist at NRL since 1963. His major activity has been in the experimental aspects of materials physics with a goal of elucidating the electronic properties of metals. **Alexander C. Ehrlich** (bottom) (PhD, physics, Carnegie Institute of Technology, 1963) was a research associate at the University of Lausanne, Switzerland, from 1963 to 1966 and came to NRL in 1966 as a National Research Council postdoctoral research associate. He is currently head of the electronic and magnetic properties group where he pursues studies

*D. J. Gillespie
George N. Kamm
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Peter L. Mart*



of the electronic structure of conducting materials and its relationship to properties. **Peter L. Mart** (right) (PhD, chemistry, The Flinders University of South Australia, 1976) is visiting the NRL on an exchange from the Defense Science and Technology Organization, Materials Research Laboratory, Australia, where he has been from 1980 to the present. He was a National Research Council of Canada postdoctoral research associate from 1977 to 1979. His research interests are high-temperature thermodynamics of inorganic materials, solid-state chemistry, and high- T_c superconductors.



A SEARCH FOR NEUTRONS IN SINGLE-PHASE PALLADIUM-DEUTERIUM

Alexander C. Ehrlich (top) (PhD, physics, Carnegie Institute of Technology, 1963) was a research associate at the University of Lausanne, Switzerland, from 1963 to 1966 and came to the U.S. Naval Research Laboratory (NRL) in 1966 as a National Research Council postdoctoral research associate. He is currently head of the electronic and magnetic properties group where he pursues studies of the electronic structure of conducting materials and its relationship to properties. **D. J. Gillespie** (center) (PhD, physics, The American University, 1977) first joined NRL as a summer student aide in 1957. His research interests are metal-hydrogen systems and electronic transport in metals and semimetals. **George N. Kamm** (bottom) (PhD, physics, Wayne State University, 1963) has been a research physicist at NRL since 1963. His major activity has been in the experimental aspects of materials physics with a goal of elucidating the electronic properties of metals.

*Alexander C. Ehrlich
D. J. Gillespie
George N. Kamm*



"NATTOH" MODEL FOR COLD FUSION

Takaaki Matsumoto (MS, nuclear engineering, Kyoto University, Japan, 1966) studied neutron and nuclear reactor physics at the Kyoto University Research Reactor Institute from 1966 to 1973. Since 1973 he has been with Hokkaido University as an associate professor of nuclear engineering. His interests include nuclear transmutation of radioactive wastes and nuclear alchemy.

Takaaki Matsumoto

