

Editorial

The 22nd European Conference on Laser Interaction with Matter (ECLIM 92) was held in Paris in May 10–14, 1993. The conference was organized jointly by the LULI of the CNRS – Ecole Polytechnique and by the Centre d'Etudes de Limeil-Valenton of the CEA.

The conference gathered 180 participants coming from 17 different countries. Due to some administrative difficulties, only four physicists from Russia were able to attend when 20 were registered.

During the 5 days of the meeting, 176 contributions were presented: 15 invited papers, allowing the main laboratories to present their programs and major results; 40 oral presentations; and 121 posters. Contributions were related to the following topics:

- Laser-driven implosion and ICF physics
- Theory and numerical simulations on laser–plasma physics
- Laser–plasma interaction
- Interaction at ultrahigh intensity
- X-ray emission and X-ray laser
- Applications of laser-produced plasmas
- Diagnostics

No proceedings of the conference were published, but, according to a now well-established tradition, this special issue of *Laser and Particle Beams* is devoted to a selection of extended versions of 26 papers that have been submitted for publication by their authors. After the two invited papers presented by Andre *et al.* for the Limeil team and A. Caruso for Frascati, the other papers are presented in the order of the above classification of topics.

Four papers are related to ICF physics: B.N. Basylev *et al.* report on experimental and numerical simulations carried out in planar geometry to model energy transport processes in ICF targets; I.G. Lebo and V.B. Rozanov present the theoretical study and 2-D numerical simulations of hydrodynamic instability in the laser target, a crucial problem for high-gain implosions; S. Yu. Gus'kov *et al.* present the idea of control of the plasma flows in laser targets by action of an external strong magnetic field; and I.G. Lebo and V.B. Rozanov present equations describing the evolution of small perturbations of the boundary incompressible fluid spherical shells with allowance for ablative effect.

Four papers deal with theory of interaction: P. Mora compares a selection of different delocalization functions with the original and discusses the physical grounds of those formulas and their limitations; C. Blancard and J. Dubau present calculations of inelastic electron–ion collision strength in Ne-like and Na-like iron; A. Calisti describes computational modeling of Stark broadening in dense plasmas; and line shapes of Stark broadened ions are presented by C. Stehlé and D. Gilles using accurate microfield distribution functions calculated in Monte Carlo simulations.

Three papers deal with laser–plasma interaction: W. Mroz *et al.* present results of experimental investigations of iodine laser interaction with targets of different Z numbers; E. Schifano *et al.* describe experiments performed at LULI in order to test the effectiveness of second-harmonic generation as a diagnostic for inhomogeneities in the interaction; and K. Masek *et al.* study pulse shortening due to plasma expansion for an iodine laser beam passing through a hole in a foil for different diameters and foil Z numbers.

Two papers are devoted to interaction at ultrahigh intensity, a rather new but expanding field: J.-P. Matte *et al.* report on experimental spectra of hot dense plasmas produced

by the interaction of a subpicosecond laser with solid targets at around 10^{17} W/cm²; and M.P. Kalashnikov *et al.* describe a glass CPA laser delivering intensities up to 10^{18} W/cm² at a power contrast ratio better than 10^{10} .

Five papers are related to X-ray emission: H. Fiedorowicz *et al.* have investigated, for the first time, the generation of X rays from Nd-irradiated gas puff targets; H. Derfoul *et al.* report on the possibility of obtaining directly from the analysis of experimental X line intensities the radial emission coefficient and a functional form for it; T. Aoki proposes and calculates a microcylinder target to lengthen the gain duration of a recombination X-ray laser; J.S. Wark and H. He determine two different cases for the diffraction of ultrashort (tens of fs) X-ray pulses by crystals; and W. Brunner and R.W. John calculate the level population densities in a collisional-radiative plasma model for the short-pulse produced recombination X-ray lasers.

Two papers deal with applications: the first one is due to C. Lazzari *et al.*, who propose a new method based on a time-resolved laser-induced breakdown spectroscopy technique for the quantitative determination of mercury concentration in air; the other one is proposed by M.M. Michaelis *et al.*, who describe three applications of the so-called colliding shock lens.

Finally, four papers are devoted to diagnostics: O. Renner *et al.* describe a double-crystal spectrometer providing 1-D spatial resolution without a slit; T. Pisarczyk *et al.* present a three-channel polarointerferometer equipped with an active registration system that provides automatic recording and processing of images; J.P. Garçonnet *et al.* develop two methods of image processing applied to a neutron penumbral imaging system; C. Reverdin *et al.* give some results of absolute calibration of several detectors used in plasma-laser studies performed using the radiation of the LURE synchrotron.

Although they represent only a small fraction of the amount of work presented during this 22nd ECLIM, all of these papers give a rather good view of tendencies and progress in the field of ICF and laser-plasma interaction.

The next conference will take place in Oxford in September 1994 and will be organized by our colleagues of the Rutherford Appleton Laboratory.

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