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Concluding remarks to ICAME2011

S. J. Campbell

Abstract An overview of the main aspects of ICAME2011 – tutorial lectures, oral and poster presentations, evening sessions - is presented along with a brief outline of several of the scientific highlights. Among other topics considered are the involvements of young scientists and female scientists, and operation of the oral and poster sessions. Despite the most challenging combinations of circumstances in the lead up to ICAME2011 that resulted in the change of venue at an advanced stage from Tokyo to Kobe, the Committee organised a high quality conference with many positive outcomes for the future. The Mössbauer community acknowledges and appreciates these efforts greatly.

Keywords Concluding remarks · International conference on the applications of the Mössbauer effect · ICAME2011

1 Introductory comments

ICAME2011, the 31st in the series of International Conferences on the Applications of the Mössbauer Effect, was held at the International Conference Center, Kobe, Japan from 25–30 September 2011. Consistent with its normal cycle and sequence, IBAME, the International Board on the Applications of the Mössbauer Effect, at its meetings during ICAME2007 in India, awarded the 2011 conference to Japan, a decision confirmed by IBAME at ICAME2009 in Austria. Having planned for almost 5 years for ICAME2011 to be held in Tokyo, the well documented tragic events of 11 March 2011 forced the Organising Committee to relocate the meeting from Tokyo to Kobe. As such the Mössbauer community acknowledges the significant

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extra loads and efforts required of the ICAME2011 organisers and wish to express their appreciation to the Organising Committee for their extraordinary efforts.

ICAME2011 was also shaped by the sad news reported in the days leading up to the conference, of the death of Rudolph L Mössbauer on 14 September 2011. A special tribute was paid to Professor Mössbauer at the Opening Ceremony by Dénes Nagy, Chairperson of IBAME, with Yutaka Yoshida, Chairperson of the Organising Committee, dedicating the conference to the memory of Professor Mössbauer.

At the outset I would like to thank the Organisers for the invitation and honour of presenting these "Concluding Remarks" to ICAME2011. Research based on the Mössbauer effect has been an integral part of my research activities since initial measurements carried out over 40 years ago as part of my PhD studies at Monash University. Since then I have been fortunate to have attended 12 ICAME conferences and several meetings in the ISIAME and Seeheim Mössbauer Workshop series. In accepting the responsibility of appraising ICAME2011, apart from attending all talks and sessions, as far as possible my aims were to adopt a 'clean sheet' attitude to ensure a fresh approach in my responses to the many facets of the conference. While this resulted in six busy days at ICAME2011, it emphasised my appreciation of the diverse and exciting range of science that can be undertaken using our incisive microscopic technique in low energy nuclear physics.

A conference comprises many aspects. Central to a successful meeting is of course the quality of the science presented and related publications. In addition to the standard oral and poster presentations over the 5 days of ICAME2011, the organisers arranged tutorial lectures for the day preceding the Opening, as well as evening sessions and innovative short five minute oral presentations. A brief appraisal of these key components together with other important issues such as the smooth operation of sessions (role of chairpersons, administrative and computer support and so on), is presented.

While science is mostly carried out in a cooperative manner by like-minded and friendly people, none the less science is a competitive affair with issues such as priority, funding, promotions and fame potentially involved. Research flourishes and develops progressively by the Scientific Method, a well established iterative process of experiment, systematic data collection and analysis, modelling, theory and feedback that we all understand and adopt. In outlining my observations and providing this feedback, I therefore offer a semi-quantitative assessment of ICAME2011 as we move forward with our enduring biennial series of international Mössbauer conferences.

2 The opening ceremony; statistics

As already indicated, the five day ICAME2011 meeting got underway with the strong awareness of all in attendance of the horrors that had led to the need to move from Tokyo to Kobe. This was captured by Conference Chairperson Yutaka Yoshida in his opening remarks: "So many things happen for this conference."; "11 March 2011: We were nearly ready, five years in preparation"; "Thank organising colleagues for their extraordinary efforts in organising this conference". As mentioned above, the Opening Ceremony was further tinged by news of the passing of our revered

Table 1 Breakdown by country of the 183 delegates at ICAME2011

Country	Delegates
Australia	3
Austria	3
Belgium	4
Canada	1
China	8
Columbia	2
Croatia	3
Czech Republic	5
Egypt	1
Finland	1
France	11
Germany	17
Hungary	6
Japan	80
Mexico	1
Oman	6
Peru	1
Poland	7
Portugal	1
Romania	2
Russia	7
Slovakia	1
South Africa	2
Spain	4
USA	6
TOTAL	183

colleague Rudolph L Mössbauer who, as we all know, was awarded a share of the 1961 Nobel Prize in Physics for his discovery and explanation of the effect that bears his name. A very fine overview and laudation of Professor Mossbauer's career was presented by Professor Nagy with Professor Yoshida dedicating the conference to the memory of Rudolph L Mössbauer. Further insightful words were provided by Honorary ICAME2011 Member Professor Teruya Shinjo who, drawing on his own experiences from international research collaborations, exhorted young Japanese colleagues to: "Attend Future ICAME Conferences; make good scientific results leading to attendance at future ICAME meetings, and to enjoy international friendships."

These introductory statements proved important to the conference as the way was now cleared to proceed in a focused manner on the key scientific aspects of ICAME2011. In particular, it allowed the aims of the conference as stated by Professor Yoshida - "Create a new generation of Mössbauer spectroscopists"; "Create strong bonds" - to be fully engaged by delegates. With a 50% decrease in visitor numbers to Japan during 2011, the attendance at ICAME2011 of 183 participants, comprising 33 invited; 118 registered and 32 students, was a very positive outcome for the organisers. As shown in Table 1, representatives of 25 countries attended the meeting with Japan, 80, and Germany, 17, having the largest contingents followed by France, China and Poland with 11, 8 and 7 delegates respectively.

3 Conference sessions – impressions

3.1 Tutorial lectures

In common with the practice at recent conferences, proceedings started the day before the official opening with a set of tutorial lectures aimed at students and junior researchers. The organisers had identified a gap in the Mössbauer literature with the six invited lecturers asked to target not just research students and early career researchers, but also to direct their oral and written presentations at the level of final year Bachelor studies which would also suit those in industry. A total of 34 students and delegates attended the set of lectures presented by six experienced and capable lecturers in the picturesque setting of the Sorakuen Gardens, Kobe. As requested, lecturers addressed the fundamentals of their topic with exemplary clarity and (mostly) avoided the common trap of overloading their slides. The fact that lecturers took time to *explain* their topic was appreciated by students.

Lecturers were required to prepare their presentations in written form with the aim of preparing a textbook comprising six chapters – General Principles; Chemical Applications; Earth Sciences; Fe-based Nanostructures; Magnetic Multilayers and Interfaces; Ion Implantation – to be published by Springer [1].

While it was not possible for Professor Philipp Gütlich to present his lecture, in keeping with the aim of ICAME2011, he prepared a special message for the next generation. Among his many insightful words, he drew out the importance of Mössbauer spectroscopy in introducing students to a wide range of fundamental aspects in science, concluding that "I consider it therefore highly recommendable, even necessary, that Mössbauer spectroscopy and relevant neighbouring fields are always part of the education in physics and chemistry." [2].

3.2 Oral and poster presentations

The conference programme was based around the nine topics deemed more or less standard for the series (see proceedings contents) along with the newer topic of Materials Research for the Global Environment, as well as Data Base and Hot Topics. Altogether around 75 talks were presented with 1 keynote lecture and 17 oral sessions (14 regular sessions of invited and contributed talks and 3 sessions of short oral presentations), together with 2 evening sessions and the opening and closing ceremonies. The poster sessions were busy affairs with 192 presentations in the 3 sessions, each of which lasted around 1.5 h.

Having attended all talks and inspected the numerous posters, the diversity and applicability of the Mössbauer effect in science continues to amaze and impress. On the one hand we reach for the stars (or at least planet Mars and meteorites fallen to Earth) to explore their mineralogy and to search for life, while on the other we plumb the depths to examine the quality of sea beds. In between these extremes we apply our incisive microscopic technique in an increasingly impressive myriad range of significant issues in science. I wonder if Professor Mössbauer, even in the enthusiastic state surrounding the award of his Nobel Prize in 1961, would have foreseen the potential for application of his discovery to the role of frataxin in iron-sulfur assembly and dysfunction-related disease, or delineation of the magnetic properties of Ni under very high pressure?

Table 2 Scientific highlights within my spheres of interest: (a) Highlights I; (b) Highlights II; (c) Highlights III

Presenter; Reference [3]	Title	Topic
(a) Highlights I		
A I Chumakov [I-14]	Solving puzzles of glasses with nuclear resonant scattering	Dynamics (T 4)
W Keune	Applications of Mössbauer spectroscopy in magnetism	Keynote
Jung-Fu Lin [I-12]	Electronic spin transition of iron in earth's lower mantle	Earth science, mineralogy and archaeology (T 9)
R Röhlsberger [I-1]	The collective lamb shift in nuclear γ–Ray superradiance	Advances in experimental techniques and methodology (T 2)
(b) Highlights II		
E Bill [I-5]	Iron-sulfur clusters – new features in hydrogenases and synthetic models	Chemical applications (T 6)
Pierre-Emmanuel Lippens [I-9]	How Mössbauer spectroscopy can improve Li-Ion batteries	Materials research for the environment (T 1)
E Colineau [I-16]	^{237}Np Mössbauer studies on actinide superconductors and related materials	Solid state physics (T 8)
J Tucek [I-17]	Zero valent iron nanoparticles and nanometric polymorphs of Fe(III) Oxide – from solid state synthesis to their applications	Nanomaterials (T 7)
Y Kamihara [I-18]	Iron based superconductors veiled probing internal magnetic fields of elements	Hot topics
Hans-Henning Klauss [I-19]	Competing order in iron Pnictidde superconductors	Hot topics
(c) Highlights III		
H Akai [I-3]	Theory of hyperfine interactions – reality of first-principle approaches	Theories of hyperfine interactions (T 3)
W M Reiff [I-6]	'High Spin Iron (II) – Mega-Gauss Internal Hyperfine Fields; Approach to Free Ion Magnetic Behaviour'	Chemical applications (T 6)
J-M Latour [I-7]	Mössbauer studies of Frataxin role in Iron-Sulfur assembly and dysfunction-related disease	Biological and medical applications (T 5)
I Fleischer [I-13]	In-Situ Mössbauer spectroscopy with MIMOS II	Earth science, mineralogy and archaeology (T 9)
J L Tirado [I-11]	Unfolding the role of iron in Li-Ion conversion electrode materials by ^{57}Fe Mössbauer spectroscopy	Materials science and industrial applications (T 10)

3.3 Scientific highlights

In attempting to indicate some of the many scientific highlights from the oral presentations that particularly caught my attention (Table 2), I was influenced most

by the key factors of good science and quality of presentation. This latter point includes many aspects such as: clear statements on the significance and context of the problem; the experimental and/or theoretical approaches; and the speaker's ability to explain the issues and outcomes as they develop. More technical aspects include the clarity and density of information contained in slides, the pace and styles of delivery, and of course the ability of the speaker to maintain interest and stick to time. This was epitomised for me in the talk by A I Chumakov who coaxed delegates through the intricacies of the long standing apparent dilemma of the boson peak in glasses while in parallel drawing out comparisons with a deep mystery in Russian history. All was finally revealed in the multi-facetted investigation with the boson peak shown by nuclear resonant inelastic scattering to be equivalent to the transverse acoustic van Hove singularity of the corresponding crystalline phase.

In addition to the talks listed in Table 2, I was also taken with the following high quality contributed talks (code as in the programme and abstract booklet [3]): Energy Domain Synchrotron Radiation ^{57}Fe Mössbauer Spectroscopy (T Mitsui, O-1; V Potapkin, O-2); Spectral Analysis (K Szymański, O-3); SF-HAXIESST Investigated by Mössbauer Spectroscopy (F Renz, O-5); Spin Crossover Thin Films (Y Garcia, O-6); Heme Proteins (V Schünemann, O-7); Weakening 'Dead Zone' in Tokyo Bay (K Shozugawa, O-19); Ni under very high pressure by NFS (I Sergueev, O-23); ^{155}Gd Mössbauer of Rare Earths (J M Cadogan, O-24); Multiferroic Thin Films (J Juraszek, O-30).

3.4 Evening sessions; short oral presentations

The evening session, in which five of the community's senior statespersons presented aspects of their many decades of research in applications of the Mössbauer effect, proved very successful. "The Golden Oldies" as I like to think of them, provided an interesting range of topics: 50 years of Mössbauer Spectroscopy: What Now? (C E Johnson); Diffusion Studies with the New X-Ray Sources (G Vogl); Redox Topotactic Reactions (J-M R Genin); Personal Recollections of R L Mössbauer (F E Wagner) and, 45 Years: From Antimony Mössbauer Spectroscopy to Nano Systems (J G Stevens). All speakers gave very fine talks in which their commitment, quality and passion shone through.

A Special Lecture - Fukushima Accident: What Happened? - was presented by M Baba of Tohoku University on the second evening of the conference. Professor Baba gave an excellent, didactic talk of great interest to the scientific audience. The consequences of the events of 11 March 2011 and beyond will continue to be felt for many years and our thoughts have been, and continue to be with the Japanese people.

The sessions of Short Oral Presentations, in which speakers were allowed only 5 min with no questions also proved successful. While such approaches have been used in other forums this was the first time they had been adopted at ICAME. These short talks were intended mainly for the younger scientists to encourage and help create the new Mössbauer generation. While most speakers presented 5 or 6 slides, several misjudged and tried to cram in as many as 10 slides. This led to serious overrun of time, generally to little avail in their intent to communicate their scientific message.

Table 3 Poster awards for young scientists at ICAME2011

Presenter; Reference [3]	Title	Topic
1. Kana Yamada [P7–24]	Mössbauer study of metal substituted ε-Fe_2O_3	Nanomaterials (T 7)
2. Mamoru Yasuike [P6–11]	Orientation of hyperfine magnetic fields of α–Iron films produced by Laser Deposition	Chemical applications (T 6)
3. Hajime Kamebuchi [P6–15]	Study on the spin crossover transition and glass transition for Fe(II) complex film, [Fe(II)(H-triazole)$_3$]@Nafion, by means of Mössbauer spectroscopy	Chemical applications (T 6)
4. Tomohiko Sato [P9–10]	^{57}Fe Mössbauer analysis of the upper Triassic-Lower Jurassic Deep-sea Chert: paleo-redox history across the Triassic-Jurassic boundary and the Toarcian Oceanic anoxic event	Earth science, mineralogy and archaeology (T 9)
5. Benedikt Klobes [P2–10]	Nuclear resonance scattering on Te Oxides	Advances in experimental techniques and methodology (T 2)
6. Alexis Perea [P10–20]	New ^{57}Fe Mössbauer investigations on $LiFe_{1-x}Mn_xPO_4$ (x = 0; 0.25; 0.5; 0.75) materials for Li-ion batteries	Materials science and industrial applications (T 10)
7. Raul R. Gabbasov [P5–7]	Breaking of interparticle interaction in conjugates of magnetic nanoparticles injected into the mice	Biological and medical applications (T 5)
8. Sergej Rackwitz [P2–1]	Installation of an IR microscope at the nuclear resonance Beam Line ID18 of ESRF	Advances in experimental techniques and methodology (T 2)
9. Hilary Masenda [P8–43]	Mössbauer study of ^{119}Sn in 3C-SiC following ^{119}In* implantation	Solid state physics (T 8)
10. Takashi Nagatomo [P6–19]	In-Beam Mössbauer spectroscopy of ^{57}Mn Implanted into Lithium Hydride	Solid State Physics (T 8)

3.5 Posters

The posters were of a consistently high quality and standard. Members of IBAME were charged with the difficult task of assessing the posters presented by young scientists for awards announced at the Closing Ceremony (Table 3). In the event P7–24 presented by Kana Yamada was preferred by a clear majority with P6–11 and P6–15 selected ahead of the other highly-rated posters as in Table 3.

The appointment of chairpersons for each poster session was good; this places responsibility squarely on the poster presenter to ensure they are present during the

time allocated for their session. On the other hand, the relatively short time of around 1.5 h allowed per session, combined with the fact that all posters were displayed for the entire conference, meant that delegates were less able to focus entirely on posters associated with a given session. I prefer to see posters displayed only for the day of their session as this allows their focused appraisal.

3.6 Talks; posters – some observations

With few exceptions, the overall quality of talks was high and speakers are to be congratulated. Over the course of 4.5 days the relatively large number of talks (about 75) created problems, particularly on the first two days when sessions continued to around 8.30–9.00 pm. About 20 talks were presented each day with as many as 10 talks following directly after each other. Educational experience tells us that attention spans do not allow the audience to concentrate for such extended periods and breaks - even if only of a mini-nature for recommended stretch breaks - should have been incorporated. Timing was helped both by the introduction of a 'Speakers Corner' adjacent to the lectern so time loss was kept to the minimum, and by the excellent computer technical support.

Given that posters are the presentation medium for most delegates, fewer talks would allow more time for appreciation of posters. With about 60 posters per session at ICAME2011, this corresponds to around 2 min per poster. Even if, say, 10–20 posters are of direct interest, this still only allows about 10–5 min per poster to digest the content and interact with the presenter.

The number of co-authors and collaborators seems to be increasing steadily; this probably reflects the increasing tendency towards consolidated use of specialised equipment and access to large facilities. Despite the sophistication and complexity of scientific problems tackled, fundamental issues endure. For example it is important to provide information about spectral analysis and sub-spectra, the quality of experimental apparatus, drive systems and so on.

3.7 Session chairpersons

The role of chairperson is very important - they help to keep the programme to schedule while assisting delegates to get the most out of sessions. Introduction of the impressive brass bell operated by a member of the support team proved a big help – its loud clang kept the speakers informed of timing, stirred those members of the audience who needed stirring, and allowed the chairperson to focus on the session. At the same time the chairperson has to pay attention to the audience; for example, on occasions the chairperson lost track of who the next questioner was, to the frustration of those concerned.

4 General impressions

4.1 Delegates

There appeared to be a fairly wide age distribution with young and not so young well represented among the 183 delegates (Table 1; Fig. 1). While it was pleasing to have

Fig. 1 (*Upper*) Young scientists and 'young at heart' scientists. (*Lower*) Female scientists should be encouraged and supported whenever possible

many female delegates, less pleasing was to find that of over 75 talks only 4 were presented by female speakers - an invited talk, a contributed talk and two short oral presentations. While many factors affect the work and intentions of a Programme Committee, it is important to ensure that, consistent with standards, young scientists and female scientists are encouraged and supported as much as possible.

4.2 Additional activities

International conferences are generally busy affairs and ICAME2011 was no exception. For example, many delegates were also involved in two IBAME meetings. The extensive list of agenda items underlines the efforts IBAME members, particularly the executive comprising Dénes Nagy (Hungary), Jean-Marc Greneche (France) and Michael Reissner (Austria), make on behalf of the community. Similarly many colleagues appreciated the meeting and discussions with Tao Zhang and Junhu Wang as they outlined the plans they and their team at the Mössbauer Effect Data Center, Dalian, China are developing in collaboration with the community. The Mössbauer community is well served by these two important bodies and they deserve our full support.

4.3 Social

To help offset the busy conference schedule, delegates were able to take part in an outing during the traditional break on Wednesday afternoon. Likewise Thursday evening saw a splendid banquet during which delegates were regaled by the wonderful concert provided by the trio of Mrs Itsuko Yoshida (piano), Mrs Naoko Kimura (violin) and Mr Masao Kimura (cello). For those delegates able to stay in Kobe on Friday afternoon after the closing ceremony, there was the opportunity for a very interesting visit to the SPring-8 synchrotron.

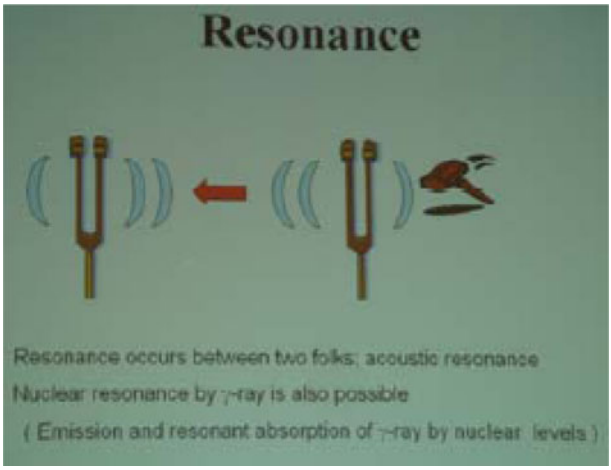

Fig. 2 Resonance between forks and resonance between folk in the Mössbauer community (after S Nasu, [1])

Fig. 3 Transfer of the mighty ICAME gavel, and with it the responsibility, from ICAME2011 in Japan to ICAME2013 in Croatia (*left* to *right*: Yutaka Yoshida, Chairperson ICAME2011, Dénes Nagy, Chairperson IBAME, Mira Ristić, Organising Committee ICAME2013, Mrs Itsuko Yoshida)

5 Appraisal

From the outset the organisers set themselves several challenges and targets - short publication time for ICAME2011 proceedings; publication of tutorial lectures as a book; short oral presentations and special evening sessions. Particularly impressive is the on-line publication of the 123 accepted papers on the Hyperfine Interactions web site by late November/early December 2011. Due to the organisers' efforts and with the support of the authors, referees and publisher, they have achieved these aims and contributed positively to the continuing development of the Mössbauer community.

Given the full schedule of talks and relatively short time available for posters perhaps two options should be considered for the future – either reduce the number of oral presentations or have parallel sessions. Introduction of two parallel sessions between the morning break and lunch on the second and fourth days of the conference would, for example, allow the programme committee greater flexibility. As

indicated above, a further recommendation is to increase participation of female scientists, consistent with maintaining standards (e.g. http://plato.stanford.edu/entries/affirmative-action/).

The commitment of the organisers to their tasks was evident at all stages. To Chairperson Yutaka Yoshida, Co-chairperson Tesuaki Nishida and all members of the organising committees: you have overcome significant hurdles and adversities in organising ICAME2011; you have done a very good job in ensuring smooth operation of all facets of the meeting while attaining high standards. We congratulate you on your efforts and the success of ICAME2011.

In the best traditions of science - which as we know is a friendly, cooperative but ultimately competitive environment - the following rating is proposed. In academic and research circles we assess student performance, review grant proposals, referee manuscripts and peer promotion applications and so on. Adopting the academic ranges of: pass (50–64); credit (65–74); distinction (75–84) and high distinction (85–100), my assessment is that ICAME2011 sits comfortably in the high distinction range – well done and congratulations.

6 Epilogue

As noted above, the tutorial lecturers explained the fundamentals of their topics clearly. Typical is the approach taken by Honorary ICAME2011 Member Professor Sabu Nasu in his discussion of resonance. In demonstrating the principle of resonance using tuning forks, Prof Nasu's slide (Fig. 2) also draws out well the resonance between folk, an aspect which underpins the enduring success of the Mössbauer community as we look towards ICAME2013 in Croatia (Fig. 3).

These concluding remarks are dedicated to the Japanese people who have been, and continue to be, affected by the natural disasters of 11 March 2011 and by subsequent events.

I would like to thank Professor Yutaka Yoshida and all members of the Organising Committee for their cooperation and for providing information about delegate numbers and poster awards at ICAME2011. My attendance at ICAME2011 was supported by Discovery Project DP110102386 from the Australian Research Council [4].

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