

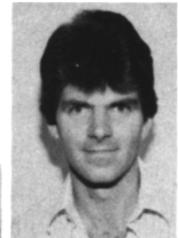
AUTHORS — AUGUST 1991

PLASMA ENGINEERING

IGNITION PROBABILITIES FOR COMPACT IGNITION TOKAMAK DESIGN POINTS

Daren P. Stotler (top) (BA, physics, Rice University, 1981; PhD, physics, University of Texas–Austin, 1986) is a research physicist at Princeton Plasma Physics Laboratory (PPPL). He is primarily interested in tokamak edge modeling and global reactor performance calculations. **R. J. Goldston** (PhD, astrophysics, Princeton University) is a principal research physicist at PPPL. His interests have included plasma diagnostic techniques based on neutral hydrogen beams, fast ion charge-exchange diagnostics, neutral beam injection physics, and confinement scaling in tokamaks. He is currently head of the Princeton Beta Experiment project physics.

*Daren P. Stotler
R. J. Goldston
The CIT Team*



BLANKET ENGINEERING

POTENTIAL OF A CATALYZED FUSION-DRIVEN HYBRID REACTOR FOR THE REGENERATION OF CANDU SPENT FUEL

Sümer Şahin (right) (MS, mechanical engineering, 1967, and PhD, nuclear engineering, 1970, University of Stuttgart, Federal Republic of Germany; habilitation, physics, University of Ankara, Turkey, 1973) has worked at the Radiation Shielding Information Center, Oak Ridge National Laboratory, with a postdoctoral NATO fellowship; at the Institute of Nuclear Energy of the Swiss Federal Institute of Technology in Lausanne, Switzerland, as advanced research scientist; at the King Saud University of Riyadh,

*Sümer Şahin
Ertuğrul Baltacıoğlu
Hüseyin Yapıcı*



Saudi Arabia, as professor; and also as professor and dean of the Faculty of Engineering at the University of Erciyes, Kayseri, Turkey. He is chair of the special commission of the State Planning Organization of Turkey for the Mainframe Planning of Scientific Research and Technology. Currently, he is professor at Gazi University, Ankara, Turkey. His research field covers neutron transport theory, fusion-fission hybrid reactors, thermionic spacecraft reactors, and radiation shielding. **Ertuğrul Baltacıoğlu** (top) (BSc, 1979; MSc, 1986; and PhD, 1989, mechanical engineering) is an academic staff member in the mechanical engineering department at Erciyes University, Kayseri, Turkey. His main interest is fusion technology and numerical reactor analysis. **Hüseyin Yapıcı** (bottom) (BSc, 1979; MSc, 1983; and PhD, 1989, mechanical engineering) is an assistant professor in the mechanical engineering department and also director of the University Computing Center at Erciyes University, Kayseri, Turkey. His main interest is to compile computer codes, in particular nuclear engineering codes, and to execute them on different machines.



DIVERTOR SYSTEMS

THREE-DIMENSIONAL THERMOMECHANICAL ANALYSIS OF A STAINLESS STEEL AND COPPER DIVERTOR PLATE FOR THE NEXT EUROPEAN TORUS

Vito Renda (top) (degree, nuclear engineering, Politecnico di Torino, Italy) 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 Joint Research Centre at Ispra, where he is engaged in the fusion technology and safety program. **Loris Papa** (high school diploma, nuclear technology) has 9 years of experience in fission reactor technology and 6 years of experience in fusion safety.

*Vito Renda
Loris Papa*



FUSION REACTORS

EFFECTS OF PARTICLE TRANSPORT ON HELIUM ASH ACCUMULATION AND SUSTAINED IGNITION IN THE INTERNATIONAL THERMONUCLEAR EXPERIMENTAL REACTOR

Martha H. Redi (top) [BS, physics, Massachusetts Institute of Technology (MIT); PhD, physics, Rutgers University] is a staff research physicist at Princeton Plasma Physics Laboratory (PPPL). Her current interests are in the area of computational modeling of particle and energy transport in tokamaks. **Samuel A. Cohen** (BS and PhD, physics, MIT) is a principal research physicist at PPPL and a professor in the Department of Astrophysical Sciences at Princeton University. His interests are in experimental plasma physics and in the design of the International Thermonuclear Experimental Reactor (ITER).

*Martha H. Redi
Samuel A. Cohen*



**MAXIMUM PERMISSIBLE AMOUNTS OF ACCIDENTALLY
RELEASED TRITIUM DERIVED FROM AN ENVIRONMENTAL
EXPERIMENT TO MEET DOSE LIMITS FOR PUBLIC EXPOSURE***Michael Täschner
Claus Bunnenberg
Werner Gulden*

Michael Täschner (top) [Staatsexamen, mathematics and physics, 1981; doctorate, biophysics and radiation protection, 1991, Universität Hannover, Federal Republic of Germany (FRG)] has been working on radioecology at the Niedersächsisches Institut für Radioökologie (NIR) since 1984. His research focuses on dispersion and deposition of aerosols, tritium behavior in the environment, radioecological modeling, and dose estimations. **Claus Bunnenberg** (center) (Dipl.-Phys., 1971, and Dr. rer. nat., 1980, Universität Hannover, FRG) has worked in the area of radioanalytical and radiometrical methods in ecological research since 1971 in the Institut für Strahlenbotanik der Gesellschaft für Strahlen- und Umweltforschung (later known as NIR) and has served as its associate director since 1987. His radiation protection and radioecological research activities include tritium behavior in the environment, radioecological modeling, and dose estimations as well as development of measuring methods. **Werner Gulden** (bottom) (Dipl.-Ing., 1969, and Dr.-Ing., 1973, Universität Stuttgart, FRG) from 1973 to 1980 developed program systems for nuclear safety analyses at Institut für Kernenergetik und Energiesysteme, Universität Stuttgart, then joined Kernforschungszentrum Karlsruhe in 1981 as a member of the project management of Projekt Nukleare Sicherheit. Since 1975, he has lectured on applied computer science at Universität Stuttgart. Since 1984, he has been a member of the Next European Torus (NET) Team, responsible for the safety and environment program.

**COLD FUSION****EXCESS HEAT PRODUCTION BY THE ELECTROLYSIS OF
AN AQUEOUS POTASSIUM CARBONATE ELECTROLYTE
AND THE IMPLICATIONS FOR COLD FUSION***Randell L. Mills
Steven P. Kneizys*

Randell L. Mills (right) (BA, chemistry, Franklin & Marshall College, 1982; MD, Harvard University, 1986) developed innovations that include magnetic susceptibility imaging for high-resolution internal vascular images, the MIRAGE cancer therapy, and the Luminide drug delivery molecule. He founded Mills Technologies in 1986. A photograph and biography for **Steven P. Kneizys** were not available at publication time.



SOME THEORIES OF "COLD" NUCLEAR FUSION: A REVIEW

Giuliano Preparata



Giuliano Preparata teaches high-energy nuclear physics at the University of Milano, Italy, where he holds a chair of theoretical physics. His interests in theoretical physics are mainly in sub-nuclear physics but have recently been directed to condensed matter physics ranging from the ^4He superfluidity to superconductivity and mechanisms of cold fusion.

COLD FUSION AS AN INTERACTION BETWEEN ION BAND STATES

*Talbot A. Chubb
Scott R. Chubb*



Talbot A. Chubb (top) (AB, physics, Princeton University, 1944; PhD, physics, University of North Carolina, 1951) has worked at the Naval Research Laboratory and as a consultant to Bendix Field Engineering Corporation. His current interests include radiation detectors and electrical discharges, ultraviolet and X-ray emission from the sun and stars, solar activity, and thermochemical energy transport. **Scott R. Chubb** (BA, physics, Princeton University, 1975; MA, 1978, and PhD, 1982, physics, State University of New York at Stony Brook) is employed in the space technology department at the Naval Research Laboratory. His current interests include microwave sensing of the ocean, the importance of atomic clocks and precision time in the global positioning system, and the recent observation of anomalous effects in deuterated metals (commonly referred to as "cold fusion" and "cluster impact fusion").

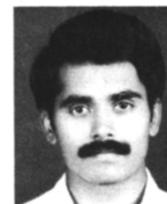


ELECTROMIGRATION APPROACH TO VERIFY COLD FUSION EFFECTS

*K. Govinda Rajan
U. Kamachi Mudali
R. K. Dayal
P. Rodriguez*



K. Govinda Rajan (top right) [MSc, physics, Bangalore University, India; PhD, Indian Institute of Science, Bangalore (IIS-B), India, 1972] is with the Materials Science Division at the Indira Gandhi Centre for Atomic Research (IGCAR) at Kalpakkam, India. His research interests include study of high pressures, crystal growth and characterization, and solid-state electromigration. **U. Kamachi Mudali** (top left) (BSc, applied sciences, 1980, and MSc, materials science, 1982, University of Madras, India; MTech, corrosion science and engineering, Indian Institute of Technology, India, 1984) has been with the Metallurgy Division of IGCAR since 1984. His research interests include electrochemical techniques for corrosion studies, localized corrosion of stainless steels and their weldments, and corrosion studies on electrode and other construction materials used in fuel reprocessing. **R. K. Dayal** (bottom right) (BE, metallurgical engineering, Roorkee University, India, 1972; PhD, IIS-B, 1984) is currently with the Metallurgy Division of IGCAR. His current research and development interest is corrosion materials. **P. Rodriguez** (bottom left) (BSc, University of Kerala, India, 1958; MS, University of Tennessee, 1965; BE, 1960, and PhD, 1976, IIS-B) is head of the metallurgy and materials program at IGCAR. His current research interests include physical and mechanical metallurgy, corrosion and compatibility studies, welding metallurgy, alloy development, radiation damage, nondestructive evaluation, and quality assurance.



THERMAL EFFECTS DURING THE ELECTROLYTIC CHARGING OF DEUTERIUM IN THE PALLADIUM LATTICE

N. Giordano (top) (chemistry, University of Messina, Italy, 1952) has been director of the Institute for Transformation and Storage of Energy (ITSE) of the National Council of Research since 1980, and he is also chair of industrial chemistry at the University of Messina. His current interest is catalysis applied to energy problems. **A. S. Aricò** (center) (industrial chemistry, University of Messina, Italy) is a researcher at the ITSE. His interests include electrochemistry and photochemistry of semiconductors for energy conversion and the study of materials for fuel cell applications. **V. Antonucci** (bottom) (industrial chemistry, University of Messina, Italy) is leader of the advanced energy conversion technology research group at the ITSE. He is involved in research programs related to the development of direct methanol and solid oxide fuel cells.

*N. Giordano
A. S. Aricò
V. Antonucci*



TRITIUM ANALYSIS IN PALLADIUM WITH AN OPEN SYSTEM ANALYTICAL PROCEDURE

Krystyna Cedzynska (photo not available) (MS, engineering, and PhD, chemistry, Technical University of Lodz, Poland) is a visiting scientist at the National Cold Fusion Institute (NCFI) at the University of Utah. Her research interests include the synthesis and investigation of the structure of the complex compounds in transition metals (spectroscopic and analytical chemistry), electrochemistry, and the performance of lithium and zinc bromine batteries. **Steven C. Barrowes** (photo not available) (PhD, physics, University of Utah, 1971) is a senior scientist at the NCFI at the University of Utah. His interests include cosmic rays, tachyon theory, and the detection of neutrons and charged particles from deuterated foils. **Haven E. Bergeson** (photo not available) (BA, 1958, and PhD, 1962, physics, University of Utah) is the director of the physics program at NCFI. He has researched cosmic rays, neutrinos, and the Fly's Eye concept. **Lori C. Knight** (photo not available) (BS, applied physics, University of Utah, 1989) is a physics laboratory technician at the NCFI. Her interests include nuclear physics, solid-state physics, thermodynamics, chemistry, and scientific programming. **Fritz G. Will** (photo not available) (PhD, physics chemistry, Munich Institute of Technology, Federal Republic of Germany, 1959) is director of the NCFI. He is also a research professor of chemical engineering at the University of Utah. His research has included electrode mechanisms, batteries, fuel cells, and space power systems.

*Krystyna Cedzynska
Steven C. Barrowes
Haven E. Bergeson
Lori C. Knight
Fritz G. Will*