

## ICCF-13 Review

Steven Krivit,

"New Energy Times" Internet magazine Senior Editor.

This report reviews a few of the highlights from the 13th International Conference on Condensed Matter Nuclear Science, held in June at Dagomys, Sochi, Russia. It is by no means a complete and full report of the excellent work performed by this research community.

Many of the Russian scientists share a strong cross-disciplinary interest in the subject of ball lightning, as well as low energy nuclear reactions. As a result, both subjects were included in the formal program. However, ball lightning does not fall within the subject matter covered by *New Energy Times*.

Yuri Bazhutov (Russian Academy of Sciences), Igor Goryachev (Kurchatov Institute), Nikolay Samsonenko (People's Friendship University), Irina Savvatimova (Federal State Unitary Enterprise) and others put an amazing amount of energy into the conference and pulled off a very effective meeting.

Bazhutov opened the conference with a formal welcome, and Goryachev provided an inspiring vision for the conference.

"Our Russian television has been stating that the city of Sochi is a possible site for the 2014 Winter Olympics," he said, "and that Sochi is the gateway to the future. I am sure that our ICCF-13 conference here at Dagomys, Sochi will be the gateway to the future."

The audience was honored to receive welcome addresses by several individuals, including Vladimir Bychkov, on behalf of Vitaliy Mikhailin, the president of the Russian Physical Society, as well as a private individual, Andrey Mozzhegorov, who helped sponsor the conference.

Mozzhegorov was initially inspired to contribute to the conference as a result of a question one of his daughters asked him. She knew that he was an advocate for science and technology, but she was aware that such progress has contributed to many ecologically unfavorable situations around the world. She asked him what he could do to apply science and technology to help make the world better.

Sometime after that, Mozzhegorov heard about the CMNS research community and began to look into the area. Mozzhegorov is not a scientist; he is an attorney and formerly a fighter pilot for the Russian military.

He was impressed with the CMNS researchers; he noted that they often explored beyond the limits of the ordinary and practiced out-of-the-box thinking. He found this inspiring. Likewise, the CMNS found his and his wife Olga's participation inspirational.



*ICCF-13 Audience: Left to right: Pierre Clauzon, Yuri Bazhutov, Irina Savvatimova, Fangil Gareev. Photo: S. Krivit*

This link will provide access to the program, abstracts and other conference information. Very few papers were distributed at the meeting. *New Energy Times* has obtained a few of them and will provide links within this report.

The proceedings may take a year or two to publish; therefore, readers who would like further details are encouraged to check online at Edmund Storms and Jed Rothwell's [www.LENR.org](http://www.LENR.org) library for uploaded papers/presentations, or contact the authors directly.

At times, barriers existed to obtaining papers or more complete details on the presentations. Sometimes, these barriers were the result of language difficulties; sometimes, these apparently were the result of proprietary commercial interests that led the researchers to keep important details under wraps.

A significant, paradoxical trend continues; as more commercial funding is coming into the field, researchers are engaging in less open exchange, outside of those researchers who share information within their collective business partnerships.

Many of the researchers use the term "cold fusion" in their presentations despite the fact that the underlying mechanism(s) is (are) still in dispute. The wisdom of such decisions, or old habits, seems uncertain because the speculative historical term has a tendency to confuse observers of the field who otherwise might regard the rigorous experimental findings with greater respect.

Despite the fact that no breakthrough announcements were delivered at the Sochi conference, the fact that excess heat and anomalous nuclear products continue to be reported, year after year, are a testament to the truth and likely significance of these novel effects of nature.

### Preparata Medal Award Winners



*Andrei Lipson receives Preparata Award from Francesco Celani. Photo: S. Krivit*

*Alexander Karabut receives Preparata Award from William Collis. Photo: S. Krivit*

The condensed matter nuclear science community has awarded prizes to its members for outstanding achievements dating to 1993, when the "Truffle Prizes" were first awarded by the Italian automotive group Fiat.

Those prizes eventually were replaced by the Preparata Medal, in honor of Italian physicist Giuliano Preparata. The production of the current set of medals was sponsored by the Fondazione Cassa di Risparmio di Asti, part of a local banking institution whose mission is to further scientific search, education, the arts, and culture.

This year's prizes were awarded to Russian scientists Andrei Lipson of the Russian Academy of Sciences and Alexander Karabut with Federal State Unitary Enterprise "Luch."

### John Dash, Wu Shou Zhang and Hideo Kozima Report Excess Heat

John Dash, professor emeritus of physics, with the Low Energy Nuclear Laboratory at Portland State University, and Wu Shou Zhang, with the Institute of Chemistry at the Chinese Academy of Sciences, described by Dash as a calorimetrist, theoretical physicist, and excellent experimentalist, reported a confirmation of a LENR phenomena that has been observed for many years; as the temperature of the electrolyte is permitted to go (or brought) to higher temperatures, the excess heat effect is amplified.

This effect also is referred to as positive feedback: the more heat that exists within the cell, the more likely excess heat is to occur.

Zhang and Dash report that "best results are obtained when the electrolyte temperature is close to the boiling point."

Italian researcher Giuliano Mengoli explicitly noted this effect in his paper "Calorimetry Close to the Boiling Temperature of the D2O/Pd Electrolytic System."

Zhang and Dash used isoperibolic calorimetry and Seebeck envelope calorimetry concurrently, and the results of each method agreed with the other.

They reported that they "were able to obtain excess heat output from 12 consecutive samples" in the multimilliwatt range with a confidence level of five sigma. They also reported the anomalous "presence of silver on the palladium surface after electrolysis in heavy water."

During the mid-1990s, mass flow calorimetry was a favored choice of LENR researchers as a reaction to critics' reluctance to accept results from isoperibolic calorimetry, which is highly complex and relatively inaccessible to nonspecialists.

Mass flow is far simpler, and critics claimed they would not accept excess heat claims from mass flow calorimetry. After such results were obtained, critics subsequently came up with additional objections to avoid the uncomfortable hypothesis of excess heat.

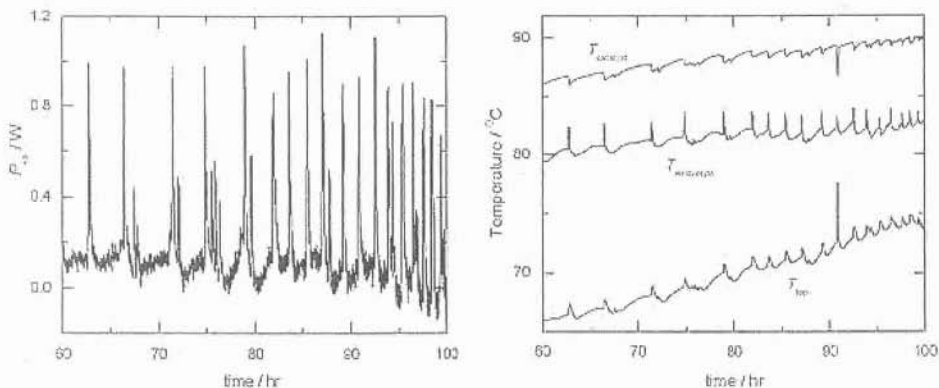
But mass flow calorimetry had and has a significant disadvantage. The circulating flow has a tendency to keep the experiment cool and unfortunately inhibit optimal results.

As a consequence of this limitation, resuming the use of isoperibolic calorimetry may now be more useful for researchers. When combined with a secondary envelope-type calorimetry system, the results become notably rigorous.

Dash et al. state in one of their papers, "Since the discovery of excess heat in 1989, the reproducibility has been a difficult problem. Our results suggest a reason why Fleischmann and Pons and other groups observed excess heat using Dewar-type electrolytic cells and isoperibolic calorimetry, but some groups using mass-flow calorimetry had difficulty detecting excess heat, or the reproducibility was very poor.

"The reason is that the latter method involves a low temperature, semi-isothermal measurement. The temperature difference between the electrolytic cell and the water flowing during electrolysis is very small. Therefore, this system has to be stimulated by various methods, e.g., high input power, laser irradiation etc. Even then, the reproducibility is still low because the cell temperature is not high enough."

Dash et al. reported periodic excess heat bursts in the 0.5 Watt range and bursts of up to 2 watts, as Dash reported to *New Energy Times* during a follow-up interview.



*Heat bursts and corresponding temperatures during electrolysis*

*New Energy Times* spoke with Dash about another anomalous observation from his team. Dash uses thin cold-rolled palladium foils for his cathodes, and these cause interesting effects. Soon after the electrolysis begins, within minutes, the cathode develops an unusual bend visible to the naked eye.

"That by itself turned me on to this in 1989," Dash said. "How can this happen? It's opposite of what you'd expect because the side facing the anode has a higher current density and if you form the hydride, it involves an expansion. But this result says that it involves a contraction on that side. So there's a big mystery."

Dash interpreted the bursts as mini-explosions, similar to that reported by researchers in China (Zhang and co-workers), Japan (Mizuno), and France (Biberian).

"It busted their cells," Dash said. "I think in all the cases, they were open cells so there would not have been a pressure buildup. In our experiments, it appears we are getting explosions, but they are controllable explosions. When you drive your car, that's what you're getting, controllable explosions, and that's what we need here." Dash also explained that they place their Seebeck envelope calorimeter within another box to isolate it thermally from the room environment. They found this was necessary to obtain optimal results. However, he states, researchers who have controlled room temperature environments wouldn't need the secondary enclosure.

They also reported experiments using mass and gamma ray spectroscopy indicating anomalous isotopic abundances and unexpected elements. "The changes in isotopic abundance and the occurrence of unexpected elements can be explained," Dash wrote, "if thermal neutrons are produced during electrolysis and during glow discharge."

### **Excess Heat Reported by Clauzon**

Pierre Clauzon, a former nuclear engineer who designed the cores for fast breeder reactors, reported 30 percent excess heat in a series of plasma electrolysis experiments that he claims was 100 percent repeatable in his lab. Measurements were made using a steam calorimeter at the Laboratoire de Sciences Nucléaires in Paris.

Clauzon exemplified the persistence of many of the CMNS researchers, saying of himself, a Frenchman, "the frog will never give up."

### **Excess Heat Reported by Celani**

Francesco Celani, a physicist with the Italian National Institute of Nuclear Physics, reported results of an Arata-style double-wall structure experiment using palladium nano-powders, though the specific details of his claims were difficult to follow.

### **Karabut Reports Excess Heat Interpretation**

Alexander Karabut, with Federal State Unitary Enterprise "Luch," presented data showing an experiment which yielded 300 watts output as a result of an unusually high energy source. *New Energy Times* was unable to obtain copies of his presentation; however, we spoke with him afterward to learn more details.

We learned that Karabut's presentation was his own theoretical treatment of data from an experiment performed around 1994 by another group of Russian researchers.

Karabut explained to *New Energy Times* that the spectacular results that he reported at ICCF-13 were not based on his own data but were those of the other group. He says that their results confirm his ideas. Unfortunately, Karabut said, all but one of the six or seven members of that group are dead. Karabut hopes to repeat their experiment himself in the near future.

### **Toyota Replication of Mitsubishi Transmutation**

After many years of absence from the field, Toyota has re-emerged on the CMNS scene through the work of Tatsumi Hioki, Naoko Takahashi and Tomoyoshi Motohiro at Toyota Central Research and Development Laboratories Inc. in Nagakute, Aichi, Japan.

The researchers have attempted to replicate the Yasuhiro Iwamura deuterium gas permeation experiment performed at Mitsubishi Heavy Industries. The Toyota team reported an experiment that showed mildly positive evidence of the low energy nuclear transmutation of cesium into praseodymium.

### **Nagel Reports on LENR Reaction Rates**

David Nagel, a research professor at George Washington University, presented a paper on reaction rates for low energy nuclear reactions at surfaces. In this paper, he reviewed the effects on surface phenomena as observed with regard to the Letts-Cravens laser effect, the Arata/Zhang palladium-black material, and the Iwamura transmutation experiments. He also made note of an experiment performed by Edmund Storms in which he reversed the polarity of the electrodes and observed anomalous behavior including excess heat.

Nagel referred to the fourth paper (in pre-print) by Allan Widom and Lewis Larsen that gives estimates and an expression for reaction rates of  $10E12$  to  $10E14$  reactions/second/cm<sup>2</sup>.

Nagel's review also displayed a perspective of the various material geometries and the range of their effects when going from millimeter to micrometer to nanometer scales.

He made his best attempt to quantify the characteristics of power generation but admitted that a complete, comprehensive analysis was out of reach because of too many unknown parameters.

He pleaded to the experimentalists, "Measure or estimate your total surface area," and to the theoreticians, "Provide values for the reaction rates per area."

### **China Institute of Atomic Energy Contributes Paper**

Songsheng Jiang of the China Institute of Atomic Energy contributed a paper, along the lines of work by Steven E. Jones (formerly of Brigham Young University), reporting evidence for naturally occurring fusion in the earth.

### **Lipson on H/D Loading**

Andrei Lipson (Russian Academy of Sciences) et al. presented new research on the use of single-wall carbon nanotubes to enhance the diffusion of deuterium/hydrogen into palladium. He also reported a rigorous method of particle detection using CR-39 detectors which indicated 3.0 MeV (DD) protons and high energy alphas in a repeatable experiment.

Lipson et al. also took a comprehensive look at nuclear signatures in CMNS experiments and reported findings and particle energies from glow discharge experiments recorded with the use of CR-39 detectors and metal filters.

### **Exploding Wire Experiments**

Two Russian groups, one from the Ryazan State Radio Engineering University and another from the Russian Federal Nuclear Center, reported results from exploding wire experiments; however, the significance and conclusions are difficult to understand. A.N. Vlasov, from Ryazan, reported that the wire was vaporized in the course of the explosion.

### **Bazhutov Reports Neutrons, Tritium**

Yuri Bazhutov presented several papers, but one particular experiment that he reported stood out. He reported that "large neutron yield reached a value of  $10E6$  neutrons per second with correlated tritium yield value  $\sim 10E11$  in heavy water & much less in light water" in his paper "Neutrons, Gamma-Rays & Tritium Diagnostic at Electrolysis with Anode Gas Discharge in Water Solution."

### **Alexander Koldamasov's Hydraulic-Electrostatic Device**

Two years ago, *New Energy Times* first reported the work of Alexander Koldamasov, brought to Edmonton, Canada, by Hyunik Yang. Yang partnered with Patrick Cochrane and his Innovative Energy Solutions Inc. business partners in an attempt to develop the Koldamasov method into a commercial product. They didn't do so well. They took a few million dollars from small private investors, produced nothing and ended up in bankruptcy.



A default judgment was issued on Aug. 29 in Clark County, Nev., district court against Ronald Foster, Patrick Cochrane and Frederick Dornan with compensatory damages of \$15 million and punitive damages of \$45 million.

Real science and potentially viable technology may be behind Innovative Energy Solutions Inc.'s failed attempt, but the lesson to learn here, as always, is caveat emptor, and watch out for the snake oil.

Yang has continued with his attempts to develop the method into a commercial product with a few deep-pocket private investors, and he has kept very quiet since his unfortunate experience in Edmonton. Yang has not appeared at any CMNS conference since the 2005 conference in Yokohama, Japan.

*New Energy Times* was able to speak with Koldamasov during the Sochi meeting and learn a great deal about the background of this work.