

An Exciting Journey is coming to an end..., is it ?

Since its start in 2011 LA³NET has stormed from success to success. Our Fellows have achieved fantastic results in their research projects, we have organized a large number of Topical Workshops that joined the laser and accelerator communities, two international Schools in Caen (2012) and Salamanca (2014), an international Conference on Laser Applications at Accelerators (2015), in addition to a number of trainings that were specifically organized for our Fellows. The European Commission has recognized our work as an outstanding success and looking back I think we can all be proud of what has been achieved. LA³NET would naturally come to an end at the end of September, however, is it really time to go ? The Steering Committee at least doesn't think so. In its recent meeting it was decided to continue supporting our Fellows in their development and communicate their research results internationally, raise awareness of the need for further national and international training programmes in this exciting field, and also organize further events across the project's scientific work packages. *I believe this is an excellent decision and look forward to continue working with our partners internationally.*

Our final project review meeting and outreach [Symposium](#) in June was the cherry on top. The Supervisory Board had the opportunity to have a careful look at all project outcomes and was impressed by the research results and the progress our Fellows have made in their professional development.

Our Fellows themselves did an excellent job in presenting their R&D results to school kids from England's North-West. They received a lot of positive feedback from the next generation of researchers and managed to fascinate them with the science. Our invited speakers did an excellent job in presenting the latest research highlights in accelerator and laser sciences and everyone agreed that it was a day to remember.

I am delighted that our final LA³NET prize was awarded to one of our own Fellows. Congratulations, Andreas, to your excellent work ! We have awarded this prize on an annual basis and it was open for applications by researchers from around the world. Andreas impressed the Prize Committee with the breadth of his work and high quality publications, e.g. in Nature Communications.

We have included a selection of research highlights in this newsletter edition, some interesting upcoming events and several position vacancies. Since this now isn't the end of the project, we will be back with our next newsletter edition as usual in about three months.



Prof. Carsten P. Welsch, Coordinator

Special Interest Articles

- Research News
- The Future for Research Training in Lasers and Accelerators
- Fellows' Activity

Individual Highlights

- LA³NET Prize Winner 2015
- LA³NET at IPAC15
- Symposium an Inspiration for Future Physicists

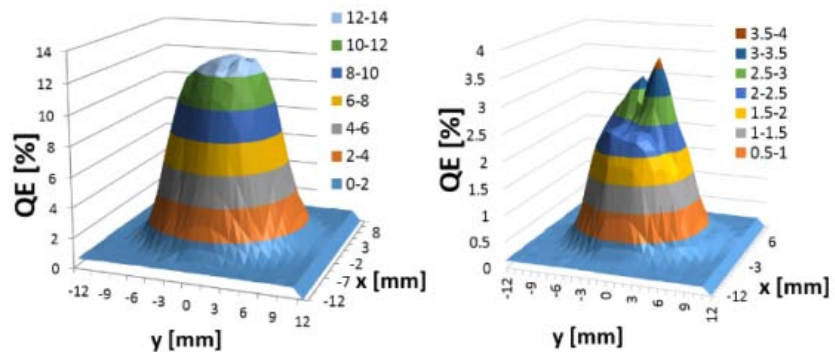
Research News

Irene Martini's Latest Measurements Shed Light on Photoemissive Deterioration of Photocathodes



As part of the research and development on photocathodes within the CLIC (Compact Linear Collider) project at CERN, photocathodes used in a RF photoinjector were characterized to investigate the correlation of their surface properties with their performance. Photocathodes are produced as thin films on oxygen-free copper substrate using a co-deposition technique and characterized in a dedicated laboratory with a DC photo-electron gun. A new UHV carrier vessel compatible with CERN's XPS (X-ray Photoelectron Spectroscopy) analysis equipment has been commissioned and is used to transport photocathodes from the production laboratory to perform a systematic study of different compounds used as photoemissive materials. The main challenge is to achieve high bunch charges, long trains and high bunch repetition rates together with sufficiently long cathode lifetimes. Cs₂Te cathodes, sensitive to an ultra-violet (UV) laser beam that were

produced at CERN showed good quantum efficiency and reasonable lifetime [1]. However, the available laser pulse energy in the UV for 140 μs long pulse trains is currently limited due to a degradation of the beam quality during the 4th harmonics conversion process. Using green laser beam in combination with Cs₃Sb cathodes would overcome this limitation. Cs₃Sb and Cs₂Te photocathodes were produced at CERN by co-deposition process and tested in the PHIN RF photoinjector, see [2]. LA³NET Fellow Irene Martini who is based at CERN led a detailed analysis of cathode surface composition through X-ray Photoelectron Spectroscopy (XPS) and correlated the findings to the cathode performance [3]. The Quantum Efficiency (QE) map shows an overall efficiency reduction in used cathodes as compared to newly produced ones, see image below, as an example. This can be explained by changes in the composition of the photoemissive layer.



QE maps of Cathode #198 (Cs₂Te) as newly produced (left) and used in the RF photoinjector (right).

XPS studies showed that both cathodes were oxidized during operation. Moreover, the detailed analysis of the XPS spectra measured on the used cathodes identified some compounds with the wrong stoichiometry

that could explain the poor photoemissive properties. Further studies on newly produced photocathodes are planned to better understand if degrading effect during photoinjector operation.

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Adapted from 'Surface Characterization at CERN of Photocathodes for Photoinjector Applications', I. Martini, E. Chevally, V. Fedosseev, C. Hessler, H. Neupert, V. Nistor and M. Taborelli, Proc. IPAC 15, Richmond, VA, USA (2015) (<https://jacowfs.ilab.org/conf/y15/ipac15/prepress/TUPJE040.PDF>).

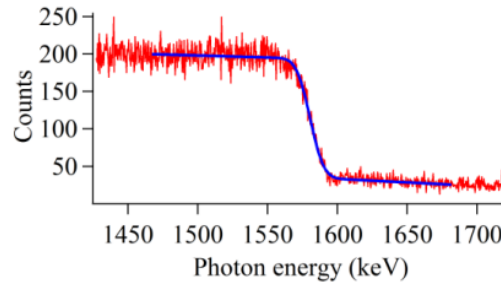


Cheng Chang Demonstrates Beam Energy Measurement Using a Novel Method of Compton Back Scattering

For Compton back scattering (CBS) measurements at storage rings, the electron beam energy of the stored beam can be determined from the known values of the electron rest energy, the laser photons energy, and the measured collision angle ϕ and Compton edge energy. A novel electron energy measurement setup based on the detection of Compton backscattered photons generated by laser light scattered off the relativistic electron beam has been proposed and developed for operation at the ANKA storage ring at the Karlsruhe Institute of Technology (KIT). In contrast to conventional methods based on head-on collisions, the setup at ANKA is realized in a transverse configuration where the laser beam hits the electron beam at an angle of around 90° . This makes it possible to achieve a relatively low-cost and compact setup since it only requires a small side-port instead of a straight section. This development could benefit storage rings with restricted space or where no straight sections are available, for example due to interferences with existing beamlines.

In the new setup, LA³NET Fellow Cheng Chang and colleagues used a High Purity Germanium (HPGe) spectrometer to determine the energy of the emitted photons [1]. The image shows a typical spectrum that was acquired from a 1.3 GeV electron beam over 120 seconds. The mechanical centres of two quadrupoles were used as reference line and the laser direction measured relative to this

line with a laser tracker and a camera. In addition beam position monitors were used to check the electron orbit orientation relative to the reference line.



Measured CBS spectrum at 1.3 GeV with fit to determine the Compton edge energy. Signal integrated over 120 seconds.

The collision angle ϕ was determined from this measurement and yielded an average value of the beam energy of $1287.0 \text{ MeV} \pm 0.2 \text{ MeV}$. As compared to conventional CBS methods for energy measurement, a compact setup based on a transverse scheme has been successfully tested at ANKA. These measurements have been extended to beam energies of 0.5 GeV, 1.6 GeV and 2.5 GeV and gave promising initial results. It was shown that longer acquisition times can help further reduce statistical uncertainties in the Compton edge and hence beam energy. This might give access to measurements uncertainties of E_{max} to below a few 10^{-5} in the future.

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Adapted from 'First Results of Energy Measurements with a Compact Compton Backscattering Setup at ANKA', C. Chang, E. Bründermann, E. Hertle, N. Hiller, E. Huttel, A.-S. Müller, M. J. Nasse, M. Schuh, J. L. Steinmann, H.-W. Hübers and H. Richter, Proc. IPAC 15, Richmond, VA, USA (2015) (<https://jacowfs.jlab.org/conf/y15/ipac15/prepress/MOPHA040.PDF>)

Simulation Studies by Yelong Wei Provide Values for Dielectric Laser Acceleration

Dielectric laser-driven accelerators (DLA) based on a grating structure have strong potential as ultra-compact electron accelerators, benefitting from high acceleration gradients of up to GV/m and mature lithographic techniques for the fabrication of the microstructures. Within LA³NET, Aimiering Aimidula completed initial studies into the optimization of such gratings structures, modifying a range of geometry parameters and critically assessing their impact on the acceleration efficiency [1]. Fellow Yelong Wei from the Cockcroft

Institute/University of Liverpool has been building on this early work to investigate acceleration of relativistic and non-relativistic electrons in double gratings silica structures using different harmonic modes of the accelerating field [2]. When a double grating structure is driven by two transverse magnetic (TM) polarized lasers from opposite sides, different harmonic modes of the accelerating electric field are simultaneously excited, see image below.

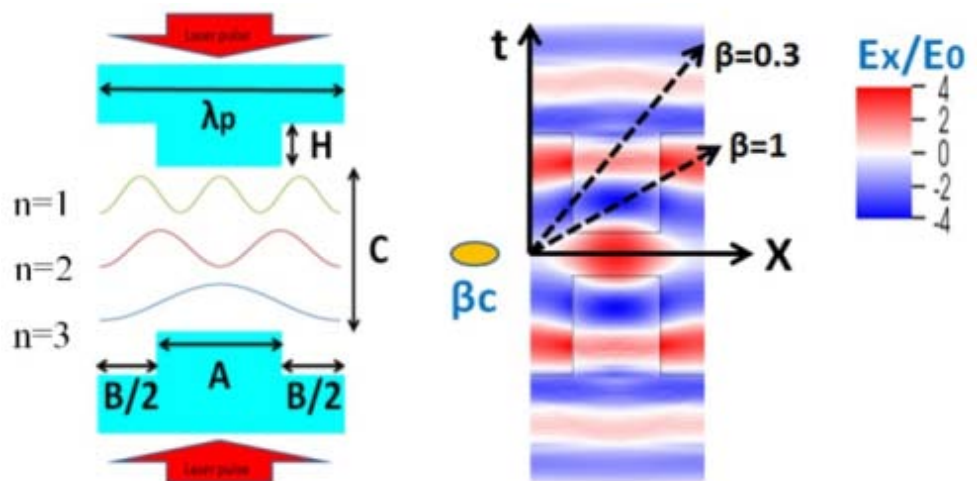


Illustration of the first, second and third spatial harmonic mode in one grating period, driven from opposite sides by lasers.

Simulations were carried out into the acceleration efficiency using the commercial CST and VSim simulation codes assuming an erbium-fiber laser emitting a wavelength of $\lambda_0=1550$ nm and silica with a refractive index of $n=1.528$ as the substrate. Both codes yielded very similar results over a wider range of parameters, supporting the findings of earlier studies. For highly relativistic electrons a maximum achievable acceleration gradient of around 2.2 GV/m was found. For non-

relativistic electrons at $\beta=0.3$ the first spatial harmonic gave access to the largest acceleration gradient of around 0.33 GV/m, as compared to 0.25 GV/m for the second harmonic and 0.16 GV/m for the third harmonic. Taking into account manufacturing constraints a grating period of 930 nm was found to be optimum in terms of simplicity of production and acceleration efficiency. This work will now be extended towards multistage acceleration.

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Network News

The Future for Research Training in Lasers and Accelerators

Recent articles in magazines such as **Physics World** and **Accelerator Science** have highlighted the importance of researcher training provided by projects such as LA³NET and the need for such networks to be maintained. The importance of lasers and accelerators to the future of the European economy was shown in the roadmap of vital scientific infrastructures for international competitiveness in the European Strategy Forum for Research Infrastructures (ESFRI). In fact, Europe is already investing heavily in world-leading facilities such as the x-ray Free Electron Laser (XFEL) in Hamburg which will enable biological and chemical processes to be studied in ever-shorter time-scales and greater resolution. There is also the European Spallation Source (ESS) under construction in Lund, Sweden which will be the highest power neutron facility in the world and the upgrade of the Large Hadron Collider (LHC) at CERN, Switzerland, already the highest energy particle accelerator and collider in the world. The next generation of world-beating large lasers is also under construction as the Extreme Light Infrastructure (ELI) located at three centres in east Europe.



Planned ELI centres.

Closer to market there is a growing need for accelerators for applications in security, healthcare, the food industry and for resolving environmental issues. This means

that more companies are involved in developing accelerator systems and although a number of higher education institutes have established accelerator physics courses, the training of accelerator scientists is not keeping up with demand. National initiatives are insufficient to supply the scientists and engineers to commission, operate and optimise Europe's facilities and so more Europe-wide coordinated training needs to be established and supported.

The importance of lasers for developing the next generation of accelerators is particularly relevant in the following areas:

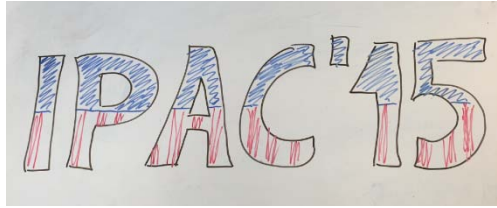
- Laser-based particle sources are well suited for delivering the highest quality ion and electron beams.
- Laser acceleration has demonstrated unprecedented accelerating gradients and might be an alternative for conventional particle accelerators in the future.
- Laser-based beam diagnostics provide the only way to characterise many complex particle beams.

LA³NET serves as an example of the benefits of network training built on project-based research within an international consortium of universities, research centres and industry. Based on the success of the project a memorandum of understanding has been drawn up to enable the consortium to sustain the network to ensure maximum benefit is achieved from the research and training already completed. However, further funding is required to keep the pipe-line open for the specialist training of subsequent generations of graduates in this field.

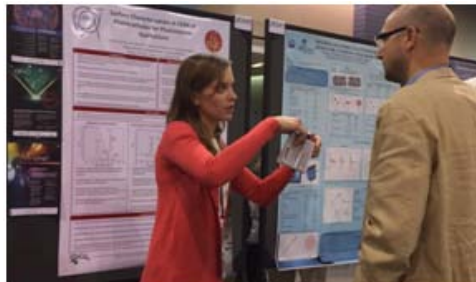
<https://www.liv.ac.uk/la3net/news/stories/title,623409,en.html#.VddEB7FwZ9M>



LA³NET in the United States I: IPAC15



Yet again LA³NET had a strong presence at IPAC, the International Particle Accelerator Conference, held this year in historic Richmond, Virginia, USA from 3rd to 8th May. Four LA³NET Fellows contributed to the conference presenting posters with article reproduced in the conference proceedings. **Irene Martini** from CERN, **Yelong Wei** from University of Liverpool/Cockcroft Institute, **Cheng Chang** and **Andrii Borysenko** from KIT presented the most recent results of their research attracting wide interest from other delegates resulting in fruitful discussions at their posters stands.



Irene Martini describes surface characterization of photocathodes



Yelong Wei explains his work on dielectric laser acceleration

In addition, Prof. Carsten P. Welsch presented an overview of the project and the project manager, Ms. Magda Klimontowska maintained an industry stand to promote the LA³NET network to the international accelerator community.

The stand displayed journal publications, the project's brochures and selected videos produced by the Fellows. In this way the project outcomes were publicized highlighting the achievements of the Fellows to raise their profiles for attracting future job opportunities. Combined with a quiz for delegates and merchandising the stand was a dynamic attraction popular with passing delegates.



Industry stand at IPAC15

LA³NET in the United States II: LAP2015



As well as promotion of LA³NET activity, supporting young researchers in the field of laser and accelerator research is an important objective of network. Consequently, LA³NET was proud to sponsor best poster awards for early stage researchers at the 7th International

Conference on Laser Probing (LAP2015) held between the 7th and 10th June at the Michigan State University, US. The announcement of the winners was made by Kei Minamisono, co-chair of the LAP2015 Local Organizing Committee with the prizes going to the following researchers:



- *Reto Trappitsch*, University of Chicago, “Resonance Ionization of Nickel Isotopes”.
- *Hillary Asberry & Andrew Miller*, Michigan State University, “Off-line Production of Transition Metal Ions for Collinear Laser Spectroscopy at BECOLA/NSCL”.
- *Maxim Nesterenko*, Novosibirsk State University, “Absolute Frequency Measurements of the Emission Transitions of Iodine in the Wavelength Regions 980 nm and 1060 nm”.

LA³NET Prize Stays In-house

It is fitting that in the final year of the project the LA³NET prize should go to one of the project's Fellows, our very own **Andreas Döpp**. His work was voted as making the most outstanding contribution to the application of lasers at accelerators from the applications received. A simple overview of his work can be seen in the video available at <https://vimeo.com/laserplasma>.

Andreas is hosted in the LA³NET network by the Spanish Pulsed Lasers Centre (CLPU) in

Salamanca, Spain. During the course of the project Andreas developed close collaboration with LOA (Laboratoire d'Optique Appliqué) in Palaiseau, France, which has had important impact on his research.

His work was considered remarkable in advancing the state-of-the-art in the development of new applications of laser plasma accelerators and new perspectives for the laser plasma light sources.



Andreas Döpp receiving the 2015 LA³NET prize from Professor Carsten Welsch and Project Manager Magda Klimontowska during the Symposium on Lasers and Accelerators for Science & Society in Liverpool.

LA³NET Brochure Updated

The brochure summarizes the research completed by the Fellows during the project along with details about the consortium members, training programme and outreach activities. The brochure was realized in close collaboration between all project partners and will be used to showcase the Fellows and their research at future conferences and events. A copy is available via:

www.liv.ac.uk/la3net/la3net_brochure/



LA³NET Events

Symposium an Inspiration for Future Physicists

In a joint effort between LA³NET and the OPAC, the outreach symposium on Lasers and Accelerators for Science and Society held at the Liverpool Convention Centre in June was truly inspirational. The event was a sell-out with 150 local A-level students and teachers joining 100 researchers from across Europe with the aim to enthuse the youngsters about science and the application of lasers and accelerators in particular. In that sense the event was a great success with feedback from students commenting about ‘discovering the unknown’, ‘innovation’, ‘beating cancer’, ‘pioneering new technology’ and ‘a possible career’.



Feedback from students.

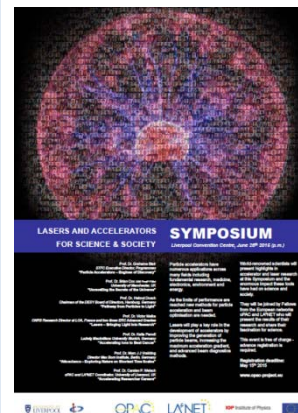
The Symposium was coordinated by Professor Carsten P. Welsch, the LA³NET coordinator. Professor Welsch explained: “This discipline offers enormous opportunities for scientific discovery but also professional development. Research Fellows from the training network LA³NET have in three years become experts in their discipline but also have developed skills in physics, engineering, IT, data analysis and project management. The involvement of

partners from industry and academia and the opportunity to work at research institutions across Europe has provided training that would be impossible by one company or one country alone.”



Prof. Grahame Blair, Executive Director of the Science and Technology Facilities Council, inspired the audience with his talk “Particle Accelerators – Engines of Discovery”.

The symposium’s main focus was a series of talks from renowned speakers such as Professor Grahame Blair, STFC’s Executive Director who explained how accelerators are used to create x-rays for use in material science, chemistry and biology. Access to this technology and skills is creating a cluster of high-technology companies at Enterprise Zones in the UK working in this field and creating exciting career opportunities for young people.



It is now possible to watch all of the presentations online including talks from other leading international scientists such as Professor Victor Malka (LOA, France), Dr Ralph Aßmann (DESY, Germany) and Professor Brian Cox (University of Manchester, UK), best known to the UK public for his television programmes about the origins of the universe. This [online resource](#) provides a unique introduction to this fascinating area of science and technology.



The Fellows presented the results of their research and shared their fascination for science.



Prof. Katia Parodi from LMU talking about "Accelerating Ions to Beat Cancer"

The Symposium also showcased a portfolio of projects from researchers at the forefront of this exciting field of science and engineering through an interactive poster session with Q&A. This gave the young people attending the symposium the opportunity to see how scientists just a few years older than themselves are pushing back the boundaries of knowledge.

Paul Taylor, Head of Physics at Merchant Taylors' School, commented that the event had been inspiring for his students, many of whom are now considering studying physics at Liverpool or Manchester universities.



Prof. Carsten P. Welsch and Prof. Brian Cox with some of the school girls who attended the symposium.

Advanced Researcher Training

The transition to permanent employment from postgraduate research is a challenging prospect in an ever more competitive job market. This was addressed for the Fellows with a four-day workshop on advanced researcher skills including knowledge transfer and spin-outs to give dedicated and practical support towards their future careers. External and internal trainers provided training and support in career planning by providing practical and specific advice on CV writing and interview skills, writing competitive grant applications and science communication and networking.

In order to address knowledge issues, the University's Business Gateway team and Dr. Marco Palumbo, IPS Fellow in the physics department, contributed dedicated sessions on intellectual property rights, commercialization and entrepreneurship that were very positively received by the course participants.

Professor Carsten P. Welsch who directed the overall training said: "The workshop provided an excellent environment to discuss effective

strategies for communicating research achievements, to develop skills that prove useful in job interviews and create awareness of the wider societal impact of research, including commercialization. We have received excellent feedback from the course participants and are convinced that this will help them in their next career moves."



Following the success of this event, a similar course was provided by Professor Welsch to final year post-graduate researchers (PGRs) from the University of Liverpool's School of Physical Sciences and the approach is to be adopted by the University.



Fellows during the Advanced Researcher Skills Workshop.

Upcoming Events

Watch this Space

The LA³NET Steering Committee will finalise the details of follow-on events for 2016 once the Memorandum of Understanding has been signed for partners wishing to sustain the

network beyond the end of September 2015 when the official contract and funding from the EC ends. Suggestions of topics and ideas about future topical workshops are welcome.

oPAC Conference on Accelerator Optimization



Now is the last chance to register for the [International Conference on Accelerator Optimization](#) before registration closes on 7th September. The conference will take place from 7th to 9th October 2015 at the [Centro Nacional de Aceleradores \(CNA\)](#) in Seville, Spain bringing together research communities from beam diagnostics, control systems and beam dynamics. The programme consists of invited and contributed talks with proceedings to be published in a special edition of PR-STAB. For more details of the topics and speakers visit the conference website: indico.cern.ch/event/380975/.



Fellows' Activity

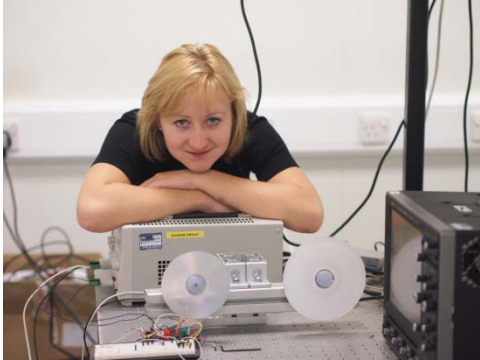
Lara Hijazi's Exposure to the Commercial World Courtesy of Laser Quantum



This August while most of Europe was enjoying the holidays, Lara Hijazi was at Laser Quantum in Constance in Germany gaining experience of state-of-the-art science in the commercial world. Here Lara observed the production of different femtosecond laser cavities for laser systems to operate at different wavelengths and for a variety of applications. She was also introduced to the company's ultrafast laser products spanning GHz and MHz, THz spectrometers and continuous wave products. All the produced laser systems are solid state based on Ti:Sa lasers.

Lara also participated in the design of a laser system cavity called Venteon which is a compact system with the pump laser incorporated inside to provide a robust source for ultrashort pulses of less than seven femtoseconds. She also gained hands-on experience soldering DC chips to be used in a laser stabilizer system and through this learned how the electronics inside a stabilizer are arranged. During this intense two-week secondment Lara also assisted with some technical aspects of a THz transmission spectrometer and in cleaning optical mounts for use inside Ti:Sa laser cavities.

Award to Encourage Entrepreneurship



We are delighted to announce that LA³NET Fellow [Alexandra Alexandrova](#) has been awarded a Royal Society of Edinburgh/STFC (RSE) Enterprise Fellowship. This prestigious award will allow Alexandra to focus on refining her business ideas for the development of a laser-based velocimeter for the characterization of gas targets used in non-invasive beam profile monitors or in other industry applications. Additional ideas

for optical diagnostics that have been developed by her [QUASAR Group](#) colleagues will also be explored.

The aim of these fellowships is to support promising researchers from science and technology to grow into successful entrepreneurs through development of business aspects of their work whilst gaining access to some of the best commercial training and mentorship available in the United Kingdom.

Prof. Carsten Welsch, head of the Liverpool Accelerator Physics Group, said: "I am very happy about this news. Alexandra is an outstanding researcher who has been working at the interface between academia and industry for many years. She has already benefited from significant training within the LA³NET project and the RSE/STFC Enterprise Fellowship will now allow her to refine her business ideas and pave the way for a spin-off company."

LA³NET Fellows Take the Lead

In July the University of Liverpool held its 13th Annual Learning & Teaching Conference and for the third year running a presentation was made on aspects of the complementary skills training implemented through LA³NET.

The presentation focused on three of the principles for good practice set out by the EC for innovative doctoral training: transferable skills training, international networking and exposure to industry. These principles were addressed by giving the LA³NET Fellows the opportunity to organize their own European

workshop with support from the EU Project TEAM at the University of Liverpool. Consequently, the Scientists Go Industry workshop was born. This brainchild of the Fellows was aimed at exploring the future career options for post-doctoral level researchers outside of academia and with external delegates was a sell-out. Details of the organization and implementation of the workshop were presented by Dr. Rob Ashworth with Luca Stockhausen expounding the fellows' experience and lessons learnt.



School's Never Out for Ever

One of the aims of Marie Curie ITN projects is to attract young people to science. To this end LA³NET Fellows engage with schools and make visits to meet with pupils and students of different ages to introduce them to science

Cheng Chang from Karlsruhe Institute of Technology visited a sixth form class at the European School in Karlsruhe (ESKA), Germany to talk about his project. For the students it was an interesting and practical alternative to their usual classes prompting questions about the speed of electrons, the uses of gamma rays and the energy costs of a large research facility.



Mateusz Tyrk returned to Poland from his current base working for the University of Dundee to visit three schools in his hometown region to explain what a top international scientist is. He described his life as a scientist by telling them about the great opportunities open to live in and visit different countries to work with other leading

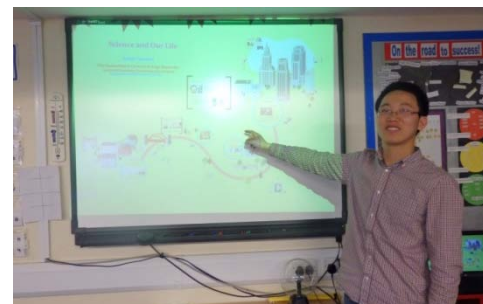
Yelong Wei from the University of Liverpool visited a primary school in Leigh near to the Cockcroft Institute where he is based to explain about his work and run fun experiments to engage the children in scientific thinking.

and the life of a scientist. Before the 2014/5 school year was over for the summer holidays a number of LA³NET fellows were able to share their passion for science with school children from different countries.



The fellows from GANIL, **Lara Hijazi and Jose Luis Henares** visited the Jacques Prévert school in Verson, France to talk with school children aged 12 -15 about their work at GANIL. The visit was organized with the Club Europa project and since one of the topics of 2015 is European mobility, Lara and Jose also shared views on their life experiences and topics such as the diversity of languages, the advantages of mobility and prospects of an integrated Europe.

specialists and contribute to different workshops and conferences all over the world. Mateusz introduced the pupils to his project by explaining what nanoparticles, accelerators and electro-optics are. He also presented various practical demonstrations of the polarization of light and luminescence based 'explosives' sensing.





Meanwhile in Sofia in Bulgaria, **Stanimir Kisyov** engaged with school students interested in physics describing his research in lasers and neutrons via a poster on "Neutron production using terawatt laser pulses". As well as discussing his work with them he also spoke about physics in general, their interest in it and what are the opportunities for future work may be for physics graduates.

To Find Out How – Look on YouTube

Now that nearly all of the Fellows have publicised their work via YouTube explanations of the research undertaken within LA³NET is accessible to all. These videos are available alongside others of a similar nature on the QUASAR Group's channel on YouTube:

www.youtube.com/user/QUASARGroup.



[Mateusz Tyrk's video](#) debunks the haggis-hunting, kilt-wearing Scottish stereotypes myth while presenting his work on electro-optic (EO) techniques for bunch length measurements.

[Andreas Döpp](#) who is based at CLPU in Spain shows the passion he has for his research talking about laser plasma lenses and [Luca Stockhausen](#), also at CLPU, presents a clear lecture on his research and its importance for future progress in treating cancer.

A number of the other Fellows made animations to present their work in an accessible graphic way. In this way [Yelong Wei](#) from the University of Liverpool in the UK describes his work on designing dielectric laser-driven accelerators.

[Jurjen Couperus](#) at HZDR in Germany shows how laser wakefield acceleration works to boost electrons and [Rui Pan](#) explains his work on beam arrival time monitors at STFC in the UK.

Finally, [Stanimir Kisyov](#) shows how his work based at IFIN-HH in Romania is progressing on the production of neutrons from laser-driven nuclear reactions.

Click on the names to watch the videos!

Partner News

Multiplying the News

Alexandra Welsch from the EU Project TEAM at the Cockcroft Institute has been appointed UK editor of Accelerating News and through this published an article about the LA³NET Conference in Mallorca. Accelerating news is a quarterly online publication for the accelerator community. The publication showcases news and results from the biggest accelerator research and development projects such as EuCARD-2, High Luminosity LHC, TIARA, FCC, accelerator-related Marie Curie networks, CERN-EC support to SESAME, as well as interesting stories on other accelerator applications.

The newsletter also features upcoming accelerator research conferences and events. See acceleratingnews.web.cern.ch/.



Acc Laser and accelerator communities converge in Mallorca
by Magdalena Klimosonowa (UNILF), Rob Ashworth (UNILF)

LA³NET Laser and particle accelerator scientists met in the town of Palma de Mallorca in March 2015. These two scientific communities were brought together with renowned speakers invited to lead sessions complemented by contributed talks from delegates. In this way, ideas at the forefront of these two fields were shared. This contributed to advancing knowledge towards the development of more functional and cheaper accelerators with ever more diverse applications from health, industrial processes and security through to fundamental research.

The meeting was held by the EU-funded project LA³NET. This large Marie Curie Initial Training Network is coordinated by the University of Liverpool to train 39 early stage researchers at doctorate level in novel projects relating to the applications of lasers at accelerators. These researchers are hosted by research centres, universities and industry partners across Europe with additional training provision from other members of the network's ecosystem.



Dr. Nathalie Lechner (GSI) giving a talk about Ion beam and laser beam diagnostics for laser ion sources.

One Step Beyond the LHC: The European Circular Energy-Frontier Collider Study

Various LA³NET partner organizations will continue working together in a consortium of sixteen beneficiaries through The European Circular Energy-Frontier Collider Study (EuroCirCol) coordinated by CERN. This includes the University of Liverpool, STFC (UK), Karlsruhe Institute of Technology (Germany) and INFN (Italy). The project is a conceptual design study for a post-LHC research infrastructure based on an energy-frontier 100 TeV circular hadron collider. The four-year study will receive 3 M€ funding from the European Union via the Horizon 2020 Research and Innovation Framework Programme to help maintain Europe in pole position in global particle physics research. The objective of this ambitious project is to develop the conceptual design of a future energy frontier hadron collider infrastructure as an international, collaborative effort under

European leadership. A new research infrastructure of such scale depends on the feasibility of key technologies pushed beyond the current state of the art. Innovative designs for accelerator magnets to achieve high-quality fields up to 16 T and for a cryogenic beam vacuum system to cope with unprecedented synchrotron light power are amongst the many challenges that will be addressed. Advanced energy efficiency, reliability and cost effectiveness are additional key factors to be considered for building and operating such an accelerator within realistic time scale and cost.

The University of Liverpool will be in charge of the project's communication, information dissemination and outreach activities, including events organization. For more information, please visit the project web site: www.eurocircol.eu.

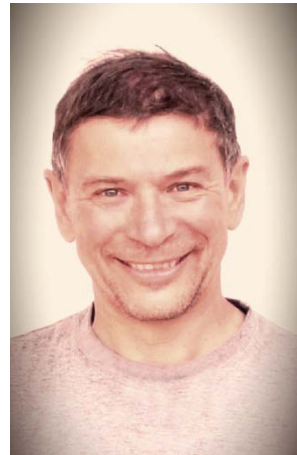


Sergey Vinogradov from Cockcroft Institute elected as IEEE Senior Member

Dr. Sergey Vinogradov, a senior Marie Curie Fellow at the Cockcroft Institute working with LA³NET Fellows from the University of Liverpool, has been elected as a Senior Member of the Institute of Electrical and Electronics Engineers (IEEE). Based on strong support by his collaboration partners and existing IEEE Fellows from the IEEE Nuclear and Plasma Sciences Society, his outstanding achievements in research, development, characterization, modelling, analysis, and applications of Silicon Photomultipliers (SiPMs) were recognized with this prestigious award.

Members of the IEEE community, especially from the Nuclear and Plasma Sciences Society, were amongst the first who

anticipated the huge application potential of silicon photomultiplier (**SiPM**) technology, initially developed in Russia in the late 1980s – early 2000s. They were also amongst the first who evaluated SiPMs in a variety of applications related to nuclear physics and nuclear medicine, including hadron calorimetry, neutrino detection and positron emission tomography. Sergey has now developed advanced probabilistic models of SiPM response and performance in photon number and time resolution, and recently, of arbitrary waveform signal detection in beam loss monitoring systems with Cherenkov fibre readout as part of his work in the QUASAR Group, with [Prof. Carsten Welsch](#).



More News...

Crowdsourcing effort - The Secrets of the Universe

In order to reach a wider audience a 3D IMAX film about the scientific discoveries at CERN and their relevance to fundamental questions about the universe is planned for distribution via science centres and museums. The film is being funded through crowdsourcing to match a grant with a large

proportion of the budget already pledged. The film is "The Secrets of the Universe" to be launched by the creators of "Particle Fever". www.indiegogo.com/projects/explore-the-secrets-of-the-universe-at-the-lhc#/story



Important Milestone towards the Realization of the ELI Beamlines Project

The ELI Beamlines Scientific Challenges 2015 and grand opening of the new building represent an important step in the European Light Infrastructure project. The conference, user meetings and opening ceremony will be held from 19th to 22nd October 2015 in the new building of ELI Beamlines in Dolní Brezany and at the Stirin Castle in the Czech Republic. The combined conference and prospective user meetings will serve to introduce the experimental capabilities of the facility and to get feedback on user needs

concerning experimental capabilities and organizational support. The grand opening of the new ELI building will be celebrated with guests from the scientific communities and industry as well as representatives from politics.

Visit the official web page for more information and for registration: research.eli-beams.eu/indico/event/sch2015



Vancacies

Professor/Reader at Lancaster University in Novel Methods of Particle Acceleration

As a founding member of the Cockcroft Institute and with a very highly ranked Physics Department, Lancaster University is seeking to appoint a Professor or Reader in Novel Methods of Particle Acceleration who will hold a significant leadership position in the Institute with major responsibility for developing its programme of research in novel acceleration techniques. The post

concerns experimental research around novel methods of particle acceleration including plasma wake field, dielectrics, photonics and meta-materials based acceleration techniques. Deadline for applications: 18th November 2015. For further details see: hr-jobs.lancs.ac.uk/Vacancy.aspx?ref=A1339

Postdoctoral Level Vacancies

Among the job websites brightrecruits.com/ often has relevant positions although it tends to be UK focussed. Two current examples are shown:

First Light Fusion Ltd in Oxfordshire, UK are looking for an experimental physicist with theoretical knowledge in high energy density related physics: brightrecruits.com/job/7898/experimental-physicist.

TeraView Ltd want someone with experience in semiconductor device physics in the field of terahertz devices: brightrecruits.com/job/7894/terahertz-device-physics.

Joke Box

Why does a hamburger have lower energy than a steak ?

Because it's in the ground state.



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Events

Sep 13 th – 17 th 2015	IBIC, Melbourne, Australia
Sep 13 th – 18 th 2015	International Conference on RF Superconductivity, Whistler, Canada
Oct 5 th - 10 th 2015	International Conference on Atomic Physics, Suzhou, China
Oct 7 th - 9 th 2015	oPAC Accelerator Optimization Conference, Seville, Spain
Oct 12 th – 16 th 2015	International Computational Accelerator Physics Conference, Shanghai, China
Oct 19 th – 22 nd 2015	ELI Beamlines Scientific Challenges 2015, Dolní Brezany, Czech Republic
Nov 19 th – 21 st 2015	ALPA 2015, Venice, Italy

NOTICE BOARD

A Memorandum of Understanding (MoU) has been distributed to the scientist-in-charge of all of the partners in LA³NET for a continuation of the LA³NET network beyond the term of the original contract and cessation of funding from the European Commission. The aim of continuing the network is to maintain consortium links to promote the work of the Fellows, help bring career opportunities to the attention of the Fellows, to continue to communicate R&D results from partner activity internationally and strengthen the links between the laser and particle accelerators communities. It would be appreciated that all relevant parties would sign and return this MoU as soon as possible if interesting in continuing to be a network partner.

DEADLINE FOR THE NEXT NEWSLETTER 30th November 2015

About LA³NET

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