

Important Results Presented During the 13th International Conference on Condensed Matter Nuclear Science (ICCF13)

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Photos by Dave Nagel, unless otherwise specified.

The 13th International Conference on Condensed Matter Nuclear Science (ICCF13) took place between June 25 and July 1, 2007, at the Dagomys Health Improvement Complex, located 12 km from the center of Sochi, Russia. Seventy-six people officially registered for the conference; attendance was down a bit from non-Russian scientists due to some difficulty in getting the appropriate visa. The breakdown, by country, was: 43 from the Russian Federation, 12 from the United States, 5 from Israel, 5 from Japan, 4 from France, 3 from Italy, 2 from the United Kingdom, 1 from India, and 1 from the Ukraine. The conference had 15 sessions of plenary (invited) talks, 11 poster sessions, two introductory sessions, and a closing session.

Yuri Bazhutov, Igor Goryachev, and the other members of the ICCF13 Local Organizing Committee are to be commended for their effort in making the conference such an excellent event and for picking such an extraordinary location for it. Sochi, which is located at the base of the Caucasus Mountains, on the eastern side of the Black Sea, is a stunningly beautiful city. In fact, three days after the conference ended, the Olympic Game Selection Committee announced that Sochi would be the site of the 2014 Winter Olympic Games.

ICCF13 Chairman Yuri Bazhutov and Secretary Igor Goryachev opened the session and various dignitaries offered welcomes, including Vitaliy Mikhailin (President, Russian Physical Society), Andrew Mozzhegorov (ICCF13 Sponsor), Konstantin Sviridov (Director, Dagomys Hotel), Akito Takahashi (President, International Society of Condensed Matter Nuclear Science, ISCMNS), and Mahadeva Srinivasan (ICCF International Advisory Committee member).



Preparata Medal

On June 25, Alexander Karabut and Andrei Lipson each received the Preparata Medal—Karabut for his seminal work involving glow discharge experiments in which he has been able to create directed, coherent X-rays, and Lipson for identifying higher energy alpha particles during experiments involving loading and

de-loading palladium with deuterium. They share the honor with past recipients Yasuhiro Iwamura, Tadahiko Mizuno, Antonella De Ninno, Peter Hagelstein, Edmund Storms, Yoshiaki Arata, Xingzhong Li, Michael McKubre, and Akira Kitamura.

Very significant talks were presented by Vitaliy Kirkinskii, Francesco Celani, and Nicolas Armanet. In each of these talks, a variant of the procedure developed by Yoshiaki Arata involving loading of D_2 gas into nano-scale crystalline structures was used to create excess heat, on demand. Armanet's and Celani's talks involved using the kind of samples (a nano-scale form of Pd, referred to as "Pd black") and pressure regimes that Arata used. Kirkinskii's talk was significant in that an alternative pressure and temperature regime was employed. In particular, Kirkinskii's group from the Siberian Branch of the Russian Academy of Sciences performed gas-loading experiments in which the temperatures were as high as $750^\circ C$. In this work, a form of differential calorimetry was used in which two identical gas-loading cells formed the basis of the measurements. One of these involved H_2 (which was used to establish the zero of the calorimeter) and a second involved D_2 . It is noteworthy that two Russian Federation patents

(2056656 and 2195717) have been issued associated with this work. Kirkinskii and his co-workers have also published their work in *European Physical Letters*.

Nicolas Armanet works with Jean-Paul Biberian. Because Biberian's mother was not well at the time of ICCF13, he could not attend the conference. It is potentially noteworthy that in the procedures used by Arata, Celani, and Biberian/Armanet, the nano-crystalline structures that are used involve ZrO_2 -Pd. Talbot Chubb, in a talk presented by Michael McKubre on Talbot Chubb's behalf, has suggested that the underlying electronic structure associated with the insulator-metallic interface that occurs in these materials can be significant. Talbot Chubb suggests that a similar insulator-metallic interface (involving BaO and Pd) in the possible forms of transmutation, suggested by the Iwamura/Mitsubishi claims, seems to be possibly relevant in



Bill Collis and Scott Chubb



Yuri Bazhutov and Mahadeva "Chino" Srinivasan



Vladimir Vysotskii, Marianne Macy and Scott Chubb discuss a poster.

this conjecture.

Other important excess heat results were presented by Emanuel Castagna and Tatiana Zilov. Emanuel Castagna's talk includes the following co-authors: Vittorio Violante at the Frascati facility, associated with ENEA; Michael McKubre and Francis Tanzella from SRI International; Kenneth Grabowski, Graham Hubler, and David Knies from the Naval Research Laboratory; and Tatiana Zilov (Energetics, Inc.) and Irving Dardik (LLC). Castagna summarized the procedures that ENEA scientists have been following for modeling potentially important effects associated with minimizing stress in the materials that are used in electrolysis experiments. The associated effort has involved a multi-country and multi-disciplinary collaboration and sources of funding. The ENEA work is distinctive because, since the work is satisfactorily-funded, the scientists who are involved can be creative and are able to use theoretical efforts to guide their work. By using theoretical ideas associated with minimizing stress on Pd lattices, in the presence of deuterium (d) loading in particular, Castagna explained how the ENEA team has been able to identify important aspects of materials preparation that have created a situation in which materials created by ENEA can reproduce excess heat effectively 60 to 70% of the time that they are used.

As impressive is the work associated with Energetics, presented by Tatiana Zilov (the last author of the paper that Emanuel Castagna presented). Dr. Zilov (and also Dr. McKubre) pointed out that the work at SRI was not being reported because of concerns by the sponsor of this work. It is tragic that a key sponsor would not allow a more complete disclosure to take place. Given the controversial nature of past work in the field, why this happened is probably understandable. But given the need for forthright scientific discourse to take place, the non-disclosure of certain results is a detriment to the field. This is a hardball situation. Individuals who are

not up to dealing with the genuine scientific discourse that is required at this point simply do not belong in the dialogue, in my opinion.

Fortunately, in spite of the non-disclosure of some seemingly important results, progress is being made. In fact, in Zilov's presentation, new innovative results were presented. In particular, by introducing ultrasonic forms of wave-like effects, it was possible on two occasions to create effects referred to as "heat after death," in which heat occurred in the absence of any form of externally applied force identified as being relevant to the associated phenomenon. Mitchell Swartz has suggested that, as opposed to a "heat after death" phenomenon in which it is assumed that an automatic "response" is required to account for the apparent creation of energy, a more rational explanation does exist in which power is generated after an initial form of "tardive" (delayed) power. Dr. Zilov found two episodes, each occurring for several days, in which heat was generated for an extended period (days) at low levels, after the initial events that triggered the effect.

Other novel outcomes also are possible. Glow discharge effects, in particular, have played a prominent, distinguishing role, in this context. Important points include the possibility that non-linear coupling can occur, leading to unexpected forms of electromagnetic coupling. How this coupling might occur is an open question. Within this context, especially interesting effects were observed by Pierre Clauzon, Alexander Karabut, and Irina Savvatimova. Routinely, Dr. Karabut apparently is able to create a form of X-ray lasing phenomenon (energies between .6 to 10 KeV), in which X-rays are emitted after deuterium is loaded into a Pd substrate, through a glow discharge procedure. Clauzon presented results confirming the kinds of effects observed by Tadahiko Mizuno, involving forms of "transmutation" associated with glow discharge experiments involv-



John Fischer and Bill Blythe



Dave Nagel and Marianne Macy



Steve Krivit with a restaurant's only English menu ("Caucasian cuisine").

ing tungsten. Dr. Savvatimova reported observing gamma ray emission during experiments involving glow discharge loading of D (deuterium) into Tungsten. David Chung, from Howard University, provided an interesting interpretation of the current (I) vs. voltage (V) behavior involved with the apparent "transmutation" effects observed by George Miley. In his interpretation of these results, Prof. Chung related I-V characteristic curves at the point that transmutation "appears" to take place to effects observed in standard tunneling of electrons in semi-conductor diodes.

Andrei Lipson and Alexey Roussetski presented novel results involving highly D-loaded materials in multilayer structures involving single wall carbon nanotubes (SWCNT) encapsulated by thin Pd films electrodeposited on top of a Pd foil. They found nuclear emissions of charged particles using CR-39 films, that indicate 3 MeV alpha particles were produced in these experiments.

Ivan Chernov (Tomsk Polytechnic University, Russia) presented novel results associated with a new phenomenon, in which many hydrogen atoms appear to be spontaneously excited by irradiation by X-rays and/or electrons. He and his collaborators propose the associated effect involves cooperative phenomena in which the hydrogen atoms/ions behave

as a "sub-system" that is excited as a single entity, similar to the kind of sub-system envisioned by Talbot Chubb (and indirectly by me) in the context of the ion band state theory that we have proposed.

John Dash presented results associated with excess heat involving heavy water and H_2SO_4 . The results indicated that in 12 experiments the effect was reproducible. Also, the average power they observed in their measurements of excess heat was ~1.2 W. They observed bursts in power of ~20 W. X-ray photoemission spectra indicate that in damaged areas of the materials, observed after the experiments were performed, silver not present prior to the experiments was present after the excess heat was produced.

Jirohta Kasagi presented results associated with deuteron beam experiments, involving "low energies" (less than 1 KeV) in solids that indicate possible d-d reactions involving unknown cooperative effects. In particular, he reported seeing very different kinds of effects when the metal target that was used was Li in a solid or liquid form.

The entire abstracts of ICCF13 can be downloaded in PDF format from:

www.iscmns.org/iccf13/ICCF13_Abstracts.pdf



Boris Sokolovski, Vladimir Bychkov, Gennady Shabanov, Dave Nagel, Nikolai Samsonenko and Alexander Vlasov



Pierre Clauzon



Vladimir Vysotskii and Mike Melich

Plans are already underway for ICCF14, which will be held in August 2008 in Washington, D.C. It is hoped that the political climate at that time, including a focus on energy, will bring some attention to the event. *Infinite Energy* will report updates on the planning of ICCF14 as they are available.



ICCF13 Conference Chair Yuri Bazhutov



Mike McKubre



Francesco Celani



The Dagomys Hotel