

AUTHORS — MAY 1994

ALPHA-PARTICLE SPECIAL

SELF-CONSISTENT ALPHA-PARTICLE TRANSPORT IN IGNITION SCENARIOS / *Gerald Kamelander, Franz Woloch, Gert Sdouz*

Gerald Kamelander (top) (PhD, theoretical physics, Technical University of Vienna, 1969) is working at the Austrian Research Center Seibersdorf and teaching plasma physics as an assistant professor at the Technical University of Vienna. His main fields of interest include nuclear physics, transport theory, and plasma physics. He is currently involved with fusion alpha-particle transport problems in predictive codes. **Franz Woloch** (center) (PhD, theoretical physics, University of Vienna, 1960) was a reactor physicist with the Organization for Economic Cooperation and Development DRAGON High-Temperature Project. He collaborated with Forschungszentrum Jülich GmbH on the Arbeitsgemeinschaft Versuchsreaktor pebble bed reactor. Since 1991, he has concentrated on plasma physics and is active in the field of plasma transport problems. **Gert Sdouz** (bottom) (PhD, physics and mathematics, University of Vienna, 1974) is a physicist in the Austrian Research Center Seibersdorf Engineering Division. His work was in fission reactor core physics and included research, code development, and licensing. During 1978, he was assigned to the Idaho National Engineering Laboratory Thermal Fuels Behavior Program as the Austrian representative for this project. Since that time, his main interest has been in the safety of western- and eastern-type reactors. In addition, he is involved in research programs for fusion reactors and spallation sources.



EFFECT OF PITCH-ANGLE SCATTERING ON THE ALPHA-PARTICLE BOOTSTRAP CURRENT IN THE NEAR-AXIS REGION OF THE TOKAMAK / *V. Ya. Goloborod'ko, Ya. I. Kolesnichenko, S. N. Reznik, V. A. Yavorskij*

A biography was not available for **V. Ya. Goloborod'ko** (top right). **Ya. I. Kolesnichenko** (top left) [DSc, 1969, and Professor Degree, 1978, physics, Kiev Institute for Nuclear Research (KINR), USSR] is head of the Fusion Theory Division of the Department of Nuclear Power Problems at KINR. His major research activity is the theoretical study of physical processes of high-energy ions produced by fusion reactions in tokamaks (alpha particles), neutral beam injection, and radio-frequency fields. He is particularly interested in current drive in tokamaks and nonlinear processes in plasmas. **S. N. Reznik** (bottom right) (DSc, physics, KINR, USSR, 1979) is a senior scientist in the Division of Theory of Future Nuclear Power Development at KINR. His current research interests include the stability of thermonuclear burn and current drive in tokamaks. **V. A. Yavorskij** (bottom left) (DSc, physics, KINR, USSR, 1979) is a senior scientist in the Division of Theory of Future Nuclear Power Development at KINR. His research areas include transport in toroidal systems and alpha-particle physics.



EDGE-LOCALIZED THERMONUCLEAR MAGNETOACOUSTIC-CYCLOTRON INSTABILITY IN TOKAMAKS / V. S. Belikov, Ya. I. Kolesnichenko

V. S. Belikov (top) [DSc, physics, Kiev Institute for Nuclear Research (KINR), USSR, 1975] is a senior scientist in the Division of Theory of Future Nuclear Power Development at KINR. His research interests include alpha-particle physics in fusion reactors. He is also working on radio-frequency (rf) current drive and heating of toroidal plasmas. **Ya. I. Kolesnichenko** (DSc, 1969, and Professor Degree, 1978, physics, KINR) is head of the Fusion Theory Division of the Department of Nuclear Power Problems at KINR. His major research activity is the theoretical study of physical processes of high-energy ions produced by fusion reactions in tokamaks (alpha particles), neutral beam injection, and rf fields. He is particularly interested in current drive in tokamaks and nonlinear processes in plasmas



ALPHA-PARTICLE-DRIVEN ALFVÉN TURBULENCE AND ITS EFFECT ON ALPHA-PARTICLE TRANSPORT / Fong-Yan Gang, D. J. Sigmar, Jean-Noel Leboeuf, Fredrik Wising

Fong-Yan Gang (top right) (BS, physics, Beijing University, China, 1985; PhD, physics, University of Texas, Austin, 1990) is a staff research scientist at the Massachusetts Institute of Technology (MIT) Plasma Fusion Center. His research interests are in the theory of fluid and plasma turbulence, plasma anomalous transport in tokamaks, alpha-particle physics in burning plasmas, and flow drive using externally launched radio-frequency waves. **D. J. Sigmar** (top left) is a senior research scientist and the acting director of the MIT Plasma Fusion Center. He specializes in the theory of magnetically confined tokamak plasma. **Jean-Noel Leboeuf** (bottom right) (PhD, Institut National de la Recherche Scientifique du Quebec, Canada, 1976) is a member of the research staff of the Fusion Energy Division at Oak Ridge National Laboratory. His research interests include computational plasma physics and plasma turbulence. **Fredrik Wising** (bottom left) (MSc, Chalmers University of Technology, Sweden, 1990) has been a PhD student at the Institute for Electromagnetic Field Theory at Chalmers University of Technology since 1990. His research interests include the physics of fast ions and burning fusion plasmas.



IGNITED AND HIGH-Q PLASMAS IN IGNITOR / Augusta Airoidi, Giovanna Cenacchi

Augusta Airoidi (top) (Laurea in Fisica, Universita' di Milano, Italy, 1962) is a computational plasma physicist at the Istituto di Fisica del Plasma of National Research Council (IFP-CNR). Her research interests are mainly in plasma/wave interaction in the electron cyclotron range both in heating modeling and in emission phenomena. She is currently involved in Ignitor simulations. **Giovanna Cenacchi** (Laurea in Fisica, Universita' di Bologna, Italy, 1963) is a computational plasma physicist at ENEA, the Italian Atomic Energy Agency. She has worked primarily in the computational modeling of magneto-hydrodynamic equilibria and transport processes in toroidal plasmas. She has also been involved in computational problems related to the toroidal magnet and the poloidal system for the Ignitor project.

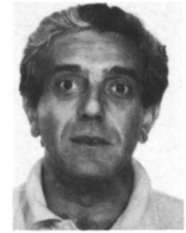


PROFILE EFFECTS ON IGNITION CONDITIONS IN FUSION PLASMAS / Fredrik Wising, Dan Anderson, Mietek Lisak, Michal Benda

Fredrik Wising (right) (MSc, Chalmers University of Technology, Sweden, 1990) has been a PhD student at the Institute for Electromagnetic Field Theory at Chalmers University of Technology since 1990. His research interests include the physics of fast ions and burning fusion plasmas. **Dan Anderson** (left) (PhD, Chalmers University of Technology, Sweden, 1973) has been with the Institute for Electromagnetic Field Theory at Chalmers University of Technology



since 1973, where he has been engaged in fusion plasma research. His research interests also cover other applications of electromagnetic field theory, in particular nonlinear optical pulse propagation and microwave discharges. **Mietek Lisak** (right) (PhD, Chalmers University of Technology, Sweden, 1976) has been with the Institute for Electromagnetic Field Theory at Chalmers University of Technology since 1977, where he has been engaged in fusion plasma research. His research interests also cover other applications of electromagnetic field theory, particularly nonlinear optical pulse propagation and microwave discharges. **Michal Benda** (no photograph available) (PhD, Chalmers University of Technology, Sweden, 1993) obtained his PhD from the Institute for Electromagnetic Field Theory at Chalmers University of Technology. His main interests are numerical magnetohydrodynamics stability calculations.



THERMONUCLEAR BURN IN A PLASMA WITH SAWTOOTH OSCILLATIONS / Ya. I. Kolesnichenko, V. V. Lutsenko, Yu. V. Yakovenko

Ya. I. Kolesnichenko (top) [DSc, 1969, and Professor Degree, 1978, physics, Kiev Institute for Nuclear Research (KINR), USSR] is head of the Fusion Theory Division of the Department of Nuclear Power Problems at KINR. His major research activity is the theoretical study of physical processes of high-energy ions produced by fusion reactions in tokamaks (alpha particles), neutral beam injection, and radio-frequency fields. He is particularly interested in current drive in tokamaks and nonlinear processes in plasmas. **V. V. Lutsenko** (bottom) (DSc, physics, KINR, Ukraine, 1992) is a senior scientist in the Fusion Theory Division of the Department of Nuclear Power Problems at KINR. His research areas include noninductive current drive, thermonuclear burn, and alpha-particle physics in tokamaks. **Yu. V. Yakovenko** (no photograph available) (DSc, automatic control, V. M. Glushkov Institute of Cybernetics, USSR, 1984) is a senior scientist in the Fusion Theory Division of the Department of Nuclear Power Problems at KINR. His research areas include fast-ion transport, thermonuclear burn, and sawtooth oscillations in tokamaks.



ROBUST BURN CONTROL OF A FUSION REACTOR BY MODULATION OF THE REFUELING RATE / Weigang Hui, Bassam A. Bamieh, George H. Miley

Weigang Hui (top) (MS, nuclear engineering, Institute of Atomic Energy, 1987) is a research assistant at the University of Illinois at Urbana-Champaign. His interests include control system design and software engineering. **Bassam A. Bamieh** (center) (BS, electrical engineering, Valparaiso University, 1983; MSc, 1986, and PhD, 1992, electrical and computer engineering, Rice University) is currently an assistant professor in the University of Illinois, Champaign-Urbana Department of Electrical and Computer Engineering and in the Coordinated Science Laboratory. His general area of interest is control and system theory and their applications. He is currently researching robust and optimal control, infinite-dimensional systems, and digital and sampled-data systems. **George H. Miley** (bottom) (PhD, University of Michigan, 1958) is a professor in the Departments of Nuclear Engineering and Electrical Engineering at the University of Illinois. In addition, he is founder and director of the Fusion Studies Laboratory at the University of Illinois. He is well known for his research on fusion, energy conversion, and nuclear-pumped lasers.



CONFINEMENT OF FUSION REACTION PRODUCTS AND RADIATION EMISSION INDUCED BY THEM / B. Coppi

B. Coppi has been a senior member of the Massachusetts Institute of Technology faculty since 1968. His contributions to basic plasma physics, fusion research, and space physics involve the theory of new plasma collective modes and transport processes. In addition, he has formulated ongoing experimental programs on magnetically confined plasmas, proposing the first experiments aimed at the attainment of ignition conditions.



DIAGNOSTICS OF FUSION PLASMA WITH $D(d,\gamma)^4\text{He}$ GAMMA-LINE BROADENING: A FEASIBILITY STUDY / Alessandro Fubini, Marcel Haegi

Alessandro Fubini (top) (Dr., physics, University of Torino, Italy, 1959) has worked in nuclear physics and plasma diagnostics. His recent work includes nuclear cross measurements at very low energies in an underground laboratory (L.N. Gran Sasso). **Marcel Haegi** (PhD, physics, University of Geneva, Switzerland, 1968) is a principal scientist at the Euratom-ENEA Fusion Laboratory in Frascati. His research interests include plasma physics, alpha-particle transport and containment, and their application to thermonuclear fusion reactors.



ION CYCLOTRON EMISSION—A NATURAL DIAGNOSTIC FOR FUSION ALPHA PARTICLES / Richard O. Dendy, Chris N. Lashmore-Davies, Geoff A. Cottrell, Kenneth G. McClements, Kin F. Kam

Richard O. Dendy (top right) (DPhil, Oxford University, United Kingdom, 1983) is a group leader in the Theoretical and Strategic Studies Department at AEA Technology, Fusion, Culham. He is a team leader within the international numerical simulation network associated with the ESA Cluster Mission, Secretary of the Plasma Physics Group of the U.K. Institute of Physics, director of the annual Culham Summer School in Plasma Physics, and holds an adjunct position at Wolfson College, Oxford University. His current research interests concern energetic ion populations in fusion and space plasmas and their consequences for radiation, absorption, and magnetohydrodynamic stability. **Chris N. Lashmore-Davies** (top left) (PhD, atomic physics, University of London, United Kingdom, 1965) in 1966 joined AEA Technology where he is currently group leader for tokamak theory in the Theoretical and Strategic Studies Department. His research interests include radio-frequency (rf) heating and current drive, instabilities of confined plasmas, nonlinear waves, and relativistic electron beam devices. **Geoff A. Cottrell** (center right) (PhD, radio astronomy, University of Cambridge, United Kingdom, 1977) joined the Joint European Torus (JET) project in 1985. He is currently principal scientific officer in the physics group (rf heating) at the JET experiment based at Culham. His current interest is ion cyclotron emission from energetic fusion products in plasmas. **Kenneth G. McClements** (bottom left) (BSc, astronomy and natural philosophy, University of Glasgow, United Kingdom, 1984; PhD, solar physics, University of Glasgow, United Kingdom, 1987) is a theoretical physicist at Culham. His current research interests include the physics of fusion products in JET and the Tokamak Fusion Test Reactor (TFTR) and kinetic processes in space plasmas. **Kin F. Kam** (bottom right) (BSc, Department of Physics, University of York, United Kingdom; Certificate of Advanced Studies in Mathematics, University of Cambridge, United Kingdom) is a theoretical physicist in the Fusion Theory and Strategic Studies Department at Culham Laboratory. His research interests include instabilities in plasma waves and alpha-particle physics in tokamak plasmas.



NEUTRON OBSERVATIONS AND ALPHA PARTICLES IN HIGH-POWER DEUTERIUM-TRITIUM PLASMAS / Jan Källne, Giuseppe Gorini

Jan Källne (top) (PhD, physics, Uppsala University, Sweden) has been a researcher since 1989 in the Department of Neutron Research at Uppsala University. **Giuseppe Gorini** (Laurea in Fisica, University of Pisa, Italy, 1985; Diploma di Perfezionamento in Fisica, Scuola Normale Superiore, Pisa, Italy, 1991) worked on the measurement and interpretation of fusion neutrons at the Joint European Torus from 1984 to 1988. He is currently a research assistant in the Physics Department of the University of Milan. His current research interests are the development of nuclear experimental methods for measurements on fusion burning plasmas and energy transport studies in plasmas using perturbative techniques.



D-³He BURNING, SECOND STABILITY REGION, AND THE IGNITOR EXPERIMENT / *B. Coppi, P. Detragiache, S. Migliuolo, M. Nassi, B. Rogers*

B. Coppi (right) has been a senior member of the Massachusetts Institute of Technology faculty since 1968. His contributions to basic plasma physics, fusion research, and space physics involve the theory of new plasma collective modes and transport processes. In addition, he has formulated ongoing experimental programs on magnetically confined plasmas, proposing the first experiments aimed at the attainment of ignition conditions. Photographs and biographies for **P. Detragiache**, **S. Migliuolo**, **M. Nassi**, and **B. Rogers** were not available at publication time.

