MEETING REPORT

SUMMARY OF THE 30TH PLASMA PHYSICS SUMMER SCHOOL, CULHAM LABORATORY, ABINGDON, UNITED KINGDOM, JULY 5–16, 1993

The 30th annual plasma physics summer school to be held at Culham Laboratory, the national center where fusion research is carried out by the United Kingdom Atomic Energy Authority under a contract of association with Euratom, took place on July 5–16, 1993. It was attended by 50 beginning graduate students from 16 countries, and as has been the case since 1984, a majority of the students came from outside the United Kingdom. The international character of the summer school is reflected in the fact that 47 different countries have sent students within the past decade. Lectures were provided by 20 lecturers from U.K. universities, the Joint European Torus (JET), and AEA Technology at Culham Laboratory.

The aim of the summer school is to provide an introduction to the basic principles of plasma physics, followed by the widest possible survey of the field of applications. Accordingly, the first 3 days covered particle dynamics (R. O. Dendy, AEA Technology), kinetic theory (J. A. Elliott, University of Manchester Institute of Science and Technology), wave theory (J. P. Dougherty, Cambridge University), and magnetohydrodynamics (MHD) (K. I. Hopcraft, Nottingham University). A successful student poster session was also held early in the course; there was no expectation of original work, but this provided an excellent opportunity for the students to discuss their projected fields of research with one another.

Thereafter, the course concentrated on applications of plasma physics. Solar physics was reviewed by A. Hood (St. Andrews University), with emphasis on MHD phenomena. D. A. Bryant and R. L. Bingham (Rutherford Appleton Laboratory) gave a minicourse of three lectures on space plasma physics, oriented toward kinetic effects. Laser/plasma interactions were reviewed by A. R. Bell (Imperial College, London), with additional theoretical backup provided by a lecture on parametric instabilities by H. C. Barr (Essex University). P. C. Johnson (AEA Technology) gave an account of the many industrial applications of plasma-based technologies.

Fusion plasma physics was reviewed in a sequence of lectures by staff from AEA Technology and from the JET Joint Undertaking. An initial overview of the subject was provided by J. Hugill (AEA Technology), who also gave a specialized lecture on plasma transport. Other AEA Technology staff members gave lectures on engineering physics issues in tokamak construction and operation (T. N. Todd), the physical principles of plasma diagnostics (P. G. Carolan), and a survey of the economic and environmental case for fusion (I. Cook); a former AEA Technology staff member (F. A. Haas) described plasma turbulence in tokamaks. An overview of JET was provided by P. R. Thomas (JET), and the lectures on fusion were backed up by a series of laboratory visits to COMPASS and START at Culham and to JET. B. Alper (JET) reviewed non-tokamak-based approaches to fusion.

J. W. Eastwood (AEA Technology) reviewed computational plasma physics, and T. J. Mullin (Oxford University) and S. J. Hogan (Bristol University) gave lectures on turbulence and chaos, accompanied by several simple physical demonstrations with high intuitive appeal.

A book, *Plasma Physics: An Introductory Course*, which is based on lectures in recent years at the Culham summer school and is edited by R. O. Dendy, will be published by Cambridge University Press. In addition to chapters written by many of the lecturers mentioned here, it contains chapters by R. J. Hastie (AEA Technology) on plasma particle dynamics, T. E. Stringer (JET) on plasma transport, J. J. Binney (Oxford University) on the use of plasma-related theoretical techniques in galactic dynamics, and R. A. Cairns (St. Andrews University) on radio-frequency heating of plasma, together with surveys of fusion plasma physics by R. S. Pease (formerly of AEA Technology) and of tokamaks by D. C. Robinson and M. R. O'Brien (AEA Technology).

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