



LASERLAB-EUROPE

The Integrated Initiative of European Laser Research Infrastructures III

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Report on Laserlab-Europe International Relations

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<i>Deliverable Nature</i>	
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PU = Public PP = Restricted to other programme participants (incl. the Commission Services) RE = Restricted to a group specified by the consortium (incl. the Commission Services) CO = Confidential, only for members of the consortium (incl. the Commission Services)	PU

1 Introduction and objectives

The objective is to establish links to laser-related communities and networks outside Europe with the aim to promote laser science and research beyond the European Research Area, and to exchange information on best practices in trans-national networking between Research Infrastructures.

Co-ordinator of WP9: 1 LU

2 Task 1: Relations with networks in other global regions

a) Relations with African Laser Networks

Task leader: LU

Laserlab-Europe has strong links to laser activities on the African continent, in particular to the African Laser, Atomic, Molecular & Optical Sciences Network (LAM Network, <http://lamoptinet.org>), to the African Laser Centre (ALC, www.africanlasercentre.org) and to the African Spectral Imaging Network (AFSIN, <https://sites.google.com/site/multispectralmicroscopy>). The LAM network, coordinated by Prof. Ahmadou Wague at the University Cheikh Anta Diop of Dakar, arranged its first African laser workshop in 1991 and has worked diligently in promoting laser science through a regular conference series and through networking. Laserlab-Europe members have for many years pursued close interaction and collaboration with LAM Network members, i.e. through lecture activities. Another important aspect is the promotion of training and access opportunities. The LAM network conference arranged in January 2014 in Dakar, Senegal was attended by Laserlab-Europe members.

In particular, LLC has, based on LAM contacts, helped establish the AFSIN activity, coordinated by Prof. Jérémie Zoueu, National Polytechnical Institute, Yamoussoukro, Ivory Coast. Hands-on 2-week workshops were annually held during the last years, in Cape Coast/Ghana, Bamako/Mali, Nairobi/Kenya (2012) and Yamoussoukro/ Ivory Coast (2013). The organization and lecturing was largely made by Laserlab-Europe researchers (LLC) and realistic research equipment was built up by each of the participating groups, which now comprises seven universities, including, apart from the mentioned countries, also Senegal, Burkina Faso, and Sri Lanka. The research activities focus on advanced diagnostics for malaria, agricultural diseases and agricultural pest insects. They comprise laboratory work as well as active and passive remote sensing at considerable distances. Main economic sponsor for these activities is the International Science Programme, Sweden. Unfortunately, the planned 2014 workshop in Ouagadougou, Burkina Faso, had to be cancelled because of the outbreak of the Ebola epidemic, and postponed till the next year. However, because of continuing problems in the region, the 2015 workshop was arranged in Dakar, again with major inputs from LLC. An access visit to the LLC by Ivory Coast researchers for performing work on structured illumination could be arranged with separate funding.

Another example for cooperation is the African Laser Centre that is a more recent pan-African laser organisation with its headquarters at the South African National Laser Centre (NLC, www.csir.co.za/lasers) in Pretoria. Close links exist between certain Laserlab-Europe partners and the ALC, with lecture and panel participation activities. The Laserlab-Europe participants focus their efforts not only on lectures and meetings, but also on seeking and promoting concrete possibilities for exchange of personnel and by providing access opportunities. Laserlab-Europe participated (through LLC) in the recent ALC 10-year Jubilee held at the LAM-10 conference in Dakar, in the presence of the ALC Board Members.

The PAERIP (Promoting African European Research Infrastructure Partnerships) consortium (www.paerip.org) ran a series of public seminars in Africa and Europe on pertinent aspects of the Africa-Europe cooperation relationship around research infrastructures. These meetings served several purposes: they aim to raise general awareness of Africa-Europe cooperation and of funding opportunities for research infrastructure partnerships; they provide a forum for

networking between the RI stakeholder community; for exchange of views on the process of cooperation; and through consultation of stakeholder opinion they can enrich the formal bi-regional policy dialogue on S&T cooperation around research infrastructures and thereby contribute to evidence-based policy making. Laserlab-Europe was represented, through one of its partner directors, at a PAERIP meeting in 2012 in London. This was a seminar on African-European research infrastructure cooperation attended by many representatives from Africa and Europe. The purpose of the get-together was to analyse ways to enhance cooperation and identify policy options and support mechanisms for cooperation on research infrastructures. Laserlab-Europe will continue to be engaged in similar discussions and seminars, exploring ways to increase collaboration between European and African laser Research Infrastructures and Research Networks.

During 2015, an African Regional Conference within the UNESCO International Year of Light was arranged in Accra, Ghana, with participation of high African governmental representatives. The opening keynote scientific speech was held by an LLC scientist in biophotonics.

b) Relations with the Laser community in Latin America

Task leader: CLPU

Laserlab-Europe partners have extensive links with Latin America, especially with Mexico, Argentina, Brazil, Ecuador and Peru. The Laserlab-Europe consortium promotes further interaction and links between Laserlab-Europe infrastructures and infrastructures in Latin America. For historical reasons, the Iberian countries have strongest connections with this region, e.g. the Ibero-American laser conferences are arranged alternately in Latin America and on the Iberian peninsula. Latin America has a strong research infrastructure with many centres covering a vast range of scientific topics. The Laserlab-Europe participants are reinforcing the relations with Latin-American partners by promoting training and access possibilities and furthermore through active attendance and support of Latin-American optics conferences such as RIAO, OPTILAS and SPECTRA.

This activity has been designed for promoting a bidirectional exchange of information. On the one hand, offering information to the Latin American laser community about the scientific activities of Laserlab partners (and about the Laserlab network as an entity) and, on the other hand, providing the Laserlab partners with information about laser-related activities in Latin America.

For example, CLPU participated, on behalf of Laserlab, in the conference of the Latin American Network of Optics (RIO-OPTILAS), which took place in Porto (Portugal) from 22nd to 26th July 2013. CLPU participated as sponsor in the conference, and a stand with information about Laserlab was put up in the exhibition area. The material offered included copies of 'Laserlab Forum', posters, merchandising, leaflets about Laserlab and hand-outs from individual Laserlab partners. The conference offered an excellent opportunity for promotion, as it was attended by over 200 people and most of them did not know about the Laserlab consortium.

As a further concrete example, Laserlab-Europe was represented, through LLC, by several invited lectures at the Advanced School of Biophotonics, arranged in Sao Carlos, Brazil, April 14-19, 2013.

CLPU hosted a predoctoral researcher at the University of La Plata (Argentina) for two 2-months training visits in 2014 and 2015. The training consisted in basic theoretical training in the pulsed lasers center in respect to the interaction of intense laser pulses with atoms, followed by work on techniques of numerical simulation to study the high-order harmonic generation. An experimental part has allowed the researcher to participate in some experiments in acceleration of charged particles by laser and mass spectrometry from filamentation processes on air. Future collaborations with the University of La Plata are planned in the training programme of CLPU.

LLC was represented with major lectures at the 2015 OPTO-ANDINA Optics School in Quito, Ecuador.

c) Relations with Asian Laser Networks and Centres

Task leader: LU

The mission and objective of the Asian Intense Laser Network (www.asianlasernet.org) is to promote collaboration in the areas of intense laser science and technology among research groups in Asian countries and regions. Similarly to Laserlab-Europe, the AILN network is active in arranging platforms for discussion among representatives from high-intensity laser facilities and members of user communities; these platforms aim at collaborative activities among Asian countries. Such common interest presents many possibilities for fruitful collaboration and connections with Laserlab-Europe. In fact good personal relations between AILN and Laserlab-Europe members exist and are already formalised through joint committee memberships in international organisations such as ICUIL and participation in joint research projects. Laserlab-Europe and AILN seek to organise joint events, such as workshops, summer schools and conferences dedicated to intense laser science and technology, enhancing research productivity and competitiveness through the network activities. This is implemented mainly through personal collaboration in the scientific committees of events.

Laserlab-Europe partners maintain close relations to Chinese universities. As an example, the LLC is connected to Zhejiang University, Hangzhou, through a Joint Research Centre in Electromagnetic and Photonics Research (JORCEP), with a substantial number of joint publications. Further, two LLC staff members have part-time appointments at the South China Normal University, Guangzhou, resulting in further joint publications and exchange of personnel. These Chinese universities are very active in international photonics conference arrangements, leading to increased mobility between Europe and China. One LLC staff member was recently appointed as the technical attaché of Sweden at its embassy in Beijing.

3 Task 2: Relations with international laser networks and societies

Task leader: LU

Based on a proposal by the OEDC Global Science Forum Coordinating Committee on Compact High-Intensity Short-Pulse Lasers the IUPAP Working Group, the International Committee on Compact, Ultrahigh Intensity Lasers (ICUIL, <http://www.icuil.org>) was established in October 2003. ICUIL is an organisation concerned with international aspects of ultra-high intensity laser science, technology and education.

ICUIL finds its members predominantly in three different global regions: North America, the Asian/Pacific Area, and Europe. The European members are almost exclusively members of Laserlab-Europe which makes this Consortium a natural and strong ICUIL partner. In return, Laserlab-Europe benefits from participation in ICUIL activities and conferences, from the close interaction with non-European laser research infrastructures, and from new scientific directions which are being pursued on a global level, such as novel laser based particle accelerators. An official decision by the ICUIL General Assembly to cooperate with Laserlab-Europe on joint conferences, workshops and/or strategy activities was made during the Kizu meeting in Japan, on September 15, 2007.

During the lifetime of the project, two ICUIL conferences were organised: the 2012 International ICUIL Conference in Mamaia, Romania (16-21 September 2012) and the 2014 International ICUIL Conference in Goa, India (12-17 October 2014). Laserlab members participated actively in these biennial meetings, which focused on the generation, amplification, compression, and measurement of high-intensity pulses as well as applications. Recurrent conference topics, among others, are:

- Ultrahigh-intensity-laser design and performance
- Novel Technologies for Ultra-Intense Lasers
- Applications

ICUIL 2016 will be held in September 2016 in Montebello, Canada, with strong involvement of Laserlab-Europe members.

The LLC is represented in important committees of two of the major global societies in optics, OSA (the Optical Society) and SPIE (the International Society of Optics and Photonics). The Abdus Salam Center for Theoretical Physics (ICTP) in Trieste arranges an International Winter School on Optics every year – Laserlab is represented in its steering group through LLC.

Laserlab-Europe is a Collaborating Partner of the International Year of Light 2015 and was centrally involved also in arrangements for the International Year of Light, IYL 2015, through participation, via the LLC, in the International Advisory Board for IYL and by delivering one of the lectures at the IYL opening ceremony in Paris.