

## AUTHORS — JULY 1993

### PLASMA ENGINEERING

#### SELF-TUNING CONTROL STUDIES OF THE PLASMA VERTICAL POSITION PROBLEM / *Guang Lin Zheng, Peter E. Wellstead, Michael L. Browne*

**Guang Lin Zheng** (top) [PhD, control, University of Manchester Institute of Science and Technology (UMIST), United Kingdom, 1992) worked on a post-graduate project on self-tuning methods for plasma control applications from 1990 to 1992. His current interests are in the areas of self-tuning control, system identification, and neural networks and their applications. **Peter E. Wellstead** (center) (DSc, Warwick University, United Kingdom) is a mechanical/electrical engineer who was seduced by the analytical appeal of control engineering during his PhD studies at Warwick University. After working in the electronics industry and a 2-year spell with the European Centre of Nuclear Research, he joined the UMIST Control System Centre, where he is now a professor of control engineering. **Michael L. Browne** (bottom) (PhD, UMIST, United Kingdom, 1974) joined the Next European Torus (NET) Team in 1987. He is responsible for the design of the architecture for the central control system and for the development of plasma feedback controls.



#### TRANSPORT STUDIES FOR IGNITION EXPERIMENTS / *Aldo Nocentini, C. Göran Schultz*

**Aldo Nocentini** (top) (physics, Trieste University, Italy, 1962) is an associate professor of mathematical physics in the Department of Mathematical Sciences at Trieste University. His main research field has been plasma physics for controlled thermonuclear fusion. **C. Göran Schultz** (University of Helsinki, Finland, 1975; PhD, Princeton University, 1982) is currently a researcher working on solar wind problems at the Space Research Laboratory at the University of Turku. He previously worked on Next European Torus (NET) stability and transport problems.



### BLANKET ENGINEERING

#### INFLUENCE OF LOTUS CONCRETE STRUCTURE, BORON-LOADED SHEETS, AND B<sub>4</sub>C FILTER ON THE INTEGRAL TRITIUM PRODUCTION OF A NATURAL LITHIUM GRAPHITE-REFLECTED BLANKET AND COMPARISON WITH EXPERIMENT / *Om Prakash Joneja, J.-P. Schneeberger, Vijay R. Nargundkar*

**Om Prakash Joneja** (right) [MSc, Punjabi University, India, 1966; Bhabha Atomic Research Centre (BARC) Training School, India, 1967; PhD, physics,



University of Bombay, India, 1976] was a scientific officer at BARC from 1967 to 1991. He is currently leader of the LOTUS fusion blanket program at Ecole Polytechnique Fédérale de Lausanne (EPFL). His interests include techniques for on-line tritium breeding measurements and the heat deposition rate in prototype fusion blankets. He is currently engaged in theoretical and experimental investigations of fusion hybrid blankets. **J.-P. Schneeberger** (top) (EPFL, Switzerland, 1950) is the director of the Institut de Genie Atomique at EPFL. He is responsible for the LOTUS blanket program and the CROCUS research reactor program. His interests include neutronic measurements and energy deposition studies in prototype fusion blankets. **Vijay R. Nargundkar** (bottom) (MSc, physics, Karnataka University, India, 1956; PhD, pulsed neutron studies, University of Bombay, India, 1966) has worked at BARC since 1957. His current interest is theoretical and experimental studies of fusion blanket neutronics.



**HAEFELY NEUTRON GENERATOR CHARACTERIZATION FROM NEUTRONIC CONSIDERATIONS AND COMPARISON WITH CALCULATIONS / Om Prakash Joneja, Michel Schaer, Cherif Sahraoui, J.-P. Schneeberger, Vijay R. Nargundkar, K. Subba Rao**

**Om Prakash Joneja** (top right) [MSc, Punjabi University, India, 1966; Bhabha Atomic Research Centre (BARC) Training School, India, 1967; PhD, physics, University of Bombay, India, 1976] was a scientific officer at BARC from 1967 to 1991. He is currently leader of the LOTUS fusion blanket program at Ecole Polytechnique Fédérale de Lausanne (EPFL). His interests include techniques for on-line tritium breeding measurements and the heat deposition rate in prototype fusion blankets. He is currently engaged in theoretical and experimental investigations of fusion hybrid blankets. **Michel Schaer** (top left) (electrical engineering, Ecole d'Ingenieur Lausanne, Switzerland, 1977) is responsible for the LOTUS experimental facility at EPFL. His interests include neutron spectrometry and activation analysis methods. **Cherif Sahraoui** (center right) (PhD, physics, EPFL, Switzerland, 1989) has studied neutron multiplication in lead and beryllium. He worked on the development of a deuteron-based minidetector for neutron spectrometry. **J.-P. Schneeberger** (center left) (EPFL, Switzerland, 1950) is the director of the Institut de Genie Atomique at EPFL. He is responsible for the LOTUS blanket program and the CROCUS research reactor program. His interests include neutronic measurements and energy deposition studies in prototype fusion blankets. **Vijay R. Nargundkar** (bottom right) (MSc, physics, Karnataka University, India, 1956; PhD, pulsed neutron studies, University of Bombay, India, 1966) has worked at BARC since 1957. His current interest is theoretical and experimental studies of fusion blanket neutronics. **K. Subba Rao** (bottom left) (MSc, physics, Baharas Hindu University, India, 1956; MS, electrical engineering, University of Rochester, 1960; MS, nuclear engineering, University of Illinois, 1962) has worked at BARC since 1962. He participated in the LOTUS program at EPFL as a visiting professor. He is currently studying criticality aspects of actinide nuclides.



**<sup>233</sup>U PRODUCTION IN A THORIA-AND-WATER MULTILAYERED ASSEMBLY USING A 14-MeV NEUTRON SOURCE / Vijay R. Nargundkar, Damaraju V. S. Ramakrishna, Om Prakash Joneja**

**Vijay R. Nargundkar** (top) (MSc, physics, Karnataka University, India, 1956; PhD, pulsed neutron studies, University of Bombay, India, 1966) has worked at Bhabha Atomic Research Centre (BARC) since 1957. His current interest is theoretical and experimental studies of fusion blanket neutronics. **Damaraju V. S. Ramakrishna** (bottom) (MSc, physics, 1965; PhD, physics, University of Bombay, India, 1985) has worked on pulsed neutron research, fast neutron spectrometry, and the application of nuclear techniques to oil well logging at BARC. For the last 10 years, he has been engaged in blanket neutronics studies, and he has participated in the LOTUS fusion blanket program at the Ecole



Polytechnique Fédérale de Lausanne (EPFL), developing experimental techniques for the estimation of tritium breeding using solid-state nuclear track detectors. His current interests are fusion blanket neutronics and nuclear geophysics. **Om Prakash Joneja** (right) [MSc, Punjabi University, India, 1966; BARC Training School, India, 1967; PhD, physics, University of Bombay, India, 1976] was a scientific officer at BARC from 1967 to 1991. He is currently leader of the LOTUS fusion blanket program at EPFL. His interests include the development of techniques for on-line tritium breeding measurements and the heat deposition rate in prototype fusion blankets. He is currently engaged in theoretical and experimental investigations of fusion hybrid blankets.



MATERIALS ENGINEERING

**A NEW METHOD TO EVALUATE THE THERMAL SHOCK RESISTANCE OF CERAMICS BY LASER PULSE IRRADIATION** / *Shigeru Akiyama, Shigeyasu Amada*

**Shigeru Akiyama** (top) (naval engineering, Nagasaki-Zosen University, Japan, 1975) is a senior technical officer in the Materials and Processing Division of the Ship Research Institute. His current interests are thermal shock analyses of ceramics and the safety problems of fusion reactors. **Shigeyasu Amada** (BS, mechanical engineering, Nihon University, Japan, 1964; MS, 1973, and PhD, 1977, applied mechanics, University of Michigan) is a professor of mechanical engineering at Gunma University, where he has taught and conducted research since 1989. His interests are ceramic coatings using the thermal spraying technique and their evaluation, thermal stress and thermal shock analyses of ceramics, and development of so-called functionally gradient materials.



DIVERTOR SYSTEMS

**HIGH-HEAT-FLUX REMOVAL BY PHASE-CHANGE FLUID AND PARTICULATE FLOW** / *Zinovy R. Gorbis, A. René Raffray, Mohamed A. Abdou*

**Zinovy R. Gorbis** (top) (Kandidat Nauk, mechanical engineering, Academy of Sciences, Kiev, USSR, 1954; Doctor of Engineering Science, mechanical engineering, Academy of Sciences, Minsk, USSR, 1963) was professor and head of the Nuclear Power Plants Department from 1963 to 1969, head of the Heat and Mass Transfer Department from 1969 to 1976, and a professor from 1976 to 1980 at the Odessa Technological Institute, USSR. From 1980 to 1987, he worked as an engineer-economist-researcher at Vilnius, USSR. In 1987, he joined the Fusion Engineering Group at the University of California-Los Angeles (UCLA). His research interests are mainly in heat transfer and fluid mechanics applied to fusion engineering problems, including particulate solids behavior. **A. René Raffray** (center) (D. Eng., mechanical engineering, University of California-Davis, 1985) is a senior development engineer in the Fusion Engineering Program at UCLA, where he is responsible for the ceramic breeder design and modeling activity. His research interests are in fusion reactor technology and heat and mass transfer. He is currently focusing on the modeling of blanket tritium transport and thermomechanics behavior. **Mohamed A. Abdou** (bottom) (PhD, University of Wisconsin, 1973) is a professor in the Department of Mechanical, Aerospace, and Nuclear Engineering at UCLA. He is also the leader of the Fusion Engineering Program. His research interests include fusion neutronics, thermal hydraulics, blanket technology, fusion reactor design, and system studies.



---

## COLD FUSION

### NUCLEAR FUSION IN CRYSTAL HYDRIDES OF LIGHT ELEMENTS / *Gennady V. Fedorovich*

**Gennady V. Fedorovich** (MSc, Engineering-Physical Institute, USSR, 1965; PhD, Institute of Applied Mathematics, USSR, 1970; PhD, physics and mathematical sciences, Higher Attestation Commission, USSR, 1975) is head of the Applied Physics Laboratory in the Theoretical Problems Department of the Russian Academy of Sciences. His principal interest is in the field of controlled nuclear fusion in solids.



### GIANT NEUTRON TRAPPING BY A MOLECULAR SPECIES PRODUCED DURING THE REACTION OF $D^+$ WITH $H^-$ IN A CONDENSED PHASE / *Gian Franco Cerofolini, Giulio Boara, Stefano Agosteo, Armando Foglio Para*

**Gian Franco Cerofolini** (top right) (DSc, physics, University of Milan, Italy, 1970) was involved in thin-film technology from 1970 to 1977; he was a staff scientist at SGS-Thomson from 1977 to 1988, involved in the physics and technology of silicon devices. Since 1988, he has been with the Functional Materials Department of Istituto Guido Donegani. **Giulio Boara** (top left) has been a researcher in the Functional Materials Department of Istituto Guido Donegani since 1987. His research interests are in the field of  $\pi$ -conjugated polymers, especially for electronics and nonlinear optics. **Stefano Agosteo** (bottom right) (DSc, nuclear engineering, Politecnico di Milano, 1989) joined the radiation detection group of the Nuclear Engineering Department at Politecnico di Milano. His research interests are neutron measurements, particularly in radiotherapy facilities, and the simulation of radiation and particle transport by Monte Carlo methods. **Armando Foglio Para** (bottom left) (DSc, physics, University of Milan, Italy, 1961) is an associate professor of nuclear radiation detection at Politecnico di Milano. His research interests include the utilization of nuclear instrumentation under various working conditions, the statistical analysis of data, and the modeling of radiation transport based on Monte Carlo simulations.

