Dear Colleagues,

We are pleased and honored to greet all participants of the 2nd ELI Beamlines Scientific Challenges Meeting in Prague. The meeting certainly will allow foreign and domestic experts to meet and discuss key scientific and technological aspects and challenges that come with the implementation of such unique and groundbreaking scientific facility. As you probably know, the goal of the ELI Beamlines project here in the Czech Republic is to build a large research facility, the first one of the ESFRI roadmap located in new member states. After the official signature was given to the Czech ELI Beamline application on the 20th April this year by the Commissioner for Regional Policy Johannes Hahn we have started the implementation phase of the project.

This type of workshops that focuses on prestigious research programs and new advanced technologies of ELI Beamlines Facility in the Czech Republic is very important for the next steps of development of ELI. We are very happy and proud to greet here the members of ISAC (International Scientific Advisory Committee) who will undoubtedly contribute to a successfull project implementation and future collaboration with the leading laser centers of the world.

The team and we deeply appreciate your attendance and and we would like to wish not only ISAC members but also all conference participants useful professional enrichment, live discussions and a pleasant experience in terms of personal encounters during our workhop.

Georg Korn, Bedrich Rus

New state-of-the-art laser facilities in the Czech Republic

ELI Beamlines: Opportunities for Science and Industry

www.eli-beams.eu

ELI Beamlines will be a high-energy, repetition-rate laser pillar of the ELI (Extreme Light Infrastructure) project. It will be an international facility for both academic and applied research, slated to provide user capability since the beginning of 2016. The main objective of the ELI Beamlines Project is the delivery of ultra-short high-energy laser pulses for the generation and applications of synchronized high-brightness X-ray sources and accelerated particles. The laser system will be delivering pulses with length ranging between 10 and 150 fs and will provide high-energy petawatt and 10-PW peak powers. For high-field physics experiments it will be able to provide focused intensities attaining 10^{24} Wcm^{-2}, while this value can be increased in a later phase without the need to upgrade the building infrastructure.

GENERAL INFORMATION

DATE

October 5 - 6, 2011

MEETING VENUE

Hotel Diplomat Prague
Evropská 15, Prague 6, Czech Republic

BASIC INFORMATION

The 2nd ELI Beamlines Scientific Challenges Meeting will take place on October 5 - 6, 2011 at the Diplomat Hotel in Prague. Together with the International Scientific advisory committee (ISAC) we will overview and update ELI Beamlines science and technology programs and discuss the steps to be done to deliver the project. The conference topics reflect the research activities of ELI Beamlines.

CONFERENCE TOPICS

1. High power (TW-PW) lasers towards higher repetition rates
2. X-ray sources generated by reprated ultrafast high intensity lasers
3. Particle acceleration by high intensity lasers
4. Applications in molecular, biomedical, and material sciences
5. Laser plasma and high-energy-density physics
6. High-field physics and theory
7. Computation and numerical approaches for ultra-intense laser matter interactions

CEREMONIAL EVENING

October 5, 19:00, Strahov Monastery

A Ceremonial evening organized on the occasion of the project launch will be held on October 5 from 19:00 at the premises of the Strahov Monastery. This event is a part of the 2nd ELI Beamlines Scientific Challenges Meeting and presents a symbolic launch of the most prestigious research project in the history of the Czech Republic. The destinquished guests invited for the ceremony include the Czech Prime Minister Petr Nečas and the ESFRI chair Beatrix Vierkorn-Rudolph. The opening ceremony is free of charge for meeting participants. Please use your invitation card as the entrance ticket to the social event. The Strahov Monastery is located close to the Prague Castle and is the second-oldest monastery in the city. It was built in 1140 and has been rebuilt numerous times since, due to the ravages of various wars. You can get there by trams no. 22 or 23 (Pohořelec stop). A bus transport from the Diplomat Hotel will be arranged for the meeting participants at 18:30.

INTERNET CONNECTION

Free wireless access will be provided in the conference centre of the meeting venue. Login/password will be available at the registration desk.

REFRESHMENT

Coffee and tea will be served during the breaks twice a day. Lunches will be available in the Loreta Restaurant.

MAP OF THE MEETING VENUE

SCIENTIFIC PROGRAM

WEDNESDAY, OCTOBER 5, 2011

08:00 – 09:00 Registration, Foyer Budapest (2nd Floor)

Library, 1st Floor

08:30 – 09:00 Press Conference

Cracow I+II, 2nd Floor

09:00 – 09:05 J. Ridky: *Welcome Address*

09:05 – 09:25 G. Mourou: *Introduction to the ELI-Project and Its Four Pillars*

09:25 – 09:45 V. Ruzicka, F. Gliksohn: *ELI Beamlines and ELI Delivery Consortium General Considerations and Current State*

09:45 – 10:05 W. Sandner (ISAC): *Europe 2016*

10:05 – 10:25 G. Korn: *ELI and ELI Beamlines Science and Technology Topics*

10:25 – 10:40 Coffee Break

ELI Beamlines Project Development Overview

10:40 – 11:05 B. Rus: *ELI Beamlines Facility Development*

11:05 – 11:20 S. Sebban: *Planned Coherent and Incoherent X-rays Sources at ELI Beamlines*

11:20 – 11:35 D. Margarone: *Planned Experiments on Acceleration of Particles at ELI Beamlines*

11:35 – 11:50 L. Juha: *Planned Applications in Molecular, Biomedical and Material Research*

11:50 – 12:05 J. Limpouch: *Physics of Dense Plasma and First Planned Proof of Principle Experiments*

12:05 – 12:20 K. Rohlena: *High Field Physics Area at ELI Beamlines and Proof of Principle*

Experiments for Climbing Up the Intensity Ladder

12:05 – 12:35 T. Homola, J. Clements: *ELI Beamlines – Delivering the Project*

12:35 – 13:00 Discussion

13:00 – 13:45 Lunch, Restaurant Loreta

Secondary Sources Session (X-rays and Laser Accelerated Particles)

13:45 – 14:15 M. Borghesi: *Acceleration with Superintense Lasers: Current Activities and Future Perspectives*

14:15 – 14:45 W. Leemans: *Progress on Laser Plasma Accelerators at LBNL*

14:45 – 15:15 L. Silva: *Recent Progresses in Laser-plasma Accelerators and Their Applications*

15:15 - 16:05 P. Raczka: *Enhanced Laser-driven Ion Acceleration via Cavity-amplified Radiation Pressure*

16:05 – 16:30 M. Zepf: *Harmonic Generation from Relativistic Plasma Surfaces in the Few-cycle Regime and Novel Approaches to Phasematching HHG in Gases*

16:30 – 16:50 I. Andriyash*: Diffraction of Relativistic Electron Beam on a High Intensity Optical Lattice as a New Approach to the X-ray Generation*

16:50 – 17:00 Coffee Break

17:00 – 18:15 ISAC (International Scientific Advisory Committee) Meeting - Members of the Committee Only

18:30 Departure to Opening Ceremony Strahov Monastery

THURSDAY, OCTOBER 6, 2011

Cracow I+II, 2nd Floor

Applications I Session

Ion Therapy

09:00 – 09:30 J. Wilkens: *Towards Radiation Therapy with Laser-driven Ion Beams: Beamline Developments and Biological Experiments*

09:30 – 09:50 U. Schramm: *Dose Controlled Radiobiological Experiments with Ultra-short Pulse Laser Accelerated Proton Beams*

09:50 – 10:10 P. Cirrone: *Chracterization of Tumor Cells after Ion Beam Irradition – Treatment Planning*

Imaging

10:10 – 10:40 J. Hajdu: *Imaging with Short Intense X-ray Pulses*

10:40 – 11:10 C. Rose-Petruck: *Imaging and Structural Investigations with Femtosecond Laser Produced X-ray Pulses*

11:10-11:25 Coffee Break

Lasers Session

11:25 – 11:55 S. Karsch: *Stability Issues in OPCPA Systems*

11:55 – 12:25 J. Collier: *ELI Relevant Technology Developments at Rutherford Appleton Laboratory*

12:25 – 12:55 J. Zhu, Jianqiang Zhu, Baoqiang Zhu, Xuechun Li, Jian Zhu, Weixin Ma, Dean Liu,Xinqiang Lu,Wei Fan, Zhigang Liu,Shenglei Zhou,Dongfeng Zhao, Weixing Shen, Yan Zhang, Baosuan Chen, Dianyuan Fan, Zunqi Lin, Shiji Wang: *The Status of High Power Laser Development in China*

12:55 – 13:15 C. Simon-Boisson: *High Energy 1 Hz Titanium Sapphire Amplifier for PetaWatt Class Lasers*

13:15- 14:00 Lunch Break

13:00 – 13:20 T. Metzger: *Short Pulse Thin Disk Lasers and Their Power Scaling for ELI´s fs-OPCPA Systems*

13:20 – 13:40 M. Hemmer: *Few-cycle and CEP Stable OPCPA at High Average Power and Applications in Strong Field Physics*

Dense Plasma Physics and Dignostics

13:40 – 14:00 G. Tallents: *The Creation and Probing of High Energy Density Plasma with High Intensity Lasers*

14:00 – 14:20 S. Pikuz: *X-ray Spectroscopy and Backlighting Diagnostic Methods Proposed for ELI Beamlines Experiments*

High-intensity Session and Theory

14:20 – 14:50 S. Bulanov: *High Field Limits in Ultra-relativistic Laser-matter Interaction*

14:50 – 15:20 C. Keitel: *Extremely High-intensity Laser-interactions with Fundamental Quantum Systems*

15:20 – 15: 40 L. Drska: *Exotic Matter Physics: Chances for ELI Beamlines*

15:40 – 16:10 V. Petracek: *Ideas and Progress on Calorimetric Detectors of Energetic Particles Generated by ELI*

16:10 - 16:30 I. Sokolov: *Modeling of Radiation-dominated and QED-strong Regimes of Laser - Plasma Interaction*

16:30 – 16:50 N. Naumova: *Simulations of Laser - Plasma Interaction in Radiation-dominated and QED-strong Regimes*

16:50 - 17:10 M. Bussmann: *Using Table-top Supercomputers for Simulating Table-top Radiation Sources*

17:10 – 17:30 M. Marklund: *TBA*

17:45 Round Table – Conclusions

17:45 – 18:00 Coffee Break

ISAC (International Scientific Advisory Committee)

The ISAC was established as a group of internationally recognized experts, who will provide expertise on scientific and technological aspects of the project and advice as well on the implementation and operation of the future international user facility.

We are very proud, that the following experts have agreed to serve as members of ISAC:

Prof. **Sergei Bulanov** (Advanced Photon Research Center, Japan Atomic Energy Agency, Japan) *bulanov.sergei@jaea.go.jp*
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Secretary:
Dr. **Karel Rohlena** (Institute of Physics AS CR, v. v. i., Czech Republic) *rohlena@fzu.cz*

Participants` List of the 2nd ELI Beamlines Scientific Challenges Meeting

	First Name	Surname	Institute	City	Country
1	Igor	**Andriyash**	Centre Lasers Intenses et Applications (CELIA)	Talence	France
2	Pavel	**Bakule**	Institute of Physics AS CR, v. v. i.	Prague	Czech Republic
3	Thierry	**BERTHOU**	SILIOS Technologies	Peynier	France
4	Marco	**Borghesi**	The Queen's University of Belfast	Belfast	United Kingdom
5	Sergei	**Bulanov**	Japan Atomic Energy Agency	Kyoto	Japan
6	Michael	**Bussmann**	Helmholtz-Zentrum Dresden-Rossendorf	Dresden	Germany
7	Pablo	**Cirrone**	INFN-LNS	Catania	Italy
8	John	**Clements**	-	Buckingham	United Kingdom
9	John	**Collier**	Science & Technology Facilities Council Harwell	Oxford	United Kingdom
10	Martin	**Divoký**	Institute of Physics AS CR, v. v. i.	Prague	Czech Republic
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12	Petr	**Džubák**	Palacký University in Olomouc	Olomouc	Czech Republic
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14	Franck	**Galipo**	Thales	Elancourt	France
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16	Erhard	**Gaul**	National Energetics	Austin	USA
17	Janos	**Hajdu**	University of Uppsala	Uppsala	Sweden
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19	Michael	**Hemmer**	ICFO – The Institute of Photonic Sciences	Barcelona	Spain
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21	Tomáš	**Homola**	-	Prague	Czech Republic
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23	Axel	**Hörhager**	JASPERS Office Vienna	Wien	Austria
24	Jan	**Hřebíček**	Institute of Physics AS CR, v. v. i.	Prague	Czech Republic
25	Roman	**Hvězda**	Institute of Physics AS CR, v. v. i.	Prague	Czech Republic
26	Buosan	**Chen**	Institute of Optics and Fine Mechanics	Shanghai	China
27	Martin	**Chyla**	Institute of Physics AS CR, v. v. i.	Prague	Czech Republic
28	Gareth	**Jones**	Gooch and Housego	Ilminster	United Kingdom
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