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Proceedings of the Third International Conference on Cold Fusion

Frontiers of Cold Fusion

October 21 - 25, 1992 Nagoya, Japan

Edited by
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Preface

These proceedings of the Third International Conference on Cold Fusion (ICCF3), Frontiers of Cold Fusion, document the beginning of a new field of science, now in its fourth year. The five-day conference, held in Nagoya, Japan at the Nagoya Congress Center, from October 21 through 25, 1992, was the third such affair. In 1990, the first cold fusion conference took place in Salt Lake City, Utah, in the United States and the second, in 1991 was held in Como, Italy. A comparison of the proceedings from these conferences, shows that not only is evidence for the existence associated to cold fusion, unassailable, but that there are now substantial interdisciplinary research efforts in many countries, probing cold fusion phenomena in depth.

In planning ICCF3, the Organizing Committee sought to cover the broadest topics relevant to this new research field, including nuclear physics, electrochemistry, solid state physics, and materials science, so that this conference was cosponsored by the Physical Society of Japan, the Japan Society of Applied Physics, the Atomic Energy Society of Japan, the Institute of Electrical Engineers of Japan, the Chemical Society of Japan, the Electrochemical Society of Japan, and the Japan Society of Plasma Science and Nuclear Fusion Research.

Aside from press and other visitors, there were 346 registered participants at the Conference from 18 countries. Of course, the largest number, 229, was resident in Japan. One hundred and forty-eight abstracts were originally submitted, of which 137 were presented at poster sessions.

At the Conference, there were 27 invited lectures and three panel discussions, incorporating comments from the International Advisory Committee. The first panel, on the Takahashi Method, included several scientists who successfully replicated Takahashi's experiment, and one who could not. The second panel was on the Theoretical Models, and included a broad diversity of opinion, including differences on whether the production of excess heat is nuclear or not, and whether "cold fusion" is actually a fusion event, or reflects some other process. The concluding session, addressed the question of the Next Step for the direction of researches in this new field.

The Conference was organized to allow maximum time at poster sessions for small group's discussions on every poster paper, which included additional discussion time even for those already presented orally in the plenary sessions, while some would have still preferred more discussions at the oral sessions. It was clear to me, as the Chairman of the Organizing committee, that the heated discussion which occurred during the conference could have continued for longer than one week.

The proceedings consist of two parts: one for the invited papers and the other for the contributed papers. For purposes of publication, the format has been changed to reflect the subject under discussion, rather than the order of the presentations at the Conference. The number of papers contained in the proceedings, is in total, 102 out of the 148 abstract titles as listed in the program.

It was not an easy task to peer review each of the submitted papers to this Conference. The editorial board of the Organizing Committee accepted a lenient standard for publication. Most papers presented at the Conference were accepted so long as they satisfied a minimum standard. Sixteen papers, though submitted, were either not presented at the Conference, or withdrawn thereafter, and these were not published. Their titles, however, have been left in the attached program, with an asterisk to denote this. Likewise, other 30 titles, for which the Secretariat did not receive papers before the publication deadline, are marked with a dagger (†).

At the Conference, the video produced by Drs. Fleischmann and Pons allowed us to see that a controllable excess heat generator was already in hand. These remarkable results were confirmed thanks to the efforts of Dr. McKubre, Dr. Takahashi, Dr. Kunimatsu and Dr. Storms, who along with Drs. Fleischmann and Pons, reported on their work at the Conference and offered extensive documentation of their experiments.

Positive heat results were also presented on several light water experiments, which may be closely related to the mechanisms of excess heat generation that we see in heavy water experiments.

There is still no evidence to prove that the heat produced is nuclear in origin. The participation of main-line scientists who are not themselves working in this field, is indispensable in stimulating discussions and exchanging ideas. For this reason we found the critical contributions by Dr. Fukai at the Conference to be of great value.

A number of still indefinite but important new results were reported at the Conference, to do with the detection of nuclear products from "cold fusion" cells. The most important among these, was the report by Drs. Yamaguchi and Nishioka, that they detected helium and energetic alpha particles, which may be a possible energy carrier for excess heat. Their results, along with other interesting nuclear experiments reported by Dr. Kasagi, and Drs. Iida and Takahashi, were extremely provocative in this regard. Whatever the relation of excess heat to the occurrence of nuclear reactions, nuclear events have been demonstrated and this raises the question for theorists, of what can explain them.

These findings are extremely important even though we do not yet understand what physics exists behind these phenomena. The one thing we can say positively, is that what we have here is no ordinary nuclear reaction. Many theorists are now trying to find mechanisms that will allow them to avoid any direct handling of the coulomb barrier. What is being created is an entirely new field of research from that of traditional nuclear sciences. Probably we should no longer call this field "cold fusion," but "fusion in solid state."

It is my belief that cold fusion will become one of the most important subjects in science, one for which we have been working so patiently, with dedication and with courage, for future generations, for those who will live in the twenty-first century. In order to achieve our goal, our ultimate goal, we must continue and extend our interdisciplinary and international collaboration.

We regret deeply the untimely death of Dr. Andrew Riley of SRI International. Recently one of the most generous sponsors of our work, Mr. Minoru Toyoda passed away. At the banquet held during the Nagoya Conference, Mr. Toyoda expressed the philosophy that led him to promote cold fusion as a science. I would like to cite the last part of his message. There he said, "Cold fusion is not a matter to be studied by one single enterprise or nation. I have confidence that it will become the greatest asset as an eventual energy for mankind, to be shared among the world." This is our dream, our common understanding and the reason why we are so intensely and patiently working on cold fusion.

I would like to take this opportunity to express my sincere gratitude to the members of the International Advisory Committee and the Organizing Committee, and to all of those who participated in the Conference. It was their cooperation that made the Conference so fruitful. On behalf of the Organizing Committee, I would like to thank the Japan Society for the Promotion of Science and all the contributors for their generous financial support. I would particularly like to express my deep appreciation to Mr. Koichi Takashima, President of Kyoei Steel Ltd. for his extremely generous contribution to this Conference.

It is also my privilege to thank the Tokyo Club for the full support which they gave to the publication of these proceedings, Frontiers of Cold Fusion.

Finally I thank Miss S. Saito and Mrs. M. Tsubaki for their dedicated work for the Conference on behalf of the Secretariat . They not only helped to make the Conference itself successful, but they were active in forwarding the arrangements for this publication.

Hideo Ikegami, Editor
National Institute for Fusion Science
March 1993

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