

# **Report on the Heavy Ion Town Meeting and the Cracow Open Symposium of the European Strategy Group**

Emphasis on nucleus-nucleus collisions

pbm

34th Course in Nuclear Physics:

Probing the Extremes of Matter with Heavy Ions

Erice-Sicily: 16 - 24 September 2012

# Update on the European Strategy for Particle Physics and the European Strategy Group

## The European Strategy Group (ESG)

The remit of the ESG is to establish a proposal for an Update of the medium and long-term European Strategy for Particle Physics, for approval by the Council. It is proposed that the proposal will take the following elements into account:

The Update of the European Strategy for Particle Physics shall in particular aim at:

enhancing the visibility of existing European particle physics programmes;

increasing collaboration among Europe's particle physics laboratories, institutes and universities;

promoting a coordinated European participation in global projects and in regional projects outside Europe;

encouraging knowledge transfer to other disciplines, industry, and society.

# The European Strategy Group (ESG)

## Members

### Member States

Austria	Prof. A.H. Hoang	
Belgium	Prof. W. Van Doninck	
Bulgaria	Prof. L. Litov	
Czech Republic	Prof. J. Chyla	
Denmark	Prof. J.J. Gaardhoje	
Finland	Prof. P. Eerola	
France	Prof. E. Augé	
Germany	Prof. S. Bethke	
Greece	Prof. P. Rapidis	
Hungary	Prof. P. Levai	
Italy	Prof. F. Ferroni	
Netherlands	Prof. S. De Jong	
Norway	Prof. A. Read	
Poland	Prof. A. Zalewska	
Portugal	Prof. G. Barreira	
Slovakia	Dr L. Sandor	
Spain	Prof. F. del Aguila	
Sweden	Prof. B. Asman	
Switzerland	Prof. K. Kirch	
U.K.	Prof. J. Butterworth	
CERN	Director General	Prof. R. Heuer

## Major European National Laboratories

CIEMAT	C. Lopez
DESY	J. Mnich
IRFU	Ph. Chomaz
LAL	A. Stocchi
NIKHEF	F. Linde
LNf	U. Dosselli
LNGS	L. Votano
PSI	L. Rivkin
STFC-RAL	J. Womersley

## Strategy Secretariat Members

Scientific Secretary (Chair)	Prof. T. Nakada
SPC Chair	Prof. F. Zwirner
ECFA Chair	Dr M. Krammer
Repres. EU Lab. Directors' Mtg	Dr Ph. Chomaz

## Invitees

### Candidate for Accession

Romania	Dr S. Dita
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### Associate Member in the pre-stage of Membership

Israel	Prof. E. Rabinovici
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### Observer States

India	Prof. T. Aziz
Japan	Prof. Sh. Asai
Russian Federation	Prof. A. Bondar
Turkey	Prof. Dr M. Zeyrek
United States	Prof. M. Shochet
EU	Dr R. Lecbychová
ApPEC	Dr S. Katsanevas
Chairman FALC	Prof. Y. Osaka
Chairman ESFRI	Dr B. Vierkorn-Rudolph
Chairman NuPECC	Prof. A. Bracco
JINR, Dubna	Prof. V. Matveev

# **The European Strategy Preparatory Group (ESPG) Members**

## **Strategy Secretariat Members**

Prof. T. Nakada	Scientific Secretary (Chair)
Prof. F. Zwirner	SPC Chair
Dr M. Krammer	ECFA Chair
Dr Ph. Chomaz	Repres. EU Lab. Directors

## **SPC**

Prof. R. Aleksan (FR)  
Prof. P. Braun-Munzinger (DE)  
Prof. M. Diemoz (IT)  
Prof. D. Wark (UK)

## **ECFA**

Prof. K. Desch (DE)  
Prof. K. Huitu (FI)  
Prof. A. P. Zarnecki (PL)  
Prof. C. De Clercq (BE)

## **ASIA/AMERICAS**

Prof. Y. Kuno (Asia)  
Prof. P. McBride (Americas)

## **CERN**

Dr P. Jenni

# Town Meeting June 29, 2012

## CERN

CERN Council has formed the European Strategy Group ESG to update the long range plan for particle physics in Europe. As part of this process the ESG preparatory group has been formed.

This ESG preparatory group has made an outline for the strategy document that foresees a section on relativistic heavy ion collisions focussing on

- soft probes, flow and hydrodynamic response of the medium
- hard probes and quarkonia
- future opportunities for colliders (LHC, RHIC, NICA) and fixed target experiments (FAIR, SPS)

Upon request of members of the ESG preparatory group, we organize this one-day town meeting to collect from the European physics community input for this section on relativistic heavy ion collisions. We solicit input from individuals, informal groups of physicists, experimental collaborations, communities for future facilities and also from laboratories, national committees etc. Contributions can be made by submitting abstracts to this web site. These will be scheduled for short oral presentations during the town meeting on 29 June at CERN.

**Dates:** 29 June 2012 (08:00-18:00)

**Timezone:** Europe/Zurich

**Location:** CERN  
Room: Council Chamber

**Chairs:** Blaizot, Jean-Paul  
Redlich, Krzysztof  
Wambach, Jochen  
Wiedemann, Urs

<http://indico.cern.ch/event/HItownmeeting>

# Conclusions of the Town Meeting: Relativistic Heavy Ion Collision

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## Content

On Friday 29 June 2012, a town meeting was held at CERN to collect input on the section of relativistic heavy ion collisions in the update of the European Strategy for Particle Physics. The meeting featured short presentations of existing and planned future heavy ion experiments at the CERN LHC, the Brookhaven RHIC, the CERN SPS, the FAIR facility in Darmstadt and the JINR in Dubna. In addition, the meeting provided a forum in which individual scientists and groups could contribute with short comments and statements. The meeting counted 237 registered participants that covered all experimental and theoretical activities in the field. The meeting concluded with an open 2-hour discussion of the priorities in the field. The following text summarizes the consensus view of the scientific community on the priorities of the field, as expressed by the participants of the town meeting.

For all contributions as well as a schedule of the Cracow meeting see:

<http://espp2012.ifj.edu.pl>

## Place

Location: Krakow, Poland

Room:

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## Abstract files

[Hltownmeeting\\_final.pdf](#)

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# Major recommendations

- 1. The top priority for future quark matter research in Europe is the full exploitation of the physics potential of colliding heavy ions in the LHC.*
- 2. At lower center of mass energies where the highest baryon densities are reached, advances in accelerator and detector technologies provide opportunities for a new generation of precision measurements that address central questions about the QCD phase diagram.**
- 3. The complementarity of LHC and RHIC is an essential resource in efforts to quantify properties of the Quark-Gluon Plasma.**
- 4. Dedicated investments in theoretical research are needed to fully exploit the opportunities arising from the upcoming precision era of nuclear research at collider and fixed target energies.**

This is used as input to the Cracow meeting

# Summary slide, strong interaction session

## Open Symposium on European Strategy for Particle Physics, Cracow, Poland, Sep. 2012

2 talks: P. Newman, QCD at HE frontier H. Appelshaeuser, QGP

Summary QCD: new facility LHeC + ongoing projects (Compass, LHC expts,...)

Discussion: LHeC-- unprecedented kinematic range for DIS studies ep, eA  
low x (saturation) physics, some capability for Higgs physics.  
Improved pdf constrains as required for HL-LHC. important input for QGP?  
Or is pp/pA sufficient? Time scale around 2025. Interference with HL LHC?  
Proton spin physics: Compass, RHICpp, JLAB12, and future eRHIC/eLIC

Summary QGP: top priority: LHC ion running and ALICE upgrade, to 2025

also: interesting physics remains at high baryon density ( $5 < \sqrt{s} < 40$  GeV)

Discussion: important discovery potential with 50 kHz Pb-Pb running for ALICE,  
ATLAS, CMS  
Ions in HE LHC?  
LHC program complementary to RHIC

high baryon density: RHIC-BES, SPS, NICA, FAIR/CBM (SIS300?)  
need of experiments at all 4 facilities? coordination needed, time scales?  
special role of SPS