HORIZON 2020 RISE-PEARL *"Periodically Bent Crystals for Crystalline Undulators"* Meeting:

Project Workshop, Mid-Term Review and Training School

Università degli Studi di Ferrara and INFN Sezione di Ferrara, Ferrara, Italy
October 23 - 27, 2017

SECOND ANNOUNCEMENT

Scope

The H2020-RISE-PEARL Project Workshop and the Mid-Term Review Meeting will be held in Ferrara, Italy during October 23-25, 2017 at the Università degli Studi di Ferrara. These events will be followed on October 26-27 with the project-related **training course on Multiscale Computational Methods for Complex Molecular Systems**.

The PEARL project aims at advancing the technologies for manufacturing of high quality Periodically Bent Crystals (PBCr). The PBCr developed in the course of this project will be utilised for the construction of novel light sources of high-energy ($h\nu \geq 10^2$ keV up to GeV range) monochromatic electromagnetic radiation by means of a Crystalline Undulator (CU). The technological and experimental part of this project will be accompanied by the complimentary advanced theoretical research utilising modern theoretical, computational and modelling methods accomplished with high performance computing techniques. A broad interdisciplinary, international collaboration has been created in the frame of FP7 PIRSES-CUTE project, which was focused on initial experimental tests of the CU idea and the related theory. This project has been successfully completed in March 2015 and left the matter experimentally validated to a degree that is tantalising, requiring further experimentation. In particular CUTE elucidated the demand on manufacturing PBCrs of an exceptional lattice quality, their experimental characterisation and exposure against the high quality beams of ultra-relativistic electrons and positrons for the observation of the strong coherent effects in the photon emission process. PEARL will focus on solving the whole complex of the important technological, experimental and theoretical problems aiming to achieve the major breakthrough in this important research area. The PEARL international collaboration is extended with respect to CUTE and involves the new partners with the essential, necessary, complementary expertise and experimental facilities. The PEARL research programme is highly collaborative and requiring numerous exchange visits between the involved laboratories, joint workshops and conferences. Therefore, RISE type of project is the most suitable for strengthening of this very essential, ongoing, international collaborative research. The talks planned to be delivered at the Workshop will concern the progress achieved towards experimental, theoretical and applied aspects of the aforementioned problems.

The mid-term report of the PEARL project will focus on the evaluation of the overall progress of the project (the work carried out within the work packages, the milestones and deliverables, the secondments executed) , on the project management, dissemination/outreach activities, impact (scientific, technical, social, commercial, environmental) as well as on the discussion of the questions concerning the project.

The planned hands-on tutorial will last for two days and aims at exploring physical models and computational approaches used for the simulations of Meso-Bio-Nano (MBN) systems and the investigation of their structure and dynamics at the atomic level of detail. The course is based on practical exercises with the universal computational package **MBN Explorer** and **MBN Studio** - a special graphical user interface and multitask toolkit for MBN Explorer. The tutorial will be performed with the latest release 3.0 of MBN Explorer and MBN Studio announced officially by MBN Research Center in March 2017. In particular, the case studies of atomic clusters, nanoparticles, biomolecular systems, nanomaterials, composite materials and material interfaces, crystalline, liquid and gaseous systems, thermo-mechanical properties of materials, dynamical, collision, chemical and irradiation driven multiscale phenomena will be discussed. Relevant physical concepts, mathematical techniques and computational methods will be introduced, including force fields and algorithms used in molecular modeling, molecular dynamics, and Monte Carlo simulations on parallel computers. Special attention will be devoted to modelling crystalline structures, propagation of relativistic projectiles in crystals, quantitative analysis of the channeling and related phenomena.

The tutorial is designed for graduate students, postdoctoral researchers and staff in computational and/or bio/nanophysical and chemical fields, material science, radiochemistry and radiobiology who seek to extend their research skills to include computational and theoretical expertise, as well as for all other researchers interested in theoretical and computational physics and chemistry.

Meeting website:

The up-to-date information about the meeting will be available on the meeting website:
mbnresearch.com/pearl-2017

Important Dates

Distribution of the second announcement: **September 15, 2017**
Deadline for registration: **October 1, 2017**

The conference fee **150€** should be paid via following link:
Conference fee payment

H2020-RISE-PEARL Meeting Program

Monday, 23 October 2017

10^{00} - 16^{00}	Participants registration
14^{00} - 14^{30}	*PEARL Workshop Opening* **Andrey V. Solov'yov (MBN Research Center):** *TBA*
14^{30} - 16^{30}	*Afternoon session I:* **Vincenzo Guidi (UNIFE):** *Manipulation of charged particle beams through orientational coherent effects in crystals* **Gianluca Cavoto (Università "La Sapienza" Roma):** *Crystal-based LHC collimation and extraction* **Ulrik Uggerhøj (Aarhus):** *TBA*
16^{30} - 16^{45}	**Coffee break**
16^{45} - 18^{45}	*Afternoon session II:* **Hartmut Backe (Uni-Mainz):** *Channeling Experiments with Electrons at the Mainz Microtron MAMI* **Simon Connell (University of Johannesburg):** *TBA* **Thu Nhi Tran Caliste (ESRF):** *Synchrotron imaging technique to study synthesis diamonds*
19^{00} - 21^{00}	**Welcome Reception**

Tuesday, 24 October 2017

9^{00} - 11^{00}	*Morning session I:* **Laura Bandiera (INFN):** *Recent experimental results on radiation generated by ultrarelativistic particles in bent crystals.* **Andrei Korol (MBN Research Center):** *Modelling of Crystals, Channeling Process and Radiation Emission with MBN Explorer.* **Werner Lauth *(Uni-Mainz):*** *Characterization of diamond crystals with the electron beam of MAMI*
11^{00} - 11^{20}	**Coffee break**
11^{20} - 13^{00}	*Morning Session II:* **Andrea Mazzolari (INFN):** *Study of beam steering in the interaction of Sub-GeV electrons with Si and Ge thin bent crystals.* **Eric Suraud (Universite Paul Sabatier):** *Application of TDDFT to structural and dynamical calculations* **Alex Sytov (UNIFE):** *On the simulation of planar channeling and quasichanneling oscillations in the deflection angle distribution in a bent crystal.*
13^{00} - 14^{30}	**Lunch**
14^{30} - 16^{30}	*Afternoon session I:* **Vadim Ivanov (SPBTU):** *Channeling of electrons and positrons in periodically bent diamond crystal* **Enrico Bagli (INFN):** *Measurement of nuclear dechanneling length for 120 GeV/c electrons and positrons in bent Si crystals.* **Barbara Fabbri (UNIFE)** *Crystalline Microporous Organosilicates with Reversed Functionalities of Organic and Inorganic Components for Room-Temperature Gas Sensing*

	Riccardo Camattari (UNIFE&INFN) *Silicon undulator prototype: manufacturing techniques*
16^{30} - 17^{00}	**Coffee break**
17^{00} - 18^{30}	**Round table discussion**
18^{30} - 19^{00}	**Workshop closing**

Wednesday, 25 October 2017

9^{20} - 11^{00}	*Mid-Term Report , Session I: overall progress (WPs, milestones and deliverables, secondments executed)* **9:20-9:40** ***Project Coordinator Report:*** Andrey V. Solov'yov (MBN RC) **9:40-10:00** ***UNIFE Team Report:*** Vincenzo Guidi **10:00-10:20** ***Uni-Mainz Team Report:*** Werner Lauth **10:20-10:40** ***AU Team Report*****:** Ulrik Uggerhøj **10:40-11:00** ***INFN Team Report*****:** Laura Bandiera
11^{00} - 11^{20}	**Coffee break**
11^{20} - 13^{00}	*Mid-Term Report, Session II: project management,dissemination/outreach activities, impact,questions concerning the project)* **11:20-11:40** ***ESRF Team Report:*** Thu Nhi Tran Caliste **11:40-12:00** ***UPS Team Report*****:** Eric Suraud **12:00-12:20** ***SPBTU Team Report:*** Vadim Ivanov **12:20-12:40** ***UJ Team Report*****:** Simon Connell **12:40-13:00** ***Project Manager Report:*** Irina Solovyeva (MBN RC)
12^{50}-13^{00}	Conference photo
13^{00} - 14^{30}	**Lunch**
14^{30} - 16^{00}	*14:30-15:45 Round table discussion.* **Participants:** PEARL Consortium (team leaders and team members) and the European Commission Officer *15:45-16:00 Mid-Term Report Closing.*
18^{30} - 22^{00}	**Conference dinner**

***Thursday 26 – Friday27, October 2017 - Open Training Course "*Multiscale Computational Methods for Complex Molecular Systems"**

The program of the Training course that will be open for the entire research community, graduate and post graduate students will be distributed with a separate announcement of the event

Conference Venue and Travel Information

The Conference will be hosted by Università degli Studi di Ferrara. The University is located in the historical center of the World Heritage medieval city of Ferrara, Italy.

How to reach the location

By plane:

BOLOGNA AIRPORT

Bologna airport named "Airport Guglielmo Marconi" is 35km far from Ferrara (about 30 minutes by car). The region set a new flybus service between Bologna airport and Ferrara called "bus&fly" (http://www.ferrarabusandfly.it/).

Ferrara/ Bologna rail line is direct (www.trenitalia.it), the airport is connected to the train station by means of a direct bus system named "aerobus" and provides direct flights to the most important Italian and European cities all year. For further information: Tel.: +39/ 051 6479615 - Website: www.bologna-airport.it

VENICE AIRPORT

Venice airport “Marco Polo” is 116km from Ferrara (about 1 hour and 15 minutes by car). Ferrara/ Venice rail line is direct (www.trenitalia.it); the airport is connected to the train station by means of a direct bus system named “flybus” and provides direct flight to the most important Italian and European cities all the year. For further information: Tel.: +39/ 041 2609260 - Website: www.veniceairport.it

VERONA AIRPORT

Verona airport “Valerio Catullo” is 106km far from Ferrara (about 1 hour and 20 minutes). Ferrara/ Verona rail line is not direct, it’s necessary to change train in Padua or Bologna (www.trenitalia.it); the airport is connected to the train station by means of a direct bus system and provides direct flights to the most important Italian and European cities all year. For further information: Tel.: +39/ 045 8095666 - Website: www.aeroportoverona.it

By train:

You find all important information in the following homepage: www.trenitalia.it
The train station of Ferrara is not far away from the city centre as you can see on the map.

Accommodation

Suggested hotels close to the venue:
- Hotel Annunziata
- Hotel Carlton
- Hotel Turing
- Hotel Europa
- Hotel De Prati

Social Program

Event	**Date / Time**
Conference reception	Monday, October 23, 2017, 19^{00} - 21^{00}
Conference dinner	Wednesday, October 24, 2017, 18^{30} - 22^{00}

Contact Information

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