



EAPPC BEAMS
MEGAGAUSS 2020
BIARRITZ | FRANCE

August 29th to
September 2nd
2021

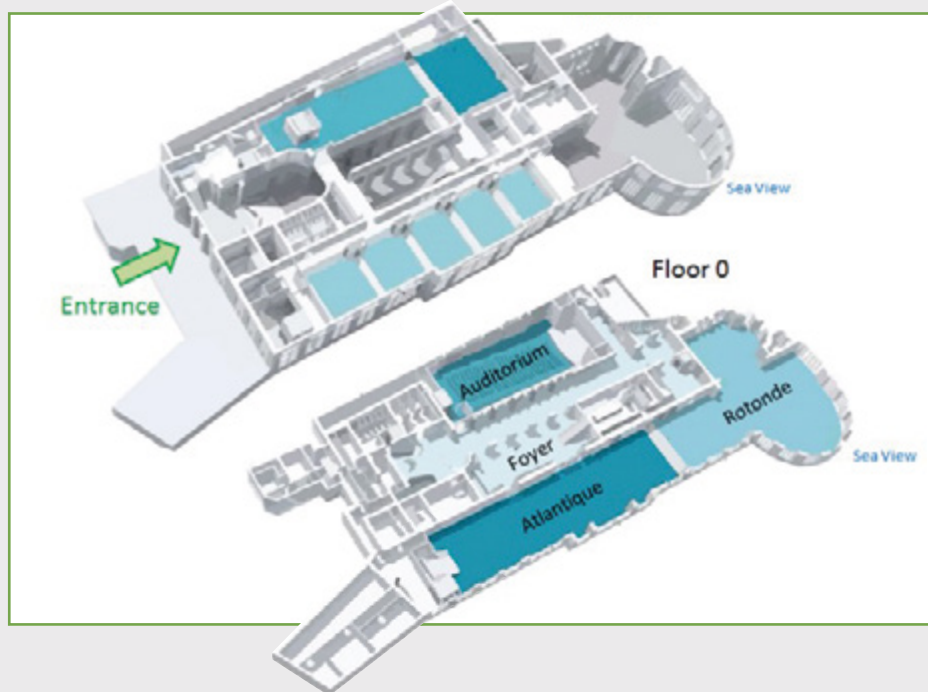
- 8th Euro-Asian Pulsed Power Conference
- 23rd International Conference on High-Power Particle Beams
- 17th International Conference on Megagauss Magnetic Field Generation and Related Topics

ITHPP
ALCEN

PLATINIUM SPONSOR

CONFERENCE INFORMATION

SUMMARY



COFFEE / TEA BREAKS

Morning Coffee/Tea breaks will be served daily (Monday, Tuesday, Wednesday and Thursday) in the Exhibitor Hall (Rotonde)

Afternoon Coffee/Tea breaks will be served daily (Monday, Tuesday and Wednesday) in the Exhibitor Hall (Rotonde).

LUNCHES

Conference fees include lunches. Lunches will be served daily 12:00 – 13:00 (Monday, Tuesday and Wednesday) in the Exhibitor Hall (Rotonde).

WELCOME RECEPTION AND BANQUET

The Welcome Reception will be held on Sunday evening, August 29th, 2021 (18:00 – 20:00) in the exhibitors Hall (Rotonde).

The Conference Banquet will be held on Wednesday evening, September 2nd, 2021 (19:00 – 21:00) in the Ambassadors Hall of the Casino.

NAME BADGES

All attendees must wear their name badge at all times to get access to all sessions, exhibits, lunches, breaks and receptions.

TECHNICAL PROGRAM 4

Monday	4
Tuesday	5
Wednesday	6
Thursday	7

WELCOME ADDRESS 9

COMMITTEES 10

International Technical Committee	10
EAPPC International Committee	10
BEAMS International Committee	11
MEGAGAUSS International Committee	11

EXHIBITORS AND SPONSORS LIST 12

PLENARY TALKS 20

Opportunities and challenges in Magnetized Liner Inertial Fusion	20
Pulsed power and electromagnetic launch developments at first light fusion: an overview	21
The laser mégajoule (LMJ) facility status	22
Primary impacts of pulsed electric fields on organisms and their industrial applications	23

TECHNICAL PROGRAM 24

Monday	24
Tuesday	29
Wednesday	34
Thursday	39

AGENDA

Sunday 29 August 2021	Monday 30 August 2021	Tuesday 31 August 2021	Wednesday 1 September 2021	Thursday 2 September 2021
	Opening Ceremony			Closing Ceremony
	Technical Program	Technical Program	Technical Program	Technical Program
Registration				
Welcome Reception		Night Out Local Flavour	Banquet	

TECHNICAL PROGRAM

Monday, 30 August 2021

	Auditorium	Atlantic room	Foyer	Rotonde Room
8:30 9:00	Opening talk and announcements			
9:00 10:00	Plenary session #PL1			
10:00 10:30				Coffee break
10:30 12:00	Oral session #O1 Pulsed Power Applications	Oral session #O2 High Power Microwave and RF Sources		
12:00 13:00				Lunch
13:00 15:00			Poster Session #P1	
15:00 15:30				Coffee break
15:30 17:00	Oral session #O3 Bio-medical and Industrial Applications	Oral session #O4 Solid State Generators and Components		

Tuesday, 31 August 2021

	Auditorium	Atlantic room	Foyer	Rotonde Room
8:45 9:00	Announcements			
9:00 10:00	Plenary session #PL2			
10:00 10:30				Coffee break
10:30 12:00	Oral session #O5 Explosive Pulsed Power and Related Topics	Oral session #O6 High Power Microwave and RF Sources		
12:00 13:00				Lunch
13:00 15:00			Poster Session #P2	
15:00 15:30				Coffee break
15:30 17:00	Oral session #O7 Pulsed Power Generators and Components	Oral session #O8 Particle Beams Physics and Technology		

TECHNICAL PROGRAM

Wednesday, 1 september 2021

	Auditorium	Atlantic room	Foyer	Rotonde Room
8:45 9:00	Announcements			
9:00 10:00	Plenary session #PL3			
10:00 10:30				Coffee break
10:30 12:00	Oral session #O9 Bio-medical and Industrial Applications	Oral session #O10 High-Energy Density Physics and Technology		
12:00 13:00				Lunch
13:00 15:00			Poster Session #P3	
15:00 15:30				Coffee break
15:30 17:00	Oral session #O11 Pulsed Power Generators and Components	Oral session #O12 Particle Beams Physics and Technology		

Thursday, 2 september 2021

	Auditorium	Atlantic room	Foyer	Rotonde Room
8:30 9:00	Closing talk and announcements			
9:00 10:00	Plenary session #PL4			
10:00 10:30				Coffee break
10:30 12:00	Oral session #O13 Pulsed Power Applications	Oral session #O14 Solid State Generators and Components		
12:00 13:00				
13:00 15:00				
15:00 15:30				
15:30 17:00				

WELCOME ADDRESS



Laurent PECASTAING
General Chair of EAPPC 2020

FROM GENERAL CHAIR

Dear Colleagues and Friends,

On behalf of the local organizing committee of the 8th Euro-Asian Pulsed Power Conference (EAPPC), jointly organized with the 23rd International Conference on High-Power Particle Beams (BEAMS) and the 17th International Conference on Megagauss Magnetic Field Generation and Related Topics (MG-XVII), we would like to warmly thank you for joining this conference.

The events from the last months regarding the COVID situation made everybody's lives more difficult and obliged us to postpone the unfolding of this event several times. But we are now adapting to this new configuration, and therefore very glad that this event can finally take place as previously planned in Bellevue Biarritz Congress Hall in Biarritz, France, from the 29th of August to the 2nd of September 2021.

Due to remaining regulations, some of you will not be able to enjoy "the immediate vicinity of the most beautiful sandy beach, where the sound of the Atlantic Ocean waves collapsing is gently captured by your ears" as promised. But the hybrid mode of the conference will allow all of you to attempt the whole sessions, and to fully scientifically interact with each other.

This important international event represents a major forum for the scientists and engineers in the pulsed power physics and technology domain, where a large number of topics will be discussed such as generators and components, pulsed power applications, high power microwaves and RF sources, high-energy density physics and technology, particle beam technology, ultrahigh magnetic field generation and applications, explosively-driven pulsed power and many others. The conference will provide an up-to-date review of the most recent achievements, together with an opportunity for exchanging scientific and technical information between industry, academic institutions and major research organizations across a broad range of current and emerging research areas.

During the conference, several important applications and their corresponding commercial opportunities will be discussed such as: the reduction of pollutants from fossil fuels, application of pulsed plasma and electric field techniques for water treatment, food sterilization and cancer treatment, novel pulsed techniques for separating water from oil, the newest results related to fusion physics and technology developed from major national research centers and many others.

For the virtual mode participants, keep in mind that: Biarritz, the Spanish border, the heart of the famous Basque country, the Atlantic Ocean seaside, Pyrenees mountains, and the exceptionally good local food and wine, will keep waiting for the next opportunity for you and your family to come, and will then welcome you with open arms.

For the others: we look forward to welcome you again of course...



Bucur NOVAC
Technical Chairman



Tom HUISKAMP
Deputy Technical Chairman

INTERNATIONAL TECHNICAL COMMITTEE

NOVAC Bucur

> **Technical Chair**

Loughborough University, **UK**

HUISKAMP Tom

> **Deputy Technical Chair**

Technical University of Eindhoven,
The Netherlands

BAYOL Frédéric

ITHPP, **France**

CADILHON Baptiste

CEA, **France**

CONG Peitian

Northwest Institute of Nuclear
Technology, **China**

DENG Jianjun

Institute of Fluid Physics,
CAEP, **China**

HADAS Yoav

Rafael National Laboratory, **Israel**

JIANG Weihua

Nagaoka University of Technology,
Japan

JIN Yun-Sik

Korea Electrotechnology Research
Institute, **Korea**

MÜLLER Georg

Karlsruhe Institute of Technology,
Germany

OLIVER Bryan

Sandia National Laboratory, **USA**

NEUBER Andreas

Texas Tech University, **USA**

PEMEN Guus

Technical University of Eindhoven,
The Netherlands

REDONDO Luis

Lisbon Engineering Superior
Institute, **Portugal**

RYOO Hong-Je

Chung-Ang University, **Korea**

SCHNEIDER Markus

French-German Institute of
Saint-Louis, **France**

SEDDON Nigel

MBDA UK, **UK**

SINCLAIR Mark

Atomic Weapons Establishment, **UK**

TOURY Martial

CEA, **France**

WANG Douyan

Kumamoto University, **Japan**

ZHANG Jiande

National University of Defense
Technology, **China**

ZURAUSKIENE Nerija

Center for Physical Sciences and
Technology Vilnius, **Lithuania**

EAPPC INTERNATIONAL COMMITTEE

CHAIKOVSKY Stanislav

Institute of Electrophysics
of the Ural Division of the
Russian Academy of Sciences,
Ekaterinburg, **Russia**

DENG Jianjun

Institute of Fluid Physics
(CAEP), **China**

JIANG Weihua

Nagaoka University
of Technology, **Japan**

JIN Yun-Sik

Korea Electrotechnology Research
Institute, **Korea**

KATSUKI Sunao

Institute of Pulsed Power Science,
Kumamoto University, **Japan**

MÜLLER Georg

Karlsruhe Institute of
Technology, **Germany**

NOVAC Bucur

Loughborough University, **UK**

PECASTAING Laurent

University of Pau, **France**

REDONDO Luis

Lisbon Engineering Superior
Institute, **Portugal**

RYOO Hong-Je

Chung-Ang University, **Korea**

SCHNEIDER Markus

French-German Research Institute
of Saint-Louis, **France**

WANG Xinxin

Tsinghua University, **China**

ZHANG Jiande

National University of Defense
Technology of China, **China**

ZURAUSKIENE Nerija

Center for Physical Sciences and
Technology Vilnius, **Lithuania**

BEAMS INTERNATIONAL COMMITTEE

COOPERSTEIN Gerald

Naval Research Laboratory, **USA**

DENG Jianjun

Institute of Fluid Physics,
CAEP, **China**

EKDAHL Carl

Los Alamos National
Laboratory, **USA**

JIANG Weihua

Nagaoka University of
Technology, **Japan**

JUNGWIRTH Karel

Czech Academy of Sciences,
Czech Republic

KOIDAN Vasili

Kurchatov Institute, **Russia**

LEOPOLD John

Israel Institute of Technology, **Israel**

LITVAK Alexander

Institute of Applied Physics, **Russia**

MAENCHEN John

Sandia National Laboratories, **USA**

MARKOVITS Meir

Ministry of National
Infrastructures, **Israel**

MESYATS Gennady

Academy of Sciences, **Russia**

MÜLLER Georg

Karlsruhe Institute of
Technology, **Germany**

OLIVER Bryan

Sandia National Laboratories, **USA**

PECASTAING Laurent

University of Pau, **France**

REDONDO Luis

Lisbon Engineering Superior
Institute, **Portugal**

SINCLAIR Mark

Atomic Weapons Establishment, **UK**

THUMM Manfred

Karlsruhe Institute of
Technology, **Germany**

VERON Laurent

CEA, **France**

WEBER Bruce

Naval Research Laboratory, **USA**

ZHANG Jiande

National University of Defense
Technology of China, **China**

MEGAGAUSS INTERNATIONAL COMMITTEE

DEMIDOV Vasily A.

Russian Federal Nuclear
Center, **Russia**

FOLEY Timothy

Los Alamos National Laboratory, **USA**

GOERZ David

USA

HAROZ Erik

Los Alamos Laboratory, **USA**

HERLACH Fritz

University of Leuven, **Belgium**

IVANOVSKY Andrey V.

Russian Federal Nuclear
Center, **Russia**

KIUTTU Gerald F.

Varitech Services, **USA**

MATSUDA Y. H.

IMSL- ISSP, Tokyo University, **Japan**

MIELKE Charles H.

Los Alamos Laboratory, **USA**

NEUBER Andreas

Texas Tech University, **USA**

NOJIRI Hiroyuki

HFLSM-IMR, Tokyo
University, **Japan**

NOVAC Bucur

Loughborough University, **UK**

QIZHI Sun

Institute of Fluid Physics, CAEP,
China

REINOVSKY Robert

Los Alamos National
Laboratory, **USA**

ROUSCULP Christopher

Los Alamos National
Laboratory, **USA**

SELEMIR Victor

Russian Federal Nuclear
Center, **Russia**

SHNEERSON G. A.

St Petersburg Polytechnic
University, **Russia**

SHVETSOV Gennady A.

Lavrent'ev Institute of
Hydrodynamics,
Novosibirsk, **Russia**

SMITH Ivor R.

Loughborough University, **UK**

STRUVE Kenneth William

Sandia National Laboratory, **USA**

TURCHI Peter J.

Compact Fusion Systems Inc., **USA**

YOUNG Andrew J.

Lawrence Livermore National
Laboratory, **USA**

SPONSORS AND EXHIBITORS LIST

Booth Number	Company name
01	ITHPP
02	CEA
03	Technology Innovation Institut
04	Pulse MC2
05	Diversified Technologies
06	General Atomics
07	HVP
08	Montena
09	JEMA
10	TECHNIX
11	EP3E

Exhibitors will be located in the Rotonde during the following dates and times.

Date	Hours	Location
Sunday, August 29	18:00 - 20:00	Rotonde
Monday, August 30	08:30 - 18:00	
Tuesday, August 31	08:30 - 18:00	
Wednesday, September 1	08:30 - 18:00	

Booth Number : 01

Defence, Research, Industry

High Pulsed Power system tailored to your application

ITHPP

ALCEN



Rock fragmentation:
Electro pulsed crushing system



Hydrodynamic Radiographic
equipment



High power microwave equipment:
non cooperative vehicle stopper system

ITHPP is a key player in the development of high pulsed power equipment: observation of ultra-fast physical phenomena, behavioral studies of materials under high pressure, electromagnetic projectile acceleration, vulnerability to lightning, high-power microwave for UAV's on-board electronic disrupting.

With such expertise, ITHPP also offers innovative equipment for rock fragmentation by shockwaves for the mining industry and pulsed electron beam sterilization equipment for pharma industry.

from **spark** to **lightning**


www.ithpp-alcen.com


Booth Number : 02




Key player in technological research and innovation in Europe



Defence and Global Security 

Low-carbon Energies 

Fundamental Research 

Information & Health Technologies 

Contact

Gramat: Lucia Le Clech - 33 (5) 65 10 54 32
CESTA: Jean Lajzerowicz - 33 (5) 57 04 42 12

CEA/GRAMAT

The CEA/Gramat center is attached to the CEA's Defence and Security Division (DAM). It ensures project management assistance to the France's defence procurement agency (DGA) and is the Defense reference center for systems and infrastructure vulnerability to the effects of weapons and the effectiveness of conventional armaments.



CEA/CESTA

Located near Bordeaux, the CEA/CESTA center, part of the DAM division, is the industrial design authority for the Deterrence Force nuclear warheads. It also brings the demonstration of their operational performance in a dual approach tests/modeling implementing a fleet of test resources, physical modeling and supercomputers. CESTA hosts the largest laser facility in Europe, the LaserMegajoule LMJ and its 176 energy beams.

www-dam.cea.fr

Booth Number : 03



Seven centres of excellence. One pioneering mission.

Working together on real-world solutions to society's greatest challenges, our research centres of excellence in Abu Dhabi, United Arab Emirates are pushing boundaries at the edge of science – from quantum computing, autonomous robotics, cryptography, advanced materials, digital security, directed energy, secure systems and beyond.

Talk to us about our pioneering partnerships in advanced technology research or visit tii.ae

PULSE mc²

ELECTRONIQUE DE PUISSANCE
COMPOSANTS & SYSTEMES HAUTE TENSION

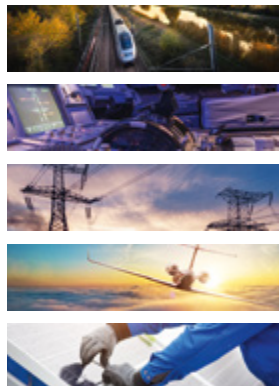
Pulse MC² est aujourd'hui la société leader en France dans la distribution de composants et systèmes de haute technologie dans le domaine de la haute tension, de l'électronique de puissance, des systèmes à haute puissance pulsée et des systèmes de communication en milieu perturbé. Nous sommes présents sur les marchés les plus variés tels que la recherche, le militaire, le médical, le spatial, l'automobile, les semi-conducteurs, etc.

Nos gammes de produits : Alimentations, générateurs d'impulsions haute tension, convertisseurs et charges électroniques, transformateurs d'impulsions et d'isolement, commutateurs à semi-conducteurs, éclateurs, thyristors, condensateurs, câbles, connecteurs, diodes, résistances, relais, sondes, diviseurs, atténuateurs, liaisons fibre optique.

www.pulsemc2.com

7, allée du Brévent – Silic 1416 – 91019 Evry cedex (France) - 01 60 86 21 26 - info@pulsemc2.fr

Booth Number : 04



POWERFUL SOLUTIONS. PROVEN PERFORMANCE.

CAPACITORS FOR DEMANDING
APPLICATIONS WORLDWIDE

- Setting the industry standard for the highest levels of reliability and confidence
- Delivering record breaking energy and power
- Catalog and in-stock availability
- R&D and custom design services
- Precision manufacturing



Learn more at www.ga.com/capacitors
©2021 GENERAL ATOMICS

GENERAL ATOMICS
ELECTROMAGNETICS

Booth Number : 06



PowerMod™ SOLID STATE PULSED POWER SYSTEMS



- Compact, Rugged, Reliable
- Voltages to 500 kV
- Currents to 20 kA
- Frequencies to Hundreds of kHz
- Hundreds of Installations Worldwide

Booth Number : 05



Solutions, design, and products fitted to customer's needs

Since 2005 HVP has been earning their customer's trust as the leading European supplier for high-voltage components, systems, and related services. Our target is being capable of supplying high-quality and reliability solutions to our clients. Herby, the main goal is to establish long-term cooperation with our customers by meeting their economical requirements and at the same time deliver excellent product quality and technical support rather than one-time sales.

HVP's approach to manufacture, distribution and sale of electronics together with their partner Dean Technology, Inc. is unique. We remain focused on providing the correct product and solution to meet each individual design. All the engineers work directly with our customers to ensure best possible technical project support. We firmly believe that through our honest, involved, and direct approach we are best able to meet our customers' needs.

With our main office in Munich, Germany, as well as branches in Turkey, Japan, and Korea we emerge to be one of the worldwide most trusted supplier of high- and low-voltage, high-power and -frequency as well as test & measurement components.

www.hvproducts.de
info@hvproducts.de

Booth Number : 07



montena

Booth Number : 08

PULSE SOURCES and MEASUREMENT

High Power
Electromagnetic
solutions



montena technology sa
Switzerland
montena.com



Booth Number : 10

Technix is a European leading manufacturer of regulated High Voltage DC power supplies, High Voltage capacitor chargers and High Voltage Electron Beam power supplies.

Our range of power goes from 150W to more than 200kW (75J/s to >100kJ/s). Our range of voltage goes from 1kV to above 250 kV.

The company is based in Creteil (near Paris) since 2000. Our 20 year old expertise In High Voltage allows us to design our own HV transformers and HV multipliers with a high level of flexibility and reliability based on a modular concept to offer a large choice of configurations.

TECHNIX designs, produces and sells over the world and is recognized as an attractive worldwide supplier, appreciated by demanding and well known customers in various industries and several research centers.

We are capable of adapting our standard models to fit your needs with a large list of options. OEM products can also be developed by our R & D team with high mechanical and electronic level requirements.

Our commitments towards our customers: **Reactivity** (of our technical and commercial teams), **Flexibility** (we answer to all specific needs), **Competitiveness** (especially for medium / high power), **Reliability** (on lead time, support & quality), **Proximity** (direct communication with design & test engineers).



innovative
energy

Power Conversion Systems

Customised solutions for any
type of Power Supply

Booth Number : 09

MEET US AT
BOOTH N° 16

Customised solutions for any type
of power supply. Let us help you
with finding the best solution for
your needs.

Experience in a wide range of
power supplies with pulses from a
few us up to continuous wave,
with voltages up to 150 kV and
currents up to 250 kA.



JEMA Energy S.A.
Parque del Circuito 10
20160 Lacrén-Oñate - Guipúzcoa - Spain
Tel: +34 943 276 400
E: info@jemaenergy.com
www.jemaenergy.com



Monday, August 30 | 09:00 – 10:00

OPPORTUNITIES AND CHALLENGES IN MAGNETIZED LINER INERTIAL FUSION



David Ampleford

Sandia National Laboratories,
Albuquerque, USA

Dave Ampleford received the MSci degree in physics and the PhD in plasma physics from Imperial College London in 2001 and 2005, respectively. He has led experiments on the Z pulsed power generator aimed at investigating the stagnation morphology observed in Magnetized Liner Inertial Fusion and experiments using the Z generator to develop bright x-ray sources. Dr Ampleford currently manages the fusion experiments organization at Sandia National Laboratories, overseeing ICF experiments and neutron diagnostic development on Sandia's Z machine. In 2014 Dr Ampleford received the IEEE Nuclear and Plasma Sciences Society Early Achievement Award. He has more than 90 refereed journal publications.

Magnetized Liner Inertial Fusion (MagLIF) provides a promising path to multi-MJ fusion yields in the laboratory. MagLIF is a magneto-inertial fusion scheme that relies on magnetic field coils to pre-magnetize a fusion fuel, a high-power laser pulse to pre-heat the fuel, and a pulsed-power driven current to compress the pre-conditioned fuel to reach fusion conditions. In recent years MagLIF has been the principal pulsed-power driven fusion scheme investigated on the 26-MA Z-Machine at Sandia National Laboratories. While the Z machine does not provide sufficient current to achieve multi-MJ yields, it allows us to test the key attributes of magneto-inertial fusion, and to address many of the risks associated with scaling to future machines. In this talk we will review recent progress on MagLIF. We will discuss how focused physics experiments, along with improved diagnostics and magneto-hydrodynamic simulations, have led to advanced understanding of preheat, implosion stability, and stagnation conditions in MagLIF. We describe how this improved understanding, along with recent improvements in available laser coupling, current coupling and magnetic field coils, have led to record fusion yields from MagLIF. Finally, we will outline scaling arguments used to define the applied field, laser preheat, and pulsed power driver required to achieve MJ yields.

Tuesday, August 31 | 09:00 – 10:00

PULSED POWER AND ELECTROMAGNETIC LAUNCH DEVELOPMENTS AT FIRST LIGHT FUSION: AN OVERVIEW



**Luis Sebastián
Caballero Bendixsen**

First Light Fusion, Oxford,
United Kingdom

Dr. Luis Sebastian Caballero Bendixsen is a Senior Scientist at the Pulsed Power Group at First Light Fusion where he is responsible for the design, development and construction of pulsed power drivers used for fusion experiments. Since joining First Light Fusion in 2017 he has seen the development and operation of all the pulsed power generators in use at First Light Fusion. This includes Machine 3 which generates currents of up to 14 MA and 1000T magnetic fields used for electromagnetically propel projectiles used in First Light Fusion's impact fusion. Previous to this Luis Sebastian hold several positions at the University of Oxford, Rutherford Appleton Laboratory's Central Laser Facility, Pontificia Universidad Catolica de Chile Physics Department and University of California San Diego's Center for Energy Research working both on pulsed power development and plasma physics.

First Light Fusion Ltd is a privately funded company researching energy generation using inertial confinement fusion. Efforts are centered around developing both simulation and experimental capabilities. For this, First Light Fusion (FLF) currently operates a pair of two-stage light gas guns with projectile velocities exceeding 7 km/s. Our electromagnetic launch capabilities include two low inductance capacitor bank pulsed power generators delivering 3.5 MA in 600 ns and 14 MA in 2 us. Experimental campaigns are focused on validation of Hytrac (multi-material hydro with front tracking and AMR) and B (parallel multi-material resistive MHD) codes, two simulation tools developed by FLF. This improves our understanding of target physics and electro-magnetic launch for projectile driven fusion experiments. Supporting our experimental facilities, world class diagnostic capabilities have been established at FLF. These include ultra-high-speed (~ 3 ns exposure) and streaked optical imaging, spectroscopy, VISAR and x-ray radiography. Rapid feedback enables iteration within experimental campaigns and continuous improvement of the designs.

During this talk an overview of the pulsed power capabilities that FLF has developed over the last 5 years will be presented, with emphasis on the design and development of M3 (14 MA in 2 us). This driver was commissioned at the end of 2018 with science experiments starting January 2019. It was designed primarily as an electromagnetic launch driver and has delivered measured projectile velocities around 12 km/s, with impact timing analysis suggesting speeds approaching 20 km/s. Plate flyer experiments will be discussed in detail showing FLF electromagnetic launch capabilities, diagnostic suite, and analysis.

Wednesday, September 1 | 09:00 – 10:00

THE LASER MEGAJOULE (LMJ) FACILITY STATUS



Tony CAILLAUD

CEA/DAM Centre du
CESTA, Le Barp, France

Dr. Tony CAILLAUD is a group leader at the Target Assembly Laboratory at the Commissariat à l'Energie Atomique (CEA) in the Département des Lasers de Puissance where the Laser MégaJoule (LMJ) is exploited for simulation program to guarantee French nuclear deterrence. He took part of the many experimental campaigns since the first experiment campaign hold on the LMJ in 2014 as a developer and operating of the plasma diagnostics. Tony Caillaud received the PhD in laser-plasma interaction physic at CELIA Laboratory in 2004. Then, he held several positions at CEA, such as developing and integrating plasma diagnostics on LMJ or developing neutron imaging for Inertial Confinement Fusion (ICF) experiments on OMEGA facility, then, testing and specifying electronic acquisition systems and calibrating of streak cameras and optical analysers for plasma diagnostics.

The Laser MégaJoule (LMJ) program ([1], [2]) aims at providing an experimental facility dedicated to the simulation program that is a keystone to guarantee the French nuclear deterrence. As advanced physics data and models are used to compute numerical simulation, the LMJ offers unique capabilities for the simulation program in High Energy Density Physics (HEDP) by validating the advanced theoretical models, the basic science (by determination of equation of state, atomic and nuclear physics). A large panel of experiments can be done on LMJ to study physical processes at temperatures from 100 eV to 100 keV, and pressures from 1 Mbar to 100 Gbar. Inertial Confinement Fusion (ICF) is also an exciting challenge, since ICF experiments set the most stringent specifications on LMJ's features. The LMJ building is a huge monument of 300 m length, 150 m width and 40 m height, composed of 4 laser bays containing 5 or 7 laser bundles each (1 bundle is 8 beams). The laser pulses duration go from 0.7 ns to 25 ns. At the end, 176 beams will be available to heat the millimetric targets. The whole laser energy will be about 1.5 MJ (UV light on target). At the building center, a large cylindrical target bay of 30 m diameter contains a 10 m diameter target chamber made of 10 cm thick aluminum covered with 40 cm thick borated concrete. Around the target chamber, a complete set of equipment allows target positioning, laser-matter interaction characterization, and laser focusing on target. An extra multi-PW beam, PETAL [3], coupled to LMJ, offers the opportunity to study matter in extreme conditions. We will introduce and describe the LMJ-PETAL facility status and provide the necessary technical performances consistently with the theoretical models constraints. We will also explain how this program relies on and feeds the industrial network from the Nouvelle Aquitaine area.

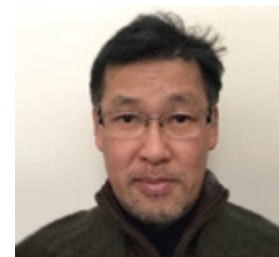
[1] A. Michel, «The French megajoule laser project (LMJ)», Fusion Engineering and Design 44 (1), 43-49 (1999).

[2] C. Lion, «The LMJ program: an overview», Journal of Physics 244 (1), 012003 (2010).

[3] N. Blanchot et al, Plasma Phys. Control. Fusion 50, 124045 (2008).

Thursday, September 2 | 09:00 – 10:00

PRIMARY IMPACTS OF PULSED ELECTRIC FIELDS ON ORGANISMS AND THEIR INDUSTRIAL APPLICATIONS



Sunao Katsuki

Kumamoto University,
Kumamoto, Japan

Sunao Katsuki was born in Kumamoto, Japan, in 1966. He received the M.S. and Ph.D. degrees from Kumamoto University, Japan, in 1991 and 1998 respectively. He started his research career in the Dr. Akiyama's Lab, Kumamoto University, in 1991 as a research associate. He started working on pulsed power generation and its applications including railgun, atmospheric pressure pulsed corona discharges and inductive energy driven high-power microwave. Around the same time, he had frequently participated in the tokamak plasma experiment in TEXTOR, Germany from 1996 to 1998. From 2001 to 2002, he had joined Dr. Schoenbach's Lab at Old Dominion University, USA, and worked on underwater submillimeter gap discharge and on medical/biological applications of pulsed electric fields (PEF). From 2004 to 2014, he had been involved in the development of highly repetitive micro z-pinch plasmas as an extreme ultraviolet (EUV) source for semiconductor lithography. Recent 10 years, he has focused on Bioelectrics, especially on understanding of physical impact of PEF on biological cells, tissues and biomolecules, and on industrialization of PEF-based food processing technologies. He has published 146 peer reviewed papers so far. Presently he is a Professor of Institute of Industrial Nanomaterials (IINa), Kumamoto University, which was established in 2020 by integration of the former Institute of Pulsed Power Science with material scientists.

Pulsed electric field (PEF) primarily impacts phospholipid membranes which are regarded as dielectric films, and giant biomolecules such as nucleic acids and proteins which have electrical charge distribution in them. PEF accumulates electrical charges on the membrane in a conductive liquid so that the trans-membrane field is enhanced to the order of 1 MV/cm. Such an extremely large field breaks down and permeabilizes the membrane. After that the transport of ions and bio molecules take places through the permeabilized membrane. We have been investigating the morphological and functional changes of membrane exposed to PEFs and the subsequent transmembrane ion transport using various kinds of cells including mammalian cells, plant cells, bacteria and artificial cells. Also, an extremely large PEF causes intra- and inter-molecular stresses in giant biomolecules, which eventually result in their structural and functional changes. Membrane proteins, which interface intracellular to extracellular regions, are exposed to such an extremely large field exceeding 1 MV/cm during the exposure to even relatively low PEF. We have demonstrated that the structural and functional changes of several kinds of proteins and their aggregation using the 1 ns, 1.5 MV/cm PEF exposure chamber. These primary impacts of PEF have been widely applied for scientific and industrial fields including biotechnology, medical treatment, food processing, biorefinery, environment, etc. and discussed the further possibility. This paper overviews the primary impacts of PEF and describes several attractive applications based on our study.

08:30 – 09:00 Opening ceremony		
09:00 – 10:00 Plenary session #PL1 – Invited Plenary speaker		
#PL1	Opportunities and challenges in Magnetized Liner Inertial Fusion	David Ampleford - Sandia National Laboratories, Albuquerque, USA
10:30 – 12:10 Oral session #O1 – Pulsed power applications		
#O1-1	New approach for an electromagnetically driven active armour system	Sylvain Pinguet - Pulsed Power Systems AG, Wallbach, Switzerland
#O1-2	Railgun Tests At ASELSAN Electromagnetic Launch Laboratory	Mustafa Karagoz - ASELSAN Inc., Ankara, Turkey
#O1-3	Advantages of nanosecond pulsed power driven streamer plasma	A.J.M. Pemen - Eindhoven University of Technology, Eindhoven, Netherland
#O1-4	Muzzle Voltage Characteristics of Railguns	Nail Tosun - Middle East Technical University, Ankara, Turkey
#O1-5	Effects of residual space charges on progressive streamer-to-leader transition in N2-SF6 mixtures under positive and negative repetitive nanosecond pulses	Zheng Zhao - School of Electrical Engineering, Xi'an, China
#O1-6	Development of a low voltage Railgun in the context of lightning restrike	Vincent Andraud - DPHY, ONERA, Université Paris-Saclay, Orsay, France
10:30 – 12:10 Oral session #O2 – High power microwave and RF sources		
#O2-1	Real time and polarimetric analysis of intense electric field using electro-optic probe	Gwenael Gaborit - IMEP-LAHC, Le Bourget du Lac, France
#O2-2	Non-Linear Absorption of High-Power Microwave Pulses in a Plasma Filled Waveguide	Yang Cao - Technion - Israel Institute of Technology, Haifa, Israel
#O2-3	A 3-D numerical analysis and experimental validation of a bipolar pulse forming transmission line for HPM applications	Njomza Ibrahim - Université de Pau et des Pays de l'Adour, E2S UPPA, SIAME, Pau, France
#O2-4	AN/TPQ-18 Radar Transmitter	Rebecca Simpson - Diversified Technologies Inc., Bedford, USA
#O2-5	Design of a vacuum interface of a microsecond timescale HPM diode with guiding magnetic field	Hanwu Yang - College of Advanced Interdisciplinary Studies, National University of Defense Technology, Changsha, China
#O2-6	Measurement and Analysis of Electron Beam Behavior in a Virtual Cathode Oscillator	Kazuki Nagao - Nagaoka University of Technology, Niigata, Japan

13:00 – 15:00 Poster session #P1			1/3
#P1-1	Research of scattering properties of lead and copper targets for protons with energy range from 60 to 110 MeV and calculating characteristics of the resulting secondary radiation	Ruslana Truntseva - FSUE RFNC-VNIIEF, Nizhny Novgorod, Russia	
#P1-2	Revisiting The Effect Of A Thin Ion Barrier Foil On The Electron Spot Size In A Relativistic Electron Beam Device For X-Ray Flash Radiography	Claude Fourment - CEA Centre du CESTA, Le Barp, France	
#P1-4	Investigations on diode current, core biasing and analogue modulation of an inductive adder	Michael Barnes - CERN, Geneva, Switzerland	
#P1-5	MHD Simulations of Physical Processes in Spherical Plasma-Focus Chambers Considering Neutron Generation	Vasilii Dolinskiy - RFNC-VNIIEF, Nizhny Novgorod, Russia	
#P1-6	Safety Method Using High Power Microwave (HPM) as defense against vehicles	Mohamad Rammal - ITHPP, Thegra, France	
#P1-7	Two-flow absolute linear instability for spherically symmetric states of dynamic equilibrium of Vlasov-Poisson plasma: a priori exponential lower estimate and counterexamples to some classical results	Sofya Bibilova - Novosibirsk National Research State University, Novosibirsk, Russia	
#P1-9	Shock-ionized dynistors and generators of nanosecond high power pulses based on them.	Sergey Korotkov - Ioffe Institute, St Petersburg, Russia	
#P1-10	Design and Modelling of a 6 GW Tesla Transformer-based Pulsed Generator for Vircator Studies	Gideon Nimo Appiah - Technology Innovation Institute, Abu Dhabi, UAE	
#P1-11	Pulsed power beams excitation for photolysis of organic molecules and modification of polypropylene superfine fibers	Olga Tchaikovskaya - Tomsk State University, Tomsk, Russia	
#P1-12	A compact coreless pulsed electromagnetic coupler for smart grid applications	Fatima Zahra Boudara - Université de Pau et des Pays de l'Adour, E2S UPPA, SIAME, Pau, France	
#P1-13	MHD Simulations of Turbulent Development of the Sausage Instability of a Z-pinch	Sergey Garanin - RFNC-VNIIEF, Nizhny Novgorod, Russia	
#P1-14	Modeling of the electrothermal behavior of a SiC MOSFET chip during a short circuit and adaptation to an entire power module	Yannick Dumollard - Alstom, Tarbes, France	

13:00 – 15:00 Poster session #P1			2/3
#P1-15	Formation of Repetitively Pulsed Titanium Ion Beams of High Power with a Submillisecond Pulse Duration	Dimitrii Vakhrushev - Tomsk Polytechnic University, Tomsk, Russia	
#P1-16	Preliminary Multiphysics Modeling of a 1m Sandwiched Electromagnetic Accelerator Prototype	Mae AlMansoori - Directed Energy Research Centre, Technology Innovation Institute, Abu Dhabi, UAE	
#P1-18	High power broadband pulse generation using asymmetric blumlein line	Yahia Achour - Ecole Militaire Polytechnique, Alerger, Algeria	
#P1-19	Current spreading over the width of thin foils (in serpentine-like systems) or flat current-conducting layers	Ekaterina Kravets - RFNC-VNIIEF, Nijni-Novgorod, Russia	
#P1-20	High frequency signal synchronization using PGA-SOC technology for security system in a radiography equipment	Roman Leduc - Universite de Pau et des Pays de l'Adour, E2S UPPA, SIAME, Pau, France	
#P1-21	Compact high-current generator for laboratory studies of high energy density matter	Sergey Efimov - Technion - Israel Institute of Technology, Haifa, Israel	
#P1-22	Using Electrostatic Finite Element Modelling to predict High-voltage insulation tests for Switchgear components	Nicolas Alferez - Alstom Group, Tarbes, France	
#P1-23	Theoretical study on the influence of corrugated shape and size on dispersion curves in coaxial slow wave structures	Siyao Chen - College of Advanced Interdisciplinary Studies, National University of Defense Technology, Tokyo, Japan	
#P1-24	Improvement adhesion and properties of protective coatings on zirconium alloys and austenitic stainless steels by pre-treatment with high-intense pulsed ion beams	Gennady Remnev - Tomsk Polytechnic University, Tomsk, Russia	
#P1-25	Design and test of a high PRF 0.5 MV Marx generator to drive PFLs	Laurent Ariztia - Universite de Pau et des Pays de l'Adour, E2S UPPA, SIAME, Pau, France	
#P1-26	Designing quasi-force-free configurations of non-destructive megagauss magnets	German Shneerson - Peter the Great St. Petersburg Polytechnic University, Saint Petersburg, Russia	
#P1-28	High voltage electrical pulses for the Extraction of Mycosporine-like Amino Acids from the Agarophyte Gelidium sesquipedale	Colin McReynolds - Universite de Pau et des Pays de l'Adour, E2S UPPA, SIAME, Pau, France	

13:00 – 15:00 Poster session #P1			3/3
#P1-29	Low-Impedance High-Power Pulsed Generator Based on Forming Line with Built-in Tesla Transformer	Jiande Zhang - National University of Defense Technology, Changsha, China	
#P1-30	Design and Implementation of a 250 kJ Pulsed Power Supply Module for Electromagnetic Launch Experiments	Huseyin Akdemir - ASELSAN Inc., Ankara, Turkey	
#P1-31	Theoretical and Practical Studies of Flashover along Cylindrical Dielectric with Coaxial Electrodes in Atmospheric Air	Alexey Zhabin - Universite de Pau et des Pays de l'Adour, E2S UPPA, SIAME, Pau, France	
#P1-32	Lifetime Test Platform of Mica Paper Capacitors under Microsecond Pulse	Zicheng Zhang - College of Advanced Interdisciplinary Studies, Tokyo, Japan	
#P1-33	Preliminary experiment of a medical pulsed point light source system	Jian Zou - China Institute of Atomic Energy, Beijing, China	
#P1-34	Powerful Cherenkov masers with 2D slow-wave structures based on high-current relativistic electron beams of sheet and tubular geometry	Vladislav Zalavsky - Institute of Applied Physics RAS, Nijni-Novgorod, Russia	
#P1-35	Development of a standard measuring system for the characterization of high voltage nanosecond pulses	Mohammad Saif Khan - Laboratoire National de Métrologie et d'Essais (LNE), Paris, France	
#P1-36	Pulsed Gas Discharge Driven by Solid-State LTD	Junxiang Yang - Nagaoka University of Technology, Niigata, Japan	
#P1-37	Joule Heating in Initiation of Discharge in Water	He Zhang - Key Laboratory of Pulsed Power Technology (Huazhong University of Science and Technology), Ministry of Education, Wuhan, China	
#P1-38	A Semiconductor Opening Switch Based on Off-The-Shelf Components	Mawuena Rémi Degnon - Universite de Pau et des Pays de l'Adour, E2S UPPA, SIAME, Pau, France	
#P1-39	Development of the 6 MA - 1 μ s driver GEPI-2 for Isentropic Compression Experiments	Frederic Zucchini - CEA Centre de Gramat, Gramat, France	
#P1-40	Durability Study of Bulk Cu-Nb Composites in High Magnetic Fields of Microsecond Duration	Alexey Spirin - Institute of Electrophysics UB of RAS, Ekaterinburg, Russia	
#P1-41	52-kV Compact Solid-State Pulsed Power Modulator For S-band 3.1MW Magnetron	Seung-Ho Song - Chung-Ang University, Seoul, South Korea	

TECHNICAL PROGRAM

Mon. 30 Aug.

Tues. 31 Aug.

TECHNICAL PROGRAM

15:30 – 17:10 | Oral session #O3 – Bio-medical and Industrial Applications

#O3-1	Biotechnological valorization of platelet releasate by selective pulsed electric fields application	Daniela Salvador - iBET, Instituto de Biologia Experimental e Tecnológica, Oeiras, Portugal
#O3-2	Pulsed electron beam: mechanisms involved in bacteria eradication	Camille Lamarche - ITHPP, Thegra, France
#O3-3	Influence of Electric Field and Gap Length on OH Radical Production by Pulsed Electric Discharge in Water	Taichi Sugai - Nagaoka University of Technology, Niigata, Japan
#O3-4	Using Subnanosecond Pulsed Electric Fields To Electroporate Bacteria	Leslie A. Vallet - Université Paris-Saclay, Institut Gustave Roussy, CNRS, Metabolic and systemic aspects of oncogenesis (METSU), Villejuif, France
#O3-5	Visualization of Local Thermalization of Conductive Fluids Exposed to Repetitive High-Power Electrical Pulses	Takumi Yamashita - Kumamoto University, Kumamoto, Japan
#O3-6	Experimental results on cell treatment and tissue ablation by a TLT based pulsed electric filed generator	Rongwei Ma - College of Chemical and Biological Engineering, Zhejiang University, Hangzhou, China

15:30 – 17:10 | Oral session #O4 – Solid State Generators and Components

#O4-1	Fast Thyristor Switch Triggering in Impact Ionization Wave Mode by a Solid-State Spiral Generator	Ivan Lavrinovich - Université de Pau et des Pays de l'Adour, E2S UPPA, SIAME, Pau, France
#O4-2	Super boosting gate driver for sub-nanosecond switching of HV SiC MOS transistor	Alicia Ana del Barrio Montañés - CERN, Geneva, Switzerland
#O4-3	Test of a multi-gigawatt, 800 ns pulse generator based on metal-oxide varistors	Hanwu Yang - College of Advanced Interdisciplinary Studies, National University of Defense Technology, Changsha, China
#O4-4	Energy recovery and switching surge reduction methods for pulsed power generators using high voltage SiC-MOSFETs	Mitsuhiko Sato - Graduate School of Science and Technology, Kumamoto University, Kumamoto, Japan
#O4-5	Solid-state SOS+MCL approach for picosecond multi-gigawatt pulse generation	Maksim Pedos - Institute of Electrophysics UB RAS, Ekaterinburg, Russia
#O4-6	10kV, 200kHz High Repetitive Pulsed Power Modulator based on Solid-State Wide band-gap switch	Jo Hyun-Bin - Chung-Ang-University, Seoul, South Korea

08:45 – 09:00 | Announcements

09:00 – 10:00 | Plenary session #PL2 – Invited Plenary speaker

#PL2	Pulsed Power and Electromagnetic launch developments at First Fusion: an overview	Luis Sebastián Caballero Bendixsen - First Light Fusion Ltd, Yarnton, Oxfordshire, England
------	---	---

10:30 – 12:10 | Oral session #O5 – Explosive Pulsed Power and Related Topics

#O5-1	System Integration of the Los Alamos MK-X Helical Flux Compression Generator and the Ranchero High Current Generator for Imploding Liner Experiments: LA-UR-21-23499	James Goforth - Los Alamos National Laboratory, Los Alamos, USA
#O5-2	Project of powerful long-pulse THz-band FEL driven by linear induction accelerator	Naum S. Ginzburg - Budker Institute of Nuclear Physics RAS, Novosibirsk, Russia
#O5-3	Instability of Thin Resistive Liners in the Linear Approximation	Sergey Garanin - RFNC-VNIIEF, Nizhny Novgorod, Russia
#O5-4	Simulations of Pulse Forming Networks (PFN) based on magnetically driven gates	Thomas Gianakon - Los Alamos National Laboratory, Los Alamos, USA
#O5-5	Alternatives for Decreasing Driving Timescale for the PHELIIX Transformer Concept	Robert Reinovsky - Los Alamos National Laboratory, Los Alamos, USA

10:30 – 12:10 | Oral session #O6 – High Power Microwave and RF Sources

#O6-1	Experimental and numerical studies of a relativistic magnetron fed by a split cathode	John G. Leopold - Technion - Israel Institute of Technology, Haifa, Israel
#O6-2	Study of high current magnetron impulse discharge	Erwan Morel - LPGP, Université Paris-Saclay, Orsay, France
#O6-3	Safety Method Using High Power Microwave (HPM) as defense against vehicles	Mohamad Rammal - ITHPP, Thegra, France
#O6-4	Design of a high-power UWB antenna for the neutralization of improvised explosive devices	Jérémy Hyvernaud - XLIM, Brive, France
#O6-5	Electron-optical systems based on cathodes with a high current density for planar spatially extended Cherenkov-type oscillators and amplifiers	Vladislav Zaslavsky - Institute of Applied Physics of the Russian Academy of Sciences, Nizhny Novgorod, Russia
#O6-6	A Semiconductor Opening Switch Based on Off-The-Shelf Components	Mawuena Rémi Degnon - Université de Pau et des Pays de l'Adour, E2S UPPA, SIAME, Pau, France

13:00 – 15:00 Poster session #P2			1/3
#P2-1	Generators of high voltage discharges in gases and liquids	Sergey Korotkov - Ioffe Institute, St Petersburg, Russia	
#P2-2	Generation of supersonic water jets by underwater electrical explosion of wire arrays	Daniel Maler - Technion - Israel Institute of Technology, Haifa, Israel	
#P2-3	Low-energy high-intensity nitrogen ion implantation of stainless steel with subsequent modification of the ion-doped layer by pulsed high-current electron beam	Dimitrii Vakhrushev - Tomsk Polytechnic University, Tomsk, Russia	
#P2-4	Research progress of pulsed X-ray phase contrast imaging	Jian Zou - China Institute of Atomic Energy, Beijing, China	
#P2-5	Comparative Analysis of Capacitive Energy Source Topologies for an Electromagnetic Accelerator	Fernando Albarracin-Vargas - Directed Energy Research Centre, Technology Innovation Institute, Abu Dhabi, UAE	
#P2-6	An intense THz Smith-Purcell source	Alexandre Goeury - CEA Centre du CESTA, Le Barp, France	
#P2-8	A 3-D electromagnetic analysis of a monopolar pulse forming line coupled to an impedance transformer for application to bio-medical domain	Njomza Ibrahim - Universite de Pau et des Pays de l'Adour, E2S UPPA, SIAME, Pau, France	
#P2-9	Solid-State Pulsed Power Generator Using Inductive Energy Storage	Xiaojing Ren - Nagaoka University of Technology, Niigata, Japan	
#P2-10	Effects of vacuum impedance changes on MILT flow using 3D electromagnetic PIC simulations	Troy Powell - Sandia National Laboratories, Albuquerque, USA	
#P2-11	Electric Field Inside a Gas Cavity Formed at a Solid-Solid Dielectric Interface Stressed with HV Impulse	Timothy Wong - University of Strathclyde, Glasgow, Scotland	
#P2-12	Non invasive electromagnetic diagnostic for new wide band gap semi-conductors	Jean-Marie Larbaig - Université de Pau et des Pays de l'Adour, E2S UPPA, SIAME, Pau, France	
#P2-13	Two-dimensional Measurement on Nanosecond Pulsed Discharge in coaxial electrode using Spectroscopic Imaging	Terumasa Ryu - Kumamoto University, Kumamoto, Japan	
#P2-14	Fish Barrier Pulse Generating System	Michael Kempkes - Diversified Technologies Inc., Bedford, USA	
#P2-15	Design and testing of RF-accelerating module for the IAP RAS photoinjector complex	Nikolai Peskov - Institute of Applied Physics RAS, Novosibirsk, Russia	
#P2-16	Effect of gas species on the plasma flow velocity generated in tapered cone plasma focus device	Shuto Watanabe - Nagaoka University of Technology, Niigata, Japan	

13:00 – 15:00 Poster session #P2			2/3
#P2-17	Pressure wave characteristics of pulsed arc electrohydraulic discharge versus underwater electrical wire explosion	Yoan Bacqueyrisses - ITHPP, Thegra, France	
#P2-18	Effect of pusher layer for radiation transport in foam layer in heavy-ion inertial fusion	Naoto Watanabe - Nagaoka University of Technology, Niigata, Japan	
#P2-19	Detection of Current Density Asymmetry in Electromagnetic Launchers via Current Barycenter Method	Gabriele Bandini - Department of Energy, Systems, Territory and Construction Engineering (DESTeC), University of Pisa, Pisa, Italy	
#P2-20	Superconducting armatures for coilgun applications	Vilius Vertelis - French-German Research Institute of Saint-Louis, Saint-Louis, France	
#P2-21	Double-beam planar magnetron-injection gun for powerful terahertz gyrotrons	Vladislav Zaslavsky - Institute of Applied Physics of the Russian Academy of Sciences, Nizhny Novgorod, Russia	
#P2-22	Investigations on two branch topologies for an inductive voltage adder based on simulations	Johannes Ruf - CERN, Geneva, Switzerland	
#P2-23	NLTL for picosecond pulse compression	Alexey Zhabin - Universite de Pau et des Pays de l'Adour, E2S UPPA, SIAME, Pau, France	
#P2-24	Electron temperature and electron density measurement of pulsed streamer discharge plasma between positive and negative voltage polarity dependence by laser Thomsonscattering diagnostics	Tomomasa Murakami - Kumamoto University, Kumamoto, Japan	
#P2-25	CMR-B-scalar sensors for measurement of magnetic field dynamics during magnetic pulse forming	Voitech Stankevicius - Department of Functional Materials and Electronics, Center for Physical Sciences and Technology, Vilnius, Lithuania	
#P2-26	Evaluation of a Multi-Channel Fast Marx prototype	Benjamin Lassalle - CEA Centre de Gramat, Gramat, France	
#P2-27	Numerical analysis on wave propagation in tamper for heavy-ion beam driven inertial confinement fusion target	Zhehao Lin - Nagaoka University of Technology, Niigata, Japan	
#P2-28	Investigation on transient current sharing between parallel SiC MOSFETs in HV pulsed-power applications	Mahdi Azizi - Electrical Energy Systems Group of the Department of Electrical Engineering at Eindhoven University of Technology, Eindhoven, Netherlands	
#P2-29	Pulsed corona discharge abating aqueous and airborne organic compounds: findings in energy efficiency enhancement	Sergei Preis - Tallinn University of Technology, Tallinn, Estonia	
#P2-30	Investigation of annular explosive emission cathodes of conductor-insulator construction	Alexander Chepusov - Institute of Electrophysics UB RAS, Ekaterinburg, Russia	

13:00 – 15:00 | Poster session #P2

3/3

#P2-31	High precision magnetic measurement on solenoids for high current electron LINAC	Bruno Cassany - CEA Centre du CESTA, Le Barp, France
#P2-32	Investigation of mechanical stresses and heating of a quasi-force-free magnet with inertial retention of the end part of the winding	German Shneerson - Peter the Great St. Petersburg Polytechnic University, Saint Petersburg, Russia
#P2-33	Compton SASE FEL Based on Sectioned RF Undulator Systems	Andrei Savilov - Insitute of Applied Physics, Russian Academy of Sciences, Nizhny Novgorod, Russia
#P2-34	A multiphase rail launcher with circular geometry and modular design: Development, construction and first experiments	Florian Zellmer - ISL Saint Louis, Saint-Louis, France
#P2-35	Modified LIF-Dip Spectroscopy of Rydberg States of Xenon for Electric field Measurement in Plasma	Wladimir An - Karlsruhe Institute of Technology, Karlsruhe, Germany
#P2-36	Different extraction structures application in high efficiency relativistic magnetron simulation	Yuwei Fan - National University of Defense Technology, Changsha, China
#P2-37	Planar relativistic sub-terahertz surface-wave oscillators and amplifiers with transverse energy output and input: concept, theory, and simulations	Naum S. Ginzburg - Institute of Applied Physics RAS, Nizhny Novgorod, Russia
#P2-38	Coupling of high voltage, high power modules for lightning strikes experimental simulation	Clement Zaepffel - DPHY, ONERA, Université Paris-Saclay, Orsay, Paris
#P2-39	Measure of Electrical Parameters of Nanosecond Dielectric Barrier Discharges (nsDBD) in Air at Atmospheric Pressure	Jean Paillol - Université de Pau et des Pays de l'Adour, E2S UPPA, SIAME, Pau, France
#P2-41	Analysis of the secondary emission of electrons in collector systems of modern gyrodevices	Mikhail Morozkin - IAP RAS, Nizhny Novgorod, Russia
#P2-42	Durability Study of Steel Layered Structures Obtained by Powder Approach in High Magnetic Fields of Microsecond Duration	Alexey Spirin - Institute of Electrophysics UB of RAS, Ekaterinburg, Russia
#P2-43	Impulse Generator for Testing the Effects of Indirect Lightning on Electronic Devices	Su-Mi Park - Chung-Ang University, Seoul, South Korea
#P2-44	The effect of impulse rise-time on the breakdown of composite ester-polymer insulation	Chris Williamson - University of Strathclyde, Glasgow, Scotland

15:30 – 17:10 | Oral session #O7 – Pulsed Power Generators and Components

#O7-1	The Saturn Accelerator Recapitalization Project	Bryan Oliver - Sandia National Laboratories, Albuquerque, USA
#O7-2	Fundamental Study of High Electric Field Surface Flashover in Vacuum	Andreas Neuber - Texas Tech University, Lubbock, USA
#O7-3	Operation of a high-impedance MITL into an undermatched load on the RITS-6 accelerator: limitations on inductive voltage adder (IVA) operation	Timothy Renk - Sandia National Laboratories, Albuquerque, USA
#O7-4	Impedance-Matched Marx, a new class of generator	Baptiste Guegan - ITHPP, Thegra, France
#O7-5	Repetitive pulsed electric fields in a large volume of water verified with measurement of opto-electric effect	Matthew Woodyard - Loughborough University, Loughborough, England
#O7-6	Revisiting the Physics of High-Current, Foil Opening Switches with Modern Codes	Christopher Rousculp - CLos Alamos National Laboratory, Los Alamos, USA

15:30 – 17:10 | Oral session #O8 – Particle Beams Physics and Technology

#O8-1	Integration test of Plasma Filled Rod Pinch diode radiographic source	Mark Sinclair - AWE, Berkshire, England
#O8-2	Dielectric Quality Assessment Methods for Complex Ceramic Tubes used for the LHC Injection Kicker Beam Screens	Tobias Stadlbauer - CERN, Geneva, Switzerland
#O8-3	A source of pulsed beams of charged particles based on a double pulse generator	Mikhail Zhuravlev - Tomsk Polytechnic University, Tomsk, Russia
#O8-4	Code-to-code benchmarking of 2D high energy beam transport in a gas cell	Chris Moore - Sandia National Laboratories, Albuquerque, USA
#O8-5	Effects of vacuum impedance changes on MILT flow using 3D electromagnetic PIC simulations	Troy Powell - Sandia National Laboratories, Albuquerque, USA
#O8-6	Development of Solid-State Switch and High Precision Capacitor Charger for Kicker Modulator System	Tae-Hyun Kim - University of Science and Technology, Seoul, Korea

08:45 – 09:00 | Announcements

09:00 – 10:00 | Plenary session #PL3 – Invited Plenary speaker

#PL3	The laser mégajoule (LMJ) facility status	Tony Caillaud - CEA/DAM Centre du CESTA, Le Barp, France
------	---	---

10:30 – 12:10 | Oral session #O9 – Bio-medical and Industrial Applications

#O9-1	Pulsed streamer discharge generation with arbitrary waveform solid-state nanosecond pulsed power technology	Tom Huiskamp - Eindhoven University of Technology, Eindhoven, Netherland
#O9-2	Experimental characterization of pulsed arc under water	Julien Thouin - Université Paul Sabatier, Toulouse, France
#O9-3	Electrical discharges used as acoustic waveform generators	Philippe Delmote - ISL, Saint Louis, France
#O9-4	Influence of fluid static pressure and temperature on electrical discharges mode in liquids	Tony Impert - ITHPP, Thegra, France
#O9-5	Investigation of performance of supersonic underwater electrical discharge as a pulsed acoustic source	Jessica Stobbs - Loughborough University, Loughborough, Leicestershire, England
#O9-6	Pulsed arc electrohydraulic discharges generated by capacitor banks versus Marx generator: characterization of generated pressure waves	Yoan Bacqueyrisses - ITHPP, Thegra, France

10:30 – 12:10 | Oral session #O10 – High-Energy Density Physics and Technology

#O10-1	Multi-probe radiography with laser-driven particle/X-ray sources	Andrea Favalli - Los Alamos National Laboratory, Los Alamos, USA
#O10-2	An ultra portable X-pinch for probing warm dense matter	Simon Bland - Imperial College, London, England
#O10-3	An indirect iterative method to couple the generator to MHD load for future Z-pinch	Quan Zhou - Tsinghua University, Beijing, China
#O10-4	PHLIX Containment Cassette - Design and Validation Testing	Vincent Garcia - Los Alamos National Laboratory, Los Alamos, USA
#O10-5	Skin electrical explosion of flat conductors	Stanislav Chaikovskiy - Institute of High Current Electronics of the Siberian Branch of the Russian Academy of Sciences, Tomsk, Russia
#O10-6	Calculational Study of the Z-Pinch Dynamics of Resistively Thick Aluminum Rods	Seth Kreher - Los Alamos National Laboratory, Los Alamos, USA

13:00 – 15:00 | Poster session #P3

1/3

#P3-1	Project of powerful long-pulse THz-band FEL driven by linear induction accelerator	Naum S. Ginzburg - Budker Institute of Nuclear Physics RAS, Novosibirsk, Russia
#P3-2	Series Gate Driving System for Solid-State Bipolar Pulsed Power Modulator Based on Modular Cell Structure	Seung-Ho Song - Chung-Ang University, Seoul, South Korea
#P3-3	Investigation of dielectric strength of mineral oil based nanofluids under high pulsed voltage	Anca Petre - Université de Pau et des Pays de l'Adour, E2S UPPA, SIAME, Pau, France
#P3-4	Microscopic Schlieren and acoustic investigation of supersonic underwater electrical discharge phenomena	Jessica Stobbs - Loughborough University, Loughborough, England
#P3-5	Electromagnetic Launcher Speed Control with a Multilevel Fast Triggering Time Algorithm (MFTTA)	Nail Tosun - Middle East Technical University, Ankara, Turkey
#P3-6	A Portable X-pinch as a Source for Dispersive Spectroscopy in High Energy Density Physics	Jergus Strucka - Imperial College, London, England
#P3-7	A9x9 Sub-microsecond Pulsed Plasma Jet Array for Disinfection and Sterilization	Hongyu Chen - Zhejiang University, Hangzhou, China
#P3-8	Generation of Sub-Terahertz Cherenkov Superradiance Pulses in Strongly Oversized 1D and 2D Periodical Surface-Wave Structures	Naum S. Ginzburg - Institute of Applied Physics RAS, Nizhny Novgorod, Russia
#P3-9	Influence of electrical conductivity on electrical discharges mode in liquids	Tony Imbert - ITHPP, Thegra, France
#P3-10	Experimental Measurements, Numerical Simulations, and Analytical Calculations of Intense Relativistic Electron Beam Parameters on the SINUS-6 High-Current Electron-Beam Accelerator	K. Nusrat Islam - The University of New Mexico, Albuquerque, USA
#P3-11	Development of a low voltage Railgun in the context of lightning restrike	Vincent Andraud - DPHY, ONERA, Université Paris-Saclay, Orsay, France
#P3-13	Investigating the benefit of solid-state architectures to improve performances of pulsed power generator for multi-pulse flash radiography applications	Jean-Marie Larbaig - Université de Pau et des Pays de l'Adour, E2S UPPA, SIAME, Pau, France
#P3-14	Numerical modeling of dynamics a proton beam in an accelerating structure with a radio frequency quadrupole	Boriskov Alexandr. - VNIIEF, Nizhny Novgorod, Russia

13:00 – 15:00 Poster session #P3		2/3
#P3-15	Longitudinal ElectroMagnetic (EM) Force Investigation	Neal Graneau - AWE, Berkshire, England
#P3-16	Multi-pulse high pulsed power generator for future X-ray flash radiography applications	Baptiste Cadilhon - CEA Centre du CESTA, Le Barp, France
#P3-17	Effects of high switching frequency and dielectric barrier discharges on enamel insulation degradation of motors fed by SiC-based inverters	Veronika Gavrilenko - National Research Tomsk Polytechnic University, Tomsk, Russia
#P3-18	Ultrafast 30-kV nanosecond solid-state Impedance-matched Marx generator for transient plasma generation	Mahdi Azizi - Electrical Energy Systems Group of the Department of Electrical Engineering at Eindhoven University of Technology
#P3-19	Nanocrystalline Magnetic Cores Under Fast Pulse Magnetization	Mawuena Rémi Degnon - Université de Pau et des Pays de l'Adour, E2S UPPA, SIAME, Pau, France
#P3-20	Reverse Vortex Flow Gliding Arc Plasma for Nitrogen Fixation in Water	Yun-Sik Jin - Korea Electrotechnology Research Institute Bulmosan-dong, South Korea
#P3-21	Update on Marx generator circuit for accelerators based on SiC MOSFETs	Luis Redondo - Lisbon Engineer Superior Institute, GIAAPP/ISEL, Lisbon, Portugal
#P3-22	Electromagnetic Particle-In-Cell modelling of the MERLIN IVA using the measured pulse-forming line drive	Anthony Meadowcroft - AWE Aldermaston, Reading, England
#P3-23	Dual pulse generation from a velvet cold cathode with a new Inductive Voltage Adder "Mi2" for X-ray flash radiography applications	Rudy Delaunay - CEA Centre de Gramat, Gramat, France
#P3-24	The Influence of Shape and Timing of Applied Pulsed Voltage on Active Species Production in Electric Discharge Water Treatment Equipment	Phung Nhat Thanh - Nagaoka University of Technology, Niigata, Japan
#P3-25	Development of Single-Turn Coils for Multiple Generation of 40 T Magnetic Field in Microsecond Duration Range	Alexey Spirin - Institute of Electrophysics UB of RAS, Ekaterinburg, Russia
#P3-26	Electronic emission of a cold velvet cathode in multi-pulse regime	Isia Mousseau - CEA Centre du CESTA, Le Barp, France
#P3-27	Construction of Repeatable Pulsed-Power Load using Liquid Metal with electrode-covered nozzle	Yuki Narita - Nagaoka University of Technology, Niigata, Japan
#P3-28	A solid-state pulsed power modulator with high stability for Hard X-ray Free Electron Laser	Long Gong - Micovey, Wuhu, China
#P3-29	Structure design of inductor with large current-carrying capacity based on Taguchi method	Xiang Su - Huazhong University of Science and Technology, Wuhan, China

13:00 – 15:00 Poster session #P3		3/3
#P3-30	Evaluation of temporal behavior of 200 keV proton bunches with prompt γ spectrometry	Andrei Stepanov - Tomsk Polytechnic University, Tomsk, Russia
#P3-31	Inductance calculations of a toroidal coil and possibilities to convert it to a pulse transformer	Maxime Berard - French-German Research Institute of Saint-Louis, Saint-Louis, France
#P3-32	Study on acoustic characteristic of underwater multi-electrode pulse discharge	Haonan Lv - Zhejiang University, Hangzhou, China
#P3-33	FPGA based Programmable Pulse Generator for Solid-State Marx Generators	J.J. van Oorschot - Electrical Energy Systems, Eindhoven University of Technology, Eindhoven, Netherland
#P3-34	Investigating the beam transport in a Linear Induction Accelerator for multi-pulse X-Ray flash radiography	Clara-Marie Alvinerie - CEA Centre de Gramat, Gramat, France
#P3-35	Analysis of shock and acoustic pressure impulses generated by an underwater exploding wire	Thanasi Frost - Loughborough University, Loughborough, England
#P3-36	XRAM Generator Investigations with a 1 MJ Demonstrator	Oliver Liebfried - French-German Research Institute of Saint-Louis, Saint-Louis, France
#P3-37	Remediation of HCH contaminated soil using dielectric barrier discharge	Shuo Zhang - Zhejiang University, Hangzhou, China
#P3-38	80kW High Voltage Power Supply for X-ray Generator	Seongho Son - University of Science and Technology, Seoul, Korea
#P3-39	High power microwave coupler with high power handling and optimized electromagnetic mode conversion	Jean-Christophe Diot - CEA Centre de Gramat, Gramat, France
#P3-40	Design of Bipolar Pulsed Power Supply for Production of Plasma Activated Water	Tae-Hyun Kim - University of Science and Technology, Seoul, Korea
#P3-41	Phase transitions induced by megagauss fields in condensed matter	Yasuhiro Matsuda - University of Tokyo, Tokyo, Japan
#P3-42	Focusing an intense relativistic electron beam for flash radiography	Adrien Dudes - CEA Centre du CESTA, Le Barp, France
#P3-43	Lumped parameter wide frequency band characterization, applied to Si and SiC power devices used in power electronics topologies	Anusha Gopishetti - Université de Pau et des Pays de l'Adour, E2S UPPA, Pau, France
#P3-44	Preliminary study of dual annular multi-beam transmission for a TM03 mode V-Band RTTO	Jiande Zhang - National University of Defense Technology, Changsha, China
#P3-45	Experimental investigation of one meter scale millisecond duration guided discharge	Leonid Arantchouk - Laboratoire d'Optique Appliquée - ENSTA Paris, Ecole Polytechnique, CNRS, Institut Polytechnique de Paris

15:30 – 17:10 | Oral session #O11 – Pulsed Power Generators and Components

#O11-1	Development and test of a high power conventional pulser for radiography application	Frédéric Bayol - ITHPP, Thegra, France
#O11-2	Characteristic research of the propylene carbonate after nano-modification	Zicheng Zhang - National University of Defense Technology, Changsha, China
#O11-3	250kV/60ns high-pulsed power generator for the 3rd axis of EPURE facility	Baptiste Cadilhon - CEA Centre du CESTA, Le Barp, France
#O11-4	Fast & Flexible Impedance-Matched Solid-State Marx Generator for PAW Generation	J.J. van Oorschot - Electrical Energy Systems, Eindhoven University of Technology, Eindhoven, Netherland
#O11-5	Detailed Analysis and Interpretation of the MERLIN Inductive Voltage Adder Commissioning Data	Mark Sinclair - AWE, Berkshire, England
#O11-6	FPGA based Programmable Pulse Generator for Solid-State Marx Generators	J.J. van Oorschot - Electrical Energy Systems, Eindhoven University of Technology, Eindhoven, Netherland

15:30 – 17:10 | Oral session #O12 – Particle Beams Physics and Technology

#O12-1	A Linear Induction Accelerator as the 3rd flash radiographic source of the Fr-UK EPURE Facility	Christophe Vermare - CEA/DAM, Centre du CESTA, Le Barp, France
#O12-2	Numerical Simulation of PHELIIX Shallow Cassette Liner Performance Tests	Marvin Zocher - Sandia National Laboratories, Albuquerque, USA
#O12-3	Generation of high-power wideband terahertz radiation in long-pulse linac-based free electron lasers	Naum Ginzburg - institute of applied physics RAS, Nijni Novgorod, Russia
#O12-4	Analytical Calculations and Numerical Simulations of Intense Relativistic Electron Beam Generation and Transportation in a Smooth Cylindrical Waveguide	K. Nusrat Islam - University of New Mexico, Albuquerque, USA
#O12-5	Experimental studies of electron beam propagation in Argon	Nicolas Szalek - Université de Pau et des Pays de l'Adour, E2S UPPA, SIAME, Pau, France
#O12-6	XRAM Generator Investigations with a 1 MJ Demonstrator	Oliver Liebfried - French-German Research Institute of Saint-Louis, Saint-Louis, France

08:30 – 09:00 | Closing talk

09:00 – 10:00 | Plenary session #PL4 – Invited Plenary speaker

#PL4	Primary impacts of pulsed electric fields on organisms and their industrial applications	Sunao Katsuki - Kumamoto University, Kumamoto, Japan
------	--	---

10:30 – 12:10 | Oral session #O13 – Pulsed power applications

#O13-1	Structure and Dynamics of Pulsed-Power Driven Rotating Laboratory Plasmas	Vicente Valenzuela-Villaseca - Imperial College, London, England
#O13-2	High pulsed magnetic field sensor based on hybrid co-substituted manganite/graphene structure	Nerija Zurauskiene - Department of Functional Materials and Electronics, Center for Physical Sciences and Technology, Vilnius, Lithuania
#O13-3	Free target acceleration by underwater electrical explosion of a wire array	Daniel Maler - Technion - Israel Institute of Technology, Haifa, Israel
#O13-4	Investigation of multilayer electromagnetic shielding effectiveness using high and low permeability materials	Roman Leduc - Université de Pau et des Pays de l'Adour, E2S UPPA, SIAME, Pau, France
#O13-5	Pulsed corona discharge abating aqueous and airborne organic compounds: findings in energy efficiency enhancement	Sergei Preis - Tallinn University of Technology, Tallinn, Estonia
#O13-6	Quantitative calculation of bubble pulsation process of underwater pulsed discharge	Yong Zhao - Huazhong University of Science and Technology, Wuhan, China


10:30 – 12:10 | Oral session #O14 – Solid State Generators and Components

#O14-1	Solid-state Dual Linear Transformer Driver Using Inductive Energy Storage	Feng Yu - Nagaoka University of Technology, Niigata, Japan
#O14-2	Resonantly Charged Semiconductor-based Marx Generator	Martin Sack - Karlsruhe Institute of Technology, Karlsruhe, Germany
#O14-3	Diode Opening Switch and Magnetic Switch Based Full Solid-state High Voltage Repetitive Nanosecond Pulse Generator	Zichen Deng - State Key Laboratory of Electrical Insulation and Power Equipment, Xi'an Jiaotong University, Suzhou, China
#O14-4	Ultrafast Switching of SiC MOSFETs for High-Voltage Pulsed-Power Circuits	Mahdi Azizi - Electrical Energy Systems, Eindhoven University of Technology, Eindhoven, Netherland
#O14-5	Preliminary Study of Ultra-High Current Thyristors Triggered in Impact Ionization Wave Mode	Thomas Maysonnave - Université de Pau et des Pays de l'Adour, E2S UPPA, SIAME, Pau, France
#O14-6	Development of fast up-scalable 10-kV SiC-MOSFET switching modules	Rainer Bischoff - IFrench-German Research Institute of Saint-Louis (ISL), Saint-Louis, France

EAPPC BEAMS

MEGAGAUSS
BIARRITZ | FRANCE

2020

 BELLEVUE CONGRESS CENTER
Aug. 29 - Sep. 02 2021



WI-FI ACCESS CODE

Login : EAPPC BEAMS

Password : biarritz21

EAPPC-BEAMS2020.ORG