

International EFES-IN2P3 conference on

**Many body correlations  
from dilute to dense nuclear systems**

Institut Henri Poincaré, Paris, February 15-18, 2011

First circular

1. Aim of the conference

Correlations play a decisive role in various many-body systems such as nuclear systems, condensed matter or quantum gases. Important examples are pairing correlations (Cooper pairs) which give rise to nuclear superfluidity (analogous to superconductivity in condensed matter), particle-hole (RPA) correlations in the description of the ground state beyond mean-field theory, clusters and  $\alpha$ -particle correlations in certain nuclei. Also the nucleons themselves can be viewed as clusters of three quarks. During the last few years, one has started to study how the character of these correlations changes with variation of the density. For instance, the Cooper pairs in dense matter can transform into a Bose-Einstein condensate (BEC) of true bound states at low density (this is the BCS-BEC crossover studied in ultracold Fermi gases). Similar effects play a role in neutron matter at low density, e.g., in the “neutron skin” of exotic nuclei. The  $\alpha$  clusters become particularly important at very low density, like in the formation of compact stars or in excited states of some nuclei (Hoyle state in  $^{12}\text{C}$ ).

The aim of this conference is to bring together experts in the topics described above, with special emphasis on dilute systems. Although the conference focuses on theory, some experimentalists will be invited, too. In addition to nuclear physics, topics from astrophysics (neutron stars), condensed matter and quantum gases will be discussed, allowing the different communities to exchange their ideas, experiences and methods.

One session of the conference will be dedicated to the celebration of Peter Schuck's retirement.

2. Topics

The topics to be discussed at the conference include:

- pairing correlations in nuclei and nuclear matter,
- clusters in nuclear systems,
- multiconfiguration methods in nuclear structure,
- alpha-particle condensation,
- effective interactions and modern nuclear forces,
- superfluid properties of neutron-star matter,
- cluster formation in compact stars,
- nuclear equation of state at low densities,
- pairing in ultracold quantum gases,
- many-body approaches beyond mean field.

3. Dates and venue

The conference will take place from February 15 to 18, 2011 at Institut Henri Poincaré, in Paris, France. The Institut Henri Poincaré is situated in the Latin quarter, close to many places of interest.

#### 4. Call for contributions

In addition to the invited talks, contributed talks will be included in the program. A poster session is scheduled, too. Please send titles and abstracts of contributions by e-mail to [mbc2011@ipno.in2p3.fr](mailto:mbc2011@ipno.in2p3.fr) before **December 1, 2010**, using the attached template file. Contributors selected for oral presentations will be notified around December 20, 2010.

#### 5. Conference fee

The conference fee is 150 euros, which includes coffee breaks and the conference dinner.

Participants who cannot afford to pay the conference fee or the travel expenses can ask for a reduced conference fee or for financial support, but the funds are limited.

#### 6. Registration

The address of the conference web site is: <http://ipnweb.in2p3.fr/mbc2011>

On this web site, more information will be available soon. In particular, participants will have the possibility to pre-register and to confirm their registration by paying the conference fee. The deadline for registration is **January 5, 2011**.

#### 7. Accompanying persons

Accompanying persons who wish to participate in the conference dinner are asked to pay a fee of 65 euros. Participants who plan to bring accompanying persons should contact the organizers by sending an e-mail to [mbc2011@ipno.in2p3.fr](mailto:mbc2011@ipno.in2p3.fr)

#### 8. Advisory committee

Marcello Baldo (Catania),  
George Bertsch (Seattle),  
Jean-Paul Blaizot (Saclay),  
Michel Girod (Bruyères-le-Châtel),  
Hisashi Horiuchi (Osaka),

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Gerd Röpke (Rostock),  
Hiroyuki Sagawa (Aizu),  
Piet Van Isacker (Caen),  
Enrico Viguzzi (Milano).

#### 9. Organizing committee

Takaharu Otsuka (Tokyo), co-chair,  
Michael Urban (Orsay), co-chair,  
Taiichi Yamada (Yokohama),  
Nguyen van Giai (Orsay),

Shinichiro Fujii (Tokyo),  
Jérôme Margueron (Orsay),  
Kouichi Hagino (Sendai),  
Yoshiko Kanada-En'yo (Kyoto).

#### 10. Contact

For all questions, please send e-mail to [mbc2011@ipno.in2p3.fr](mailto:mbc2011@ipno.in2p3.fr)

#### 11. Summary of important dates

Deadline for abstract submission: December 1, 2010,  
Deadline for registration: January 5, 2011,  
Conference: February 15-18, 2011.