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The Publication of the International
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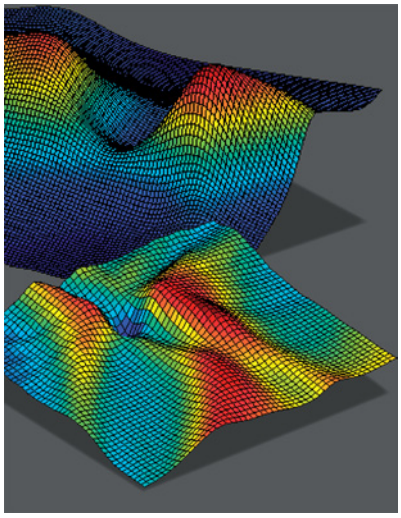

The cover picture illustrates aspects of research carried out by Keith Earle, recipient of the IES Silver Medal 2011 Instrumentation. These figures show the effects of varying fit parameters on two metrics for determining goodness of fit. The underlying spectrum is a simulation with added noise to model a Pake doublet, using the parameters originally determined by G. Pake (J. Chem. Phys. **16**, 1948, 327-336). The top figure is a portion of the expectation value 'landscape' of the mean squared residual. At the optimum parameter set, the expectation value is a maximum corresponding to the best possible choice of parameters. The bottom figure summarizes the information in a different way, based on ideas from differential geometry introduced into statistical analysis by R. A. Fisher. The 'landscape' here plots the Fisher information. In this case, at the optimum parameter set, there is no further information to be gained by varying parameters and the Fisher information is a minimum. The Fisher information acts as a metric on parameter space, and one can use the methods of classical differential geometry to introduce a rigorous notion of curvature into parameter space.

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volume 22 number 4 2013

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Editorial

Dear colleagues,

In this issue we say farewell to Seigo Yamauchi-san, the late President of the IES, our dear mentor, colleague and friend. Thanks to the efforts of Takeji Takui-san, President of the Asia-Pacific EPR Society 2012-2014, we have a collection of articles devoted to the memory of Seigo-san. We are most grateful to everyone who contributed to the EPR newsletter Anecdotes and In Memoriam columns (pp. 6–15).

As promised, Glenn Millhauser (Silver Medal: Biology/Medicine) tells his success story, and his radiant smile confirms that he enjoys his research (pp. 3, 4). The younger generation of researchers is represented by articles from Xing Rong and Leonid Rapatskiy, APES 2012 Young Investigator Awardees (pp. 4, 5), supplementing the APES2012 conference report by Yong Li and Haijun Yang (pp. 19, 20).

Daniella Goldfarb's conference report about the 6th EFEPR School held at the Weizmann Institute in Israel (pp. 16, 17) is accompanied by the comments from the young participants: Andrin Doll (Gunnar Jeschke group), who got the poster prize there, Alexander Taguchi (Sergei Dikanov group) and Thomas Nick (Marina Bennati group) (pp. 17, 18). Alexander and Thomas got prizes for active participation in discussions. Have a look at their photos and remember these guys: in the future they probably will be featured in the Awards column of our newsletter. Daniella's efforts were highly valued by Graham Smith, President of the EFEPR (p. 19).

By the way, with this issue we finalize our tenth volume, no. 22. In Autumn 2002, the Editorial office was moved to Kazan and in 2003 we published our first volume of the *EPR newsletter*, no. 13. It was a bit nervous to start our activity with this unlucky number but fortunately, it did not turn out to be a bad omen for our team. It is my greatest pleasure to thank former Associate Editors Graham Timmins and Takeji Takui, the current Associate Editors Candice Klug, Hitoshi Ohta and Thomas Prisner, Sergei Akhmin, our Technical Editor, and Scott Morton (La Plume and Sons), our printer, for their wonderful and inspiring collaboration. Special thanks go to Keith Earle, Shirley Fairhurst, Peter Höfer, John Pilbrow, Stefan Stoll, to name a few, for their continuing support. The limited space does not make it possible to name everybody who helps with our publication but their efforts are gratefully appreciated.

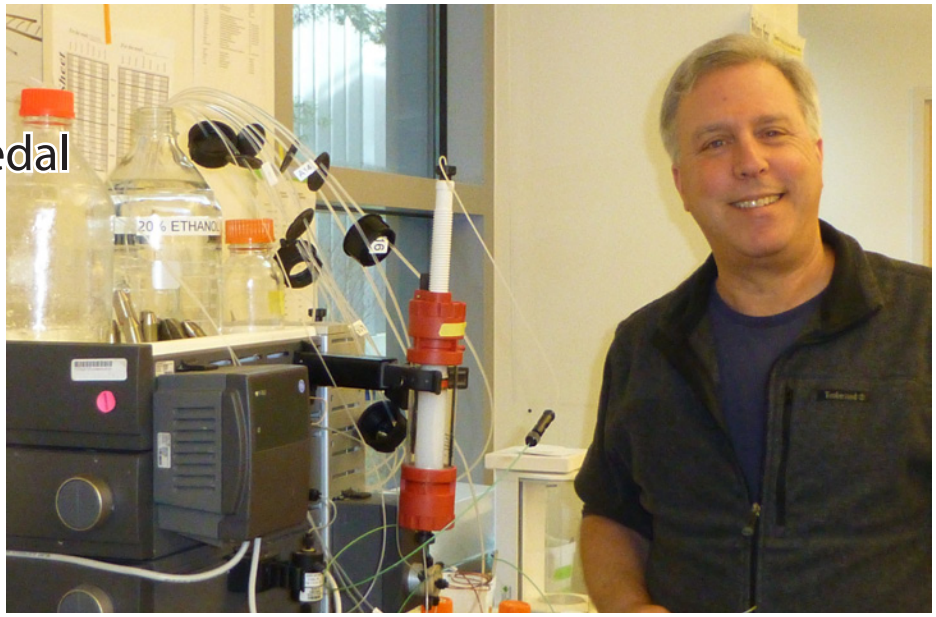
We do our best to meet the needs of our readership and provide them with diverse information that is both instructive and entertaining. However, dear readers, we are always open to your advice and recommendations. Please feel free to contact us if you have any ideas on how we can make the *EPR newsletter* even more interesting and useful for all.

We look forward to your input.

Laila Mosina

The 2012 IES Silver Medal for Biology/Medicine

Glenn L. Millhauser: EPR in its Many Flavors – a Journey and a Community



I saw my first EPR signal in 1978, when I was an undergraduate at the California State University, Los Angeles. I had the good fortune to work with Harold Goldwhite, a remarkable inorganic chemist, who wanted to see if we could use bulky organic groups to stabilize a phosphorus atom in its radical state. Having just completed organic chemistry, and learning how "rare" free radicals are, I loved the idea of creating a small molecule with a persistent unpaired electron. The synthesis of Harold's design seemed to go well, and the stoichiometry looked right, so we were definitely encouraged. But, of course, the only way to know if we really had a free spin was to do EPR. I knew absolutely nothing of the technique other than it is a parallel of NMR but works on electrons. We went down the hall and approached Richard Keys, a wonderful physical chemist, with the hope that we might use his instrument to test our tentative phosphine radical. All electronics were bigger back then – much bigger – and this was especially true for EPR instruments. The Keys EPR stood floor to ceiling with knobs, dials, protruding wires and, to the best of my recollection, may have even had vacuum tubes. And it warmed the room. But the thing worked – all we needed to know. So, we prepared a fresh sample, placed it in the instrument, went through a bunch of balancing and tuning, and initiated the scan. Just about everybody in the EPR field knows the queasy sensation of watching a baseline scan, wondering if at some field location a derivative signal will pop out. This was my turn and, after a tense wait, a signal appeared. A gorgeous doublet, just like we hoped for, arising from an electron coupled to ^{31}P (I = 1/2).

For graduate work, it was a thrill to land in Jack Freed's lab at Cornell. As we in the EPR field all know, Freed and colleagues pioneered the use of EPR line shapes for extracting molecular dynamics, as interpreted through the seemingly mystical Stochastic Liouville Equation. I had access to one of the first home built pulsed EPRs, and my quest was to measure spin echoes, and hence T_2 relaxation times of simple nitroxides. Several had already done this and reported lovely variations in T_2 with solvent viscosity and temperature, all beautifully predicted by relaxation theory. I was mainly in a personal "tune up" mode, figuring out how to get high quality signals for upcoming experiments. One day it dawned on me that, as EPR spectroscopists, we tend to always tune the magnetic field to give the highest amplitude signal. But in a near solid-state spectrum, there are low amplitude regions away from the intense edges, and I wondered whether we were overlooking different relaxation profiles in these untested segments. Figuring that I could set this up in an automated fashion, I wrote a small computer program that let me run a repeated sawtooth profile on the magnet, while acquiring the spin echo amplitude for increasing pulse separations. Applying Fourier transform to the tau dimension, we developed the first 2D EPR spectrum. And sure enough, we saw beautiful T_2 variations across the nitroxide spectrum. It was a blast working with Jack, and the rich environment of the Freed lab, to develop theories to explain these variations in terms of different motional models.

Since coming to UC Santa Cruz, I've used double label EPR to examine conformations in polypeptide helices, and collaborated with Claudio Toniolo at Padova on the novel TOAC label that is rigidly fixed to the polypeptide backbone. But, of course, what's occupied us for the last decade is the prion protein (PrP), and how it takes up copper. Prion diseases, which include mad cow disease and Creutzfeldt-Jakob disease in humans, come from a misfolded form of PrP. Although similar to Alzheimer's disease, the prion diseases are transmissible and, thus, particularly insidious. The link between PrP and prion diseases is absolutely clear. What's not known is why all mammals have the prion protein. The protein can be eliminated (knocked out) in lab animals and yet they seem fairly normal. My lab and others figured that PrP must play a role in regulating copper, an essential element in neurological tissues. EPR in its many forms – cwEPR, ESEEM, DEER, multi-frequency – proved to be remarkably useful in revealing the structural biology of PrP and its interaction with copper. And with much of the basic work behind us, we are now finding relationships between alterations in

The 2013 ISMAR Prize
Jack Freed
Cornell University
Ithaca NY
USA

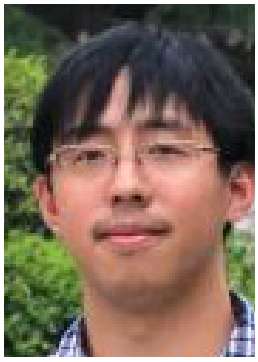
The 2013 Bruker Prize
Takeji Takui
Osaka City University
Osaka
Japan

The 2013 IES Young Investigator Award
Dane McCamey
The University of Sydney
Sydney
Australia

copper uptake and inherited diseases, and how both copper and zinc regulate the protein's distribution and its in vivo processing.

I'm very honored to receive the 2012 Silver Medal from the International EPR Society. The scientific journey has been enormously fun, and very gratifying. But beyond this is the pleasure of working in EPR – a vibrant field, constantly pushed forward by remarkable colleagues who willingly share ideas and opinions. In our prion work, we've had the great pleasure of collaborating with EPR leaders such as Gary Gerfen, Jack Peisach, Bill Antholine and others. And none of this would go forward without the wonderful students and postdocs who have come through my lab. Each of them brought insight, intensity, and their own particular view on the next important problem and how to solve it. I look forward to the future – continued conversations, advances in instrumentation, new concepts in EPR and its application to prions – and offer my sincerest gratitude to the Society and the many members of the EPR community.

The 2012 APES Young Scientist Awards



Xing Rong

I would like to thank Asia-Pacific EPR/ESR Society for providing me with the opportunity to present my recent work as part of the Young Scientist Award Lecture at the 8th APES conference in Beijing. The title of the talk is "The development and application of the pulsed ESR spectrometer", which presents the development of the first homebuilt pulses ESR spectrometer in China and related scientific research, such as quantum computation with solid-state spins. This study was carried out with many collaborators. I especially express my gratitude to Prof. Jiangfeng Du at University of Science and Technology of China, who is my PHD supervisor and guides me towards the exciting EPR world. I also would like to thank Prof. Dieter Suter, Prof. Xinhua Peng and Prof. Jihu Su for their generous help during my PHD life. I think the experience in APES is very precious and I really appreciate the award and encouragement by the members of APES.

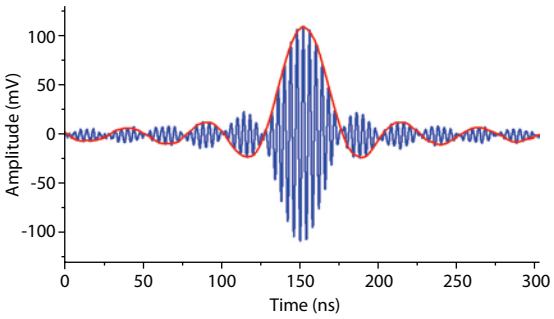


Figure 1. Shaped microwave pulse generated by the homebuilt spectrometer. Red line is the sinc function and the blue line is the microwave pulse, which is observed via demodulated by 9.7 GHz.

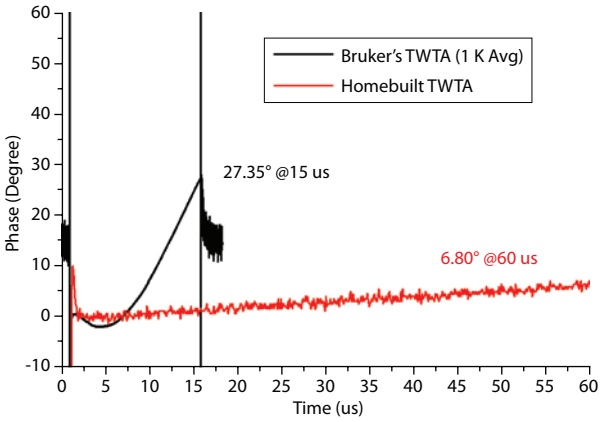


Figure 2. Phase droops of two TWTAs. The black line is the data collected from E580 and the red line is from the homebuilt spectrometer.

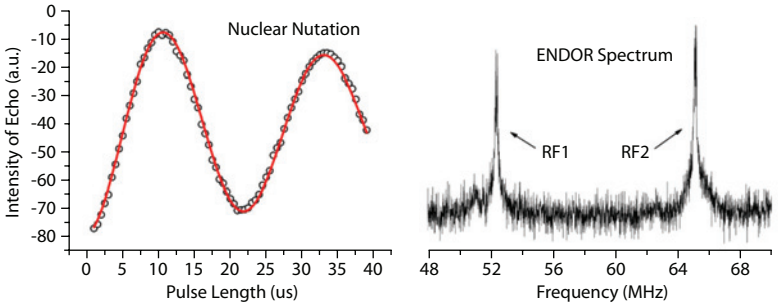


Figure 3. Nuclear Rabi oscillation and the ENDOR spectrum. Sample is Phosphorus-doped silicon.

Electron Paramagnetic Resonance plays a very important role in nowadays science and techniques. My study focuses on the quantum computation based on electron spins. The electron spin has been taken as a 'qubit', the quantum version of bit, encoded with quantum information. Many physical systems, such as Nitrogen doped in C_{60} Fullerene, Phosphorus-doped silicon and single nitrogen-vacancy (NV) center in diamond, are proposed as quantum computers. Pulsed EPR technique can be used to manipulate the qubit very fast up to Gigahertz [1]. So an electron spin can be used as a processing qubit. With pulsed ENDOR, a nuclear spin can be employed as a memory qubit, storing the quantum information for its long memory time.

One of the major obstacles to realize quantum computation is the decoherence effect. This effect stems from the interactions between electron spins and the environment. Thus, it is fist vital to overcome this effect if we are going to build a quantum computer. In 2009, we applied the dynamical decoupling technique to suppress the decoherence effect [2] mentioned above. The electron spin in the gamma-irradiated malonic acid single crystal is taken as a qubit. This qubit was found to suffers severe decoherence effect because of

the electron spins' hyperfine couplings to the nearby nuclear spins. By utilizing the dynamical decoupling technique, we succeeded in prolonging the coherence time of qubit. On the other hand, the qubit can be considered as a sensitive probe, which reflects the information of the environment. By employing different dynamical decoupling sequence on the qubit with different temperatures and electron spin concentrations, we were able to characterize several relevant decoherence mechanisms in this solids. Later, we experimentally investigated the ability of dynamical decoupling technique to preserve the entanglement [3], which is a key resource of quantum information processing. Phosphorus-doped silicon was utilized as a test-bed. We first generated entanglement state via pulsed ENDOR technique and then the quantum states evolved within the environment. The concurrence, used to measure the entanglement, decayed rapidly. With the help of the dynamical decoupling, we found the lifetime of the entanglement states was prolonged from 0.5 microseconds to about 30 microseconds.

The accuracy control of qubits is also of great importance for quantum computation. However, the noise, which is not only from environment but also introduced by the imperfect control, makes the precise control of qubits a great challenge. Composited pulses, developed in NMR, are powerful weapons for us to suppress the noise. Commercial pulsed EPR spectrometers provide microwave pulses, of which amplitudes and phases cannot be modulated arbitrarily with high precision. However, the ability to modulate microwave pulses precisely is necessary for composited pulses. A commercial device, which outputs arbitrary waveform at 10 GHz, is extremely expensive. Thus, we decided to construct a homebuilt pulsed EPR spectrometer in 2010. In 2011, this equipment was finished. The amplitude and the phase of the microwave can be modulated precisely (see Figure 1). We also have improved the TWTA, which is essential for pulsed EPR experiments. The commercial TWTA suffers a severe phase droop. In our equipment, the phase droop is linear and is kept small (see Figure 2), thus can be efficiently compensated with the precise phase modulation in our spectrometer. Pulsed ENDOR experiments are also available in our homebuilt equipment. Figure 3 depicts a nuclear Rabi oscillation and an ENODR spectrum with Phosphorus-doped silicon. Several experiments have been carried out on the homebuilt instrument. One is to investigate the non-classical correlations, named discord, in the absence of entanglement in solids [4]. We discussed the relationship between the discord and the quantum phase transitions. The sudden changes of the quantum discord are observed, which capture unambiguously the critical points associated with the behavior of the Hamiltonian. Our results display the potential applications of quantum correlations in studying the fundamental properties of quantum systems, such as quantum criticality of nonzero temperatures.

Now I am continuing the research of quantum computation based on electron spins. Since composited pulses are available in our instrument, it is natural to exploit the advantages of the fruitful composited pulses in pulsed ESR. I hope this will help us to give some enlightenment to the research field of pulsed EPR.

1. Fuchs, G.D., Dobrovitski, V.V., Toyli, D.M., Heremans, F.J., Awschalom, D.D.: Gigahertz dynamics of a strongly driven single quantum spin. Science **326**, 1520–1522, doi:DOI 10.1126/science.1181193 (2009)
2. Du, J.F. et al.: Preserving electron spin coherence in solids by optimal dynamical decoupling. Nature **461**, 1265–1268, doi:10.1038/nature08470 (2009)
3. Wang, Y. et al.: Preservation of bipartite pseudoentanglement in solids using dynamical decoupling. Phys. Rev. Lett. **106**, 040501 (2011)
4. Rong, X. et al.: Quantum discord for investigating quantum correlations without entanglement in solids. Phys. Rev. B **86**, 104425 (2012)

Leonid Rapatskiy

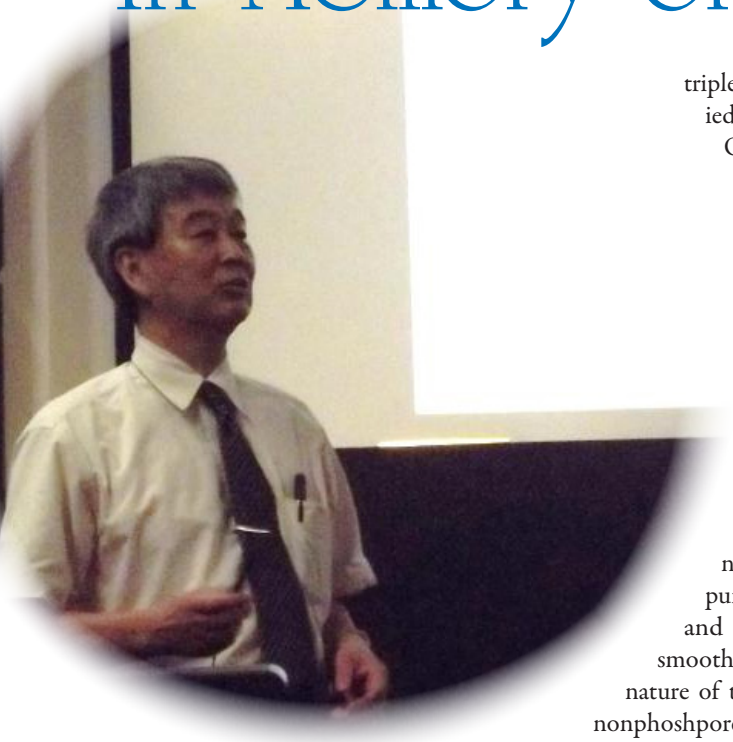
I would like first to thank the organizing committee of APES 2012 for the opportunity to present my work and selecting me for the Young Scientist Award. It's a great honor for me to receive this prestigious prize, especially when handed over to me by my first supervisor, Prof. Sergei A. Dzuba. I am also grateful to Prof. Yong Li and Dr. Hai-Jun Yang for support in organizational issues. I really enjoyed every day of my stay in Beijing, visiting the Great Wall and the Thirteen Tombs of Ming Dynasty. I hope I can learn much more about local culture and traditions during my next visit to China.

After completing my doctoral project, I continued working as a Postdoc researcher in the group of Prof. Wolfgang Lubitz at Max-Planck-Institute for Chemical Energy Conversion, Mülheim an der Ruhr. Since the time I came to Mülheim I was studying mainly the catalytic site of Photosystem II (PSII) – the oxygen evolving complex (OEC) – and related model manganese complexes. These systems are well suited to study by EPR spectroscopy, which I have started to learn during my Bachelors work back in Novosibirsk with Dr. Leonid Kulik. I have to note that experimental study of complicated exchange-coupled systems, such as the OEC of PSII, is very challenging task and it requires to take into account theoretical calculations in order to achieve reliable results. Close collaboration with the group of Prof. Frank Neese from theory department of our institute has made possible the analysis of such a system, combining experimental and theoretical approaches.

The work I presented in Beijing is about investigation of water binding sites in the OEC of PSII, which catalyzes the water-splitting reaction (for details see [1]). Understanding how nature performs this reaction in an efficient way is critical to harnessing its potential as a fuel source. The inorganic core of the OEC – the Mn_4O_5Ca cluster – in which during its catalytic cycle exist as an effective spin state $S_T = 1/2$, well suited to study by EPR spectroscopy. Advanced EPR techniques, including W-band (94 GHz) ELDOR-detected NMR (EDNMR) technique, in combination with isotope labeling ($^{17}O/^{2}H$), have for the first time allowed the definitive assignment of water-exchangeable oxygen atoms that are magnetically coupled to the Mn_4O_5Ca cluster, including an exchangeable μ-oxo bridge. Due to higher sensitivity of the EDNMR technique compared to conventional ENDOR spectroscopies we were able to record the orientation dependence of the ^{17}O signal envelope, providing additional structural information. Briefly, these results suggest that the exchangeable μ-oxo bridge links the outer Mn to the Mn_3O_3Ca open-cuboidal unit, which further refines the reaction pathway of O-O bond formation, supporting an oxo/oxyl coupling mechanism.

1. Leonid Rapatskiy, Nicholas Cox, Anton Savitsky, William M. Ames, Julia Sander, Marc. M. Nowaczyk, Matthias Rögner, Alain Boussac, Frank Neese, Johannes Messinger, and Wolfgang Lubitz: Detection of the water binding sites of the oxygen-evolving complex of photosystem II using W-band ^{17}O ELDOR-detected NMR spectroscopy. Journal of the American Chemical Society (2012). http://pubs.acs.org/doi/abs/10.1021/ja3053267

In Memory of Seigo Yamauchi



Seigo Yamauchi, professor of Tohoku University, my former colleague and a long-time friend died suddenly of subarachnoid hemorrhage on September 26, 2012. In the last May Seigo and I attended Sam Weissman memorial symposium held in St. Louis. He was cheerful and lively at that time. In July, I observed him playing an active role as the chairman of the second international symposium of electron spin science held in Sendai. There was no sign of health problems with him. So his sudden death was really difficult to believe. It was a great shock and a grief to me.

Seigo obtained his Ph.D. at Tohoku University, working on ODMR studies of organic triplet molecules with Prof. Tohru Azumi. He succeeded in obtaining sublevel phosphorescence spectra of an organic triplet for the first time. He then stayed for two years in Dave Pratt's laboratory in Pittsburgh continuing ODMR work. Seigo joined my research group in the fall of 1979 shortly after I started my work in Kyoto. Initially we continued ODMR work on organic triplet states, but in 1981 we started time-resolved EPR(TREPR) with laser excitation together with a senior research student Masahide Terazima. We wanted to study short-lived nonphosphorescent triplet states, because there were many interesting short-lived triplet molecules that could be studied by neither ordinary EPR nor ODMR. However, we met many difficulties in the beginning. Since we had no fund to buy a commercial laser, we started with a home-built nitrogen laser. This laser produced a huge noise, and the reduction of the noise was the first obstacle to overcome. After considerable struggle we succeeded in observing the phenazine triplet signals nearly buried in noises. Fortunately we could obtain a fund to purchase an excimer laser in 1982, and our TREPR work advanced smoothly thereafter. We clarified the nature of the triplet states of a series of nonphoshporescent azaaromatic molecules. Short-lived triplet molecules we studied include distorted excited molecules such as benzyl and conjugated enones. Seigo also started to apply TREPR to metal complexes such as rhodium complexes. It was a happy time for doing TREPR work: there were numerous interesting excited triplet molecules we could study by TREPR.

In addition to the work on excited triplet states, he also studied transient radicals generated by excimer laser excitation of carbonyl molecules and azaaromatics. The radical signals are generated by CIDEP (chemically induced dynamic electron polarization) and we could study many interesting photochemical reactions. There was a regrettable experience too. In 1983 he observed an E/A type signal by irradiating acetone in 2-propanol at low temperature, which is probably the first observation of the radical pair CIDEP signal in solution. However, we could not come up with a suitable explanation and we did not publish the result. Later the Oxford group gave a correct explanation to this signal. So we missed a chance of making an important discovery. Seigo had been chagrined at this for a long time.

After ten productive years in Kyoto, he moved to Tohoku University in 1989 as associate professor in Prof. Iwaizumi's laboratory. This was a very good move, because he could pursue new directions of research. He developed the research on metal complexes taking an advantage of the tradition of Iwaizumi's laboratory. A pulsed EPR spectrometer was already operating there and Seigo could start FT-EPR spectroscopy immediately. Besides Sendai was an excellent place to carry out EPR research, because there were three laboratories working on EPR at Tohoku University and young researchers could improve together through friendly rivalry.

I here summarize his main achievements in Sendai. 1) He analyzed the zero field splittings of Rh and Pt complexes and elucidated the electronic structures. 2) He succeeded in observing EPR spectra of excited triplet states of porphyrin and phthalocyanine complexes in liquid solution. This was a challenge to the commonly accepted view that EPR spectra of excited triplet states cannot be obtained in liquid solution. 3) He initiated the TREPR work on excited multiplet states by combining triplet states and doublet states. In studying these new multiplet states he applied the techniques of advanced EPR such as high frequency EPR and two dimensional nutation method, and established the method to analyze them. 4) He developed new ways of studying excited triplet states by means of W-band EPR.

I have been impressed with his many excellent qualities as a scientist: he took a very positive attitude toward research, he was very persistent and patient, he always liked to challenge new problems. He also had a proper competitive spirit. When he was in my laboratory, he was blessed with physical strength and worked very hard. He was a good teacher to students: he liked to work with students and took good care of them. He trained a number of able young students in Kyoto and Sendai. Moreover, he started summer schools for training graduate students allover in Japan in EPR spectroscopy and photochemistry of metal complexes. He served as principals of these schools.

I should also mention his contributions in promoting international cooperation. He had made numerous collaborative researches with scientists abroad. He was active in organizing

several Sendai-Berlin symposia on advanced EPR and organized the 2nd international symposium on electron spin science as the chairman. Seigo's achievements were highly recognized nationally and internationally. He received the Chemical Society of Japan award for creative research in 2003 and the Society of Electron Spin Science and Technology (SEST) award (2007). He received International EPR/ESR Society Award Silver Medal in Chemistry (2001) and Zavoiski Award (2011). He was elected as the president of the International EPR/ESR Society in 2012.

Though he was to retire from Tohoku University at the end of March 2013, he was very active in research and enthusiastic about future plans. The Japanese EPR community hoped that he would actively engage in promoting electron spin science as the president of the international EPR society. What a pity that all these hopes were suddenly lost. Seigo was a frank and straightforward person, easy to keep company with. He loved sports (especially baseball) and drinking sake (rice wine) with friends and students. Many people liked and relied on him. He will be remembered as a wonderful person as well as a fine scientist.

Noboru Hirota, IES Fellow,
Emeritus Professor,
Kyoto University

It was inconceivable for me to learn that Seigo Yamauchi passed away so suddenly on September 26, 2012 at the age of only 64. Just one month earlier, I had left Sendai after a two month´s research stay in his laboratory. I remember vividly the numerous "tea times" in his office, where we discussed scientific projects as well as other topics related to the 2nd International Symposium on Electron Spin Science which he organized as Chairman in Matsushima in July 2012. It was amazing for me to see how carefully he planned every detail of this meeting which seemed to be a "matter of the heart" for him after the three disasters which stroke the Northeast part of Japan in March 2011.

Seigo and I met for the first time in the house of Haim Levanon in Jerusalem in connection with a Spin Chemistry Conference which Haim had organized. Since then, we have met many times in different countries, including Japan, Germany, England, Russia, Israel, Canada, the Netherlands, the United States, Australia and South Korea. Seigo was a most welcome speaker at various International Conferences in the field of EPR and electron spin science. Time permitting, Seigo accepted these invitations and always presented very clear and highly significant talks.

I had the good fortune to spend three longer research stays in his laboratory in Sendai. Seigo was always a very generous and most sensitive host to me and my wife Sigi. He carefully planned lecture trips for us throughout Japan enabling us to visit friends and colleagues of him in Tokyo, Shizuoka, Kobe, Osaka, Kyoto and Hiroshima. Thanks to Seigo and his colleagues, we were introduced to Japanese life and culture, which was a great experience for us. We shall never forget the Tanabata Festival which we celebrated together in Sendai in August 2012 just six weeks before his sudden death.

In the years 2000–2005, Seigo and his students were regular short-time visitors of Freiburg, performing carefully designed EPR experiments on photo-excited triplet states using our time-resolved Q-band EPR spectrometer. During one of these visits, I learned that Seigo had never been to France before. So, we decided to make a day's tour through the Alsass visiting medieval towns and villages such as Colmar, Kaysersberg and Riquewihr. Since our "number one driver" Sigi was busy in preparing a joint dinner for Haim, Hedva and Seigo in Freiburg, I was driving and Seigo acted as co-driver. I am sure that he enjoyed the trip although the reading and spelling of the various Alsass names must have been very demanding for him.

In Seigo's scientific activities, there are two major subjects: The interactions of light with organic molecules and metal complexes which lead to the formation of transient paramagnetic species and the interactions of the light-induced electron spins with the magnetic field which give rise to electron spin polarization. Using time-resolved multifrequency EPR in combination with pulsed laser excitation, Seigo was able to explore the fundamental processes which control the formation of electron spin polarization in photo-excited triplet states and triplet-radical pairs. More recent, he also became interested in the photochemistry of the short-lived radical intermediates in photoactive proteins. Applying high time and spectral resolution W-band EPR, Seigo and his team were able to obtain novel information on the primary electron transfer steps in plant photosystem II and I.

Seigo Yamauchi was a well-known international scientist of high reputation. He had long standing co-operations with leading groups from different countries all over the world, including Germany, Israel, the United States and Russia. His pioneering work in the field of electron spin science was recognized by the conferment of several national and international awards. In 2011, Seigo was the recipient of the prestigious Zavoisky Award, presented to him in Kazan. Since 2012, he was President of the International EPR(ESR) Society. With Seigo Yamauchi, the scientific community has lost an outstanding international scientist in the field of EPR. In addition, I have lost a dear friend.

Gerd Kothe,
Institute for Physical Chemistry,
Freiburg University

On September 26, Prof. Seigo Yamauchi from Tohoku University died suddenly at the age of 64. He was the President of The International EPR (ESR) Society this year.

Prof. Seigo Yamauchi received his Ph.D. in 1976 from Tohoku University (His advisor was Prof. Tohru Azumi). He became a Research Assistant Professor in Prof. David W. Pratt's laboratory and later moved on to the laboratory of Prof. Noboru Hirota (Kyoto University), where he was a Research Associate from 1979 to 1989; he studied time-resolved ESR during this period. He became an Associate Professor in Tohoku University in 1989, and in 2006, became a Professor there. Prof. Yamauchi received 2001 Silver Medal for Chemistry of IES (International EPR Society). Recently, he won The International Zavoisky Award for 2011 for his contribution to multi-resonance and multi-frequency time-resolved EPR spectroscopy in elucidating the electronic structures of excited states in organic and metallo-organic complexes.

Prof. Seigo Yamauchi was my supervisor when I received my Ph.D. in 1996, and I am deeply saddened by his sudden death.

I believe that Prof. Yamauchi understands what the most important characteristic of a good researcher is. This is obvious from the fact that several of his students have become reputable researchers. For example, Prof. Ohkoshi (from the University of Tokyo), who was the first doctoral course student under the supervision of Prof. Yamauchi in Tohoku University, is one of the most famous researchers on magnetic materials.

Prof. Yamauchi especially encouraged us to pursue original work and perform unique experiments independently. When I was a master's course student, he said to us, "If you get interesting ideas that other researchers in

our lab do not notice, you have the ability to get a Ph.D."

In other words, being a good researcher is not about competing to solve similar problems quickly, but about finding novel research fields, which is the most important aspect. This is what I aimed to achieve, and it inspired me to study the excited multiplet states of porphyrins linked to nitroxide radicals.

This summer, I chaired a domestic conference on the photochemistry of coordination compounds, and I invited Prof. Yamauchi as a special lecturer. Incidentally, this was the last time he gave a special lecture.

For his retirement from Tohoku University, Japanese researchers were planning a party. They were in communication with him until just before he died, and we very much regret his passing.

Now, by trying to think and behave like Prof. Yamauchi, I am trying to bring out hidden talents in my students by increasing opportunities to express unique, original, and independent ideas in their research.

I would to take this opportunity to thank our Prof. Yamauchi one final time.

Kazuyuki Ishii,
Institute for Industrial Science,
The University of Tokyo

When we lose a close friend and good person, we think about his life and about his accomplishments. About Seigo, I have very clear memories. Each meeting with him – at conferences; in the Free University of Berlin, where we both often visited Prof. Klaus Moebius; in Sendai and in Kazan – brought me joy and inspiration. The essence of Seigo made a strong impression on me. And not only on me. Many scientists in Kazan were fortunate to meet Seigo in Kazan on his arrival in Autumn 2011 for the solemn ceremony presenting him the International Prize in honor of Zavoiski for his prominent contribution to the development of EPR. This event had a major public resonance in the Republic of Tatarstan. Thirty six well-known scientists from around the world were nominated for this Prize in 2011. In this intense competition, the international selection committee chose Prof. Seigo Yamauchi. I see his selection as a tribute to his life's work, reflecting the well-earned gratitude and recognition of friends, colleagues and scientific community.

Seigo Yamauchi will forever remain in my memories and in the memories of his many friends and colleagues all over the world. He is a part of the history of world science.

Kev Salikhov,
Kazan Physical-Technical Institute

Cherishing Sego's memory

The early and unexpected passing away of Prof. Seigo Yamauchi brought back to me sad memories, a "déjà vu" of the untimely death of Larry Kevan and Arthur Schweiger. All involved major figures in the field of EPR spectroscopy that were personally very dear to me. The news came as a shocking e-mail out of the blue early in morning. Seigo was a colleague and a friend whom I got to know and appreciate both scientifically and personally in the last decade.

Prof. Seigo Yamauchi was most known for his pioneering outstanding research on photoexcited multiplet species, which are paramagnetic in the ground state. For this he used a variey of state of the art EPR techniques such as time resolved EPR and 2D pulse EPR. These studies gave novel information on the electronic properties in the excited state, which are also important for evaluation of the magnetic properties in the ground state.

Seigo has just been elected as the president of the International EPR (ESR) society), this attests to his high standing and appreciation in the EPR community and his passing away is a great loss. Unfortunately, he had no chance to carry out all he planned as a president for our society.

Our friendship has begun in 2004 when Seigo and Klaus Möbius invited me to join the Sendai-Berlin-Novosibirsk meeting on EPR spectroscopy that took place in Sendai. This was a wonderful meeting, both scientifically and socially. It was the first time that I was exposed EPR activities in Japan (except from reading the literature), to Japanese culture and life style. Seigo's hospitality was outstanding; we were always accompanied by his smile and calmness that hid the hard work and tremendous efforts he put in the meeting organization.

When I heard about the Tsunami hitting north Japan and Sendai I immediately wrote Seigo as I worried about him, his family and his lab. Seigo answered as soon as he had access to the internet – I am sure that he had many other things to worry about – yet he found the time to respond and let us know he was ok. I was relieved to hear that the damages were relatively minor and could be fixed.

I had the chance to meet Prof. Yamauchi again in 2011 in Kazan when he was awarded the prestigious International Zavoisky award for his contributions to the field of EPR spectroscopy. He was the star of the meeting, a rather stressful situation but Seigo remained cool. I am sure he was moved and excited, but it never showed up, he kept his unique sense of humor and his modesty and presented a wonderful lecture. He did not let these events carry him up into grandeur.

Last time I met Seigo was shortly before his death, at the "The Second International Symposium on Electron Spin Resonance" held in Matsushima in July 2012. I was very much impressed by his perseverance to keep going in spite of the terrible Tsunami. Seigo organized a superb meeting with the highest possible scientific level covering a wide range of topics, all reflecting the high standard of his work and Japanese science. In addition, he exposed us, the foreigners, to Japanese culture and made sure that we see some of the remaining damages of the Tsunami. I learnt to admire the Japanese perseverance in general and that of Seigo in particular. Again he managed everything so well with the help of his close colleagues, all with an admirable tranquility. But, it was clear that he was taking too much upon himself. Just a week before he organized an EPR school in Sendai where he took upon himself a heavy teaching and organizational load.

I was fortunate to have known Seigo and I cherish his memory.

Daniella Goldfarb,
Weizmann Institute of Science,
Department of Chemical Physics

Professor Seigo Yamauchi passed away unexpectedly on September 26, 2012. At the time of his death, Professor Yamauchi was the president of the International EPR society and nearing his retirement from teaching and research at the Institute of Multidisciplinary Research for Advanced Materials (IMRAM) at Tohoku University in Sendai, Japan. He made many significant contributions to the study of excited state properties and spin evolution in complex organic and organometallic molecules using multifrequency time-resolved and pulsed EPR. As a testament to his impact in these fields, his outstanding work had been recognized by many awards, including the 2011 International Zavoisky Award.

My first introduction to Professor Yamauchi was through his scientific work. I have been

reading his published papers since I started my graduate research. I greatly admired the careful, thorough, and thoughtful way he approached spin chemistry and electron paramagnetic resonance spectroscopy. His work was not only a reference for my own experiments, but also an example for how to conduct research and present scientific results.

I had the privilege to spend three months this past summer doing research in Professor Yamauchi's laboratory. I could not have had more gracious, compassionate, and thoughtful hosts than Professor Yamauchi and his laboratory during my stay in Sendai this summer. The personal attention he gave to me and my work was valuable; I cannot begin to fully express my gratitude.

Because of his upcoming retirement, I knew that I would be one of the last students to visit his laboratory at Tohoku University. I did not expect to also be one of the last students with the privilege to work with and learn from such a gifted teacher. Professor Yamauchi's had a great enthusiasm and passion for the field of spin chemistry. He spoke with great admiration of his colleagues, with great humility about his own work and accomplishments, and with great affection for his friends and former students. He will be dearly missed.

Lauren Jarocha,
The University of North Carolina
at Chapel Hill

The message of Seigo Yamauchi´s sudden death on September 26, 2012 has been a great shock for us and has left us in deep grief.

Seigo was a great scientist, one of the leading figures in his field in Japan, Asia and worldwide. He and his group produced a large number of very important results advancing both EPR spectroscopy and the understanding of paramagnetic systems, and spin chemistry in general. In November 2011 I participated in the ceremony where he – as the first scientist from Japan – received the prestigious Zavoisky Award in Kazan. I vividly remember how this was celebrated by his friends and colleagues – and also by the international magnetic resonance community. It was only consequent – and an obvious decision – that he was elected president of the International EPR/ESR Society in 2012. This is a very important and influential post – and we were all looking forward to his presidentship in the next 3 years. To our all dismay this has now come to an unexpected end by his sudden death.

Only two months earlier in July 2012 we have met him in good health in Matsushima, Japan where he organized a marvelous international conference on Electron Spin Science. Afterwards he took us to Sendai and hosted us at his home university. This was a wonderful event for me and I can say also for the many other guests from abroad. It has not only been Seigo's excellent science but also his great hospitality and friendship that brought us back so many times to Japan during the last ten years.

In June 2011 we had the pleasure to have him visit our Institute in Mülheim/Germany for the first time on the occasion of a Symposium celebrating Klaus Möbius' 75th birthday. I am very grateful for his significant scientific and personal contributions to this event, in which he also described his long standing relations with Germany and his friendship with Klaus Möbius.

...It is hard to express my deep feelings about Seigo's death – both as a scientist and personal friend of him. I wish his family and friends, and all his Japanese coworkers and colleagues strength and confidence for the future.

Seigo, we will miss you sadly.

Wolfgang Lubitz,
Max Planck Institute for Chemical Energy
Conversion (Previous Name: MPI for
Bioinorganic Chemistry)

It was a deep shock to hear of Seigo's untimely death. He was a scientist of the highest caliber, as is apparent from his published work and from the international recognition he received. His group rapidly attained the status it now enjoys, and he collaborated freely and successfully with many scientists outside of Japan. For someone who accomplished so much he was extraordinarily modest and un-assuming.

But his science is not what I wish to write about here but rather to remember him as a person. He was quite simply a delight, always helpful, always friendly and instinctively generous. He never said a bad word about anyone but rather rejoiced in knowing them. I always looked forward to seeing him at conferences and regarded him as a personal friend. As with everyone who knew him I shall miss him enormously. The EPR community has lost a quite lovely colleague who has enhanced our area of study at the same time as enhancing our personal lives.

Keith McLauchlan,
The University of Oxford

An Unfailing Challenger, Mentor and our Friend: In Commemoration of Late Professor Seigo Yamauchi, IES President Since 2012

Seigo Yamauchi suddenly passed away very early in the morning, 00:15, on September 26, 2012. Seigo had been a very close friend of both of us, Klaus and Takeji, in many aspects. Seigo was a special person to many other friends of his. We think of Seigo and his life as his common friends. His sudden passing away was a tragedy and an immense loss in our community. We could not find the right words for such a tragedy. Seigo just left us too suddenly. It was so painful for me, Takeji, to see his beloved wife saying in tears, "This is a bad dream. I am still dreaming," in front of cold, dead Seigo, when paying my last respects to Seigo.

I met a young and established scientist, Klaus and had a chat for the first time with him at the Banff ISMAR Conference in Canada in 1976, and there I heard about Seigo's excellent work at Tohoku University from a postdoc of Professor D. W. Pratt's lab., University of Pittsburgh. I was so delighted to hear this and at the same time I was curious to hear more about it simply because I had only known Seigo as a JSPS postdoc working at Tohoku University under Professor T. Azumi's supervision at that time.

Later on, Seigo came to the United States and worked with Professor Pratt until he came back to Japan in 1979 to join Professor N. Hirota's group at Kyoto University. Just before Seigo was appointed Assistant Professor there in September 1979, Professor Hirota told me his decision of the appointment and asked my opinion, since I had come back to Japan from University of British Columbia one year earlier. Professor Hirota had precisely appreciated Seigo's talents in terms of science and for being a global academic. Indeed, Seigo became a global scientist. I still remember how I was so excited to know the decision of Professor Hirota.

Seigo and I had shared a particular sympathy and desire to improve our individual lab. situations in our own field of science since we both came back to Japan. When Seigo debuted as academic in Japan, he sat up all night in the lab. at Kyoto University, twice a week, continuously for whole years. Eventually, the first few years found him a pioneer in time-resolved EPR spectroscopy and related chemistry. Seigo opened up photo-excited triplet-state mediated chemistry with Pro-

fessor Hirota and coworkers. As years went by, every time Seigo initiated a new field or research project, his burning desire made a breakthrough in the first stage of the process. Seigo started his career in molecular optical spectroscopy at Tohoku University and then commanded electron magnetic resonance in many aspects at Professor Pratt's and Professor Hirota's labs. Indeed, Seigo was an unfailing talented challenger, but he was a remarkable nonstop hard worker until his life suddenly and unexpectedly stopped.

Seigo always recollected his days in Kyoto University as a young scientist. After he moved to Tohoku University in 1989, Seigo's research trends met with rapidly developing electron magnetic resonance techniques. Seigo had the opportunity to meet Klaus through the mediation of the trends. If one visits the website of his lab., one will find amazingly many valuable contributions from his group. They are a kind of an advanced text book. I had better say that they are like gems of the value of learning advanced molecular paramagnetic spectroscopy, in which photo-excited paramagnetic states and related spin dynamics play central roles. I have recently launched a couple of new collaborative projects with Seigo, and we have made some achievements and publications just before and after Seigo gave way, but we were only at the starting line on the way to our goal. The recent publication in Journal of Physical Chemistry was the very first and last paper that he wrote by his own hand, and in which he wished to explore a new area of excited paramagnetic states in organic/inorganic hybrid complex chemistry.

Seigo was a natural mentor, as his website clearly suggests. Seigo brought up a number of academics and researchers throughout his life. Some of those work at the University of Tokyo as professors. Seigo was the founder Principal of the Summer School of the Society of Electron Spin Science and Spin Technology (SEST) and present Principal in 2012. You will find moving obituaries written by his ex-students, the first one and the last one, in this issue of the EPR Newsletter. Seigo was not only a real mentor, but also he was an unassuming person to help people, as I was told by Professor Keith McLauchlan, University of Oxford, in a story which was forwarded to the Seigo's family after his passing away. I know that Seigo behaved in a very responsible way. Sometimes, his attitude seemed to me as sort of Japanese classic chivalry, which not many people nowadays attempt to keep.

Before I hand over to Klaus, I would like to say again, "Seigo was a man who knew the most about molecular excited states," characterizing salient features of Seigo as an outstanding scientist. And, in order to show how immense Seigo's scientific achievements and his life work are, I would like to add: "When you feel a sudden gust of wind blown through excited-state science, Seigo will be around. Seigo will never be a past scientist, but live as thousands of winds, as long as excited states are kept studied in science." We, Takeji and Klaus, really think so. I believe that life is short but science is long – like art. Seigo's achievements will last with his name in the scientific worlds. Seigo as a thinking reed of science really will leave a name for himself.

With my deepest sympathy to the family, friends and colleagues of Seigo,

Takeji Takui,
Founder President of SEST (the Society of Electron Spin Science and Technology),
President of APES (Asia-Pacific EPR/ESR Society) 2012-2014,
Department of Chemistry and Molecular Materials Science,
Graduate School of Science,
Osaka City University

For those who knew Seigo Yamauchi personally it is still inconceivable: On September 26, 2012, Seigo passed away, suddenly, unexpectedly, at the age of only 64. His colleagues of the international magnetic resonance community grieve for Seigo Yamauchi, they have lost an outstanding scientist and admirable human being.

In all the years in Sendai at the Tohoku University, Seigo Yamauchi was strongly involved in doing research at the forefront of molecular EPR spectroscopy, creating and cultivating international and interdisciplinary research on photo-processes in organic molecules, proteins and their biomimetic model systems. Scientific face-to-face cooperations with physicists, chemists and biologists from around the world were Seigo's key strategy for scientific success, personal delight and satisfaction.

I share the sadness of his family, friends and colleagues when realizing that we can no longer enjoy Seigo's company, his encouragement and understanding of our sorrows. In particular I remember with deep gratitude his enduring support in establishing a firm link of friendship and cooperation between the Sendai and Berlin EPR laboratories of the Tohoku University and Free University. We will keep his memory alive and can only hope that his family and friends will find some comfort in knowing that a large part of the international scientific community will never forget Professor Seigo Yamauchi as an outstanding personality and scientist. He and his Japanese colleagues, for example those from Sendai, Kyoto, Osaka and Shizuoka, have made it clear that the Japanese EPR community belongs to the leading scientific communities in advanced EPR spectroscopy of the world. It was a logic consequence that 2012 Professor Seigo Yamauchi was elected President of the International EPR (ESR) Society. How sad that he could not complete his term.

From the international EPR conferences where Professor Seigo Yamauchi was the scientific and organizational driving force I want to mention only two, the 2nd Sendai-Berlin Joint Seminar on Advanced EPR, October 2004, and the 2nd International Symposium on Electron Spin Science, July 2012:

The 2nd Sendai-Berlin joint seminar was held in Sendai, October 7–9, 2004. The 1st joint seminar took place in Berlin during the same days of October 2002. The idea of such seminars was based on the understanding that EPR spectroscopy is in a "transition state" with respect to the exploration of new areas of applications and of novel developments of advanced EPR instrumentation, in particular in terms of pulse techniques and high-field extensions. Explorations of such transition states require intensive discussions among experts in the field and scientists from various disciplines who are interested in potential applications. And, indeed, numerous sustaining scientific and personal contacts between Japanese and German scientists have been created or promoted as a result of such dedicated joint seminars – also to the benefit of the many young scientists from Japan and Germany who were encouraged to participate – and who will probably be responsible for the future of EPR spectroscopy in their respective countries. In the final discussion there was a consensus of opinion that the traditional format of the joint Sendai-Berlin EPR seminars should be continued, but should be extended next time to a triangular Sendai-Berlin-Novosibirsk Joint Seminar. Indeed, in August 28–31, 2006, this triangular EPR meeting was realized under the chairmanship of Dr. Sergei Dzuba from Novosibirsk, Russia.

The 2nd International Symposium on Electron Spin Science was held in Matsushima, July 23–25, 2012, and Professor Seigo Yamauchi was the Chairman. He was particularly eager and involved in realizing this international meeting – one year after the horrendous earthquake

and tsunami with subsequent explosion of the Fukushima nuclear power plant. In a letter to me he expressed his deep wish that – in spite of the continuing sadness about the victims of these catastrophes and in spite of the fact that forever one has to remember this disaster – many people in Japan including him, his family and many of his friends look forward to new horizons after the catastrophes and try to make their way to a positive future. And the 2012 Matsushima meeting was just a visible symbol of this optimistic thinking. How sad that Seigo's positive look into the future did not prevent his own tragedy of having to pass away so early!

The days in Matsushima at the Symposium will remain unforgettable for me and all the other foreign participants and guests owing to the fantastic hospitality and generosity of Seigo Yamauchi and his Japanese co-organizers and colleagues. The excellent scientific program was so nicely complemented by carefully chosen social events, just to mention the boat trip in the magnificent Matsushima bay. Seigo Yamauchi seemed to be much relaxed during the boat trip, he was smiling at us who were overwhelmed by the beautiful landscape – which looked like a traditional Japanese woodcut.

When we had our last e-mail exchange on September 18, 2012, Seigo complained of heavy headaches but, typical for his modesty, he continued: " My case is not so serious but we have to take care of these things by ourselves. ...This is a good alarm for our future life. We have to slow down our speed a bit although this year is the last academic year for me." A week later I was informed that Seigo was transported to a hospital for a serious illness and that at present there is very little hope for his recovery. And next day the feared sad news arrived that Professor Seigo Yamauchi has past away this morning, September 26. What a shock! And he had so many plans to carry into effect! What a cruel fate!

I have met in my life rarely any other person who was so knowledgeable in science and beyond and – at the same time – was so modest in his interactions with colleagues. He was prudent in his judgement – both on scientific issues and human behavior – and simultaneously perceptive in trying to understand the background of arising problems. He was scientifically and politically open to unconventional ideas and strategies – as long as he could approve the intentions behind them. He had a firm assessment of what he considers right or wrong, but he never was dogmatic in imposing his assessment on others – as long as they had good arguments for their views. He belonged to the rare species of persons who first listen to the arguments and watch their proponents to defend them before agreeing or disagreeing with them. Moreover, his perception, his acting and his feeling seemed to be consistent with each other – another rare example of a real human being.

Seigo Yamauchi was always a real gentleman, and one of the nicest and most stimulating gentlemen I ever met. He will be greatly missed by his family and friends and by the magnetic resonance community as a whole. We have lost a stimulating colleague. With his family and friends we share the mourning for Seigo Yamauchi.

Klaus Möbius,
Vice President for Europe
of International EPR (ESR) Society,
Department of Physics,
Free University Berlin

山内清語

Professor Seigo Yamauchi, Professor of Physical Chemistry at Tohoku University, has died. We remember one of the greats of Electron Spin Science.

Seigo Yamauchi was born in the Fukushima Prefecture in Japan. In 1976, he obtained his PhD from Tohoku University where he had studied under the supervision of Professor Azumi on a thesis entitled: "Study on Intra and Intermolecular relaxation process focusing on the triplet spin sublevels".

He took up his first postdoctoral position in Prof. David W. Pratt's group (University of Pittsburgh), before he was elected to assistant professorships at Kyoto University (with Prof. Noboru Hirota) and later Tohoku University (with Prof. Masamoto Iwaizumi) before his promotion to a full professorship at the same institution.

Seigo was one of the pioneers of time-resolved EPR both in Japan and world-wide: during his time in Kyoto he home-built his first time-resolved, laser flash photolysis EPR spectrometers exploring triplet states and photo-induced chemical reactions. Shortly after his move to Tohoku University he started to design and apply time-resolved and pulsed EPR to the study of composite molecular systems. His much admired and greatly respected work on photo-induced multiplet states of Radical-Triplet composite systems by high field EPR is one of the prime examples of Seigo's originality and scientific vigor with which he approached all problems. The investigation of photogenerated states was Seigo's true passion and although in our community he is naturally best known and greatly respected for his contributions to EPR/Spin chemistry, Seigo was a scientist who explored many avenues to study these systems, with his work on Raman spectroscopy of the photogenerated states of photoreceptor proteins just serving as one such example.

Seigo's pioneering contributions have been honored across the world and the number of awards is seemingly endless with just a few named here: the International EPR/ESR Society Award: Silver Medal in Chemistry 2001, The Chemical Society of Japan Award for Creative Work 2003, The Society of Electron Spin Science and Technology (SEST) Award 2007, The Japanese Photochemistry Association (JPA) Lectureship Award 2010 and finally The Zavoisky Award only last year.

Seigo's energy and talent to organize conferences, meetings and summer schools seem unparalleled and his support for the young generation is maybe reflected best in the fact that he organized the SEST (Society of Electron Spin Science and Technology) summer school for the last 10 years running.

Seigo was a very keen and very active sports man (baseball and badminton were his favorites) and loved to socialize with his colleagues and friends. Just this summer at the 2nd ISESS which – as always – he had organized to perfection, we saw Seigo run up the stairs in between yet another great scientific session and the evening's social event at considerable speed but with a spring in his step and a smile on his face. This picture will stay with us for a long time as it reflects in so many ways the Seigo we knew.

His premature death has robbed our area of science of one of its greatest proponents.

We would like to offer our deepest condolences to Seigo's wife and his three sons.

On behalf of Seigo's ESR colleagues and friends in the UK

The RSC ESR Group:
Mark Newton, Chairperson,
Department of Physics,
The University of Warwick;
Christiane Timmel,
Department of Chemistry,
The University of Oxford;
Eric McInnes, Secretary,
School of Chemistry,
The University of Manchester;
Kiminori Maeda,
Department of Chemistry,
The University of Oxford

Se Connaitre, S'Entendre, S'Entraider

On September 26th 2012, Professor Seigo Yamauchi, President of the International EPR(ESR) Society (IES) passed away at an age of 64 years. Seigo was one the most distinguished scientists in the field of EPR, with major contributions to pulsed multi-frequency EPR spectroscopy and its application to electronically excited states of organic and metallo-organic systems. His research earned him, among other awards, the Silver Medal in Chemistry of the IES in 2001, the Chemical Society of Japan Award for Creative Work 2003, and the International Zavoisky Award 2011. He served as a Japan representative to the Asia-Pacific EPR/ESR Society (APES) and became council member of APES in 2004. Seigo maintained an active, lively, and yet modest personality throughout his life and was much liked by his colleagues and students. We feel saddened and grieved by his unexpected passing away at an early age and the loss for the magnetic resonance community. On behalf of Groupement AMPERE, we wish to express our condolences to the IES.

Bernhard Blümich,
President of Groupement AMPERE;
Gunnar Jeschke,
Secretary General of Groupement AMPERE

Prof. Yamauchi was a well known expert in EPR of triplet molecules. His papers on excited triplet states became classics for EPR scientists involved in such type of studies. Prof. Seigo Yamauchi was very kind to people and helped colleagues a lot in daily life. Due to his warm and responsive character, Seigo had very wide scientific cooperation and a lot of friends all over the world. The list of his collaborators includes more than 10 different countries – Germany, Russia, Israel, Italy, Spain, Canada, etc. There was no surprise when Seigo was elected as a President of International EPR Society.

Seigo Yamauchi visited Novosibirsk and Moscow several times and had a long cooperation with Russian scientists. Prof. Valery Tarasov from Moscow Institute of Chemical Physics, Prof. Yuri Grishin, Prof. Sergei Dzuba and I were among visitors of his laboratory. A series of papers in cooperation with Valery Tarasov and my group were published during last years. From my own experience I know what a great pleasure was to visit Seigo's laboratory

in Sendai. During two months of my short term visit we performed series of experiments on W-band TR EPR of molecular magnets, as well as the TR EPR study of triplet molecules in cyclodextrines. Papers summarizing these results were published in 2012 in JACS and in special issue of *Applied Magnetic Resonance*. It was great to discuss scientific problems with Seigo, since he always revealed very wide and deep knowledge of spin chemistry and EPR of many different photochemical systems. Prof. Seigo Yamauchi was awarded the Voevodsky Prize for his outstanding contribution in EPR, which was presented during the conference "Spin Chemistry and Spin Physics" in Kazan in October 2011. We were very glad for an opportunity to congratulate him with this prestigious award.

Prof. Seigo Yamauchi was a very hard worker. He was very skilled in experimental physics, as well as in understanding physical chemistry. He also was an excellent organizer – the last ISESS-2012 was perfectly organized, both from the point of selecting bright scientific highlights for presentation at the conference, and also due to social events allowing participants to come along, discuss scientific problems and start cooperation.

It is very sad that we have lost such a good scientist and nice person as Seigo Yamauchi. All Russian EPR scientists express deep condolences to his family and all his friends and colleagues. We will miss Seigo very much and will always remember him with affection.

Elena Bagryanskaya,
President of Russian EPR Society,
Novosibirsk Institute of Organic Chemistry
and Laboratory of Magnetic Resonance,
International Tomography Center

Spin Chemistry Community will miss Seigo greatly

On behalf of the International Spin Chemistry Committee, we write to say how sad we were to hear the shocking news of Seigo Yamauchi's sudden and untimely death. He was a brilliant scientist with a lovely sense of humour. We have known him for many years, mostly through our interactions at Spin Chemistry and EPR conferences and we always looked forward to his unfailingly stimulating and enjoyable lectures which combined clever experiments with meticulous interpretation.

The Spin Chemistry community will miss him greatly – he was one of our leading lights. Our next conference, to be held in Austria in April 2013, will not be the same without his cheerful and inspiring presence. We are delighted that Professor Takui has accepted our invitation to present a memorial lecture honouring Seigo's life and work. It will give us all the opportunity to say a collective thank you and goodbye to an admired and respected friend, colleague and collaborator.

Stefan Weber,
Institut für Physikalische Chemie,
Albert-Ludwigs-Universität Freiburg;
Peter Hore,
Department of Chemistry,
The University of Oxford

Dr. Seigo Yamauchi, an excellent leader in the field of EPR spectroscopy

It was a great shock to hear of the sudden and unexpected passing of Dr. Seigo Yamauchi on September 26th, 2012, six months before he was due to retire from Tohoku University.

Dr. Yamauchi was prominent in the fields of photochemistry and spin chemistry as widely acknowledged. He also won many international and domestic honors for his outstanding scientific contribution. He was a member of a board of trustees of SEST (the Society of Electron Spin Science and Technology) for a considerable period, and contributed to many activities of SEST such as Annual meetings and International Symposia. With great enthusiasm he worked to educate young scientists by running an Annual Summer School on Spin Chemistry for students.

I respect him for being a great scientist and a man of character as his long-time old friend and also as a president of SEST.

I pray for his peace in heaven. We all will deeply miss him.

Hisao Murai,
President of the Society of Electron Spin
Science and Technology (SEST),
Department of Chemistry, Faculty of Science,
Shizuoka University

Seigo's sudden death hit hearts of all people who knew him and collaborated with him. He was a brilliant scientist. He contributed a lot in the field of EPR and its applications in spin chemistry, new materials in molecular sciences, photoexcited complexes, biological model systems. His role was very important in developing these scientific directions in Japan, and he influenced very positively also on EPR development in the whole world. He was highly respected in international EPR community. He was a very active member of the Asia-Pacific EPR/ESR Society, in which he was a country representative from Japan for many years. He received many prestigious national and international awards. For many people who knew him he was not only a good scientist but also a good friend. He travelled a lot throughout the world attending different scientific conferences, and it was a great pleasure to meet him. He was a very sympathetic person with whom it was very interesting to discuss not only scientific problems but also general problems of the human society.

His death is a great loss for his friends.

I express my heartfelt condolences to Seigo's family and all our colleagues.

Sergei Dzuba,
Immediate Past President of APES,
Institute of Chemical Kinetics and
Combustion, Novosibisrk

All about Seigo: His science and marks

Seigo Yamauchi, Professor of Tohoku University in Sendai and IES president, passed away on September 26th at the age of 64. Before he was admitted to a hospital, he had been living a very busy but healthy life as usual. It was a sudden and too early passing, losing his hopes and plans for the future and leaving his beloved wife Sachiko and three sons, unmarried. His enthusiastic appearance as a symposium chairman in the International Symposium on Electron Spin Science 2012 in Matushima on July 23–25 is still fresh in my memory. Also it was only a half year ago when we read his article, letter of the president, in the *EPR newsletter*, volume 21 number 4, 2012, presenting his ambition for the development of IES. His sadden passing was a great shock to us.

Prof. Seigo Yamauchi was born in 1948. He graduated from Chemistry Department, Faculty of Science, Tohoku University in 1971 and completed the graduate course, receiving Doctor degree in 1976. His research activity in this period was made under guidance of Prof. Tohoru Azumi and his thesis was on researches for triplet sublevel properties of aromatic molecules by zero-field ODMR studies. From 1977 to 1979 he worked at the University of Pittsburgh as a post-doctoral fellow in Prof. David W. Pratt laboratory. In 1979 he returned to Japan to join the Prof. Noboru Hirota's laboratory in Kyoto University as a research associate. He made many exciting ▶

findings on spin and molecular dynamics in photochemical reactions of organic molecules by the time-resolved EPR spectroscopy.

In 1989 Dr. Yamauchi moved to Tohoku University and joined my laboratory as an associate professor. In 1996 he became Professor after my retirement from the university and succeeded the laboratory. His researches in Tohoku University initiated from those on dynamics of photo-excited triplet states and photo-chemical reactions of metal coordination compounds using the cw-time-resolved and pulsed EPR spectroscopies. He had developed his researches to several subjects. One of the topics achieved was success of EPR observation of excited triplet states of some porphyrins and their metal complexes in fluid solutions, though EPR observation for excited triplet states in fluid solutions had been usually impossible. His success of the observation and analyses of temperature dependent spectra for the fluid solutions led to new findings characteristic of fluid solutions, including distinctive excited state behavior, inter-state dynamics and so on. He further developed his studies to new type excited state molecules with various spin multiplet states, from doublet to sextet, which are produced by adding various radical molecules to photoexcited triplet state molecules. He discovered their various distinctive characteristics of photo-absorption/emission, their lifetimes, as well as their magnetic properties, and clarified their mechanisms. All of his researches were still in progress.

In his research, Prof. Yamauchi employed various spectroscopic methods such as time-resolved EPR, time-resolved ENDOR, X-band FT-EPR, low field frequency scan EPR, and high frequency (W- and K-band) pulsed EPR. His use of time-resolved ENDOR for the studies of photo-excited triplet states was the first successful ENDOR observation for photo-excited molecules. He also developed various analytical methods, including pulse two-dimensional nutation methods which were useful for determination of spin multiplicity and separation of the spectra. The methods are now widely employed for analyses of spectra.

For his remarkable research activities, Prof. Yamauchi was awarded several prizes including the IES silver medal for Chemistry (2001), the Chemical Society of Japan Award for Creative Work (2003), the Society of Electron Spin Science and Technology (SEST) Award (2007), the Japanese Photochemistry Association Lectuership Award (2010), and the Zavoisky Award (2011).

For many of us, Prof. Yamauchi's passion to educate the youth is forgettable. He founded an ESR summer school in 2003 and the photochemistry of coordination compounds summer school in 2005. Since then he organized both schools every summer as a school director. Prof. Yamauchi was also eager for promote international relationship. He organized international seminars, including the Sendai Symposium on Advanced EPR (1995–2004), Sendai-Berlin Seminar (Berlin, Sendai, 2001, 2004) and Sendai-Berlin-Novosibirsk Seminar on Advanced EPR (Novosibirsk, 2006). Those seminars in Sendai were held by the participation of mainly members of the sendai EPR groups and invited participants from abroad. Those seminars were not so big, but really substantial and also stimulative especially for young participants such as students. The 2nd International Symposium on Electron Spin Science which was held at Matushima near Sendai, on July of 2012 has become the last international event he organized as a chairperson.

Prof. Yamauchi was involved in other academic activities. He served on the Advisory Board (1998–2001) and Editorial Board (2002–2012) of Appl. Magn. Reson., NMR and ESR section editor of Bull. Chem. Soc. Jpn (2005–2006), and Asia-Pacific ESR/EPR Society Japan representative committee (2006–2008). In 2012 Prof. Yamauchi was appointed to the IES as President and his activity as the president just started from the beginning of 2012. His too early passing is extremely unfortunate.

Prof. Yamauchi was very friendly and faithful to many persons. He loved to play various sports and was really a nice man. When he was in my laboratory he supported my researches and other jobs from the heart.

Finally I close this memorial by noting that we held a memorial meeting on December 11th at the Sendai City International Hall, where Prof. Yamauchi organized SEST 2011 symposium one year ago. More than 270 people gathered to morn his passing. He'll be truly missed. Rest in peace, dear Seigo Yamauchi. We also send sincere condolences to his family.

Masamoto Iwaizumi,
Emeritus Professor,
Tohoku University

A Great Scientist and Genuinely Nice Person

I was so very sorry to hear that Seigo had passed away suddenly, especially after seeing him in such good spirits and vigor during the ISESS meeting in Matsushima only two months earlier. He will be remembered not only as a great scientist, but as a genuinely nice person. It is a tragedy that he will not be with us able to inspire all of us with his important insights. Over the years, we had many fruitful discussions and a great deal of fun at banquets and other social events. I will miss him immensely.

I extend my heartfelt condolences to his family.

Michael R. Wasielewski,
Argonne-Northwestern Solar
Energy Research (ANSER) Center,
Department of Chemistry,
Northwestern University, Evanston

Seigo Yamauchi, 1948–2012: An Appreciation of the Science and the Man

Professor Seigo Yamauchi began his scientific career under the tutelage of Professor Tohru Azumi, who is recognized by both the physics and chemistry communities as one of founders of modern spectroscopy of electronically excited molecular states. In their first collaborative scientific paper, on non-vertical energy stransfer in stilbene [1], the authors stated their attempt to "present a new interpretation which clearly accounts for the drop of activation ratio by an easily understandable and clear-cut mechanism." This phrase "easily understandable and clear-cut mechanism," representing the desire to provide an extreme clarity of scientific thought, became a remarkably common feature in Seigo's future scientific research papers. Every investigation undertaken by Seigo was necessarily well motivated. It is a rare gift indeed to constantly pursue such exhaustive comprehension of scientific effort, and Seigo was fortunate to possess this gift in full measure. This is why the statement "done for the first time" was a particular feature of his papers, and an imprint of Seigo's scientific accomplishments.

Seigo's criterion for a "clear-cut mechanism" was definitely not a reduction to simplifications that might borderline the mundane. Rather, he strove for deep insight into the particular phenomenon of interest. Some examples include his brilliant analysis, in a series of papers published with Professors Hirota and Terazima, concerning the TREPR spectroscopy of weakly phosphorescent molecular excited states (mixed ^{3}n-π^*, $^3\pi$-π^* in azaaromatics and carbonyls [2, 3]. Along with Professors Hans van Willigen and Klaus-Peter Dinse, Seigo pioneered the use of pulsed EPR to ▶

study photochemically generated transient radical species. The 2D–FTEPR technique was utilized by Seigo in a quantitative study of spin correlated radical pairs for the first time [4–6].

Over the past two decades, several scientific teams lead by Möbius, Lubitz, and Corvaja in Europe, Wasielewski and Forbes in the U.S., Salikhov and Kandrashkin in Russia, van der Est in Canada, and Yamauchi, Kobori, Teki, and Kobayashi in Japan, have been deeply involved in the study of multi-spin systems, often comprised of electronically excited molecular triplet states and stable ground state nitroxide radical doublet spin states. It is fair to say that the acknowledged leader of this exemplary group of scholars was Seigo Yamauchi. Indeed, the first experimental observations of excited doublet and quintet spin states were performed Seigo's laboratory [7, 8]. A bit later, a series of papers followed Seigo's experimental findings, providing a deep theoretical analysis of spin-selective processes in multi-spin systems [9–12]. Not surprisingly, Seigo was highly honored for the scientific merit of this work (applying TREPR to multi-spin systems), culminating in his receipt of the prestigious Zavoisky Prize in 2011. With this much deserved international recognition, Seigo became a frequently invited guest in laboratories and to conferences all over the world.

Seigo deeply and sincerely loved Japan and its people, culture and history. He appreciated Japanese nature and his country's technical achievements, and he had a vast knowledge of Japanese cuisine and traditions. And all these interests provided him with an incredibly delicate reverence for other people's feelings and cultures. He was an amazingly hospitable host and a keen guest. Collaboration with him was a real delight, an experience no one would ever want to interrupt.

One of us (MDEF) was fortunate to have Seigo visit his laboratory in May 2012 and stay at his home. During this visit Seigo gave an outstanding lecture on high-frequency TREPR of photoexcited triplet states to an enthusiastic group of UNC graduate students and postdocs. His excellent teaching skills were on full display during this lecture, and we were spellbound for a full 90 minutes. Later in the visit, Seigo was equally entertaining and educational while interacting with my children – the special "mystery lock box" he gave them provided hours of bewilderment and fun, in a typical cryptic Japanese style. It was here during several meals and nights by the fire in my living room that we learned up close how warm and generous Seigo could be, with his patience and good humor.

One of Seigo's last papers [12] was my (MDEF's) first with him, and one of VFT's last. It represents a "full circle" of collaboration that began with VFT many years ago and incorporates a sophisticated synthesis, a delicate set of experiments at X- and W-band, rigorous theory, and above all, "the easily understandable and clear-cut mechanism" we would strive for on Seigo's behalf. We are proud to be co-authors on this paper and very fortunate to have had the opportunity to work with Seigo on such an interesting problem.

Within the sadness of Seigo's too-early departure is one silver lining: the knowledge that his legacy, as a scientist and as a human being, perpetuates through his wonderful family, his outstanding publications and well-trained students, and the memories carried by those whose lives he touched so positively, even for a short time.

Malcolm D. E. Forbes,
Chapel Hill, North Carolina;
Valery F. Tarasov,
Moscow

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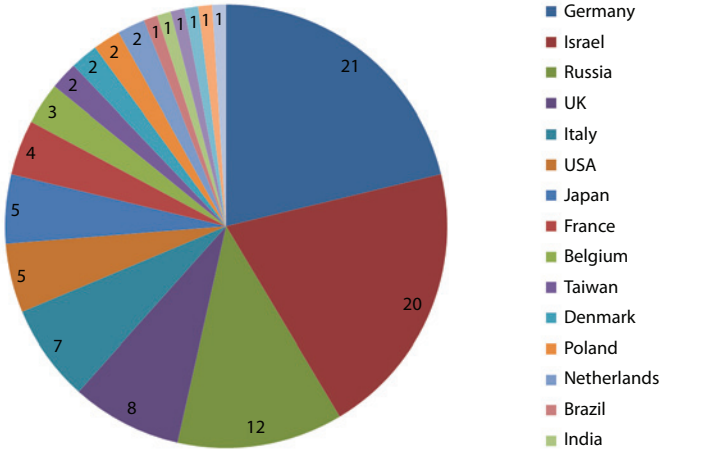
The 6th EFEPR school on advanced EPR spectroscopy
Weizmann Institute of Science, Rehovot, Israel, January 12–18, 2013

The 6th EFEPR (European Federation of EPR groups) school on advanced EPR spectroscopy took place during a warm sunny week last January at the Weizmann Institute of Science, Rehovot Israel. The school was extremely well attended. There were 120 participants, among which 21 lecturers and 82 graduate students, postdocs and researchers from all over the world, including USA, Japan, Taiwan and India (see the Chart for details). The program was very extensive, starting every morning at 8:30 am, and formally ending at 9:00 pm, followed by fun social activities. Yes, 8:30 am is early in the morning – but all school participants were there with a cup of coffee ready to absorb Magnetic Resonance and EPR – theory and experiments. This was particularly pleasing.

The school started with the very basics of magnetic resonance like the spin Hamiltonain and the density matrix formalism and ended with the newest advances in closely related fields like optical and electric detection of EPR and nuclear dynamic polarization (DNP). Although the school was dedicated to EPR, it also meant to stress that EPR is part of the broader field of magnetic resonance and not a standalone field. This was taken into account in choosing the program and lecturers, trying to convey its broad scope. Not all teachers were practicing EPR spectrscopists. Here is a brief summary of the lecturers and the topics they presented. Z. Luz: Early days of magnetic resonance in Israel; G. Denninger: Bloch equations, rotating frame, FID; S. Vega: Density matrix formalism and the spin Hamiltonian; M. Brustolon: Relaxation theory; P. Carl: EPR instrumentation; L. Frydman: With a little help from my friends ... dynamic nuclear polarization; S. Ruthstein: Lineshape analysis



The geographical distribution of the registered school participants (excluding teachers)

of nitroxide spin labels; S. Stoll: Introduction to pulse EPR and ESEEM; K. Möbious: CW ENDOR methods; D. Goldfarb: Pulse ENDOR methods; S. Stoll: Introduction to EasySpin; S. Van Doorslaer: ESEEM/HYSCORE spectroscopy; G. Jeschke: DEER/PELDOR; V. Krhamtsov: In-vivo EPR; R. Bittl: High spin systems and metalloenzymes; F. Neese: Quantum chemical calculations of EPR parameters; C. Timmel: Spin-correlated radical pairs; G. Smith: High field EPR; A. Blank: EPR imaging and EPR sensitivity; E. Lifshitz: ODMR; K. Lips : Electrical detection of EPR. For more information look at http://mr-lab.technion.ac.il/epr_school/grants.html.

In addition to the frontal lectures, there were lab demos and tutorials, led by the lecturers, for small groups of participants where it was possible to digest the material presented in the lectures and do exercises. The lecturers did an outstanding job, presented wonderful lectures, at times also accompanied by experimental demonstrations. Many of them stayed throughout the full week of the school and interacted closely with the students. The engagement and degree of interest of the students was very impressive and heartwarming. From the very beginning of the school they asked questions that enlightened the school. Two of the students, Thomas Nick (MPI, Gottingen) and Alex Taguchi (U. of Illinois), who stood out with their curiosity were awarded prizes for their active participation. We also had a very lively poster session with about 60 excellent posters and very enthusiastic presenters covering all areas of EPR spectroscopy. It was a pleasure watching all the young scientists at the poster engaged in energetic discussions. Poster prizes, a contribution the PCCP journal, were awarded to Mizue Asada (Nagoya University) and Andrin Doll (ETH).

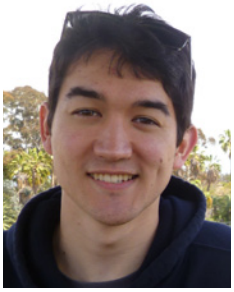
In addition to scientific program there was also time for social activities that included a mixer at the beginning of the school, a couple of late evenings with some getting together and beers, and a trip to Jerusalem followed by the conference dinner, also in Jerusalem. This helped forming personal contacts, friendships that hopefully will develop in the future to scientific collaborations.

I think that the school was successful, at least it fulfilled my high expectations. All this was made possible by the very kind financial support we got from many sources. The Weizmann Institute of Science has supported the school most generously along with COST (European network for hyperpolarization physics methodology in NMR and MRI), EFEPR, Bruker Biospin, ISMAR (Internation Society for Magnetic Resonance), Bar-Ilan University, Technion (Israel Institute of Technology), Jeol, Lumitron and Tzamal. All these sponsors allowed us to give many students grants that made it possible for them to attend the school. This support is highly appreciated by the organizers and the whole EPR community.

I will end with some personal words – organizing this school required quite some efforts but it was also a great privilege. It allowed me to meet a wonderful cohort of young scientist from all over the world, all eager to learn, discuss and question, with open hearts to make friends and enjoy. I think that the field of EPR has a good future with all these young scientists joining in. I now look forward for the next school.

Daniella Goldfarb

Impressions from the 6th EF-EPR School in Rehovot



By the time I embarked on my trip to the EFEPR School at the Weizmann Institute in Israel, I had read five books devoted to EPR theory and had two years of experience running CW and pulse EPR under my belt. I was simulating HYSCORE data and was in the process of designing scripts to extract the necessary parameters from my experimental data automatically. I recall myself sitting in the airport wondering whether or not the EFEPR School really had much to offer me, and if traveling to the other side of the world was a good use of my time.

My experience at the Weizmann Institute was very humbling, to say the least. Starting from day one was a rigorous treatment of EPR theory from the ground up. In this lecture, all of the holes and misconceptions in my EPR knowledge were made obvious and thrown out the window, and replaced with a structured framework of how EPR works. The homemade demos on driven resonance phenomena were a great touch that aided in my understanding of the material and really made that first lecture enjoyable. With the groundwork set, we moved on to the spin density matrix formalism and relationship with the spin Hamiltonian. This was another well-constructed lecture that made very clear an otherwise very complicated subject. After more fabulous lectures on relaxation theory, EPR instrumentation, and DNP (Dynamic Nuclear Polarization) with enough information to fill up an entire semester-long class, we were served a fantastic dinner and treated to a couple beers with the speakers. There ended day one.

The pace never slowed down that week as the EPR world experts worked us through techniques like ENDOR, ESEEM, PELDOR, EasySpin, and quantum chemical calculations of EPR parameters, to name a few. Of special interest to me were the tutorial sessions meant to expand upon what was learned in lectures. For example, I attended the EasySpin tutorial led by Stefan Stoll (creator of EasySpin). To learn EasySpin side-by-side with its creator was one of the many rare and fruitful opportunities the EFEPR School provided. I also got to meet Gunnar Jeschke, coauthor of my favorite EPR book, Principles of Pulse Electron Paramagnetic Resonance.

Social interaction at events such as these is in many ways just as important as the lectures. Making friends and having scientific discourse with your peers can generate ideas and potentially even future collaborations. The EFEPR organizers did a great job of providing for these opportunities. In the middle of the week, we participated in a half-day guided tour of Jerusalem. It was a great cultural addition to the trip, and allowed me to talk with the other students in a more casual setting. The poster session was another great medium to generate meaningful scientific discussion. Everyone's work there was EPR-related, making every conversation an intriguing and beneficial one.

I highly recommend the EFEPR School for both beginners and veterans to EPR. It is a rare opportunity in which many EPR world experts are gathered in the same hall, at your disposal for questions and intellectual conversation. Equally important is the opportunity to meet and talk to motivated young scientists in the field, who may one day make a significant impact in EPR.

Alex Taguchi

This summer-like school in Rehovot was special in many ways. Students from all over the world, from the US to Japan, attended and contributed. After arriving on the worst day for travelling, the Shabbat, we found a nice accommodation and were first introduced to the great variety of Israeli cuisine. The host and her team were well prepared and toggled a lot of small and large problems throughout the week. Thanks a lot, Daniella Goldfarb.

The first lecture immediately created a nice atmosphere. Although MRI combined with DNP is quite far from my field it opened up a new horizon and led to new expectations for the week.

On Sunday, the school started at 8:30, so we had not much time to recover from our flights. The audience stayed a bit shy during the first lectures. After lunch break, this initial state was overcome and the week could start with talks and questions about all possible subjects of EPR. During the week, everyone found his or her favored lecture depending on his own background and interests. Stefan Stoll was a wonderful teacher. He even presented common pitfalls, which he had encountered, talking to other students before. As well, Shimon Vega did a great job showing the applicability of Wigner matrix elements.

The understanding of new topics is always fostered by discussions with other students. Communication between participants got livelier especially after the first free evening, when the large majority of participants went to Tel Aviv. After some detours, we ended up in restaurants in the old harbor area. This was possible thanks to Helen from Haifa, who somehow became our Israeli guide. The next day, the people knew each other and the posters were already up, so some used the breaks to ask their colleagues, "What are you actually doing?" Otherwise, the discussion started during the short poster session. Personally, I was interested in posters, showing solutions to sensitivity problems like the arbitrary wave form generators and their broadband excitation.

Compact and interesting tutorials were given by experts in their field or even by developers of generally accepted programs like EasySpin and DEER Analysis. Theoretical concepts, which were discussed before in the lectures, could now be tested, for instance stochastic Liouvillen Eq. and Redfield theory. The ORCA tutorial gave a first insight into setting up a DFT job and the mechanism of spin polarization could be visualized in comparison of two simple compounds. In both hyperfine spectroscopy tutorials, I also got new ideas on how to detect low gamma nuclei, which will be of interest within my PhD project.

With our trip to Jerusalem, we gained some impressions on the Holy Land and had time to get to know more people, while driving on the bus. After a tour covering the most interesting sights, the evening was concluded with one glass of wine and a delightful kosher dinner.

The last evening we wanted to relax together but due to the large number of people knowing each other, it was somehow difficult to find a place.

At the end of the conference, the topics got broader distributed from spin correlated radical pairs to EPR imaging. Noteworthy was the talk from Klaus Lips, which was comprehensible for a wide audience explaining EDMR on solar cells. Additionally, he recorded all speakers and remarkably, these speakers are interested to become even better teachers with the help of these videos. Actually, everyone greatly appreciated that most of them stayed the whole week there and seeked discussions with the students.

Frankly, I don't like to be encouraged by professors to network. So I put it like this we met some colleagues and I would even dare to say, friends there.

In conclusion, the school was absolutely worth the visit for everyone, from half a year experience in the field up to two years. In the end, a lot of topics have to be reviewed theoretically and practically to gain a deeper understanding of what has been shown.

Thomas Nick

When leaving for the EPR school in Israel, I had a number of prospects. In fact, I already attended the last EPR School in Konstanz. At that time, however, I was a master student without much of a background on EPR in particular. Back then, the school allowed me to get a sight behind the curtain and sort out all those hieroglyphs (ESEEM, ENDOR, PELDOR, ...). I may add here that Konstanz was definitively worth the visit. A lot from there still remains until today, even though I found myself saturated quite often during the lectures. For Rehovot, I therefore hoped to reach saturation less frequent and at a later time during each lecture.

At first, I was a bit worried that the summer school was taking place during wintertime. I actually figured out myself when I arrived few days before the school in Israel that it can get cold, stormy, rainy and even snowy: Snow accumulated up to 10 cm on the roofs of Jerusalem. But just in time with the beginning of the school, it started to warm up. From a central European perspective, it felt almost like a real summer school. And just right now back home, I can still recognize some remaining tan that I picked up on Tel Aviv's beaches after the school.

When I arrived in Rehovot for the school, I was likewise surprised by the abundance of exotic trees on the campus. The student house was located within short walking distance from the main campus. In addition, a number of bars were located in suspicious proximity to the main campus. Needless to say, these served as a very welcome retreat after a long day of lectures.

For myself, the school did a great job in presenting its keen program. The topics covered a very broad range and it was a fine opportunity to have each speaker teaching their own expertise. As expected, partial saturation was unavoidable, but the breaks in-between the lectures accommodated enough sunshine and food to get along with that. The atmosphere was very positive and there was a lot of exchange going on. On almost every day, the last point on the official program included some sort of social activity. During two evenings, there were casual student-meets-speaker sessions, which I regarded as very valuable experience. Another evening was dedicated to explore Tel Aviv, where most participants got some funny adventure with public transportation. As a highlight, we explored Jerusalem on the conference trip. Everyone who has been there before knows that this gives an impressive glimpse on the cultural diversity in that area.

Ultimately, the school came to an end after 6 diverse days. At this point, I'd like to thank all the involved people for making this school possible. To any student who never participated on such a school, I can assure that it is worth considering at any stage of education.

Andrin Doll

On behalf of the European Federation of EPR groups, I would like to extend my huge thanks to Professor Daniella Goldfarb and her team for organizing the 6th European Federation EPR School on Advanced EPR at the Weizmann Institute in Israel.

This is not only a major organizational task, but a major fund-raising task as there is traditionally a strong emphasis on keeping costs down and being able to offer bursaries to allow students from as many different groups as possible to attend. This is far more work than a comparable conference and requires considerable political and organizational skills and EFEPR was extremely lucky that someone of Daniella's stature and ability volunteered for the task.

The European Federation EPR school is widely viewed in Europe as a very special event that has considerable impact, and where sponsors receive very high recognition and genuine appreciation. The fist school was held in Caorle, Italy and was organized by Marina Brustloton, the first EFEPR President and was viewed as a huge success. It was followed by schools in Retie, Belgium, Wiesbaden, Germany, St. Andrews, Scotland and Konstanz, Germany. Many of the students of early schools now hold senior academic positions. It is held every two to three years and not only brings together some of the best EPR experts in the world, to teach the next generation of EPR specialists but creates an environment where the best students meet each other, discuss their research and form future international collaborative links. It is always an honour to be asked to teach at these events. Although it is a European organized event it has also always welcomed students from across the world and I know Daniella worked extremely hard to significantly reduce travel costs for those travelling from afar.

The Weizmann campus was beautiful, the trip to Jerusalem was incredible, the hospitality was marvelous, the research in the magnetic resonance labs hugely impressive, and I know many people took the opportunity to spend another few days to explore this remarkable region.

From all the students who attended, from all the EPR groups who sent students, from all the teachers at the school I would wish again to extend a huge thanks to everyone involved. The bar has been set very high for the next EFEPR EPR school – likely to be held in 2015.

Graham Smith,
President
The European Federation of EPR Groups

The 8th Asia-Pacific ESR/EPR Symposium (APES2012)
Tsinghua Science Park, Beijing, China, October 11–15, 2012

The Symposium was successfully held at Wenjin Hotel in Tsinghua Science Park in Beijing, China. The meeting attracted more than 110 participants from 15 countries and regions (including 67 participants from overseas). There were a total of 6 plenary lectures, 2 Young Scientist Award lectures, 39 invited lectures, 15 oral lectures and 38 posters presented in 17 lecture sessions and one poster session over the five days of the conference.

During the conference, all participants fully communicated the latest research results in all aspects of EPR/ESR field ranging from theoretical and experimental advances in CW EPR/ESR, pulsed EPR, high frequency and high field EPR, ENDOR, time resolved EPR, FMR, EPRI, CIDEP and ODMR to applications in medicine, biology, chemistry, materials science and quantum calculation. The conference promoted and facilitated academic exchange and collaboration among the EPR/ESR community. Two excellent poster awards were elected, and EPR/ESR equipment manufacturers JEOL and BRUKER introduced their progresses in technologies.

The plenary lectures were made by famous scientists who work in the fields of EPR/ESR many years in different countries. Those reports included: "PELDOR technology for biomolecules studies" by Prof. Yury D. Tsvetkov from Russia, "In vivo EPR to guide management of therapeutic, accidental, and malicious radiation exposures" by Prof. Benjamin B. Williams from USA, "Three dimensional electron spin resonance imaging (ESRI) of endogenous nitric oxide radicals generated in vivo" by Prof. Baolu Zhao form China, "Multi-frequency and pulsed ESR study on electric- and bio-functional materials" by Prof. Toshikazu Nakamura form Japan, "Magnetic and electrical phase separation in proton-irradiated graphite as revealed by electron spin resonance" by Prof. Cheol Eui Lee form Korea, "Nucleic acid structure and dynamics: perspectives from spin labeling" by Prof. Peter Z. Qin from USA.

The Young Scientific Awards of APES2012 were obtained by two young scientists, Dr. Xing Rong from China and Dr. Leonid Rapatskiy from Germany. Dr. Xing Rong gave the lecture "The development and application of the pulsed ESR spectrometer" and Dr. Leonid Rapatskiy gave the lecture "Detection of water binding sites in the oxygen-evolving complex of photosystem II poised in the S2 State using high field (94 GHz) ^{17}O-ELDOR detected NMR spectroscopy" (see also pp. XX).

In the general meeting during the conference, the following researchers were elected as the APES Council Members for 2012–2014.

President: Prof. Takeji Takui (Japan)
Vice-President: Prof. Yong Li (China)
Vice-President: Prof. Hitoshi Ohta (Japan)
Immediate Past President: Prof. Sergei Dzuba (Russia)
Secretary: Prof. Kazunobu Sato (Japan)
Country/Regional Representatives:
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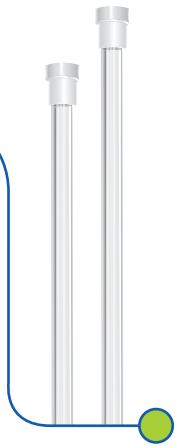
China: Dr. Haijun Yang
India: Prof. Subray Bhat
Japan: Prof. Toshikazu Nakamura
Republic of Korea: Prof. Hong-In Lee
Russia (Siberia): Prof. Elena Bagryanskaya
Advisory Council Members:
Prof. Czeslaw Rudowicz (Founder President, Poland, formerly Hong Kong)
Prof. Sa-Ouk Kang (Former Vice-President, Republic of Korea)

Biennial Asia-Pacific EPR/ESR Symposium is an excellent place for exchanging scientific ideas with strong friendship among the participants not only from Asia-Pacific region, but also from all over the world. APES2012 is the eighth symposium following the successful APES1997 (Hong Kong, China), APES1999 (Hangzhou, China), APES2001 (Kobe, Japan), APES2004 (Bangalore, India), APES2006 (Novosibirsk, Russia), APES2008 (Cairns, Australia), and APES2010 (Jeju, Korea). APES2012 was organized by Tsinghua University.

Professor Yong Li, Chairman, and Dr. Haijun Yang, Secretary General of Local Organizing Committee Department of Chemistry, Tsinghua University



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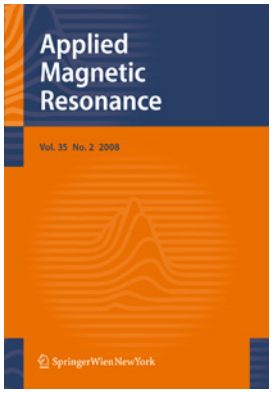

Discount AMR subscription rate for IES members

Springer offers the journal *Applied Magnetic Resonance* at a special subscription rate for the members of the IES. In 2013, it is EUR 209,- (excl. VAT and carriages charges) for volume 44 (12 issues) (regular list price EUR 2215,- plus postage).

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2013 ACERT Workshop
Pulse Dipolar ESR Spectroscopy (PDS) and Biomacromolecular Structure and Function: Instrumentation, Methods and Applications
Cornell University, Ithaca, New York, USA, June 12–14, 2013

2013 ACERT Symposium
International Symposium on Modern ESR
Cornell University, Ithaca, New York, USA, June 15, 2013

Mail or Email your registration to:
ACERT 2013 Workshop and Symposium
Website: www.acert.cornell.edu
Email: acert@cornell.edu
Joanne Trutko, Administrative Manager
Cornell University, Department of Chemistry and Chemical Biology
B28 Baker Laboratory
Ithaca, NY 14853 USA
Phone: 607-255-4632
Fax: 607-255-6969
jkt27@cornell.edu

41st Annual ISOTT Meeting & EPR 2013
Dartmouth College, Hanover, New Hampshire, USA, 24– 28 June, 2013
www.dartmouth.edu/~eprctr/meetings

Supramolecular Functional Systems for Organic Electronics Conference
Institut de Science et d'Ingénierie Supramoléculaires (I.S.I.S.), Strasbourg, France
26–28 June, 2013
www.superior-network.eu/conference
The conference is organized under the framework of the EU-funded Initial Training Network "SUPERIOR" (www.superior-network.eu).

Paolo Samorì
FRSC
Institut Universitaire de France (IUF)
Director
Institut de Science et d'Ingénierie Supramoléculaires (I.S.I.S.)
Université de Strasbourg & CNRS
Email: samori@unistra.fr
Homepage: www.nanochemistry.fr

International Conference
Modern Development of Magnetic Resonance-2013
Kazan, Russian Federation
24–28 September, 2013
www.kfti.knc.ru/magnetic_resonance2013
The Zavoisky Physical-Technical Institute of the Russian Academy of Sciences organizes the Zavoisky Week from 24 till 28 September 2013 including the Annual International Conference "Modern Development of Magnetic Resonance-2013" and Zavoisky Award 2013 ceremony (www.kfti.knc.ru/eng/zavoisky).

The conference is organized under the auspices of the Groupement AMPERE.

The scope of the conference covers the following topics: Theory of magnetic resonance · Low-dimensional systems and nano-systems · Electron spin based methods for electronic and spatial structure determination in physics, chemistry and biology · Molecular magnets and liquid crystals · Spin-based information processing · Strongly correlated electron systems · Chemical and biological systems · Medical physics · Magnetic resonance imaging · Other applications of magnetic resonance · Modern methods of magnetic resonance · Magnetic resonance instrumentation · Related phenomena

Chairman Kev M. Salikhov, Full Member of the Russian Academy of Sciences
e-mail: salikhov@kfti.knc.ru

Scientific Secretary Violeta K. Voronkova, Dr. Sci.
e-mail: vio@kfti.knc.ru
phone: 7 (843)2319086
fax: 7 (843)2725075

Important Dates: Deadline for the registration and submission of abstracts – June 15, 2013. Notification of the report acceptance & Hotel reservation – June 30, 2013.

The EPR community has available to it a list server. The address is epr-list@xenon.che.ilstu.edu. To subscribe to the list, send the words SUBSCRIBE epr-list to majordomo@xenon.che.ilstu.edu. That sends a message to Reef Morse who will then manually place you on the list. This honors only legitimate requests to join the list. Reef also moderates the list which keeps it spam-free.

POSITIONS

Post-doctoral position in structural studies of kinesins

A post-doctoral position is available immediately for a multi-disciplinary research project investigating the regulation of kinesin activity from the cellular to the molecular level. The group comprises the laboratories of Gary Gerfen, Ao Ma, David Sharp and Hernando Sosa in the Department of Physiology and Biophysics of the Albert Einstein College of Medicine, New York, USA. A strong interest in cell and structural biology is required for this position. A major component of the structure/function characterization will involve site directed spin label EPR (SDSL-EPR) spectroscopy, with contributions from Cryo-electron microscopy, X-ray crystallography, fluorescence spectroscopy and molecular modeling.

State of the art resources are available in each of the participating laboratories and in the core facilities of the Albert College of Medicine. These capabilities include EPR (PELDOR, high frequency, HYSCORE), several modalities of fluorescence microscopy (con-focal, epi, tirf, single-molecule polarization etc.), cryo-electron microscopy and state-of-the-art computer clusters for molecular simulations. All four laboratories in the group are located in the Albert Einstein College of Medicine in New York City, USA, which offers a vibrant scientific and social environment. Interested applicants should forward a CV and three reference letters to Gary Gerfen at gary.gerfen@einstein.yu.edu.

Yeshiva University is an equal opportunity employer committed to workforce diversity.

Associate Director
Electron Paramagnetic Resonance Center (EPR Center), Department of Radiology
Geisel School of Medicine at Dartmouth College

Location: Hanover, New Hampshire.

Position Description: We are seeking an Associate Director for our highly successful EPR Center. This individual will work closely with the director, Harold Swartz, to continue and expand the activities of the Center. He/she will be expected to play an active role in the development of the clinical and preclinical activities of the Center, including development of new funding sources.

Qualifications: The ideal candidate must have a Ph.D. and direct and extensive experience with in vivo EPR and active funded research that can be transferred to the Geisel School of Medicine. Extensive experience in the administration of complex high quality research programs is strongly desired.

Compensation, etc.: This will be a tenure track position with a competitive salary.

The individual will receive an appropriate academic appointment as a member of the faculty of the Geisel School of Medicine.

Application Process: Qualified applicants should send their contact information, CV with research interests and current funding, letter describing their qualifications, and the names and addresses of five references to:
E-mail: Traci.Rosenbaum@Dartmouth.edu
Mail: Traci Rosenbaum,Administrative Director, EPR Center, Geisel School of Medicine at Dartmouth College,
Vail Building 705, Hanover, NH 03755

The Geisel School of Medicine/Dartmouth College is an Equal Opportunity and Affirmative Action Employer. We welcome applications from & will extend equal opportunity to all individuals without regard for gender, race, religion, color, national origin, sexual orientation, age, disability, handicap or veteran status.

EPR Specialist Position at Johns Hopkins

Postdoctoral or specialist (staff) position is available immediately to study membrane proteins at the Johns Hopkins University School of Medicine in Baltimore, Maryland, USA. We study conserved membrane enzymes with implications for human health (see Nature Chem Biol 8:759, eLife 1:e00173, and Nature Rev Micro 7:411), and are generously funded by the National Institutes of Health (NIH) and the Howard Hughes Medical Institute (HHMI). The project uses site-directed spin labeling (SDSL) with nitroxide probes to study the dynamics, distance measurements, and saturation kinetics with CW-EPR methods. The applicant must have at least 3 years of prior experience in SDSL, EPR, spectrum

simulations, and distance measurements as evidenced by publications. Experience with membrane proteins is preferred but not essential. Position will come with generous salary and benefits, depending on experience and record of achievement. Interested applicants please send detailed CV and contact information for 3 references to rosanna@jhmi.edu.

Research Positions – Advanced EPR of Biochemical and Chemical Systems

Several research positions (doctoral and postdoc level) are presently available in the Biophysical Chemistry Department of the Max Planck Institute for Chemical Energy Conversion in Mülheim/Ruhr, Germany. We are looking for highly motivated young scientists in the field of Electron Paramagnetic Resonance who are interested in studying biochemical and chemical systems related to the topic of the institute.

In-house projects:

- Photosynthetic systems (reaction centers, water oxidation);
- Hydrogenase enzymes and related model systems;
- Radical enzymes and protein maquettes.

Collaborative projects:

- EPR instrumental developments dedicated to EPR studies of (single) protein micro crystals;
- Advanced EPR investigation of highly reactive chemical intermediates and their weakly bound intermolecular complexes.

Our lab is equipped with 10 modern EPR spectrometers covering the frequency range from 2 to 244 GHz capable of the complete repertoire of CW EPR and pulse techniques (ENDOR/TRIPLE, ELDOR, ESEEM) in combination with laser excitation and freeze quench techniques. More details can be found on our website: www.cec.mpg.de.

Candidates should have project relevant knowledge and be trained in Magnetic Resonance Spectroscopy, preferably in EPR. Candidates with an interest in EPR instrumental development and microwave engineering are specifically encouraged to apply.

Please send your application including CV and the scope of scientific interests to:
Prof. Wolfgang Lubitz
Max Planck Institute for Chemical Energy Conversion, Stiftstrasse 34-36, 45470 Mülheim an der Ruhr, Germany
e-mail: wolfgang.lubitz@cec.mpg.de

Post doctoral/Ph.D positions available

Two post doctoral (or Ph.D) positions are available in the laboratory of Prof. Daniella Goldfarb at the department of Chemical Physics, Weizmann Institute, Rehovot, Israel.

The research focus is development of pulse EPR methodology, including distance measurements using standard and new spin labels, and applications of pulse EPR to biological systems.

The positions require background in Magnetic Resonance, and/or Biochemistry/Structural Biology.

Information about the groups and the Weizmann Institute can be found at www.weizmann.ac.il/chemphys/EPR_group and www.weizmann.ac.il.

Interested candidates should contact Daniella Goldfarb (daniella.goldfarb@weizmann.ac.il) for further information.

For serious suitable candidates the possibility of a funded visit to the lab will be offered prior to final decisions.

Bruker BioSpin Corp

Bruker BioSpin Corp is looking for a highly motivated individual to join our EPR Service team to install and support high technology EPR Spectrometer Systems in customer research labs. This individual will install and service our EPR Spectrometer Systems and train customers for basic operation of the equipment. A BS in electrical engineering, electronics or related fields or equivalent experience is required. Experience diagnosing and repairing electronic, electromechanical and/or mechanical equipment is required. General understanding of analog electronics, digital electronics, high voltage circuitry/circuits, microwave technology, vacuum technology, cryogenics; strong technical skills on analytical instrumentation required.

Please send resume, cover letter and salary requirements to bruker.jobseprfse0620@bruker-biospin.com

EQUIPMENT

For sale

Varian E-line spectrometer components as a system or individually: 9" magnet and power supply, 2 - consoles; 2 - E101 X-band bridges; 1 - E102 X-band bridge with GasFET & dispersion; TE102 and TE104 X-band cavities with ENDOR fittings and liq He Cryo Industries flow cryostat; 1 - E110 Q-band bridge with GasFET & dispersion; Q-band frequency counter; Q-band TE011 cavity components with pumped He Cryo Industries supervaritemp type cryostat; Dell computer and interface.

Contact Cindi Rohwer (email cindi.rohwer@unh.edu or via phone 1-603-862-1795) for further information.

For sale

Bruker ER 041 XK-H X-band microwave bridge and external controller.

Contact Cindi Rohwer (email cindi.rohwer@unh.edu or via phone 1-603-862-1795) for further information.

Design and construction of EPR electronics

The University of Denver can supply electronic design and construction services for EPR applications. Low-noise pulse amplifiers, low-noise 100 kHz preamplifiers, boxcar integrators, and pulse timing systems are available. We also supply a conversion kit to convert Varian field-control units to voltage-controlled scan operation. A 6-digit 1-ppm frequency counter is available in X-, C-, S-, L-band, or MHz versions. Complete microwave/RF bridges from 150 MHz to L-, S-, or C-band are available from designs previously built and tested at the University of Denver.
Please contact: Richard W. Quine, e-mail: rquine@du.edu, phone: 1-303-871-2419

For sale: Varian and ESR equipment

Resonance Instruments has available: (1) Replacement klystrons for Varian EPR bridges and some Bruker bridges (at reduced prices) and other klystrons; (2) Resonance Instrument's Model 8320A is a general purpose Hall-effect based magnetic field controller that provides direct control and precise regulation of the magnetic field between the pole pieces of an electromatnet. Its high resolution permits precise adjustment of the magnet's field either though the front panel keyboard or though an RS232 serial interface with your PC.

Please contact: Clarence Arnow, President, e-mail: 8400sales@resonanceinstruments.com, phone: 1-847-583-1000, fax: 1-847-583-1021.

Available: Used Varian EPR equipment

(1) Varian E-104 EPR spectrometer with vertical style bridge and e-line fieldial. (2) Varian E-9 EPR spectrometer. Both available with warranty and continued service support. (3) Varian TM cavity with flat cell holders and flat cells. (4) Varian E-257 variable temperature controller with heater sensor and insert holder. (5) Varian E-272B field/frequency lock accessory.

Please contact: James Anderson, Research Specialties, 1030 S. Main St., Cedar Grove, WI 53013, USA. phone/fax: 1-920-668-9905, e-mail: janderson36@wi.rr.com

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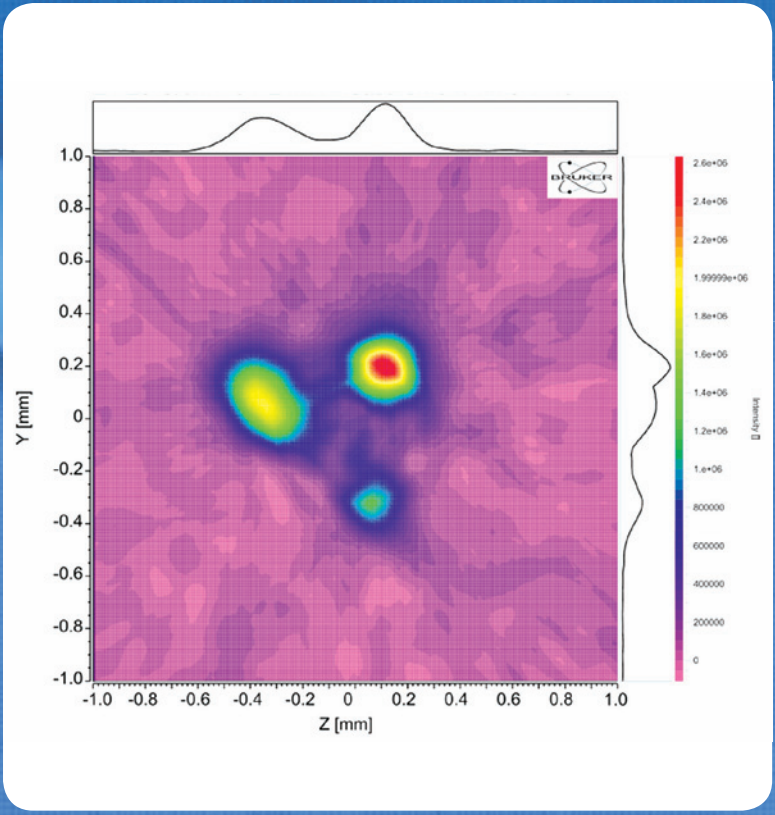

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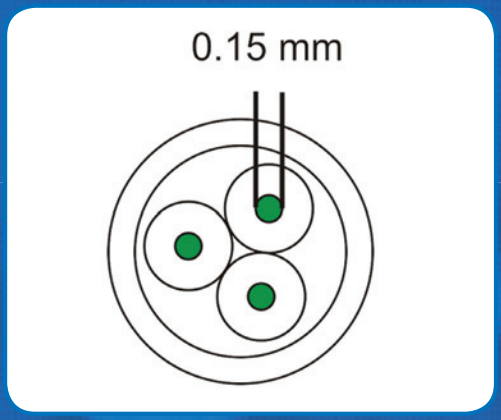

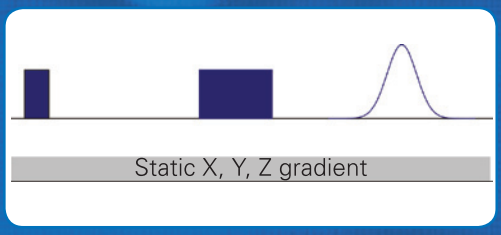

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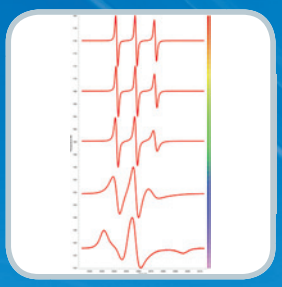

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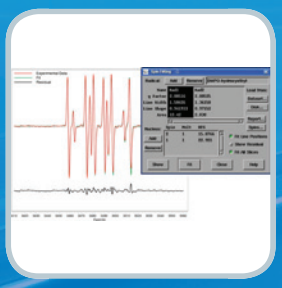

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