

# PREFACE

The study of Condensed Matter Nuclear Science (CMNS) has continued to advance through 11 past conferences (ICCF1 at Utah, USA in 1989 to ICCF11 at Marseilles, France in 2004) and many new compelling scientific findings are becoming known. The historical 1989 claim of “cold fusion” had renewed hope of a portable clean nuclear reactor. The subsequent great wave of denial and hostility forced the claim and further research efforts out of mainstream science. Nevertheless, due to misconceptions and misinformation, very few people know that several hundred researchers from around the world have continued this research during the past 16 years. The efforts by this faint stream of research have now revealed that there exist new kinds of nuclear effects directly related to the nature of condensed matter. The nuclear effects in condensed matter are much more than real “cold fusion”; they include important nuclear effects such as transmutations and resulting release of energy as significant heat with minimal and safe radiation. Low levels of radiation are found in at least some reactions, but are usually absorbed within the cell itself so the system is categorically safe. Through discussions at international conferences (ICCF1–ICCF11), a majority of researchers agreed that the name “cold fusion” was misleading. A new name, closer to the exact phenomenon, Condensed Matter Nuclear Science, is most appropriate.

This emerging field, CMNS, treats nuclear effects in and/or on condensed matter, targeting its application for portable clean nuclear sources. This is an inter- and multi-disciplinary academic field, including nuclear physics, condensed matter physics, surface physics, and chemistry and electrochemistry. CMNS applications involve many other fields of science and technology (nuclear engineering, mechanical engineering, electrical engineering, laser science and engineering, material science, nano-technology, biotechnology, energy politics, etc. To promote the development of CMNS and establish the academic field of CMNS, the field needs highly efficient, cooperative efforts of researchers, and related people working in different fields. International linkage and collaborations are also needed.

The full name of this conference is the *12th International Conference on Condensed Matter Nuclear Science*. However, we decided to keep the acronym ICCF12 for the Conference, considering our original standpoint and tradition.

The International Society for Condensed Matter Nuclear Science (ISCMNS) made a start in 2004 to promote the understanding, development and application of CMNS and has become a main supporting body of the ICCF series conferences till ICCF11. However, ICCF12 is sponsored by other societies like JCF (Japan-CF Research Society) and supported also by non-ISCMNS members. ICCF12 will provide an international scientific forum for direct interaction and stimulation among many scientists working in the CMNS field and participation and presentation of newcomers will be welcome.

The Conference site and date were: Shin-Yokohama Prince Hotel, Yokohama-city, Japan on 27 November–2 December 2005.

The following topics were discussed in the conference:

- Excess Heat and Related Nuclear Products.
- Nuclear Processes and Transmutations.
- Materials and Condensed Matter Conditions.
- Analyses and Diagnoses Techniques.
- Innovative Approaches.
- Theories on Condensed Matter Nuclear Effects.
- Engineering, Industrial, Political, and Philosophical Issues.

For organizing and preparing ICCF12, the following members of LOC (Local Organizing Committee) and IAC (International Advisory Committee) have made contributions.

### **Local Organizing Committee**

Akito Takahashi, Chairman, Osaka University, Japan.

Ken-ichiro Ota, Co-chairman, Yokohama National University, Japan.

Yasuhiro Iwamura, Co-chairman, Mitsubishi Heavy Industries, Japan.

Shigenori Mitsushima, Secretary, Yokohama, National University, Japan.

Shinya Narita, Secretary, Iwate University, Japan.

Hiroshi Yamada, Iwate University, Japan.

Tadahiko Mizuno, Hokkaido University, Japan.

Akira Kitamura, Kobe University, Japan.

Kazuaki Matsui, Institute of Applied Energy, Japan.

Koichi Tomimura, The Thermal and Electric Energy Technology Foundation, Japan.

### **International Advisory Committee**

Tullio Bressani, Department of di Fisica Sperimentale, Universita di Torino, Italy.

Francesco Celani, INFN, Frascati, Italy.

Antonella De Ninno, ENEA, Frascati, Italy.

Peter Hagelstein, MIT, USA.

Akito Takahashi, Osaka University, Japan.

Ken-ichiro Ota, Department of Energy and Safety Engineering, Yokohama, National University, Japan.

Jirohta Kasagi, Laboratory for Nuclear Science, Tohoku University, Japan.

Yasuhiro Iwamura, Mitsubishi Heavy Industries, Japan.

Xing Zhong Li, Tsinghua University, China.

Andrei Lipson, Institute of Physical Chemistry, The Russian Academy of Sciences, Moscow, Russia.

Michael McKubre, SRI International, USA.  
George Miley, Fusion Studies Laboratory, University of Illinois, USA.  
Nikolai Samsonenko, People Friendship University, Russia.  
Francesco Scaramuzzi, ENEA, Frascati (retired), Italy.  
Mahadeva Srinivasan, BARC (retired), India.  
Edmund Storms, Lattice Energy, LLC, USA.  
William Collis, ISCMNS.  
Jean Paul Biberian, University of Marseilles Luminy, France (Chairman, ICCF11).  
Yuri Bazhutov, Institute of Terrestrial Magnet, Russia (Chairman, ICCF13).

### **Sponsors of ICCF12**

ISCMNS: International Society for Condensed Matter Nuclear Science.  
TEET: Thermal and Electric Energy Technology Foundation.  
JCF: Japan CF-Research Society.

All the full papers submitted for Proceedings book were peer-reviewed by the specialists from Japan. Revised drafts were edited, converted into LaTeX format and send to the publisher (World Scientific Publishing Co. Pte. Ltd., Singapore).

For some of the presentations at the meeting of ICCF12, authors did not submit full papers and those papers are not included in the Proceedings book.

Due to trivial mistake, a few papers submitted to ICCF11 (Marseilles) Proceedings could not be included in the Proceedings of ICCF11 (published by World Scientific Co, 2006). These missing papers by Dr. V. Violante group are included in the present book for compensation.

*Editors*

*Akito Takahashi, Ken-ichiro Ota, and Yasuhiro Iwamura  
30 June 2006*