

AUTHORS — NOVEMBER 1991

EXPERIMENTAL DEVICES

USE OF ACTIVATION TECHNIQUES FOR THE MEASUREMENT OF NEUTRON YIELDS FROM DEUTERIUM PLASMAS AT THE JOINT EUROPEAN TORUS

Owen N. Jarvis (top right) (BSc, physics, 1957, and PhD, nuclear sciences, 1960, University of Birmingham, United Kingdom) joined the United Kingdom Atomic Energy Authority (UKAEA) Harwell Laboratory in 1960 to work on the 140-MeV proton synchrocyclotron. He became involved in neutron diagnostic design work for the Joint European Torus (JET) in 1979 and is now leader of the JET neutron diagnostics group. **Edward W. Clipsham** (top left) (Intermediate BSc, United Kingdom, 1954) joined UKAEA Harwell Laboratory in 1957 to work on the application of radioactive isotopes as tracers in geological studies. Since 1986, he has been a member of the JET neutron diagnostics group, working on activation analysis. **Malcolm A. Hone** (second from top right) (applied physics, Oxford Polytechnic, United Kingdom, 1965) is a member of the JET neutron diagnostics group where he is involved in the development and operation of fusion product diagnostics. **Brian J. Laundy** (center left) (BSc, chemistry, University of London, United Kingdom, 1954) joined UKAEA Harwell Laboratory in 1954, where he worked in the fields of powder technology and mineral analysis. He is now a member of the JET neutron diagnostics group, where he is involved in the operation of the diagnostics and analysis of data. **Mario Pillon** (third from top right) (Dr., nuclear engineering, University of Rome, Italy, 1982) has been a member of the Applied Neutronics Division at ENEA since 1984. His research is in the field of neutron diagnostics and related neutron transport calculations for tokamaks. He is also working on benchmark experiments for the validation of neutron calculations for fusion reactor blanket design and is responsible for the construction of a neutron source generator. **Massimo Rapisarda** (bottom left) (Dr., physics, University of Palermo, Italy, 1979) has been a researcher in the Applied Neutronics Division at ENEA since 1983, working in the field of neutron diagnostics on tokamaks. His research is in time-resolved neutron flux measurements and activation measurements with applications to tokamaks. **Guy J. Sadler** (bottom right) (Ing. Civil Physicien, University of Liege, Belgium, 1970; Dr. rer. nat., University of Cologne, Federal Republic of Germany, 1976) joined the experimental department of JET in 1979. He was involved in the specification, design, and commissioning of the JET fusion product and X-ray diagnostics. His current main responsibility is the detailed interpretation of the data measured by these

*Owen N. Jarvis
Edward W. Clipsham
Malcolm A. Hone
Brian J. Laundy
Mario Pillon
Massimo Rapisarda
Guy J. Sadler
Pieter van Belle
Karl A. Verschuur*



systems in the JET program. **Pieter van Belle** (top) (chemistry, Van Leeuwenhoek Institute, The Netherlands; BSc, physics) joined the experimental department of JET in 1980, where he was initially involved in the evaluation of proposed diagnostic systems. In 1983, he became a member of the JET neutron diagnostics group, where he is currently involved in the operation of neutron diagnostics and the development of data analysis techniques. **Karl A. Verschuur** (bottom) (physics, University of Technology, The Netherlands) joined ECN Petten in 1959 to work in the field of radiation shielding. He became involved in neutronics calculations for fusion in 1974 and has regularly performed neutronics calculations for the JET neutron diagnostics group since 1979.



FUSION REACTORS

AN ALTERNATING CURRENT TOKAMAK REACTOR WITH OHMIC IGNITION AND BOOTSTRAP CURRENT

Osamu Mitarai (top) (MS, mechanical engineering, 1977, and PhD, nuclear engineering, 1979, Kyushu University, Japan) is an associate professor of electrical engineering at Kumamoto University of Technology. He worked in the Department of Physics at the University of Saskatchewan from 1981 to 1984, where he built the STOR-1M tokamak. His current interests are in the areas of alternating current tokamaks, current drive, ignition studies for deuterium-tritium and D-³He tokamak reactors, spin-polarized fusion, transport studies, and cosmology based on plasma physics. **Akira Hirose** (center) (BE, 1956, and ME, 1967, Yokohama National University, Japan; PhD, University of Tennessee, 1969) is currently engaged in tokamak (STOR-M) experiments and theoretical work on anomalous transport. He is interested in waves and instabilities in plasmas, anomalous transport, and plasma turbulence. **Harvey M. Skarsgard** (bottom) (BE, engineering physics, 1949, and MSc, physics, 1950, University of Saskatchewan, Canada; PhD, nuclear physics, McGill University, Canada, 1955) is a member of the faculty of the physics department at the University of Saskatchewan, where he started a plasma physics research laboratory. He has worked mainly on plasma heating experiments with the Plasma Betatron and STOR tokamaks.

*Osamu Mitarai
Akira Hirose
Harvey M. Skarsgard*



ICF DRIVER TECHNOLOGY

THE DIODE-PUMPED NEODYMIUM LASER-DRIVEN INERTIAL CONFINEMENT FUSION REACTOR

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 of Hanover in 1978. Since 1973 he has worked at the Swiss Federal Institute for Reactor Research (later named the Paul Scherrer Institute). His present research interest lies in the field of improved laser drivers for inertial confinement fusion reactors.

Walter Seifritz



CONVERSION OF LASER ENERGY TO A STRONG MAGNETIC FIELD

Keeman Kim (top) (BS, 1983, and MS, 1985, nuclear engineering, Seoul National University, Korea; PhD, nuclear engineering, University of Illinois-Urbana-Champaign, 1990) is working on the Advanced Photon Source Project at Argonne National Laboratory. His areas of interest include plasma instability and transport, laser/target interaction, X-ray laser, and particle accelerator physics, including magnet measurement, beam position monitoring, and feedback system. **Won-Ho Choe** (PhD, nuclear engineering, Massachusetts Institute of Technology, 1985) is an assistant professor in the nuclear engineering department at the University of Illinois-Urbana-Champaign. His interests include tokamak plasma theory, magnetically insulated inertial confinement fusion, and laser-driven magnetic field compression.

*Keeman Kim
Won-Ho Choe*

**COLD FUSION****OBSERVATION OF HEAVY ELEMENTS PRODUCED DURING EXPLOSIVE COLD FUSION**

Takaaki Matsumoto (top) (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. **Kazuya Kurokawa** (Eng. Dr., metallurgical engineering, Hokkaido University, Japan, 1983) worked as a research associate at Hokkaido University from 1983 to 1991. He is now an associate professor of metallurgy at Hokkaido University. His interests are in heat-resistant and nuclear materials.

*Takaaki Matsumoto
Kazuya Kurokawa*

**PRECURSORS TO "COLD FUSION" PHENOMENON AND THE DETECTION OF ENERGETIC CHARGED PARTICLES IN DEUTERIUM/SOLID SYSTEMS**

S. Y. Dong (top right) [BS equivalent, nuclear physics, University of Science and Technology, People's Republic of China (PRC), 1963] is a senior scientist at the Institute of Nuclear Energy Technology of Tsinghua University. He is currently interested in dosimetry and radiation protection. **K. L. Wang** (top left) (BS equivalent, electrical engineering, Tsinghua University, PRC, 1955) is a professor of physics at Tsinghua University and is currently interested in accelerators and ion sources. **R. Y. Hu** (bottom right) (BS, electronic technology, Jiangxi University of Industry, PRC, 1981; MS, accelerator physics, Tsinghua University, PRC, 1991) is an assistant scientist at the Institute of Nuclear Energy Technology at Tsinghua University. **D. W. Mo** (bottom left) (BS equivalent, nuclear physics, Tsinghua University, PRC, 1961) is a senior scientist at the Institute of Nuclear Technology at Tsinghua University. He is currently interested in

*S. Y. Dong
K. L. Wang
Y. Y. Feng
L. Chang
C. M. Luo
R. Y. Hu
P. L. Zhou
D. W. Mo
Y. F. Zhu
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Y. T. Chen
M. Y. Yao
C. Ren
Q. K. Chen
X. Z. Li*



experimental nuclear physics and applied nuclear technology. **Y. F. Zhu** (top) (BS, physical chemistry, Nanjing University, PRC, 1985; MS, surface chemistry, Peking University, PRC, 1988) is an associate scientist at the Analysis Center at Tsinghua University. His research interests include surface chemistry, semiconductor materials, function materials, and surface analysis methods. **X. Z. Li** (bottom) (PhD, nuclear engineering, University of Wisconsin, 1983; PhD equivalent, high-energy physics, Tsinghua University, PRC, 1965) is a professor of physics and head of the fusion power program at Tsinghua University. Photographs and biographies for **Y. Y. Feng, L. Chang, C. M. Luo, P. L. Zhou, C. L. Song, Y. T. Chen, M. Y. Yao, C. Ren,** and **Q. K. Chen** were not available at publication time.



INDICATION FOR THE TEMPORARY PRODUCTION OF DEUTERON-DEUTERON FUSION NEUTRONS DURING ELECTROLYTIC INFUSION OF DEUTERONS INTO A MASSIVE PALLADIUM SLAB

Michael Bittner (top right) [MSc, physics, Technische Universität Dresden (TUD), Federal Republic of Germany (FRG), 1987] works as a research associate at the nuclear physics department at TUD in the field of neutron detection techniques. **Andreas Meister** (top left) (Dr. sc. nat., physics, TUD, FRG, 1984) is an associate professor in the nuclear physics department at TUD. His research has focused on nuclear reactions with fast neutrons (nuclear reaction mechanism) and resonance neutrons (chemically induced shifts of neutron resonance positions and crystal lattice effects on the resonance cross section). His current interests include fusion neutronics. **Detlef Ohms** (no photo available) (Dr. rer. nat., electrochemistry, TUD, FRG, 1978) is a research associate in the chemistry department at TUD. He researched electrocatalysis, energy conversion in electrochemical power sources, and electrochemical technologies. His current interests include fuel cell electrodes and electrocatalysis of oxygen reduction. **Elief Paffrath** (center right) (Dr. rer. nat., physics, TUD, FRG, 1985) is a research associate at the nuclear physics department at TUD and works in the design of high-intensity neutron generators for 14-MeV neutrons. **Dietmar Rahner** (no photo available) (Dr. rer. nat., electrochemistry, TUD, FRG, 1981) is a research associate in the chemistry department at TUD. He has researched electrochemical kinetics, corrosion, electrocatalysis, and electrochemical power sources. His current interests include study of materials and electrochemical research on lithium batteries. **Rainer Schwierz** (center left) (Dr. rer. nat., physics, TUD, FRG, 1988) works as a research associate in the nuclear physics department at TUD. He researches instrumentation and methods for nuclear physics. **Dieter Seeliger** (bottom right) (Dr. rer. nat., 1968, and Dr. sc. nat., 1971, physics, TUD, FRG) is a professor of experimental neutron and nuclear physics and head of the physics department at TUD. His research interests include neutron spectroscopy, neutron-induced reactions, nuclear fission, neutron resonances, preequilibrium processes and reaction mechanisms, fusion neutronics, and nuclear fusion in condensed matter. **Klaus Wiesener** (no photo available) (Dr. rer. nat. habil., electrochemistry, TUD, FRG, 1969) is a professor of electrochemistry and head of the electrochemical department at TUD. He has researched power sources, materials, electrochemical technologies, electrocatalysis, and the application of electrochemical techniques to environmental protection. **Peter Wüstner** (bottom left) (MSc, physics, TUD, FRG, 1988) is a student researcher in the nuclear physics department at TUD. His area of study is fusion neutronics.

*Michael Bittner
Andreas Meister
Detlef Ohms
Elief Paffrath
Dietmar Rahner
Rainer Schwierz
Dieter Seeliger
Klaus Wiesener
Peter Wüstner*



MEASUREMENT OF NEUTRON BURST PRODUCTION IN THERMAL CYCLE OF D₂ ABSORBED TITANIUM CHIPS

Rongbao Zhu (top right) [nuclear physics, Nanjing University, People's Republic of China (PRC), 1967] is an associate professor at China Institute of Atomic Energy (CIAE) and group leader for safeguards technical support. His research interest is the development of nuclear instrumentation and methods. **Xiaozhong Wang** (top left) (nuclear physics, Nanjing University, PRC, 1964) is an associate professor at CIAE. He researches neutron physics. **Feng Lu** (second from top right) (nuclear physics, Nanjing University, PRC, 1967) is an associate professor at CIAE. His current research interests include development of nuclear instrumentation and methods for nuclear safeguards. **Dazhao Ding** (second from top left) (PhD, CIAE, PRC, 1961) is a professor of nuclear physics at CIAE as well as deputy director of the national laboratory at the Beijing Electron-Positron Collider. His research interests include nuclear structure, nuclear reactions, and synchrotron radiation application. **Jianyu He** (third from top right) (physical chemistry, College of Leningrad Chemical Engineering, USSR, 1962) is a professor at CIAE and is responsible for directing experimental activities. **Hengjun Liu** (third from top left) (nuclear physics, Beijing University, PRC, 1979) is an engineer at CIAE. His research focuses on development of nuclear instrumentation and methods. **Jincai Jiang** (fourth from top right) (physics, Zhejiang University, PRC, 1986) is a research assistant at CIAE. His current research interests include development of nuclear instrumentation and methods, and computer application to nuclear safeguards. **Guoan Chen** (fourth from top left) has worked in the gamma spectroscopy laboratory in the Radiochemistry Division at CIAE since 1977. She is interested in the measurement of nuclear material using a gamma spectrometer. **Yuan Yuan** (fifth from top right) (nuclear physics, Fudan University, PRC, 1989) is a research assistant at CIAE. Her interest is in neutron spectroscopy. **Liucheng Yang** (fifth from top left) (nuclear physics, Fudan University, PRC, 1989) is an associate professor at CIAE. His interest is in the development of nuclear instrumentation and methods. **Zhonglin Chen** (bottom right) (nuclear physics, China University of Science and Technology, PRC, 1964) is a senior engineer and deputy director of the Nuclear Physics Division at CIAE. His interests are in theoretical physics and neutron physics. **Howard O. Menlove** (bottom left) (PhD, nuclear engineering, Stanford University, 1966) spent a year as a Fulbright Scholar at Kernforschungszentrum Karlsruhe and, prior to working at Los Alamos National Laboratory, had considerable experience in neutron and fission physics as well as gamma-ray spectroscopy. His recent work has focused on instrumentation for international safeguards, neutron activation analysis techniques, application of nuclear methods to nondestructive assay of fissionable materials, and investigation of low-level neutron counting.

*Rongbao Zhu
Xiaozhong Wang
Feng Lu
Dazhao Ding
Jianyu He
Hengjun Liu
Jincai Jiang
Guoan Chen
Yuan Yuan
Liucheng Yang
Zhonglin Chen
Howard O. Menlove*



ESTIMATE OF THE NEUTRON TRANSFER FUSION RATE

Michael Danos [electrical engineering, Riga University, USSR; electrical engineering, Dresden University, Federal Republic of Germany (FRG); electrical engineering, Hanover University, FRG; physics, Heidelberg University, FRG] is a physicist with the National Institute of Standards and Technology. His interests include high-energy theoretical physics, nuclear structure, and quantum field theory. No photo and biography are available for **V. B. Belyaev**.

Michael Danos
V. B. Belyaev



ON A WEAK FLAVOR FOR COLD FUSION

THE TWO FACES OF THE COULOMB BARRIER

Lali Chatterjee (PhD, Jadavpur University, India, 1980) is a University Grants Commission Research Scientist in the Department of Physics at Jadavpur University. She has worked extensively on various aspects of muon physics, quantum electrodynamics, and particle physics. Her current research interests include muon-catalyzed fusion and particle physics.

Lali Chatterjee



TOPOENERGETIC EVIDENCE OF COLD FUSION PHENOMENA

George Dragan (BS, 1968, and PhD, 1980, physics, University of Bucharest, Romania) is head of the research and design department for analytical and testing systems at the Enterprise for Measuring and Controlling Devices in Bucharest. Formerly, he was a researcher in the polymer and physical chemistry departments at the Institute for Chemical Research in Bucharest. His research interests include materials sciences, testing systems, and composite system behavior.

George Dragan



ON VERY LOW ENERGY HYDROGENIC NUCLEAR REACTIONS

Frederick J. Mayer (top) (PhD, plasma physics, Case Institute of Technology, 1968) is president of Mayer Applied Research, Inc. (MARI), a research company based in Ann Arbor, Michigan. Before founding MARI, he directed fusion experiments, plasma diagnostics, and advanced research at KMS Fusion. Mayer currently consults on applying physics to industry with companies as well as with national laboratories in the areas of inertial and magnetic fusion, plasma physics, and nuclear physics. **John R. Reitz** (PhD, theoretical physics, University of Chicago, 1949) was a member of the Theoretical Division of Los Alamos Scientific Laboratory from 1949 to 1953. He was a faculty member at Case Institute of Technology (now Case-Western Reserve University) from 1954 to 1965 and was appointed professor of physics in 1960. In 1965 he became manager of the physics department research staff at the Ford Motor Company, where he remained until his retirement in 1987. He is currently a consultant in physics.

Frederick J. Mayer
John R. Reitz

