

## Training at the Interface between Lasers and Accelerators

CLPU in Salamanca was a perfect host for the LA<sup>3</sup>NET network's advanced School on Laser Applications at Accelerators. The School was held between 29<sup>th</sup> September – 3<sup>rd</sup> October 2014 and attracted more than 70 participants. Lecturers from institutions such as CERN in Geneva, UCLA in the USA, DESY in Germany and COSYLAB in Slovenia covered all areas of laser applications, including beam generation, acceleration and diagnostics. The course triggered many interesting discussions and allowed our Fellows to put their research into a much broader context. *As usual, all presentations are available online and can be accessed via the project web page.*

**There are many different career options for researchers that have received training in the R&D areas the LA<sup>3</sup>NET project covers.** However, the exact nature of these jobs is not always clear from an outside perspective. Our Fellows, in close collaboration with the EU Project TEAM have put together an exciting program for a Topical Workshop on "Scientists go Industry". This event will be held in Berlin, Germany on 17-18 November 2014. Experts from the world of consulting, patent law, medical accelerators and (inter)national research centres will provide an overview of current employment opportunities and career pathways. *No more than a handful of places is still available, i.e. you will need to register quickly if you would like to join in.*

The LA<sup>3</sup>NET project was commended as a European success story as part of its formal mid-term review meeting. The project is required to provide regular progress reports and also subject to several financial audits. The EU Project TEAM, based at the Cockcroft Institute, have teamed up with experts from KPMG, the oPAC network, experienced project managers from within the network, and external consultants and are delighted to announce that a dedicated **EU Project Administrator Training Day** will be held in Liverpool on 5<sup>th</sup> December 2014. We will share best practice amongst course participants, establish close links between Project Officers and stimulate discussions around the changes from the 7<sup>th</sup> Framework Program to Horizon 2020. *The event is free of charge - registration can be done by simple email.*

Last, but certainly not least, we have just opened registration for a **Topical Workshop on Beam Diagnostics** and an international **Conference on Laser Applications at Accelerators**. Both events will be held at the end of March on Mallorca, Spain. *Places will be strictly limited, so I suggest to register as soon as possible.*

I hope you will enjoy this newsletter edition and to see you soon at one of our upcoming events !



Prof. Carsten P. Welsch, Coordinator

### Special Interest Articles

- Fellows Research News
- Network News
- Upcoming LA<sup>3</sup>NET Events

### Individual Highlights

- LA<sup>3</sup>NET School at CLPU
- LA<sup>3</sup>NET Prize 2015

## Research News from LA<sup>3</sup>NET Fellows

### Luca Christopher Stockhausen's experimental campaign in UK bears fruit

**CLPU Fellow Luca has been rewarded for his efforts working in collaboration with the University of Strathclyde by having his research published in the New Journal of Physics in a paper entitled "Azimuthal asymmetry in collective electron dynamics in relativistically transparent laser-foil interactions" by R.J. Gray *et al.***

The paper describes the experimental demonstration of asymmetry in the collective dynamics of ponderomotively-driven electrons in the interaction of an ultraintense laser pulse with a relativistically transparent target. The 2D profile of the beam of accelerated electrons is shown to change from an ellipse aligned along the laser polarisation direction in the case of limited transparency, to a double-lobe structure aligned perpendicular to it when a significant fraction of the laser pulse co-propagates with the electrons.

The temporally-resolved dynamics of the interaction are investigated via particle-in-cell simulations. The results provide new insight into the collective response of charged particles to intense laser fields over an extended interaction volume, which is important for a wide range of applications, and in particular for the development of promising new ultraintense laser-driven ion acceleration mechanisms involving ultrathin target foils.

#### **Full reference and link to the paper:**

*'Azimuthal asymmetry in collective electron dynamics in relativistically transparent laser-foil interactions'*, R. J. Gray, D. A. MacLellan, B. Gonzalez-Izquierdo, H. W. Powell, D. C. Carroll, C. D. Murphy, L. C. Stockhausen, D. R. Rusby, G. G. Scott, R. Wilson, N. Booth, D. R. Symes, S. J. Hawkes, R. Torres, M. Borghesi, D. Neely, P. McKenna (2014), *New Journal of Physics*, 16. ISSN 1367-2630. A preprint can be downloaded [here](#).



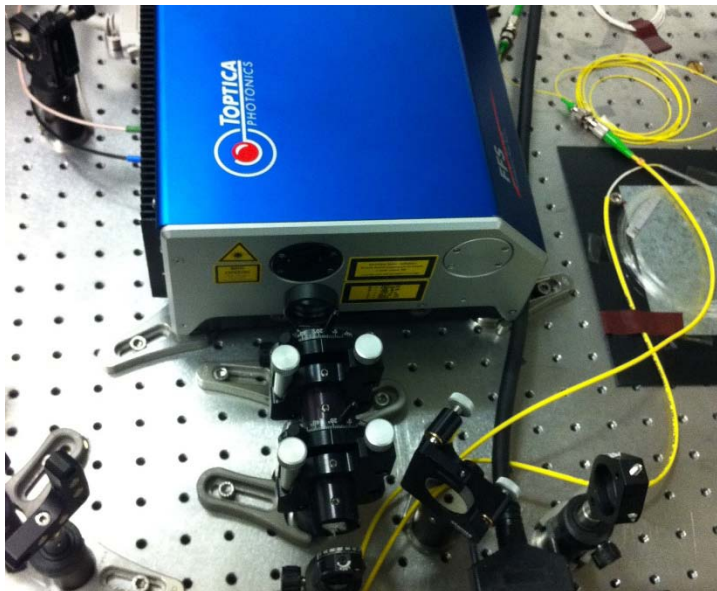
Target wheel holding the ultra-thin targets employed in the experiment.

## Rui Pan's Progress on Electro-Optic Bunch Arrival-time Monitor at STFC

**Compact Linear Accelerator for Research and Applications (CLARA) has been designed to be a dedicated flexible FEL test facility with the FEL wavelengths are in the visible and VUV.** CLARA requires timing systems with ten femtosecond level precision for the synchronization and higher precision timing diagnostics. It will be a major upgrade to the existing VELA accelerator test facility at Daresbury Laboratory in the UK [1].

Current state-of-the-art beam arrival-time monitors (BAMs) use electrical pickups, and their sensitivity is largely limited by the attainable bandwidth. The project aims to investigate the use of electro-optic (EO) materials with ultrafast response times (THz range bandwidth) to develop BAMs targeted at achieving femtosecond level precision in determining arrival times.

An erbium fibre laser with centre wavelength at 1550 nm and 70 fs pulse duration is considered as the main tool of the measurement. Since the high EO coefficient ( $r_{33}=31$  pm/V) at this wavelength, LiNbO<sub>3</sub> crystal can be a good candidate as the EO pickup. Considering the ultrafast laser pulse will be propagating in fibre, higher-order nonlinear effects and dispersion need to be considered. The split-step Fourier method is used to numerically model the propagation. Consequently the maximum input power and the length of dispersion compensating fibre for the EO BAM can be determined. Based on the above simulation studies on EO material and laser propagation in fibre, a scheme of EO BAM will be designed soon.



Photograph of the experimental setup.

[1] J.A. Clarke, et al., 'CLARA conceptual design report', JINST Vol. 9, No. 05, p.T05001 (2014)

## Novel Acceleration Techniques – latest research from Yelong Wei at the Cockcroft Institute

**Dielectric laser-driven accelerators (DLA) have the potential to become a strong candidate for ultra-compact electron accelerators in the future and might even open up new avenues for high energy physics accelerators and free-electron lasers.**

Due to a much higher damage threshold fluence ( $0.2 \sim 2 \text{ J/cm}^2$ ) than metals, these dielectric microstructures can support accelerating fields that are orders of magnitude higher than what can be achieved in conventional radio-frequency cavity-based accelerators, which can increase the acceleration gradients up to GeV/m. In 2013, an experiment successfully demonstrated acceleration of relativistic electrons with an accelerating gradient of 250 MeV/m [2] in a fused silica double grating structure and the acceleration of non-relativistic 28 keV electrons with gradient of 25 MeV/m [3] close to a single grating structure was also observed. These two experiments make it possible to envisage an all-optical DLA in the future. Based on these results, Yelong's work mainly focuses on investigating dielectric laser-driven acceleration of electrons from non-relativistic to relativistic in double grating structures exploiting the spatial harmonics which was excited by the diffraction of incident laser. Compared to acceleration of non-relativistic electrons in a single grating structure, double grating structure has high acceleration efficiency, less deflection force and wider vacuum channels. For simulations, the laser wavelength  $\lambda_0$  was chosen to be 1550 nm emitted by an Er-fiber laser. Silica ( $\text{SiO}_2$ , refractive index  $n=1.528$ ) was chosen as the double grating structure material due to favourable properties of transparency, electric field damage threshold, thermal conductivity, nonlinear optical coefficients and chemical stability.

So far preliminary investigations have been completed into comparisons of the acceleration efficiency for different spatial

harmonics in a double grating structure to accelerate low energy electrons with speed of  $\beta=0.3$ . It was found that it is most efficient for the first spatial harmonic to interact with low energy electrons ( $\beta=0.3$ ) compared to the second and third spatial harmonics. However, if we choose the first spatial harmonic to accelerate the low energy ( $\beta =0.3$ ) synchronously, the grating period  $\lambda_p$  should be  $0.3 \lambda_0$ , which may not be feasible due to fabrication limitation, where  $\lambda_0$  is the wavelength of laser.



Based on these analyses, we plan to design a feasible multi-staged DLA scheme based on the double grating structure with initial grating period of  $\lambda_p=0.6\lambda_0$  in the future. It is composed of two acceleration stages: in the first stage the electrons will be accelerated by the second spatial harmonic from  $\beta=0.3$  to  $\beta=0.6$ , then switched to second stage exploiting first spatial harmonic to accelerate electrons from  $\beta=0.6$  to relativistic. Each stage consists of many small sections, the grating period of which has to be scaled up to meet the requirement of continuously phasing match between electrons and spatial harmonic until the electrons become relativistic. The overall objective is to present a multi-staged dielectric laser-driven accelerator (DLA) for accelerating electrons in a double grating structure from non-relativistic to relativistic in the future.

- [2] E. A. Peralta, K. Soong, R. J. England, E. R. Colby, Z. Wu, B. Montazeri, C. McGuinness, J. McNeur, K. J. Leedle, D. Walz, E. B. Sozer, B. Cowan, B. Schwartz, G. Travish, and R. L. Byer, *Nature* 503, 91 (2013).  
 [3] J. Breuer and P. Hommelhoff, *Phys. Rev. Lett.* 111, 134803(2013).



## Network News

### Accelerator Scientists Reach Out

LA<sup>3</sup>NET made a large contribution to this year's Euro Science Open Forum ([ESOF2014](#)) where thousands of researchers, politicians, entrepreneurs, business representatives and journalists gathered for presentations and discussions on new science and research policy. This high profile science outreach forum took place in Copenhagen, Denmark between 21<sup>st</sup> -26<sup>th</sup> June 2014 with the aim of promoting science to the public and engaging those working in science in discussions with the public and policy makers as well as to each other. On Sunday 22<sup>nd</sup> June Jakob Krämer and Rob Ashworth and were joined by Michael Budde from Danfysik and Daria Astapovych from oPAC to speak about training within the networks. These insiders from network training described the university coordinator viewpoint, the industry perspective and the experiences and expectation of early career researchers. In this way the functioning of these most advanced learning programmes was explained. The presentations were made to a packed hall in the fine settings of the Carlsberg Museum in Copenhagen stimulating a range of questions about the networks, how they are managed and the impact.

Later in the week Prof. Welsch led two sessions on *accelerating researcher training* and *accelerating green technologies*. On the basis of three very large networks that cover research in accelerator science and technology a first interactive session

explained how international mobility, cross sector exposure, training through cutting edge research and participation in multi-disciplinary workshops all contribute to a unique learning experience. LA<sup>3</sup>NET Fellow Andreas Döpp from CLPU and Daria Astapovych contributed to this session together with Seamus Hegarty from CERN who provided an HR perspective on the effects of researcher training within Marie Curie Initial Training Networks. For the session on green technologies Prof. Welsch was joined by Danfysik's VP Dr. Arnd Baurichter and the company's former CEO Dr. Bjarne Roger Nielsen, as well as Dr. Andreas Jansson from ESS. They described the important role accelerators have for science and society and how new technologies can help design and build research facilities with minimum environmental impact. All talks received very positive feedback and triggered interesting questions from the audience



### Promoting LA<sup>3</sup>NET to Industry and Higher Education

Summer was a busy time for promoting the network both to industry and to higher education at Liverpool. The project first had a presence at Physics Innovate (the University of Liverpool's contribution to the city's Business Week) where Rob Ashworth and Helen Williams maintained a stand. There was a good turnout for the event with plenty of representatives from industry. The event also featured a fascinating range of talks on the emerging practical applications from physics

research held in the opulent Liverpool Town Hall Chambers. Rob also attended the University of Liverpool's Learning & Teaching Conference contributing a talk about the advantages of training at post graduate level within a network based on the experiences of LA<sup>3</sup>NET. This was a highly useful day in sharing knowledge in order to maintain training at the highest possible level in line with current thinking on the best approaches.



## LA<sup>3</sup>NET Event

### Laser and Accelerator Communities merge for Cross-discipline Training



The Spanish Pulsed Lasers Centre (CLPU) in Salamanca, Spain hosted the Advanced School on Laser Applications at Accelerators on behalf of the [LA<sup>3</sup>NET](#) consortium between 29<sup>th</sup> September and 3<sup>rd</sup> October 2014. The event comprised lectures from internationally renowned speakers, study sessions, an industry-focussed day and poster/industry exhibition attracting over 70 participants from all over the world.

The school was opened by [CLPU](#) Director Prof. Luis Roso and Dr. Enrique Conejero Jarque from the University of Salamanca with introductions on behalf of the host institutes. This was followed by a brief overview of LA<sup>3</sup>NET before the main lecture programme started. The first day included talks about an introduction to lasers, the history of accelerator development in Europe, accelerator applications, as well as beam generation, acceleration and diagnostics.

Day two included lectures on laser ion sources, photo injectors and Free Electron Lasers (FELs), in addition to a two-hour study session giving delegates a chance for a hands-on look at some of the topics covered. An outreach talk about "attosecond science" by Prof. Luis Plaja in the evening on the main University of Salamanca campus attracted more than 100 students from the university and local high schools in addition to the

school participants. The presentation in Spanish with English slides was a most entertaining and enlightening success which was well received by the audience across both languages and so proved worthwhile for inclusion in future events in other countries.

The following days covered advanced topics in ion and electron acceleration, commonly used simulation codes for accelerator design and optimization, as well as industry applications of accelerators and lasers. This was complemented by a [Laserlab](#)-sponsored visit to the facilities at CLPU - an intriguing excursion to the forefront of laser technology and applications with a tour of five laboratories. This included the mechatronics lab where components are manufactured, a laser lab where investigations are underway to investigate the application and effects of ultra-short x-ray pulses for radiographs and a new laser development lab for the first Spanish tuneable femtosecond laser. In addition, the tour covered the user target room for the first and second phase terawatt Vega lasers which are currently operational and then the pièce de résistance, the new building where all three Vega lasers will be housed to achieve petawatt capability for end-user experiments. There was also a second study session and a lively poster display and industry exhibition, sponsored by [Danfysik](#).



The School drew to a close with talks on THz applications, compact X-ray sources and the Extreme Light Infrastructure (ELI) project. The School stimulated many fruitful discussions throughout the week and was an excellent addition to the many scientific events the network has organized to date. All presentations can be found on the School's [Indico site](#).

## Upcoming LA<sup>3</sup>NET Events

### Sharing best practice in EU project finance & administration

Having been recognised as a success story by the European Commission with excellent-rated coordination LA<sup>3</sup>NET is now organising an **Administrator Training Day** to share best practice.

Administrators from the project's partner organisations across Europe have been invited to take part on the 5<sup>th</sup> December 2015.

LA<sup>3</sup>NET is indebted to CLPU staff and in particular Ms. Yaiza Cortés for the local organization and support. The effort of all lecturers for their hard work and excellent contribution to make the School such a success is also appreciated.

The event will take place at the University of Liverpool and will cover the following areas:

- Project audits – how to complete correctly & difficult questions
- Final project reporting
- Best practice in ITN coordination
- Changes between FP7 & Horizon 2020

For further details or to take part contact

[robert.ashworth@cockcroft.ac.uk](mailto:robert.ashworth@cockcroft.ac.uk)



### Scientists go Industry: Laser and Accelerator Physics

**The workshop will be hosted at the Helmholtz Association in Berlin 17<sup>th</sup> – 18<sup>th</sup> November 2014.**

To satisfy society's needs science and industry must complement each other. Therefore, the Fellows of LA<sup>3</sup>NET specialized in laser and accelerator physics are aiming to bring both communities together in this workshop. Through a combination of talks from industry speakers, poster and discussion sessions, the aim is to comprehensively explore the corporate and industry career opportunities open to young post-graduate and post-doctorate scientists in the laser and accelerator physics field. There will be speakers talking about their organisations and

experiences from companies as diverse as Roche, Siemens, Management Consulting, Wynne Jones, The Technology Partnership, Danfysik, The Science Europe Office, Thales, Research Instruments, DESY, Helmholtz Association, SourceLAB and Heidelberg Ionenstrahl-Therapie Centrum.

This event will be open to early stage researchers, both from within LA<sup>3</sup>NET and from the wider scientific community. **The deadline for registration is 17<sup>th</sup> October so don't delay, register today:**

<https://indico.cern.ch/event/318719/>



## Mallorca Workshop and Conference – register now

LA<sup>3</sup>NET is pleased to announce that registration for its 2015 events is now open. The network will organize a [Workshop on Beam Diagnostics](#), followed by an [International Conference on Laser Applications at Accelerators](#) at the end of March 2015. **Both events will be held at the [Son Caliu Resort in Mallorca, Spain](#) and a special discount of €50 applies for those attending both events.**



### Beam Diagnostics Workshop 23<sup>rd</sup> - 24<sup>th</sup> March 2015

**Diagnostics systems are essential constituents of any accelerator. They reveal the properties of a beam and how it behaves in a machine. Without an appropriate set of diagnostic elements it would simply be impossible to operate any accelerator let alone optimise its performance.** Lasers provide the highest time and spatial resolutions for transverse and longitudinal beam profile measurements, they allow the detection of density differences in particle beams with high dynamic ranges and permit measurements of very important machine parameters such as the momentum compaction factor and beam emittance. These topics will be addressed in this

dedicated topical workshop on laser-based Beam Diagnostics.

The event will be structured around the different topic areas relating to beam diagnostics. Each topic will be initiated by a renowned speaker invited to give a talk of 40 minutes about the state-of-the-art and their own research in this field. This will be followed by 20 minute talks by other delegates about latest research results. All participants in the workshop are invited to use the 'Submit a new abstract' link to upload abstracts for consideration by the Programme Committee. The cost of the workshop is €350 to cover accommodation and all meals. The registration deadline is 27<sup>th</sup> February 2015.

### Laser Applications at Accelerators Conference 25-27 March 2015

**The programme will consist of invited talks bringing together laser and accelerator researchers, as well as contributed talks that will be selected by the Programme Committee from all contributions to the event.** The conference proceedings will be published in a special edition of Nuclear Instruments and Methods A.

The cost of the conference is €650 to cover accommodation and all meals. The registration deadline is 27<sup>th</sup> February 2015. Several scholarships for early stage researchers outside of the network will be available.

During this 3-day international conference the following areas will be covered:

- Laser-based particle sources
- Laser-driven particle beam acceleration
- Lasers for beam diagnostics and fs timing systems
- System integration



## Symposium 26<sup>th</sup> June 2014

**A Symposium on Accelerators & Lasers for Science and Society is to be held at the Convention Centre Liverpool** aimed at promoting interest in science among the general public and high school students in particular

It will be also be a celebration of the achievements of LA<sup>3</sup>NET so put the date in your diary.

Full details to follow on the website and in the next newsletter with regular updates available via the project's [Facebook](#) site.

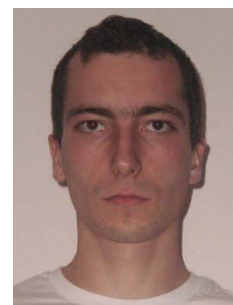
## Fellows News

### New Fellow recruited for Romanian Post

**Stanimir Kisyov** has joined IFIN-HH to complete the full complement of LA<sup>3</sup>NET funded Fellows. Stanimir studied Astrophysics, Meteorology and Geophysics in the University of Sofia, Bulgaria and obtained a Bachelor's degree in 2010. Thereafter he started a Master's degree in Nuclear Physics and Physics of Elementary Particles and graduated in 2012. The main topics of his study were: nuclear structure, gamma-spectroscopy, experimental techniques in nuclear physics, fast-timing scintillation detectors and measurements of half-lives of excited nuclear states. Stanimir started a PhD in Nuclear Physics in 2013 on the subject of

the structure of transitional nuclei around 100Å and the experimental techniques for measuring their properties.

In August 2014 Stanimir joined the LA<sup>3</sup>NET network to work on computer simulations of a neutron detection set-up consisting of plastic scintillators. The work requires the simulation of real experimental conditions such as the events triggered by the laser system and the response of the neutron detectors used in the real experiment. Beside the numerical studies, his research involves experimental work with extremely fast electronics and data acquisition systems.



**Welcome !**

### Research Project at IFIN-HH

Stanimir's project is the study of neutron production from 2 stage nuclear reactions driven by terawatt laser-target interactions. High power laser pulses are able to accelerate electrons and heavy ions at high energies, inducing a huge number of nuclear reactions events and intense fluxes of radiations including X-rays, gamma-rays and neutrons. Whether for the optimization of laser driven neutron generators or for the characterisation of heavy ion acceleration mechanisms, a complex neutron detection system will be a valuable tool to measure the energy and angular distribution of generated neutron flux taking advantage of neutron time of flight to cope with huge prompt gamma ray flash. This project requires an integral approach into the simulation of the experimental conditions, i.e. the events triggered by the laser system, and the

response of different types of neutron detectors. The trainee will carry out numerical studies, use existing detector systems including associated fast electronics and data acquisition systems and will participate in experiments, off-line data analysis and the dissemination of results in conferences and articles. They will be embedded into an international collaboration and will profit from the experience at IFIN-HH, at the neighbouring Institutul National de Fizica Laserilor, Plasmei si Radiatiei (INFLPR) and European partners where high power lasers system are in operation. The trainee will also be trained in the development of latest control system technologies, an important element of the overall system integration.



...STOP PRESS...

Due to the vagaries of the recruitment process delays occurred resulting in surplus funds that the EC agreed could be used to create additional short-term posts. Effective action meant that two new Fellows were engaged in time to attend the Advanced Laser School in Salamanca to initiate their time within the network. LA<sup>3</sup>NET welcomes:

**Ms. Lara Hijazi, recruited by GANIL**  
**Mr. Matthieu Veinhard, recruited by CERN**

...STOP PRESS...

## Fellows' Representative Succession

**Congratulations to Luca Stockhausen who has become the Fellows' representative for the all-important final year of the project.** Luca attended the latest Steering Committee meeting held in Salamanca along with Jacob Krämer (for an update on the Scientists Go Industry workshop) and outgoing representative Jurjen Couperus. Jurjen did a good job keeping the management informed of the Fellows' opinions and comments on the network throughout the year, his efforts were much appreciated by all.



## Partner News

### Laser Quantum Anniversary

**Now in its 20<sup>th</sup> year, having spun out of Manchester University in 1994, Laser Quantum is the UK's largest laser manufacturer with a wide range of products from the continuous wave technology to ultrafast systems, and has just expanded its ultrafast range with the acquisition of Venteon Laser Technologies GmbH, Hannover, Germany.**

Founded in 2008, Venteon is a world renowned manufacturer of few-cycle femtosecond laser systems (<5.5fs) and amplifier solutions. Venteon will remain at its current location in Hannover and all the current Venteon products will be available through Laser Quantum's sales offices.

Over the last 20 years Laser Quantum has grown from a university spin out to its current

position of over 100 employees covering more than 30 product ranges and with facilities in the UK, USA and now two in Germany. There are now more than 12,000 Laser Quantum lasers in laboratories and industrial settings worldwide covering applications including biomedical science, fundamental physics and aerospace as well as more niche markets such as bird scaring and art restoration.

After the successful integration of Gigaoptics in 2012, Laser Quantum continues to expand its product portfolio through acquisition, collaboration and internal R&D to deliver innovative, affordable laser solutions.

For further details please visit [www.laserquantum.com](http://www.laserquantum.com)



## Vacancy

There is a vacancy at CERN for an *Applied Physicist or Engineer with experience in solid-state, gas or optical particle detection technologies to work on particle beam sensors for the measurement of beam loss and transverse profiles*. The post is in Beams Department which hosts the Groups responsible for beam generation, acceleration, diagnostics, controls and performance optimisation for all CERN accelerators including the LHC. The work will be in the Beam Instrumentation Group and

collaborate with many different specialists in the field of physics, electronics, software and mechanics to master the challenges of precise particle beam measurement. The task will be to simulate, design, build, install and commission beam profile and loss monitoring systems in all of CERN's accelerators.

The closing date is 28<sup>th</sup> October 2014. See <http://jobs.web.cern.ch/job/11217>



## LA<sup>3</sup>NET Prize 2015

LA<sup>3</sup>NET is proud to offer an annual €1,000 prize and certificate to the young researcher judged to have made an outstanding contribution to research into the application of lasers at accelerator facilities.

To be eligible to be considered for the prize the researcher must be within the first five years of their professional career (starting from the date that they were awarded the qualification that would enable them to register for a PhD).

To apply send a description of your research contribution along with a letter from your supervisor verifying your application and a brief CV to the LA<sup>3</sup>NET coordinator [Prof. Carsten P. Welsch](#).

The deadline for application is 30<sup>th</sup> June 2015. All applicants will be informed of the decision for the 2015 prize before October. The decision of the project panel will be final.



## Joke Box

What do you call an electrician who detects faults?

Sherlock Ohms

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**LA<sup>3</sup>NET Events**

Nov 17 <sup>th</sup> -18 <sup>th</sup> 2014	Scientists Go Industry, Berlin, Germany
March 23 <sup>rd</sup> -24 <sup>th</sup> 2015	Beam diagnostics workshop, Mallorca, Spain
March 25 <sup>th</sup> -27 <sup>th</sup> 2015	LA <sup>3</sup> NET Conference, Mallorca, Spain
June 26 <sup>th</sup> 2015	Symposium on Accelerators for Science & Society, Convention Centre, Liverpool, UK

**Other Events**

Nov 23 <sup>rd</sup> – 29 <sup>th</sup> 2014	CERN Accelerator School on Plasma Wake Acceleration, Geneva, Switzerland
Jan 12 <sup>th</sup> – Feb 13 <sup>th</sup> 2015	JUAS: Science & Physics, Archamps, France
Feb 16 <sup>th</sup> –March 20 <sup>th</sup> 2015	JUAS: Technology & Applications, Archamps, France
March 11 <sup>th</sup> -13 <sup>th</sup> 2015	oPAC Topical Workshop on Computer Aided optimization of Particle Accelerators, GSI, Darmstadt, Germany
May 3 <sup>rd</sup> – 8 <sup>th</sup> 2015	IPAC15, Richmond, Virginia, USA
June 7 <sup>th</sup> – 10 <sup>th</sup> 2015	Laser Probing (LAP2015), East Lansing, Michigan, USA
Aug 23 <sup>rd</sup> -28 <sup>th</sup> 2015	FEL 2015, Daejeon, South Korea

**NOTICE BOARD**

**LA<sup>3</sup>NET's Mallorca Workshop and Conference**

Don't forget to register early for the [Topical Workshop on Beam Diagnostics](#) and the [International Conference on Laser Applications at Accelerators](#) at the end of March 2015. Both events will be held at the [Son Caliu Resort in Mallorca](#), Spain and a special discount of €50 applies for those attending both events.

DEADLINE FOR THE NEXT NEWSLETTER 30<sup>th</sup> November 2014

**About LA<sup>3</sup>NET**

The exploitation of Lasers for Applications at Accelerator facilities for ion beam generation, acceleration and diagnostics is the goal of this new Network within the FP7 Marie Curie Initial Training Network (ITN) scheme. In this frame, research centers, universities and industry partners from across Europe will develop beyond-state-of-the-art techniques and technologies through a joint inter-sectorial training program for early stage researchers within a unique European partnership.

*This project has received funding from the European Union's Seventh Framework Programme for research, technological development and demonstration under grant agreement no 289191.*



[www.la3net.eu](http://www.la3net.eu)

