2016

Extreme Light Infrastructure

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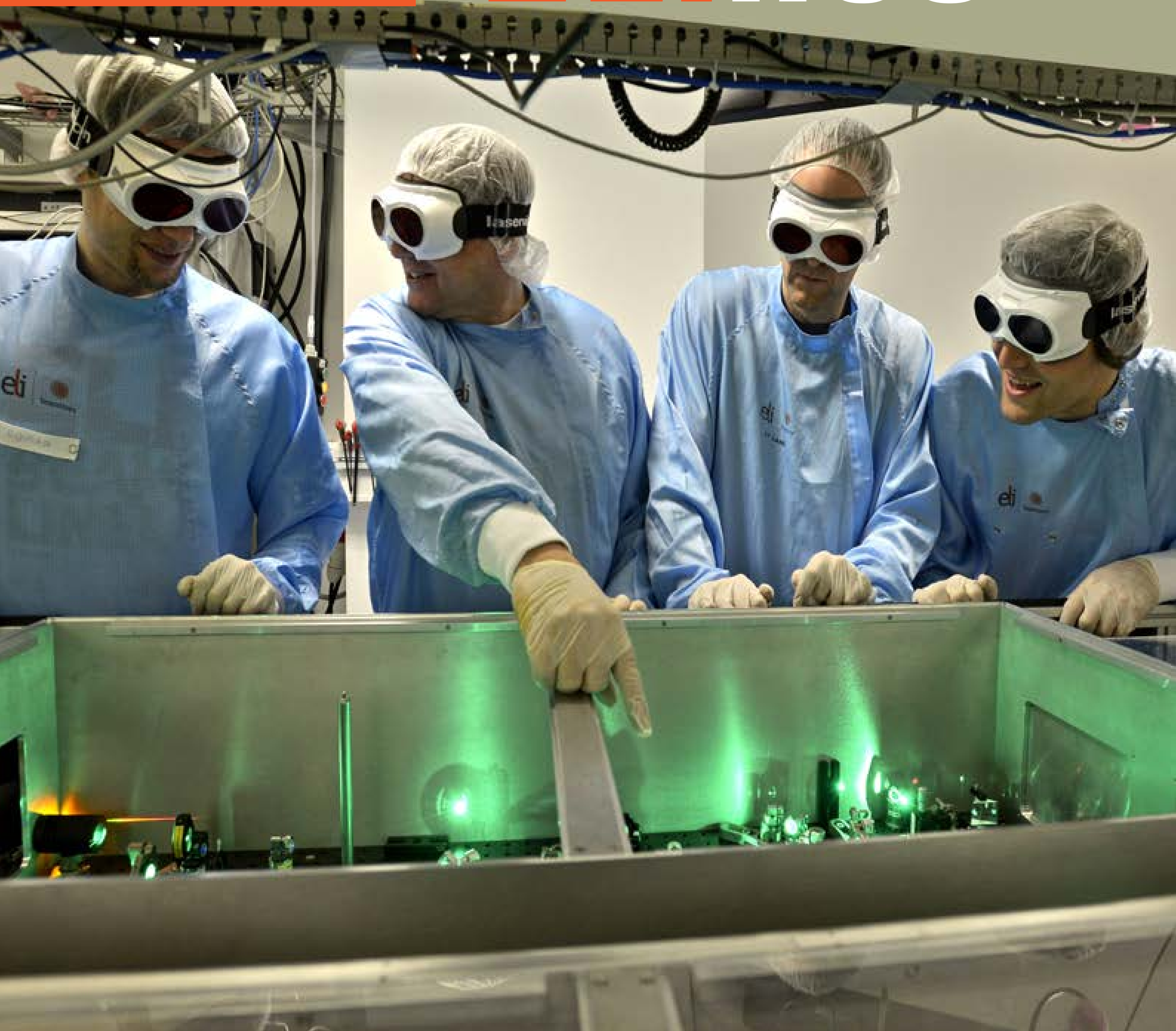
ELInes



I. Editorial

Carlo Rizzuto

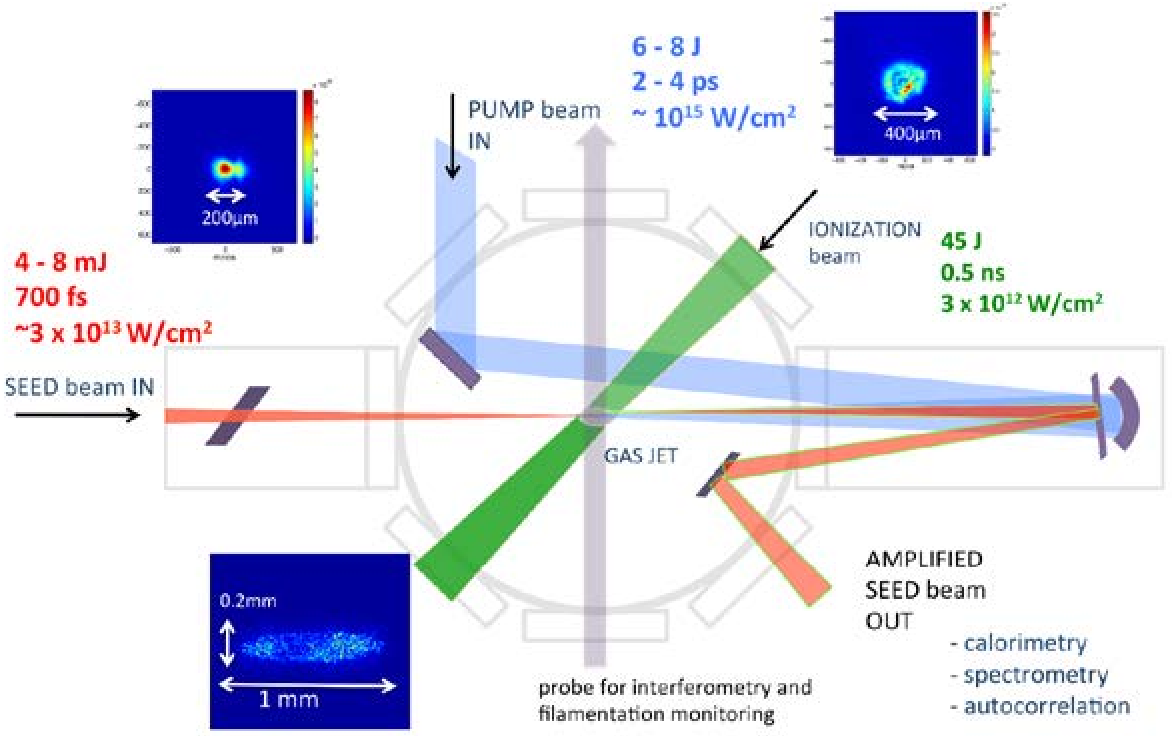
While the three pillars are working hard on the activities connected to the acceptance tests of the buildings and the first installations of the instrumental facilities, the activities towards setting-up the ELI-ERIC have been moving forward on various fronts: the formal one, consisting of the definition of the Statutes and a first draft of Regulations, and the more substantial one consisting of editing the Scientific and Technical document for the European Commission which describes the achievements in the construction and the perspectives for services to users. During the meeting with the prospective partners in Dolní Břežany on the 30th of June and the 1st of July, this issue will be described more in detail, and will hopefully result in several ideas to be embedded in the documents mentioned above.

The past months we have also seen a much stronger integration of the management of the three pillars into one common effort. More and more we are acting as the common Board of Directors of ELI-ERIC. The new ISTAC, the International Scientific and Technical Advisory Committee, has elected as first Chair Sandro De Silvestri, and is already having an impact on the common scientific outlook. The mutual trust and understanding which has been built has also allowed the three Host Country Governments to move forward and a first important target has been reached by Romania, approving the appropriate conditions to host the first Statutory Seat, which will then rotate between the three pillars to underline the equal importance and aspiration for international achievements of the three host countries.

Carlo Rizzuto
Director-General, ELI-DC International Association AISBL

II. Contents

III. Highlights



ELI Beamlines
The experimental layout for the plasma amplification experiment.

3.1 ELI Beamlines – Plasma amplification in Physical Review Letters

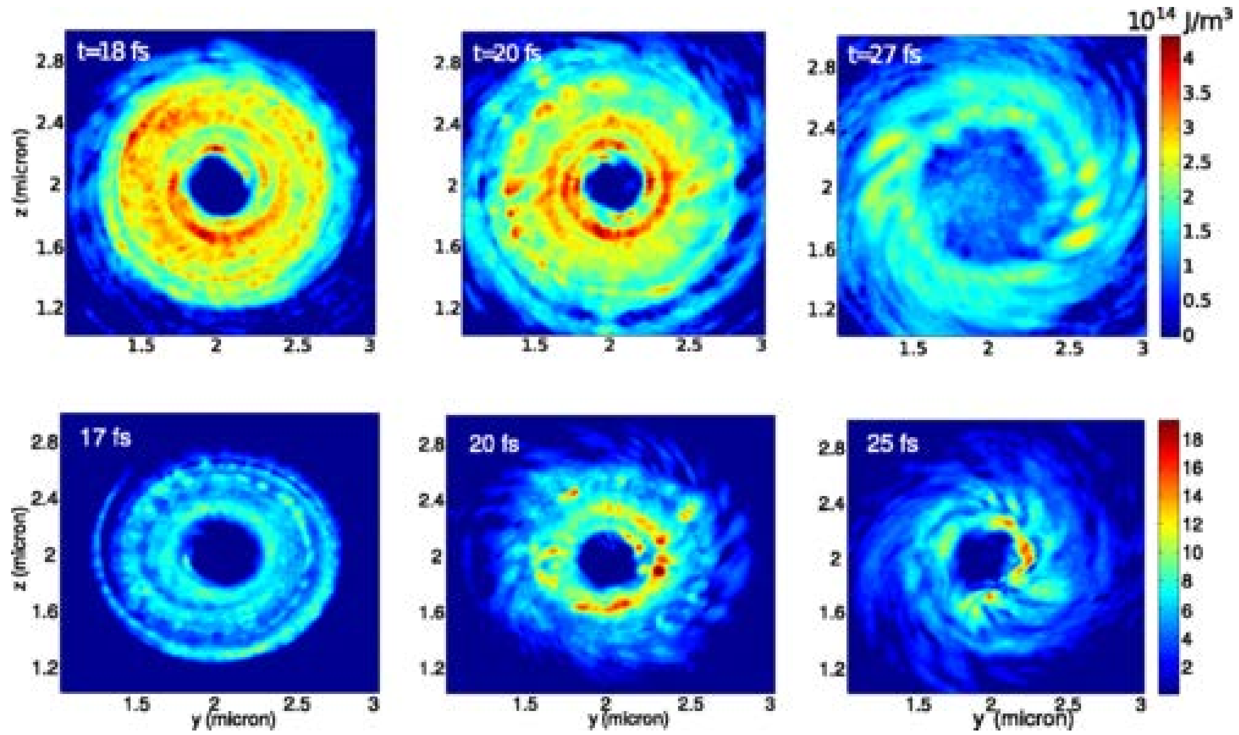
Recently, a team of scientists including Stefan Weber from ELI Beamlines published an article in *Physical Review Letters* on plasma amplification. Plasma can sustain much higher energy fluxes than standard optics and will allow amplification of light pulses to power levels beyond 10 petawatt. The team investigated the spectral characteristics of the amplified pulse in order to better understand and control the amplification process.

Read the article here: http://journals.aps.org/prl/abstract/10.1103/PhysRevLett.116.075001

3.2 ELI-NP – Technical Design Reports

The *Romanian Reports in Physics* recently featured a supplement entirely devoted to the technical design of the ELI-NP facility. Besides the key article about the laser facility itself, the publication also comprises extensive descriptions of the experiments which will be possible at the Romanian site.

Read the supplement here: http://www.rrp.infim.ro/inpress.html



ELI-ALPS
Averaged energy density distribution viewed from the direction of laser propagation corresponding to the cylinder (top) and cone (bottom) targets.

3.3 ELI-ALPS – Simulation of attopulses generation

In *Phys. Rev. E*, ELI-ALPS researcher Zsolt Lécz together with Alexander Andreev from the Max Born Institute published an article on simulating the generation of high-intensity attopulses in cylindrical geometry. The large incidence angle and constant ponderomotive pressure lead to nanobunching of relativistic electrons responsible for the laser-driven synchrotron emission. The researchers developed a numerical method to find the source and direction of the coherent radiation that ensures the existence of attopulses.

Read the article here: http://journals.aps.org/pre/abstract/10.1103/PhysRevE.93.013207

IV. Scientific experiments and new research opportunities

4.1 Introduction

One of the key missions of the Extreme Light Infrastructure, ELI, is to prepare and make available to the academic and industrial international users communities beyond state-of-the-art high-power laser and gamma-ray production technologies, together with innovative and unique experimental stations. Altogether, starting from 2018, these will enable unprecedented discoveries in many disciplines, the birth of new research fields, such as nuclear photonics, and novel applications, which can change for ever our lives. Till then, thanks to our creative researches and engineers, in the following pages we would like to share with our readers our dreams for the future, an open invitation to join and support ELI's endeavour.

4.2 Gamma beam experiments at ELI-NP

By Dimiter L. Balabanski

ELI-NP will provide brilliant narrow-bandwidth gamma beams of energies up to 19.5 MeV with a spectral density of 10^4 photons per second per eV, two orders of magnitude higher to what is available nowadays. This will open an avenue for photonuclear experiments at frontiers unreachable today.

Recently the ELI-NP science team finalized the work on the technical design reports for experiments at the facility. They are published and available on-line at *Romanian Reports in Physics*.

Nuclear astrophysics

To mention a few: ELI-NP experiments will approach key problems in nuclear structure, nuclear astrophysics and nuclear reactions. For example, over the last 40 years the $^{12}C(^4He,\gamma)^{16}O$ reaction, which controls the amount of carbon and oxygen in nature through the burning of helium in stars, attracts the attention of scientists. This reaction is the best illustration of the philosophical anthropic principle, which

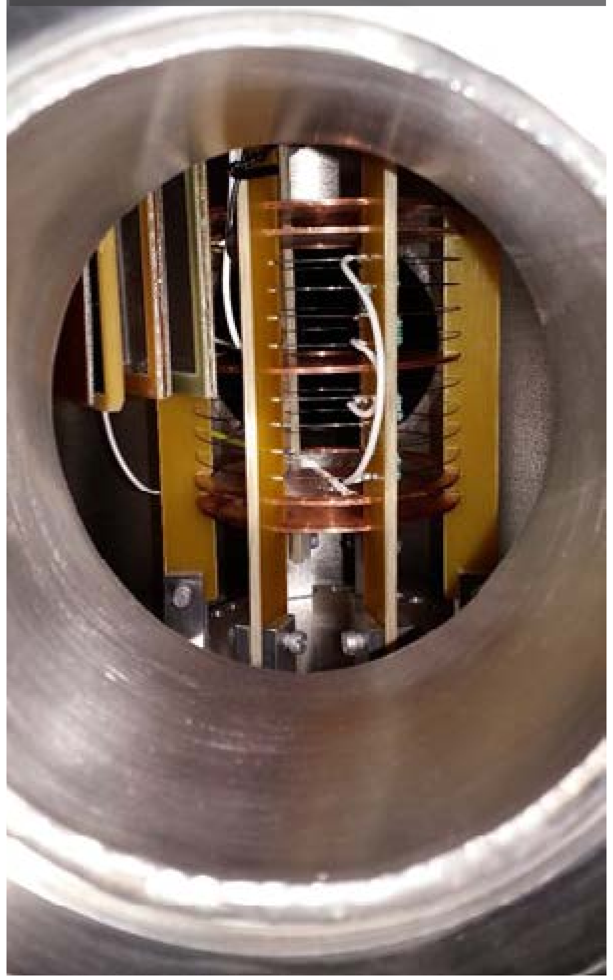
Figure 1: The ELI-NP mini-eTPC detector at the beam line of the IFIN-HH Tandem accelerator

says that observations in the Universe must be compatible with the conscious life that observes them. These studies have reached their sensitivity limit at particle accelerators, due to the low cross section of the reaction at low energies. At ELI-NP, it will be possible to study the inverse $^{16}O(\gamma,^4He)^{12}C$ reaction and understand the process. For the realization of these studies, a state-of-the-art time projection chamber with electronic read-out (eTPC) is been designed. It utilizes the novel gas electron multiplier (GEM) technology. Tests with a first prototype of the ELI-eTPC were carried out in-beam at the Bucharest Tandem laboratory.

Fission barriers

Another example, which addresses both the precision and sensitivity limits, are studies of fission barriers in the light actinide nuclei. The existence of a third minimum in the multi-humped fission barrier has been disputed over decades. The intense narrow-bandwidth gamma beams at ELI-NP provide a possibility to study transmission fission resonances with good precision. In the experiment, the fission cross section is studied as a function of energy. When the gamma beam is tuned to excite a state in the first potential minimum of the nuclear system, it can couple to states in the second or third minima, which demonstrates itself in the appearance of sharp

Figure 2: The Bragg ionization chamber, ready to be mounted at the neutron guide of the Budapest Reactor



resonances in the fission cross section. For the realization of these measurements, high-precision double-sided Bragg ionization chambers are designed and a first prototype was tested recently at the Budapest Reactor Center.

In short: experiments at the ELI-NP GBS will provide new opportunities to the users to address key physics problems.

4.3 ELI Beamlines: L1 front end exceeded the milestone target

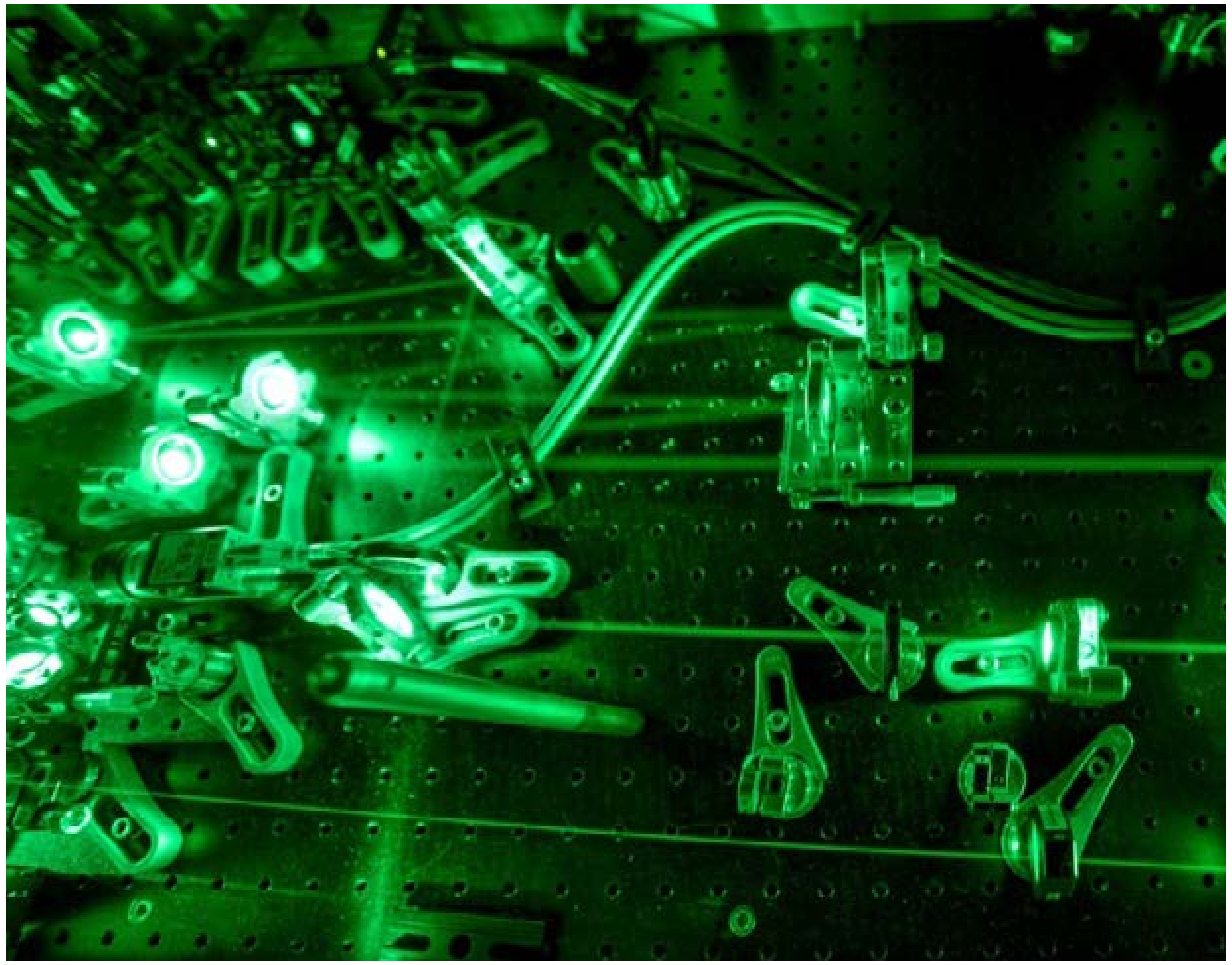
The L1 beamline of ELI Beamlines is designed to be capable of generating up to 100 mJ broadband pulses with duration of 15 femtoseconds (femto = 10^{-15}) at pulse repetition rate of 1 kHz. This results in a peak power greater than 6 TW available on a target every millisecond. The whole system will be installed in the new laser hall in Dolní Břežany by end of 2017.

One box, one switch

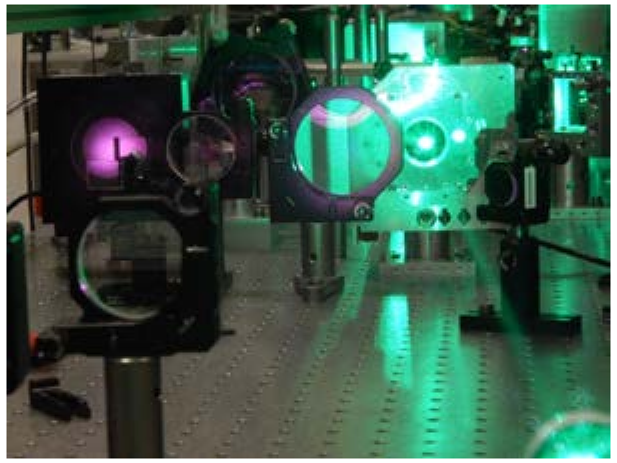
One thing that laser scientists always try to keep in mind when designing such a complex laser system, is that the users are expecting the beam to be available daily and for extended periods of time. A lot of effort is therefore put into high quality customised designs aimed at making all subsystems reliable and automated where possible.
'We can't be spending time fiddling with mirrors and playing with laser alignment; we focus on engineering the laser subsystems that we can set and forget wherever possible', said Jonathan Green, the senior researcher at L1. One example of this is the fiber-based seed distribution system. 'We have a network of fiber components which condition and distribute the seed pulses from a single oscillator to all our pump lasers and require no alignment whatsoever! Just two boxes, which fit nicely in an electronics rack, replace a 5 way optical splitter, 2 Offner stretchers, 4 pulse pickers, 2 delay lines, and 2 piezo actuated mirrors. Having all this taken care of in a box with just an ON switch makes our life a lot easier in the lab,' Green said.

All L1 beamline pump lasers, used for pumping the optical parametric amplifiers, are based on Yb:YAG thin disk technology. In industry, continuous thin disk lasers are known for their exceptional quality and reliability. In the L1 front end two high repetition rate, high energy picosecond thin disk pump lasers were developed in-house. Both of these lasers are based on components meeting the industrial standards. 'High quality of pump laser output is directly influencing the quality of broadband pulses. High reliability is necessary for uninterrupted day-to-day operation of the beamline as a part of the user facility,' said Jakub Novák, who developed both pump lasers.

'The bigger of two pump lasers reaches the exceptionally high pulse energy of 90 mJ at 1 kHz repetition rate in pulses shorter than 2 ps.



Generated infrared pulses are converted into green light, reaching an energy of more than 40 mJ at 1 kHz, which is the highest ever reported energy of a green laser with comparable properties,' Jakub said.



Transferring the energy from the high power (green) picosecond pump pulses to the broadband signal pulses in seven stages of nonlinear crystals via parametric amplification (OPCPA), the picosecond duration broadband pulses are amplified by a factor of more than 5 million. This allows for unprecedented pulse energy at this repetition rate for pulses that are compressible to less than 12 fs.

4.4 ELI-ALPS: Exclusive view on ultrafast processes

By Dimitris Charalambidis

While the research opportunities opened up at ELI-ALPS span a notably broad spectrum of scientific and technological areas, at the very core of ALPS's research ID is the understanding and control of ultrafast processes.

ELI-ALPS will operate lasers, secondary sources and specialized user end stations with an exclusive combination of parameters that allow a variety of investigations not possible to be implemented anywhere else so far. In particular the availability of high repetition rate, coherent radiation sources, emitting pulses with high photon energies, highphoton fluxes and ultrashort pulse duration in the attosecond (atto=10^{-18}) temporal regime is a unique tool for the investigation of what is known as correlated charge motion in atoms, molecules and solids, to mention one specific family of processes to be addressed at ELI-ALPS.

Talking electrons

On the molecular level, charges and their motion affect the motion of other neighboring particles. Electrons in atoms, molecules and solids are "talking" to each other for short time intervals, an effect known as electron-electron correlation. Characteristic times of this effect are in the attosecond regime. Nuclear motion and electronic motion in molecules are in many cases not decoupled as conventionally assumed. This coupled motion may result in structural and charge rearrangement dynamics of short characteristic times of the order of hundreds of femtoseconds (femto = 10^{-15}) down to few femtoseconds.

In condensed matter, spin dynamics relevant to magnetism can have characteristic times of the order of 10fs, electron-electron scattering may occur at even lower times of the order of 1 fs, while dephasing and plasmonic dynamics enter the attosecond regime. The understanding and eventually control of such phenomena, through targeted steering of the charge motion, is of highest importance as they underlie a number of central processes ranging from chemical reactions and light harvesting or charge rearrangements in biomolecules to processes directly relevant to novel materials and information technologies.

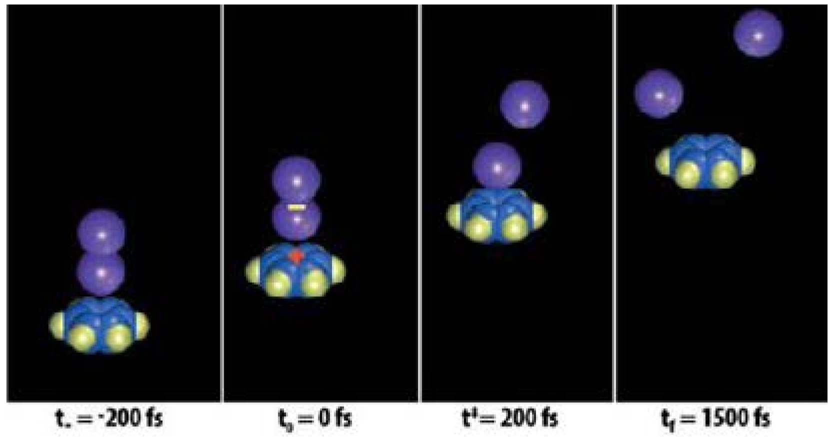
Pump probe

The study of any of the above ultrafast dynamics is optimally performed through the so called pumpprobe technique, where a "pump" radiation pulse of ultra-short duration initiates the dynamics and the "probe" pulse probes their evolution at a later instant. This is a non-linear process and thus seeks for high radiation intensities often in the extreme ultraviolet or X-ray spectral region. Obtaining detailed and unambiguous information about the above processes often requires performance of as complete as possible experiments and/or observation of extracting multiple interaction products in coincidence. The availability of specialized end stations is then a key parameter in extracting this information.

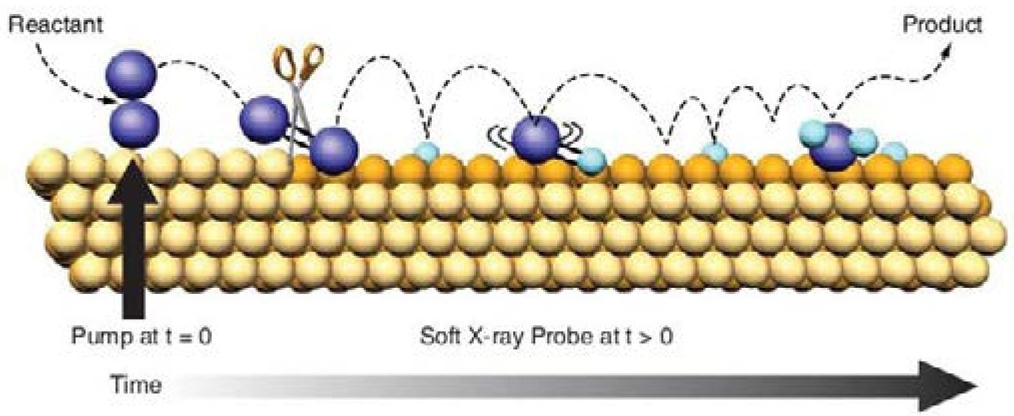
Ultra-high temporal resolution, short wavelengths, high repetition rates and high photon fluxes form the harvest of the combination of the novel laser, THz and intense high order harmonic generation attosecond sources of ELI-ALPS. End stations such as Reaction Microscope, particle and radiation imaging devices, Nano-ESCA facilities, complete the instrumentation that will be made available to the users of the infrastructure. ELI-ALPS will uniquely provide all the above mentioned parameters and facilities the combination of which, for the time being, is not available in any other laboratory.

First experiments

Initial benchmarking experiments tackling problems related to the above mentioned processes are the two photon double ionization of a Helium atom and the two photon dissociative ionization of molecular Hydrogen. These two "simple" systems already involve a rich spectrum of correlations and complex coupled dynamics. Starting with such small systems that can be treated exactly by *ab initio* theory, research will be further extended to more complex systems such as amino acid molecules, i.e. structural blocks of proteins and eventually proteins themselves but also condensed matter samples, such as low dimensional materials and nanostructures.



The iodine molecule (I_2, top) is split by exchange of an electron with the ring molecule benzene (C_6H_6, bottom). Femtosecond laser pulses can be used to take snapshots of molecular reactions in progress. (J.S. Baskin and A.H. Zewail: Freezing atoms in motion: Principles of Femtochemistry and demonstration by laser stroboscopy – Nobel Prize Report, J. Chem. Ed. 78, 737 (2001))



A catalytic reaction could be studied real time. A known (input) reactant is adsorbed on the surface (left). The reaction of the compound could be initiated by a pump pulse (time=0). The process is considered as a chain of reactive steps involving the formation of currently unknown intermediate products due to very rapid charge transfers which can be examined using probe pulses (time>0, middle). A known (output) product is desorbed from the surface (right). (Scientific Needs for future X-ray sources in the US, LBNL SLAC white paper (2008)).

V. Portraying colleagues

5.1. Daniel Ursescu, senior scientist at ELI-NP

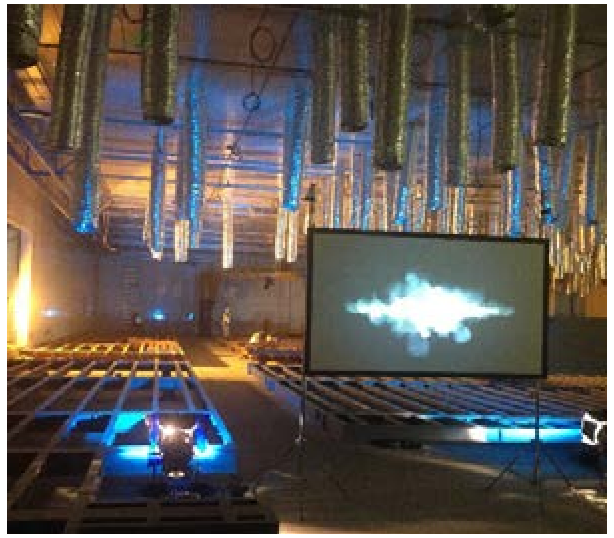
After earning his PhD in laser physics in Germany at GSI Darmstadt in 2006, Daniel Ursescu (1976) returned to his birth country Romania and started working at the National Institute for Laser, Plasma and Radiation Physics. Since 2011, he is employed by ELI-NP, commuting as coordinator between the laser and experiments.

How did you get involved in ELI-NP?

'I had been working on the development of laser systems and related applications for about 6 and a half years in Germany; then I got a job offer from the laser physics institute in Romania. As a part of that job, I took part in the preparatory phase of ELI. I was involved in work package 7, which was concerned with the laser driven secondary sources. We established the specifications of the desired laser beamlines. At the end of ELI's preparatory phase, I got in charge of the actual laser implementation for ELI-NP.'

What are your current responsibilities at the facility?

'I was participating in the tendering procedure for the dual 10 petawatt arm laser system that ELI-NP will host. And besides that, I am also doing research myself. Our researchers at ELI-NP team cooperate with colleagues from, France, Germany, Israel, Spain, the UK and the USA to address the broad range of technologies needed at high power laser facilities. We are in the middle of commissioning the new building, which will host the laser and gamma systems. This building is something really special: it hosts a huge cleanroom and the whole floor is vibrational decoupled from the environment. Furthermore, the building will be heated with geothermal extraction, for which we had to drill more than 1000 wells. In fact, this will be one of the largest buildings in Europe which uses geothermic extraction for heating.
Some additional features for the building came up during the workshops we organised with users. The construction is somewhat delayed, partly because of that. But we hope



to start installing the laser system in a couple of months. Due to budget and time schedule constraints, we have chosen to buy the laser systems.
We would have loved to do the development ourselves, but that would have led to too many risks in the implementation.'

What ambitions do you have for the facility?

'My first ambition is a very pragmatic one: ELI-NP is a success if we deliver what we stated: two 10 petawatt laser beams and the most brilliant gamma source in the world. If we succeed in that, it will be a great achievement for the scientific community, as a starting point for the experimental program.
My second ambition is perhaps somewhat more visionary: I hope that we will be able to offer the community the environment it needs to perform such ground-breaking research that it will lead to one or more Nobel prizes.'

'It is a huge joint effort, where everyone is pushing to deliver the best. All of our partners are doing a great job, we have the best providers we could dream of. Also the Romanian Government and European community have always been very willing to support the ELI endeavour. I can only hope this will stay the same in the future.'

5.2. Katerina Falk, scientist at ELI Beamlines

The Czech born Katerina Falk (1984) left her country when she was 16 to continue her education in Scotland and England. After earning her PhD in Atomic and Laser Physics in Oxford in 2011, she held a postdoc position at Los Alamos National Laboratory, US. In 2015 she returned to Czech Republic to take up her current job as scientist at ELI Beamlines.

How did you get involved in ELI Beamlines?

'ELI approached me near the end of my post doc in Los Alamos, when I was thinking about the next step in my career. My husband and I had already decided we wanted to come back to Europe. The fact that this job was in the Czech Republic, close to my family, was a nice bonus.'

What are your current responsibilities at the facility?

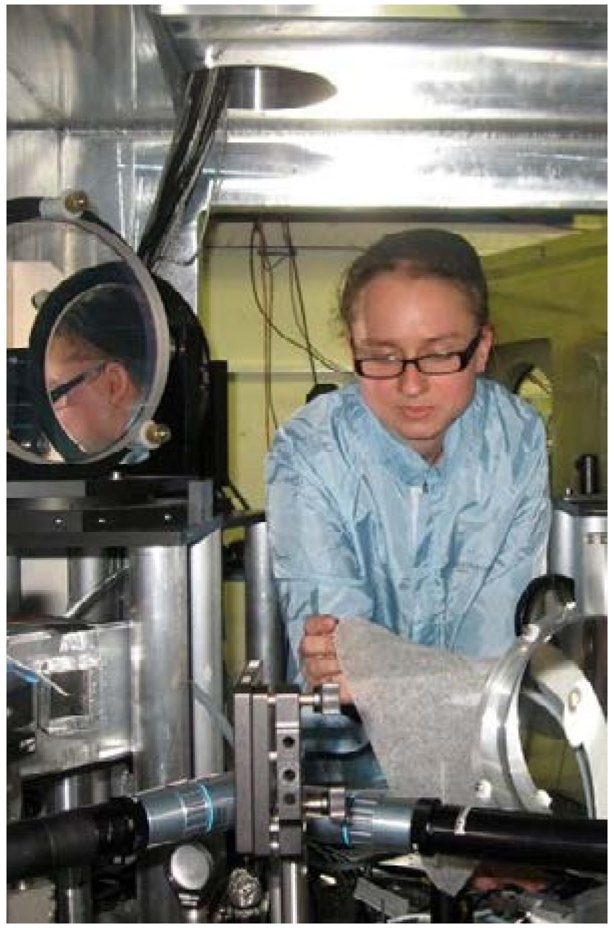
'I do research as well as facility building. My main focus is on the design, tendering, and construction of instrumentation and diagnostics we need. Currently, the construction of the building has finished, but the lasers are not yet installed. For my research that is not problematic: I have always travelled around the world to do experiments at facilities with the specifications I needed for the experiments at hand.'

What is your research about?

'My research is focussed on unravelling the dynamics of dense matter. Detailed understanding of the equation of state of elements in very dense circumstances is for example essential for the modelling of the inner structure of astrophysical objects, such as a planets like Jupiter. Furthermore, my research is closely related to confinement for energy production. Besides this, I develop new probes in the form of x-rays and particles to study the details of dense matter.'

What will ELI Beamlines mean for your research when it's fully operational?

'ELI Beamlines will combine high peak power and thus high energy with high repetition



rates. That way the facility will be able to produce the extreme dense states of matter I am interested in. We can accelerate electrons, protons and neutrons and, very importantly, we will be able probe matter on very short timescales with multiple beams.'

What is your ambition with your research?

'I am interested in a variety of subjects. For example, I am now looking into bond hardening. This occurs when you irradiate specific structures with a high power laser. Before the matter starts melting, during a short period of time the structure actually gets stronger. That is an interesting new field of research. In a second line of research, we try to produce novel electron probes and new powerful X-ray probes.
And last but not least, I am currently starting a new project on transport coefficients. That is more aimed at nuclear fusion applications. We need to understand the radiation and propagation inside a fusion reactor, to be able to explain the observed heating of the system.'

These ambitions nicely summarize Falks fascination for science: 'For me fundamental curiosity and application always go hand in hand. I think it is crucial to gain thorough understanding at a fundamental level, before we for example can save the world with fusion.'

5.3. Csaba Janáky, senior research fellow at ELI-ALPS

Hungarian born Csaba Janáky (1984) holds a PhD in Chemistry, received in 2011 at University of Szeged, Hungary. Since his thesis defence, he has been employed by that same university as an assistant professor and Marie Curie Fellow.

How did you get involved in ELI-ALPS?

'I am studying photo induced processes in semiconductors and at semiconductor/metal and semiconductor/electrolyte interfaces. During my work the following question has come up very often: what happens before the charge carriers reach the surface? I am a native of Szeged so I have heard several talks during the planning phase of the ELI-project. I was always wondering about the new opportunities this facility can potentially provide. Most recently, it turned out that our research activity, which is carried out within the "Momentum" Excellence Program of the Hungarian Academy of Sciences, has a lot of open questions which can possibly be answered by ultrafast laser methods. Consequently, it was a rational decision to get involved in ELI-ALPS.'

What is your job title at the facility, and what are your main tasks?

'I am a senior research fellow and also the leader of the Ultrafast Dynamics in Semiconductors Research Group. My current role is to build up a team of excellent research scholars and lay down the principles of a few proof-of-concept experiments to be carried out when the infrastructure will be completely ready. I am also responsible for the Chemistry Laboratory within the ELI-ALPS facility, which will provide the chemical background for both internal and external users.'

What will be the focus of your group?

'We are going to focus on the ultrafast processes occurring in semiconductors and at semiconductor interfaces upon their interaction with short laser pulses. We aim to uncover the nature of photo generated charge carriers and to characterize the features photoconductivity in various new generation semiconductors. We focus on nanostructured materials, both organics (conjugated polymers) and inorganics (oxides, chalcogenides).'

Which question do you hope to be able to answer in the coming decade?

'I hope to contribute to the better understanding of photo induced processes in semiconductors and at their interfaces. We aim to establish structure/property relationships at the nanoscale. Understanding ultrafast carrier dynamics will provide valuable input for the rational design and selection of materials, morphology, nanostructures, heterojunctions, and interfaces which will result in improved performance in solar cells, solar fuel generation, and organic electronics. Development of in operando experiments will result in new knowledge which can be directly exploited in practical applications.'

VI. Apply Now

6.1 ELI-ALPS

Senior Embedded Programmer

The successful candidate will develop embedded programs as part of the DAQ chain for data acquisition and online data processing (front-end detector electronics, optionally GPUs), develop high-speed data interfaces and injection techniques and elaborate multiple alternative solution architectures with some prototypes.

http://www.eli-alps.hu/sites/default/files/allashirdetesek/ELI_ALPS_embedded_programmer_20160607.pdf

Electrical Engineer

The successful candidate will develop specialised control and measurement systems for scientific application, be involved in testing and assembling hardware prototypes in certain cases, and will be designing hardware architecture for experiment control.

http://www.eli-alps.hu/sites/default/files/allashirdetesek/ELI_ALPS_electrical_engineer_20160607.pdf

Early Stage Researcher and Research Fellow (Laser Infrastrucure Division)

The candidate will be assigned to a group whose duty consists in designing, developing and implementing amplified ultrashort pulse laser systems and associated diagnostics. The group is also in charge of the operation and maintenance of the laser systems.

http://www.eli-alps.hu/sites/default/files/allashirdetesek/ELI_ALPS_LaSo_jobs_20160607.pdf

More information can be found on the ELI-ALPS website here:
http://www.eli-alps.hu/?q=en/jobs

6.2 ELI Beamlines

Geodetec Engineer

The geodetic engineer will be responsible for leading and helping with the alignment of all the technological systems in ELI building and keeping the ELI geodetic alignment system in fully operational state. He or she will support and participate also on other installation activities carried on by the technology installation and integration team, in coordination with laser, experimental, systems engineering and technical teams.

http://www.eli-beams.eu/wp-content/uploads/2011/05/geodetic-engineer.docx

Applied Physicist – Radiation Protection

Amongst the responsibilities of this job are the evaluation of radiation fields by means of Monte Carlo simulations; the design and optimization of beam dumps, shielding, etc; software development for Monte Carlo simulations; close and active cooperation with experimental groups and collaborating institutes; and possible participation in radiation protection operational activities.

http://www.eli-beams.eu/wp-content/uploads/2011/05/Applied-physicist-radiation-protection-1.pdf

Technology Installations Engineer

The candidate will work as part of a group supporting technology installations, working closely also with other team of scientists, optical and mechanical engineers, control system engineers and programmers. Responsibilities include preparation of technical documentation and detailed plans for technology/equipment installations; helping with and coordinating technology installation tasks for multiple teams; hands-on participation in technical installations of laser components and other ELI technology systems.

http://www.eli-beams.eu/wp-content/uploads/2011/05/technology-installations-engineer.pdf

More information can be found on the ELI Beamlines website here:
http://www.eli-beams.eu/jobs/

6.3 ELI-NP

Laser Engineer/Physicist for 10 PW Lasers

The successful candidate will participate in all activities related to installation, testing and commissioning of the high power laser systems (HPLS and LBTS); actively participate in the development activities related to laser systems and provide technical support for high power laser related experiments.

http://www.eli-np.ro/jobs/160325/Laser_Engineer-Physicist_10PW_ELI-NP_RA1_Profile.pdf

Electronic Engineer

The successful candidate will provide technical assistance upon delivery-taking of various deliverables; participate in the installation and commissioning of the various electronic equipment and their further use; supervise the operation of the electronic equipment after commissioning; develop the instrumentation for radiation detectors, designing data acquisition systems and data filtering; design, simulate, prototype and test mass production of electronic boards; maintain magnet supply and control sources and design control systems for stepper motors, position and temperature sensors, vibration sensors.

http://www.eli-np.ro/jobs/160325/Electronic_Engineer_ELI-NP_Profile.pdf

Senior Researcher [Research Scientist II (CSII) and Research Scientist I (CSI)]

The successful candidate will propose topics of research relevant for ELI-NP; advise the Head of Research Activity on the specific research field(s) within their areas of expertise; coordinate the activity of PhD students; participate in the scientific strategy meetings of ELI-NP and in scientific events; participate with leading roles in the elaboration of the Technical Design Reports (TDRs) for the experiments of ELI-NP; maintain and enhance the existing scientific collaborations, and establish new ones; lead teams of researchers and engineers in measuring the equipment’s parameters and assessing the fulfillment of the technical requirements.

http://www.eli-np.ro/jobs/160325/Senior_Researcher_ELI-NP_Profile.pdf

More information can be found on the ELI-NP website here:
www.eli-np.ro/jobs

VII. Events

7.1 ELItrans Workshop Magurele, May 23-24, 2016

The ELItrans workshops took place in Bucharest-Magurele, at the National Physics Library, in the period 23-24 May 2016. They were composed of 3 sessions, with discussions and presentations dedicated to: Gamma beams diagnostics, Hard X-Ray, XUV and Particle, and included a visit to the ELI-NP site. Six international experts have joined the ELITrans team during these workshops to present their ideas and recommendations. The workshop audience - about 35 people, including participants from all three ELI pillars - involved in activities related to the various diagnostic techniques presented during the workshop.

The Diagnostics Work Package 6 of the ELItrans project addresses the need for standard methods and protocols for the characterization of primary (laser) and secondary sources, throughout the entire ELI project.

The workshops MS.17 - "Workshop on secondary source protocols" and MS.18 - "Workshop on gamma source protocols" have been focused on gathering together the ELI community, as well as external experts in the field, to discuss and analyze the challenges of this work and more precisely the Task 2 - "First steps towards international standardization of these methods and protocols, together with the scientific communities and the industry". These workshops followed the "Workshop on user-facility interfaces" and the "Workshop on laser diagnostics protocols" organized in 2015 in Bucharest and Prague, respectively.

The program of the workshop can be found here:
http://www.eli-np.ro/indico/conferenceTimeTable.py?confId=50#all

7.2 Perspectives of ELI – moving forward to ELI-ERIC

On May 31st-June 1st the Workshop "Perspectives of ELI for the European Research Community" took place, organized by the Extreme Light Infrastructure – Delivery Consortium and the three pillars of the Extreme Light Infrastructure from the Czech Republic, Hungary and Romania. The event was hosted in Dolní Břežany by the ELI Beamlines.

During the two intense-work days, the management of ELI-DC and of all three ELI pillars met with the prospective Partners and Users of ELI to discuss the progress over the last year and receive feedback from them concerning the ELI project's goals and challenges moving forward to the ELI-ERIC European Research Infrastructure Consortium.

The ensuing discussions and animated debates represented a key point and a very useful step in the current dynamics involving the nearly completed construction process of the three pillars and their integration into a single Infrastructure through the setting-up of the ELI-ERIC.

The participants addressed the issue of the establishment of the framework of ELI-ERIC, how to attract users, what are the best services that ELI should offer, how ELI will build the relationship with industry, etc.

The workshop stimulated the partners and users to merge their ideas, give their comments and criticisms thereby establishing a functional and passable road to ELI's future success. ELI-ERIC will be a flexible European organization, attractive and competitive at the international level.

All the participants brought their contribution to a deeper understanding of the founding principles of the future open access ELI-ERIC, that can reach out more effectively to the laser community world, hopefully creating valuable scientific results as well as interesting developments in technical training and education, as well as for the industry and through this, stronger socioeconomic returns.

The discussions about the start-up of ELI-ERIC and of its ways to interact with the scientific and industrial stakeholders will be continued, and will help ELI and the whole European laser community to achieve novel results, which will influence the whole European Research Area, offering new perspectives in laser science and technology for the world.

7.3 ELISS Summer School 2016, August 21-26, 2016

During the last four years, the ELI Summer School has grown into a well-respected and greatly-appreciated youth scientific program, which is very unique not only in the context of Central Europe, but also world-wide.

Every summer since 2012 there is a great opportunity to spend last week in August on the students´ event called ELISS - ELI summer school. As a joint event of ELI Beamlines, ELI-ALPS, ELI-NP and HiLASE scietific centres, the summer school is located in Dolní Břežany near Prague in the Czech Republic.

ELI Summer School targets students around the world participated in seminars led by distinguished academics and researchers from three pillars of ELI project. This year there will be 17 speaker presenting more than 27 topics. We are expecting to welcome over 100 participants in ELI Beamlines' new building in Dolní Břežany.

"The program was very busy but at the same time very interesting. I wish I could take part in this kind of summer school again in the future." Student from France at ELISS 2015

A part of ELISS2016 programme is the announcement of the first winner of the 'Wolfgang Sandner' Scientific Excellence Prize for Young Researchers. The prize is meant as a stimulus for young researchers engaging into a bright scientific career.

More information:
http://www.eli-beams.eu/blog/eli-events/eli-beamlines-summer-school-eliss-2016/

WOLFGANG SANDNER PRIZE

SCIENTIFIC EXCELLENCE PRIZE FOR YOUNG RESEARCHERS

The award recognizes early career scientists with outstanding instrumental, experimental or theoretical contributions to the scientific field of extreme light research and applications.

MORE INFO

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