

Fourth international Conference on
Superstrong Fields in Plasmas.
Scientific and Economic Report from the organizers

The Fourth international Conference on Superstrong Fields in Plasmas took place in Varenna, Italy, from October 3 to October 9, 2010. The technical program was developed from October 4 to October 8. The conference was followed on October 9 by the annual meeting of the SILMI Management committee.

The Conference was sponsored by the Programme "SILMI" of the EUROPEAN SCIENCE FOUNDATION (ESF) and was directed by:

- Dimitri Batani (Università di Milano Bicocca, Italy and vice-chair of the SILMI programme of the ESF)
- Maurizio Lontano (Istituto di Fisica del Plasma, CNR, Italy)
- Charles Joachain (Université Libre de Bruxelles, Belgium and chair of the SILMI programme of the ESF)
- Matteo Passoni (Politecnico di Milano, Italy)
- Elio Sindoni ("Piero Caldirola" International Center, Italy).

The purpose of the Conference was to provide a comprehensive account of the most recent research in the field of the interaction between ultraintense ultrashort electromagnetic radiation and matter. The advent of laser systems capable of delivering very short pulses and very high intensities has made accessible new regimes to experimental investigations and has opened new horizons in the interaction of laser fields with atoms, solids and plasmas. In these extreme conditions, electrons are accelerated at velocities close to the velocity of light and electromagnetic fields become much larger than atomic electric fields, so that strongly non-linear and relativistic interactions take place. The traditional distinction between solids and atoms on one side and plasmas on the other side tends to vanish and exotic states of matter are created. A large variety of applications have arisen, from novel light and X-ray sources, to new particle acceleration techniques and the "fast ignition" approach to Inertial Confinement Fusion.

The technical program consisted in 14 sessions devoted to the following subjects:

1. Laser driven electron acceleration (3 sessions)
2. Laser driven ion acceleration (3 sessions)
3. Inertial fusion
4. Fast ignition
5. Attosecond pulses/Ultrafast molecular processes
6. Ultraintense laser-matter interaction

7. Projects of laser facilities
8. X-ray production
9. Astrophysics and nuclear physics using ultraintense lasers
10. Developments in superintense laser technology.

3 poster sessions (for a total of about 45 posters) completed the program.

A lot of new and recent experimental and theoretical/numerical results have been presented during the Conference, in each of the above-mentioned fields. Just few of them are briefly highlighted in the following, to give a feeling of the overall scientific framework:

1. Optimization of the Target Normal sheath acceleration mechanism; experimental and theoretical investigation of novel target configurations; Experimental and theoretical investigation of the Radiation Pressure and Radiation Pressure Dominated acceleration; Foreseen applications.
2. Recent results from the National Ignition Campaign at NIF; advances in the comprehension of the requirements for the Fast Ignition scheme.
4. Advances in the generation of isolated attosecond pulses and their applications to atomic physics.
5. Fundamental properties of the interaction of superintense pulses with overdense matter: absorption mechanisms, relativistic mirrors; nuclear physics experiments in plasma environments obtained with superintense lasers
6. Development of novel x-ray sources with unique properties for the investigation of matter (atoms, molecules, condensed matter).

A technical session as also organised to provide the participants with the last advancements in the fields of laser technologies (in particular improvements of basic pulse parameters like ultrahigh contrast) and related measurement techniques.

More details about the complete technical program can be found in the Conference Book of Abstract (which complements this Report).

The presented contributions will be collected in a forthcoming special issue of the Journal “Nuclear Instruments and Methods A” (Elsevier), to be published in 2011.

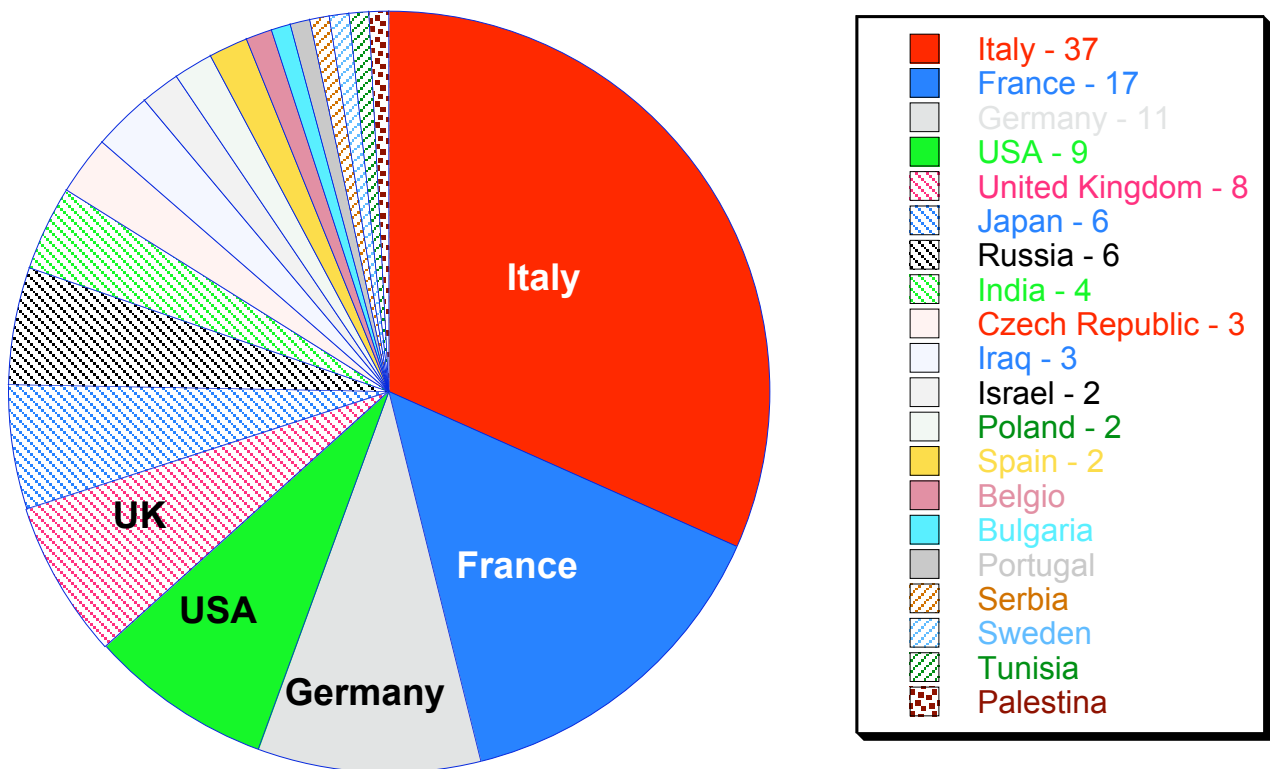
116 researchers, including both senior scientists and Ph.D. students attended the Conference, from 20 different countries. Here we present the basic statistics of the conference:

Participants:

| | |
|------------------|----|
| INVITED SPEAKERS | 18 |
| ORAL | 38 |
| POSTER | 39 |

| | | |
|--------|----|-------|
| MALE | 99 | 85,3% |
| FEMALE | 17 | 14,7% |

Nationalities



Concerning the economic report of the conference, the Fourth international Conference on Superstrong Fields in Plasmas has received a support of 40 k€ from the SILMI programme of the ESF.

This has been distributed as follows:

Direct support to the conference (secretariat and organization expenses):
4000 €

Payment of FULL FEE (450 €) for the following senior participants:

Yas Fadel al-Haddithi, Gordienko V., Maquet A., Meyer-ter-Vehn J., Pegoraro F., Roth M., Manoranjan Khan, Mayuko Koga, Limpouch J., Margarone D., Raczka P., Walhstroem G.G., Batani D., Gakovic B., Weng S., Bijert J., Joachain C., Passoni M., Sharma A., Haider A., Apostolova T., McKenna P., Ros D., Michette A., Crespo H., Volpe L., Sindoni E.

Tot 27 participants or 12150 €

Payment of REDUCED FEE (350 €) for the following student participants:

Sylla F., Cousin Seth, Vauzour B., Antonelli L., Ivanov K., Katzir Y., Liberatore C., Malvache A., Mandal L., Morace A., Paleari S., Zani A., Borot A., Castro G., Nafees S., Nindrayog A.S., Sameh S., Sgattoni A., Narayanan V., Siwaar L., Tamburini M., Pathak N.C., Al Tarazi S., Levato T, Ciapponi L., Gemini L., Merlo G., Principe I., Mascali D.

Tot 29 participants or 10150 €

Accommodation and travel support for the following participants:

Rashida Jafer (650 €), Luca Volpe (650 €), Yas Fadel al-Haddithi (550 €), Claudio Perego (650 €), McKenna P. (450 €), Ros D. (450 €), Tamburini M. (450 €), Michette A. (450 €), Pathak N.C (450 €), Al Tarazi S. (450 €), Levato T. (450 €), Manoranjan Khan (550 €), Batani D. (550 €), Gakovic B. (550 €), Passoni M. (550 €), Sharma A. (450 €), Haider A. (450 €), Mandal L. (450 €), Nafees S. (450 €), Sameh S. (450 €), Sgattoni A. (450 €), Narayanan V. (450 €), Siwaar L. (450 €), Sylla F. (450 €), Vauzour B. (450 €), Lopez-Martens R. (450 €), Mallka G. (450 €), Gazzada F. (450 €)

Tot 13700 € (28 participants over 116 received a support towards travel and accommodation, on average each of them received about 490 €)

Grand Total 40000 €

Please notice that, in addition to the support from the ESF, the Conferences has received the following support:

- INFN (Italian National Institute of Nuclear Physics): 3000 € as a contribution to the rent of Villa Monastero (the location of the conference)
- EPS (European Physical Society): 700 € to pay for two students' fees
- Politecnico di Milano: 4000 € to pay for the creation and the management of the web site for the conference
- University of Milano Bicocca: 4000 € to pay towards the realization of the conference proceedings.

The Organizer of the Conference
Prof. Dimitri Batani

