International NR Newsletter

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International Society for Neutron Radiology
(www.isnr.de)

Editorial

In 1997 the first International NR Newsletter was issued by S. Fujine, the Deputy President of ISNR in that year. Until 1999 two more issues were sent to all members of ISNR. With this fourth issue we want to continue this series.

The NR Newsletter aims in informing on recent activities of the ISNR and its members, as well as giving reviews or comments on interesting topics. Together with our webpage and your personal engagements it is the spokesman for our community. Your cooperation, i.e. your contributions to the NR Newsletter, will decide whether and when there will be succeeding issues.

With all my best wishes to you and your families for a successful and peaceful Happy New Year.

Yours

Thomas Bücherl

From the President of ISNR

By Frikkie de Beer

This year of 2006 was an exciting year for the neutron radiographers all over the world as the next World Conference on Neutron Radiography took place at NIST, USA. This event is taken place every 4th year and always provides the opportunity for all the participants to renew collaborative relationships, to broaden their communication network, to present their work and for newcomers to the fraternity to learn, meet and experience the unique science being practiced by world wide recognized researchers.

In the early years of neutron radiography, the application that caught the eye of the world was the application of neutron radiography in the aircraft industry with early Al-corrosion detection. At the WCNR-8, R&D work regarding the application of Nrad related techniques to the hydrogen fuel cell development, put Nrad again in the lime light and on the agenda of many researchers – let us explore the opportunity to market Nrad through this unique application.

It is also a pleasure to see retired neutron radiographers still participating in discussions and attending conferences. Your input and efforts during the early days to put Nrad on the map and to explore the technique, is and will be recognized for ever. Your participation and discussions creates the ideal opportunity for young researchers to learn from you – a very important issue we can not ignore.

In the next 2 years before the next event on the neutron radiography calendar, the ITMNR-6 in Japan in 2 years time (2008), many of us will be involved in high tech experiments, will travel the world as experts to give advice and / or to learn from experts. You are all invited to join this topical series of international gatherings midway between the world conferences on NR – popular in a sense that it provides another platform to present and learn about unique applications in the field of neutron imaging.

I want to urge members to frequently visit the ISNR web page and to provide information on activities in your region to our secretary, Thomas Bücherl for publishing.

As we approach the end of 2006, I which you all a happy festive season and an energetic start of the New Year.

REMARKS ON ISNR CONSTITUTION AND POSSIBLE CLARIFICATION

(Extracted from letter by J. Barton to T. Bücherl with permission Dec 06)

The NR community has been overwhelmingly cooperative and friendly, in spite of coming from so many different countries and cultures. When I organized the First World Conference on Neutron Radiography, held in San Diego in 1981, I was "An unemployed consultant" with time available. I did most of the organization without help, but, based on my previous twenty years in the field, it was very well attended (140 papers from 20 countries, which I think is still a record). The proceedings include invited summaries on many facility designs. (A Web search may find copies)

In the absence of any ISNR structure it was easy for me to arrange rotation of subsequent meetings: to Paris (1986); Osaka (1989); San Francisco (1992); and Berlin (1996), each host being selected to be near the center of most activity at the time, while also rotating in turn between the three continents contributing most NR research: America, Europe, Asia.

There have been over thirty different countries participate in the NR community, and I suspect each different culture would have different views on the function of a Constitution. In the UK, for example, the democracy deliberately avoids having a written constitution, preferring to work with slowly evolving tradition, and established practices. In contrast, in the USA, there is an Original Constitution that is modified only rarely by amendments, and which is the basis for changing interpretations by the Supreme Court. Iraq provides a recent example of constitution differences.

The foundation of ISNR took place between 1992 and 1996 and is recorded in some detail in the WCNR-5 proceedings (see J.P.Barton, International Society for Neutron Radiology - Foundation, Pages 765-769). One goal was to provide a framework to help perpetuate and expand the community activities, while allowing a mechanism to resolve any occasional differences or disputes. A second goal of any constitution is to provide protection for the entire community against accumulation of over-dominant power, which could otherwise feed on itself to the advantage of the power hungry, but to the disadvantage of the rest. A third goal was to keep the constitution as brief and simple as possible, recognizing that the NR community is very international and very small in numbers of concerned individuals.

As detailed in the WCNR-5 proceedings the drafting, review and revisions of the constitution took four mailings to all recipients of the International Neutron Radiography Newsletter, prior to general adoption by universal vote at WCNR-5.

Of course some differences are almost bound to occur, but the only one of which I became aware, prior to the ISNR foundation, was between WCNR-3 and WCNR-4, when an individual in another country who was relatively new to the community, made known late that he wanted to host WCNR-4. When denied this, he started independently a so-called International Topical Meeting on NR, which has since continued as the series known as ITMNR. Some difficulties ensued due to lack of co-ordination on dates, locations etc. That single problem appears now to have been co-operatively resolved, first with the establishment of ISNR (1996), and then by the first amendment to the constitution (2002), which combines management of the two series.

The ISNR appeared to function well when at WCNR-6 in Osaka 1999, with John Lindsay having been Vice President from 1996 to

1999, and the rotation expected to return to America, an appeal was received from Dr. Chirco to host the WCNR-7 of 2002 in Rome, Italy. With the support of the many European votes on the Board of directors the decision was taken democratically to change the rotation from USA to Italy.

Therefore, in retrospect, the ISNR constitution has provided a mechanism for the decisions to rotate the WCNR series from Berlin (1996) to Osaka (1999) then to Rome (2002) to Washington DC (2006) and next to South Africa (2010). Some disappointment is to be expected and one such who has made his frustration known is a representative of the India with its over 22 nuclear power reactors, over 100 neutron radiography workers, and over 1000 million population.

While the choice of officers by election has been very important, the composition of the ten elected places on the Board of Directors has not seemed, in retrospect, very critical. Most decisions have taken place with little apparent division of opinion, and there have been no close votes. However, in the future, with the ease of emails and phone conference calls, it is certainly foreseeable that The Board could become more active in between meetings, in which case Board composition could become more important.

The organizer of WCNR-8, M. Arif, during his talk on the conference banquet (Photograph by F. de Beer).

While amendments to the brief ISNR Constitution can be made through the Board of Directors I suggest that if more organizational agreements are needed the Board consider supplemental documents such as "By Laws" (For voting procedures etc.) and "Rules" (for general organizational procedures). A written history of past ISNR experience could also serve to provide continuity and promote useful evolution.

The 8th World Conference on Neutron Radiography

By Frikkie de Beer

The 8th World Conference on Neutron Radiography was held at the National Institute of Standards and Technology (NIST) in Gaithersburg, MD USA from October 16-19, 2006. Gaithersburg is located 30 km north of Washington, D.C. and the conference was held during fall – a time when the USA is covered in the most beautiful colors. This was the 8th International World Conference of this nature with the intention to get most of the individuals involved in neutron radiography activities in the world together under one roof for a week of fruitful discussion and participation. This conference proofs again the uniqueness of neutron imaging in every sense of the word. The traditional thermal neutron radiography are now complemented by techniques such as phase contrast imaging, cold and fast neutron imaging, tomography, dynamic and real time imaging - techniques to be explored and to be utilized by the participants at their own facilities – techniques that make neutron radiography an exciting analytical tool and important R&D role player in the world.

The conference was organized successfully over 4 days. Within 4 sessions

per day and 5 speakers per session, 72 presentations were given. As the neutron radiography facility at NIST is a dedicated facility for hydrogen fuel cell R&D, two sessions were dedicated to this unique and important application of Nrad. The conference includes also a visit to the NRAD facility at NIST as well as a poster session where 35 posters were presented. Participants from 27 countries joined the conference which makes it a truly gathering of the experts from all over the world.

Honorable guest speaker Harold Berger and his wife (Photograph by F. de Beer).

The conference banquet was held at the Chart House Restaurant in ALEXANDRIA, VIRGINIA where Harold Berger addressed the participants as honorable guest speaker of the evening.

On the last day of the conference the ISNR-Board was elected by the participants of the conference for next 4 year period. Elected are:

President:
Frikkie de Beer (South Africa)

Vice-President:
Eberhard Lehmann (Switzerland)

Secretary:
Thomas Bücherl (Germany)

Board:
M. Arif (USA)
Marton Balasko (Hungary)
Les G. I. Bennett (Canada)
Jack S. Brenizer (USA)
Nikolay Kardjilov (Germany)
John T. Lindsay (USA)
Roberto Rosa (Italy)
Burkhard Schillinger (Germany)
Cheul Muu Sim (Korea-South)
Nobuyuki Takenaka (Japan)
Ray Tsukimura (USA)

We all agree that the organizers under the chairmanship of Dr M. Arif did an excellent job to put this conference together – we want to thank them all.

The IAN2006

by Eberhard Lehmann

The workshop "Imaging and Neutron" was held as during October 23 – 26, 2006, on the area of the new spallation neutron source SNS in the Oak Ridge National Laboratory, located near Knoxville (Tennessee, USA).

The organizers took the opportunity to invite many experts from the neutron radiography community, which held its „8th World Conference on Neutron Radiography" just the week before in Gaithersburg at the National Institute for Standardization and Technology (NIST). Therefore, an audience of more than 100 people from all over the world discussed during the three days of the workshop the status, latest developments and future opportunities in the field of neutron imaging.

Although everyone in the community is aware that other techniques like X-rays, magnetic-resonance-imaging (MRI) and ultra-sonic methods have lately made enormous progress it becomes clear that neutrons in the field of imaging have an enormous potential, as well.

New approaches like phase-contrast imaging, micro-tomography and energy-selective techniques were presented and first such experimental results were already shown.

SNS has the intention to become one of the strongest sources with pulsed neutron beams in the near future. However, the majority of experiments in the present SNS layout are diffraction and

(Photograph by E. Lehmann)

scattering devices, optimized for using the time-of-flight principle.

Therefore, it was surprising for the participants to be invited by the organizers for a such large scale event when no intention and conception for a neutron imaging beam line has been settled until now.

Nevertheless, everybody did the best to present results, conceptions, speculations and options in relation to future trends and improvements. In particular, the eleven sessions of the workshop dealt with new techniques, challenges, cultural heritage investigations, medical and biological applications, material research, homeland security and further application fields.

Based on the success of the meeting and the lessons learned by the responsible persons in Oak Ridge an instrumental team was formed, with the intention to provide a "Letter of Intend" for a dedicated neutron imaging device at SNS in spring 2007. This would be the first one at a pulsed source with the high potential for state-of-the-art imaging using time-of-flight features.

News from the Board

by Thomas Bücherl

According to the constitution, "Immediately after election the President shall appoint a deputy with whom to work together in preparing the next WCNR", F. de Beer has appointed Dr. Chris Franklyn as Deputy-President for the term 2006 - 2010. He is head of the Radiation Utilization Department at Necsa and has recently received a 30year long service award certificate from Necsa. For a couple of years, he directed the fast neutron radiography activities at the Van de Graaff accelerator at Necsa in a R&D collaboration with a well known diamond company in South Africa. He is well known by some of the members of the ISNR and is active in the field of SANS (currently in a IAEA TC sponsered activity to create a

new SANS facility at beam tube no-1 at the SAFARI-1 nuclear research reactor).

Obituary in honour of Attila Kuba

by Marton Balasko

Attila Kuba finished his university study in 1976. In the same year he joined the Laboratory of Cybernetics at the University of Szeged and has been working there and in its successors since. With his work of high standards and unbroken diligence he received the honor and respect of his colleagues and students. He was the head of the Department of Image Processing and Computer Graphics since its foundation in 1994, and he became a full professor in 2005.

Attila Kuba (1953-2006)

He was the lecturer of the computer graphics, image processing and medical image processing courses. He also spent much time with students outside of lectures. He supervised several scientific student works, diploma and doctoral theses. His office was always open to his students and colleagues. It is hard to imagine that beside so many voluntary engagements how he managed to find time for carrying on his own research.

His main research interest was tomography, more specifically discrete tomography, but he has left his everlasting marks in other fields also. He was the author or co-author of many academic papers, and the editor of several publications and books.

He was one of the initiator of the neutron tomography research work in Hungary. He took part in the work of COST 524 European project. He gave many of high-level presentations about the application of discrete tomography with neutron beam. He was the member of the organizing committee of ITMNR-5 world conference.

He was visiting professor in Germany, Italy, England, and the United States. He established an extensive network of connections both nationally and internationally, which he also often used to assist his colleagues and students in getting international study trips and scholarships.

His scientific and teaching achievements were acknowledged by the Kalmár's prize in 1981, and by the Fáy Andrá's „School founding master teacher" prize in 1997.

He was the member of IEEE, IEEE Signal Processing Society, IAPR, the János Bolyai Mathematical Society, the John von Neumann Computer Society, and the Hungarian Association for Image Processing and Pattern Recognition, for which he was also the president for several years.

Between 1997 and 2000 he received the Széchenyi professor fellowship.

Between 1993-94 he was a Humboldt research fellow in Erlangen, Germany. He was the secretary of the Hungarian Humboldt Association between 1997-2003, and from 2003 the president. He was a chair or co-chair of several prestigious international conferences and summer schools. Unfortunately, he was not able to attend the DGCI 2006 conference, which he organized at the end of October, but he made sure of the successful flow of the conference by giving advices over the phone and email.

We all will miss him so much and we will keep the commemoration to him for ever.

New members

We welcome **Emmett Barnes**, USA, as new member of ISNR. Concerning his relation to neutron radiology he writes:

"I have not been directly active in Neutron Radiology recently, but I have a continuing interest in the subject. I work in the Radiographic Laboratory here at Picatinny Arsenal, which supports the research, development, and production of munitions by the U.S. Army. Several years ago we participated in the U.S. Department of Energy's (DOE) Californium Market Evaluation Program and acquired a large Cf-252 source. We designed and fabricated our own Cf storage cask and neutron radiography facility, which was used to explore the application of neutron radiography to a variety of munitions products. The project ran for several years, and hundreds of neutron radiographs (film) were generated.

Although we still have the Cf source, it gradually decayed to the point where it was no longer feasible to make neutron radiographs. However, I have continued to advise munitions engineers on the use of neutron radiography, and we have utilized commercial neutron radiography laboratories from time to time.

Our neutron radiography facility is still intact, and there has been some renewed interest in neutron applications here. I believe there is a good possibility of making neutron radiography a more practical method of inspection for industrial applications by employing digital imaging techniques to reduce exposure times. Pending approval by the Army and DOE, the first step will be to replenish the Cf source to a useable level (~10 mg). This would be followed by a project to evaluate various digital imaging methods and possibly to develop improvements. Regardless of whether the digital methods prove advantageous, I plan to use the in-house Cf neutron radiography facility as a complement to our x-ray resources for nondestructively testing munitions products and for training younger engineers, scientists, and technicians in the practical aspects of neutron radiographic system designs and applications."

New publications

References of your or interesting new publications should be listed here.

News from the labs

News from your lab, (intermediate) results of your investigations on NR, examples of actual radiographs and tomographs, descriptions of new or planned set ups etc. should be presented here

Dates

September 2008, ITMNR-6, Kobe, Japan.

September 2010, WCNR-9, South Africa.

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