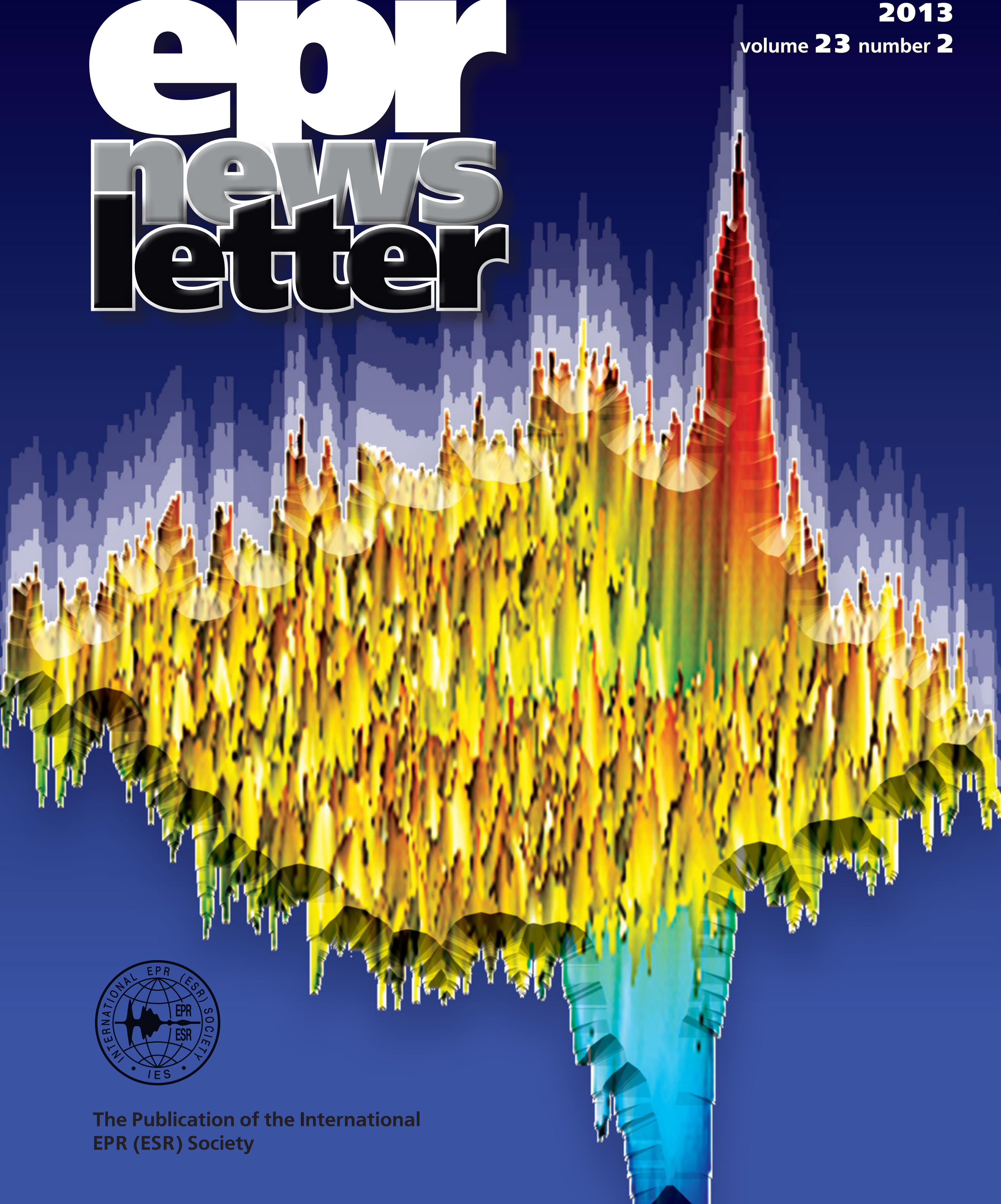
epr newsletter

2013
volume 23 number 2



The Publication of the International EPR (ESR) Society

epr newsletter

www.epr-newsletter.ethz.ch

The official publication of the International EPR (ESR) Society is supported by the Society, by corporate and other donors, the Zavoisky Physical-Technical Institute of the Russian Academy of Sciences, Kazan, Russian Federation, and the Swiss Federal Institute of Technology, Zürich, Switzerland.

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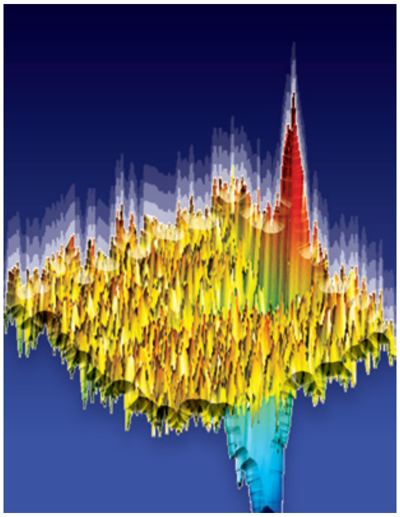
Please feel free to contact us with items (news, notices, technical notes, and comments) or ideas for the *EPR newsletter*.
The *EPR newsletter* is published quarterly by the International EPR (ESR) Society and is available in electronic and printed form to all members of the Society. The deadlines for submission of news for upcoming issues: Spring March, 15; Summer June, 15; Fall September, 15; Winter December, 15.

ISSN 1094-5571

PRINTING: LaPlume and Sons Printing, Inc.
One Farley Street, Lawrence MA 01843 USA
phone: (978) 683-1009, fax: (978) 683-4594



The cover picture illustrates aspects of the research carried out by Kev M. Salikhov, recipient of the Bruker Award 2012. It shows the high-field transition of the three-dimensional time-resolved EPR spectrum of triplet excitons in the photoexcited anthracene/tetracyanobenzene crystal (Appl. Magn. Reson. **28**, 181–193 (2005)). The absorption-emission pattern of the spectrum is due to the spin-dependent mutual triplet-triplet annihilation.

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ETH
Eidgenössische Technische Hochschule Zürich
Swiss Federal Institute of Technology Zurich

Editorial

Dear colleagues,

Indeed, good news never comes alone. As a result of the EPR Symposium at the 55th Annual Rocky Mountain Conference on Magnetic Resonance held in Denver, we have two new Sponsors: Active Spectrum (James R. White, President) and Virginia Diodes, Inc. (Jeffrey L. Hesler, Chief Technical Officer) (see their ads in this page). We welcome James and Jeffrey, and look forward to the long-term collaboration with them for our mutual benefit.

Support of our long-term sponsors Bruker BioSpin, GMW, JEOL Japan & USA, L&M EPR Supplies, Molecular Specialties, Norell, Research Specialties, Resonance Instruments, Scientific Software Services, and Wilmad-LabGlass, coupled with recent sponsors Keycom, Cryogenic Ltd., Adani Systems, Magnettech GmbH, Active Spectrum, and Virginia Diodes, Inc. makes it possible for the society to expand and diversify its activities for your benefit, the IES members. In turn, our sponsors can now promote their products to the international magnetic resonance community. It is important that the efforts to get new sponsors continue. If you know any other company that may be interested in collaboration with the IES, please feel free to inform their CEOs about us. Show them a copy of the *EPR newsletter* with the beautiful ads of our sponsors as an example. Do not be timid! If you make an attempt, there is a nonzero probability that you succeed. If you do not make an attempt, this probability is zero for sure. Another component of the IES budget is your dues. It is important that you pay them on time and also invite your colleagues and collaborators to join the IES. In the long run, this money returns to the members in many ways.

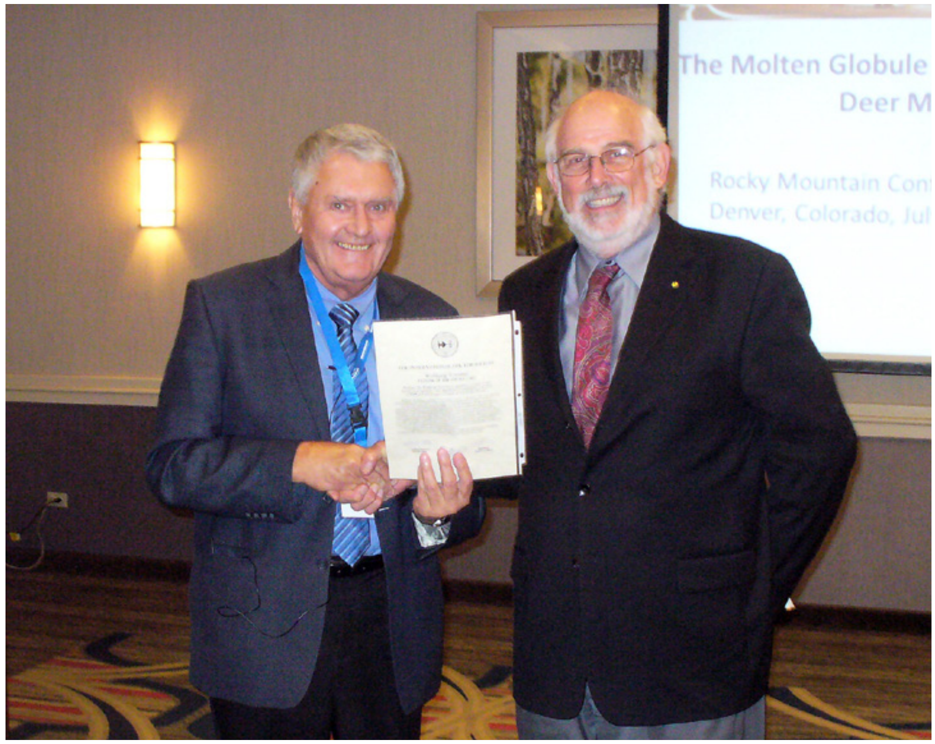
Good news! Graeme Hanson is starting a new column describing cutting-edge EPR (spectroscopy and imaging) and its applications in the diverse fields of science (pp. 14, 15). The implementation of this brilliant idea will certainly add a new facet to the *New Books and Journals* column and be quite instructive and helpful to our readership.

The words of Wolfgang Trommer: “It is great fun to learn something new, to dig into new questions and problems” from his article in the *Awards* column (pp. 4, 5) and those of Marina Bennati: “There is so much to do, keep going!” in the *IES Young Investigator Award Revisited* column (pp. 6, 7) are in wonderful harmony and could serve as a guideline for the young generation of researchers, and, in my feeling, they nicely finalize my editorial full of good news.

Laila Mosina

P.S. Looking at the red “tower” pictured in the cover of this issue I have a strange feeling that it resembles the Empire State Building in New York, USA. What do you think, guys? Am I right?

The IES Fellowship to Wolfgang Trommer



Professor Wolfgang Trommer is one of the pioneers in the area of EPR spin labeling and has contributed immensely to the subject and its application to various enzymes.

He has truly performed seminal works and ideas in the fields of EPR spin labeling, including development of novel spin traps and spin labels such as first synthesis and application of the functional spin-labeled cofactors, spin labeled perdeuterated and 15N-substituted NAD and ATP derivatives, spin-labeled CoA derivatives, spin-labeled and spin-labeled photoaffinity nucleotide derivatives, and first observation of dipolar coupling in a spin labeled protein. Currently Prof. Trommer continues his exciting and extraordinary scientific adventure with recent development of novel fluorescent nitrones for detection of reactive oxygen species with subcellular resolution.

In recognition of his life's work in the fields of EPR spin labeling Prof. Wolfgang Trommer richly deserves the International EPR (ESR) Society Fellowship.

The IES Young Investigator Award to Dane R. McCamey

Dr Dane R. McCamey is recognized as a leader in the development of alternative detection mechanisms for spin resonance – particularly pulsed electrically-detected magnetic resonance (pEDMR).

Utilizing the unique observables available in pEDMR, he has developed the ability to investigate fundamental physical processes in a wide range of electronic devices, such as the thin films used for organic electronics. His research has pushed the number sensitivity of spin resonance in nanoelectronic devices containing tens of spins, demonstrated electrical detection of pulsed spin resonance at extremely high fields with application to quantum information processing at room temperature. He also developed a broadband "on chip" spin resonance system with fast readout capable of operation at cryogenic temperatures and is involved in developing electrical detection techniques for use in high-frequency (>240 GHz), high-power (>1 kW) systems. His work is often published in leading journals (*Science*, *Nature*, *Nature Materials*, *Physical Review Letters*, etc) and is widely cited. He serves on the Scientific Committee of the Rocky Mountains Conference on Magnetic Resonance, and is involved in reinvigorating the EPR capabilities in Australia, through both infrastructure development and as a member of the Management Committee of the Australian EPR Network.

In recognition of his contributions to electrical detection of spin resonance in both organic and inorganic semiconductor materials and devices, particularly his contributions to the development of pulsed techniques, and the development of pulsed electrically detected spin resonance at high magnetic fields, Dr Dane R. McCamey richly deserves the Young Investigator Award of International EPR (ESR) Society.

Detours to a Professorship: How and Why I Became a Professor of Biochemistry

Dr. Wolfgang E. Trommer

Full Professor of Biochemistry,
Department of Chemistry,
TU Kaiserslautern, Germany

It had to be chemistry, there was absolutely no doubt in my mind. Long before we had chemistry in high school, I did experiments at home. This was stimulated by a classmate whose father was a chemist and who supplied us with all necessary chemicals. But in those days it was even easy for myself to purchase chemicals in a pharmacy in Frankfurt where I lived. Initially without any restrictions and later, I must have been around 16, my parents had to sign a form that would allow me to buy 'dangerous chemicals' as well. Meaning explosive and/or toxic compounds.

During my studies of chemistry at the Goethe University in Frankfurt, a strong interest in physics developed in addition. I attended mathematics for physicists, theoretical mechanics and passed a rather difficult test – difficult for chemists, that is. I took a lab course in physics for physicists, not the one for chemists, and so on. It was to be physical chemistry in the future. Later I had quite an advantage by having taken these courses including one in chemical technology at the DECHEMA, Deutsche Gesellschaft für Chemisches Apparatewesen. It was decided that such courses could be substituted for rather tedious and time consuming literature preps in organic chemistry and I definitely had not planned on it. And yet, it came about differently. I became so fascinated by the only literature prep in organic chemistry that I decided to do a diploma and later a Ph.D. thesis in organic chemistry.

I was then still rather young for German standards. Having begun elementary school at not yet six, not having been drafted to do service in the army, as I had already been in the third semester, when we had the physical examination, and having passed the lab courses in inorganic and organic chemistry in only two semesters each. In those days we had to complete a certain number of analyses and preps, regardless of the time it took us. We were assigned bench spaces in the respective institutes which were used by many fellow students for three, four or even more semesters each. With a few others I had, however, found ways to work on evenings and even at night, leaving the building through windows in the hoods. So I was only 25 when I got my Ph.D. and in the meantime had made substantial changes in my plans for the future.

The father of a fellow student and close friend worked as chemist at one of the three big German chemical companies that had originated from IG-Farben after the war. For years it had been his job to produce a white paint from a side fraction formed in the steam cracker from raw oil. The paint was to be used for marking lanes on roads. The fields painted with numerous white lines on the Autobahn are, I gather, well-known. The stability of such paints is thus tested in real life. His product passed these tests perfectly well, he was more than happy, but then a different kind of raw oil was used and this side fraction was no longer formed ....

So if it has to be chemical industry, I thought, then more into management. During my Ph.D. work I had taken courses in business administration and had had this topic even as a separate oral test in my final Ph.D. examination, the 'rigorosum'. This extra exam got me the mark 'excellent' (mit Auszeichnung). The comment of the professor, who, according to the rules because of the rating 'mit Auszeichnung', could not claim his fee for holding the exam: 'you did not merely know everything but you even understood' disturbed me quite a bit. What kind of students are there in business school?

I put an ad in the 'Blaue Blätter', the monthly publication of the German Chemical Society and got quite attractive offers from industry.

But it ended up differently again. Prior to industry, I considered taking an enticing postdoc position in the USA. Everything was settled for Georgetown University in Washington, DC, in the laboratory of the father of the anti-baby pill, had it not been for his sudden and untimely death. Then came an offer from the biochemist in Frankfurt, Gerhard Pfleiderer, who had just accepted a professorship at the newly founded Ruhr University in Bochum, to move with him in about a year following the completion of the construction of the chemistry building and to be 'the organic chemist' in a huge research group there. In the meantime he suggested that I spend a year as postdoc with the biochemist Bernhard Witkop at NIH.

And again, it turned out differently. A friend from early childhood and high school in Frankfurt was working towards his Master of Law at Harvard University in Cambridge, Massachusetts. 'Why don't you apply here', was his rather naïve suggestion. Organic Chemistry at Harvard, that meant Robert (Bob) Woodward, without question the king of organic chemistry in those days. Not only because of his Nobel Prize for the syntheses of almost all significant alkaloids, but also because of the so-called Woodward-Hoffmann rules describing the stereochemical course of cyclizations as governed by orbital symmetry. If alcohol and cigarettes had not caused his early death, he could have shared a second Noble Prize for these orbital symmetry rules with Roald Hoffmann.

For reasons of space I cannot describe a fairly large number of coincidences which eventually got me into Woodward's lab at Harvard for two years – a time which had a significant and long-lasting impact on me.

Back in Germany as the chemist in Pfleiderer's lab at the Ruhr University. Nine (9) postdoc positions, eight of them filled, with a medical doctor, biologists, biochemists, chemists and one as a back-up, just in case. A huge institute with more than 60 collaborators. And all of us were supposed to work on a single joint project – impossible! After I had succeeded with the synthesis of a combined coenzyme-substrate analogue together with my first Ph.D. student, it started to decompose on the shelf of the biochemist, who was busy with his own work. Consequently, I learned some enzymology and tested my compound myself. And another coincidence. The biology department had hired a biophysicist who as physicist by training built his own EPR spectrometer but had little insight into potential biological applications. He asked me for some input and 'the circle was closed back to physics'. We started to synthesize spin-labeled cofactors and study their interaction with dehydrogenases.

When Pfleiderer moved to Stuttgart I went with him – he deliberately wanted to reduce his work group and chose two of us. Once at the University of Stuttgart, I submitted my habilitation thesis (Doctor of Sciences is it called in Eastern Europe) on work done in Bochum and obtained the 'venia legendi', the right to teach in biochemistry and organic chemistry. After another year as professor for these fields in Stuttgart I was offered a full professorship in biochemistry at the University of Kaiserslautern in 1981.

And again, new and quite different research areas were added. A clinical immunologist from Saarbrücken convinced me that we should employ bifunctional reagents, which we had started to develop already in Bochum, to couple auto-antigens to toxins as a potential treatment of autoimmune diseases. We moved later even further into medicine, although structure-function relationships in proteins remained in our main focus.

What have the experiences been, good, or not so good?

The idea that I could work in areas I am personally interested in, totally independent of financial constraints, proves to be only partly true. Even the support from our funding agency, DFG, the German Research Foundation, is submitted to current 'fashions'. And the reviewer of your proposals will put you in a certain drawer. Trommer has done decent work in EPR, spin-labeling, fundable. But immunology, cell cultures of antigen-specific lymphocytes; please look for a competent collaborator… And yet, it is great fun to learn something new, to dig into new questions and problems, even as an apprentice. When I was to be retired several years ago I applied successfully to the responsible ministry for an extension. And I am still in my institute and as you could read a few years ago in our regional newspaper in an interview with me taken in my office on a Sunday afternoon, 'this lab is the center of my life'.

IES Young Investigator Award Revisited

Marina Bennati:

When I was asked to write an article for the EPR newsletter as a former IES Young Investigator (2002) I felt almost too old for this contribution. However, thinking about it, I realized that I still have a lot of dreams and visions. During my career, I went through many stages: Three times I changed my living country (Italy-Germany-USA-Germany) and finally managed to settle down in Germany. Over all those years I have met so many people who taught and inspired me. Perhaps this article is an occasion to acknowledge them all.

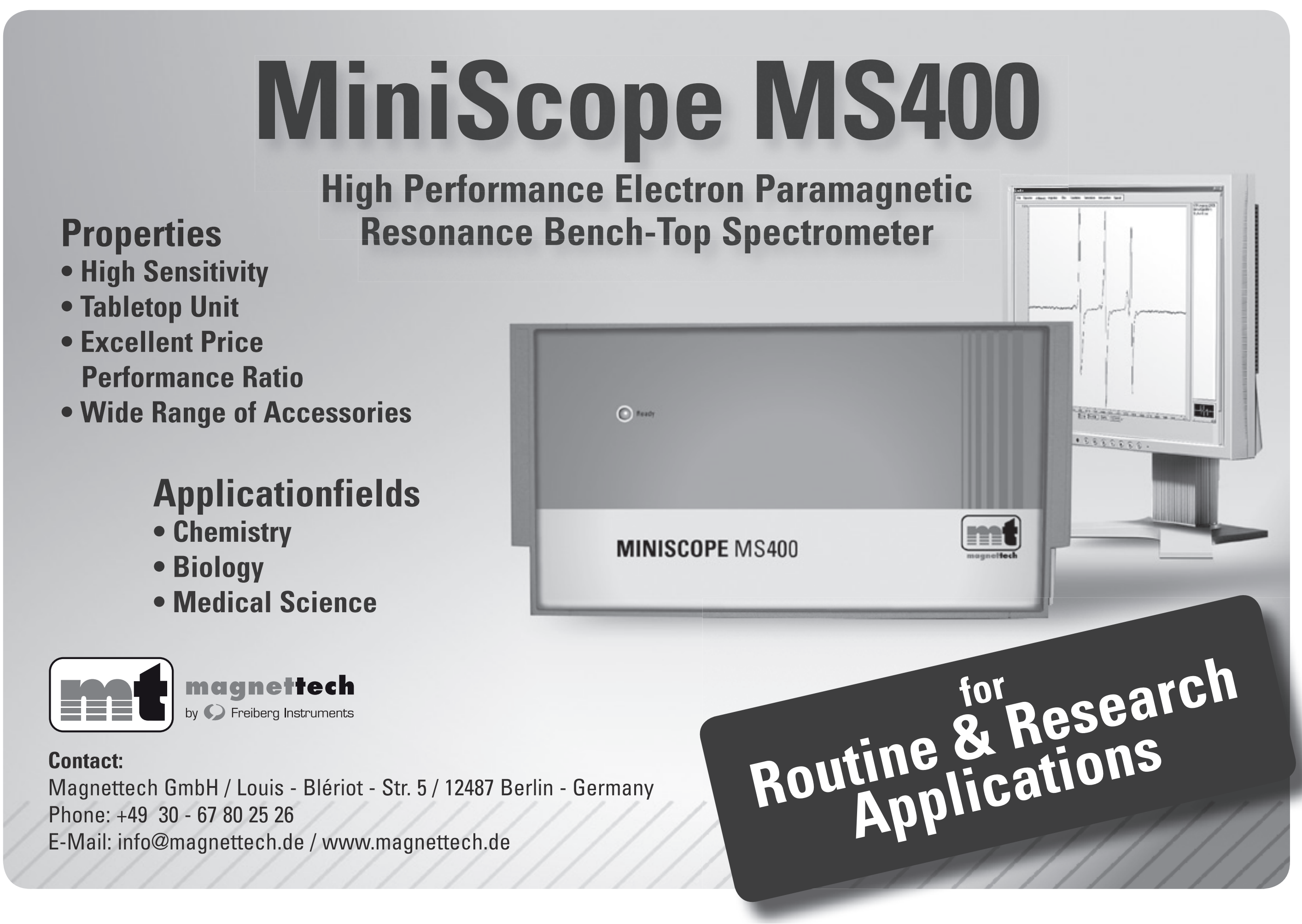
I got my master's degree in Physical Chemistry from the University of Münster (Germany) working for Werner Müller-Warmut. He had done some fundamental contributions in dynamic nuclear polarization (DNP) in the 1970s and 1980s but, as a Master student, I was not much aware of it. I had been rather fascinated by his lecture series on magnetic resonance (the best lecture I have ever heard!) and I decided to go for this field. For my PhD I moved to Michael Mehring's lab in Stuttgart. He offered me to work on pulse EPR and there everything started. I had great scientific interaction with Michael but also with several people in the department and many outstanding students. In Michael's lab I also met my husband and we started a quite *ambitious* project of pursuing both our independent careers as well as, many years later, starting a family.

At the end of my PhD, Michael recommended that I join Bob Griffin's lab at MIT. I was somehow scared of the idea since I had never been to the US before and my (*Italian*) English was quite poor. Michael told me: "Don't worry, Bob is one of the nicest people I have ever met". And he was right – as usual. The time in the US shaped my life, scientifically and personally. In my later career I pursued many research areas I had started there. In 2002, I received the IES Award for implementing pulsed ENDOR spectroscopy at 140 GHz/5 Tesla. At that time (the mid 90s), Bob had one of the very few home-built high-field EPR spectrometers world-wide; commercial ones were still in development. Having no other EPR instrument in the lab except this machine and a DNP gyrotron, I became really dedicated to it. In the initial time, Gary Gerfen, also a postdoc in Bob's lab, introduced me to high-frequency EPR with all its physical and technical issues. I quickly realized that continuous wave EPR was quite challenging at high frequencies. Thus, I proposed implementing a pulsed bridge to Bob and he reacted enthusiastically. The work finally led to a pulsed ENDOR spectrometer. During that time I strongly interacted with Chris Farrar and collaborated with Volker Weis, both mainly dedicated to DNP at 140 GHz. Besides the EPR/DNP group, Bob's lab was at the heart of the magnetic resonance community and I had the opportunity to exchange ideas with other outstanding postdocs (most of them set up their own labs afterwards) and meet the most prominent experts in magnetic resonance from all over the world. Being a woman, a determining experience during my time in the US was to learn from the terrific female scientists around me, not least of which was JoAnne Stubbe, who raised my interest for biochemistry and enzymology. She was the first female professor I had ever talked to and we initiated a long-standing collaboration and friendship.

Back to Germany, I joined Thomas Prisner's lab in Frankfurt to obtain my habilitation (the classical German career track to a permanent professor position). I was able to start my independent research using DFG funding and following the idea of employing EPR distance measurements to locate transient amino acid radicals during enzymatic catalysis. Although research was going well, in my mid 30s I started struggling with the challenge of combining my scientific career with a family. I had my two kids during this time and I felt that seeking a permanent position in that situation was quite hard. Fortunately, opportunities often pop up in life when least expected (to young researchers it means: Never give up!). My chance came from a sudden interest in DNP about a decade ago. Working with Thomas in Frankfurt was the ideal match to jump into this field. We started "reinvestigating" dynamic nuclear polarization in liquids thinking about new experimental set-ups and possible mechanisms, an impulse that led to a larger research team. We also initiated a new collaborative project with the Max Planck Institute (MPI) for Biophysical Chemistry in Göttingen that paved the way to my current appointment. The investigation of polarization transfer mechanisms between electron and nuclei meanwhile belongs to my core research.

In my lab methodical development is carried out hand-in-hand with applications in biological science. We continue examining the capabilities of EPR techniques at high microwave frequencies in terms of sensitivity and resolution in order to identify and study paramagnetic centers in enzymatic catalysis. Since last year, the advent of the commercial 263 GHz spectrometer to the lab has posed new technical challenges but also opened up several exciting perspectives in this direction. The experience gained with dynamic nuclear polarization has motivated us for further methodical work. We are investigating avenues to increase the DNP enhancements in liquid solution within a new two-field DNP spectrometer that allows for DNP pumping at low fields and NMR signal detection at high fields. Furthermore, we are transferring concepts of polarization transfer from DNP to ENDOR by exploring electron-nuclear cross polarization for pulse ENDOR experiments.

What I like most about science and my job in particular is the intellectual exchange with my colleagues, co-workers, and students. I believe that a constructive synergy is essential to drive new ideas and to push a research field to new frontiers. In this context, I am really happy that we have succeeded in creating a new DFG-sponsored network of German EPR spectroscopists that will certainly contribute to substantial progress in the field (www.spp1601.de). Recently, through my current scientific environment at the MPI for Biophysical Chemistry, I discovered a lot of fascinating research in the direction of life sciences, from molecular machines to neurobiology and developmental biology. My current vision is that EPR spectroscopy will soon become indispensable in the life sciences similarly to more established techniques such as X-ray, optical, or NMR spectroscopy. The beauty of EPR is the combination of fascinating spin physics, cutting-edge technology, and its capability to look at the inner workings of diverse macromolecules. To any young researcher I would like to say: "There is so much to do, keep going!"



Workshop “Spins as Functional Probes in Solar Energy Research”
Helmholtz Centre Berlin for Energy and Material Research, Berlin, Germany 10–12 April, 2013

The workshop “Spins as Functional Probes in Solar Energy Research” organized by the German research network EPR-Solar at Helmholtz Centre Berlin for Energy and Material Research (HZB) brought together international materials scientists to discuss the potential of EPR based techniques in solar energy research. In 2008 the German network EPR-Solar was formed, with the aim to develop and apply dedicated EPR and electrically detected magnetic resonance (EDMR) methods to solve pressing questions related to defect states in silicon photovoltaics (pv). After five years of successful research, the funding period of EPR-Solar terminated by the end of 2012. Partner Institutes forming EPR-Solar were Technical University Munich (TU), Free University Berlin (FUB), Forschungszentrum Jülich (FZJ), Max Planck Institute for Iron Research (MPIE), former BESSY and HMI. The approach chosen by the EPR solar partners turned out to be very successful and resulted in a number of important breakthroughs both in the field of thin film silicon research and EPR method development. Some highlights were first pulsed electrically detected ESEEM experiments, first DFT based g-tensor calculations on dangling bonds in amorphous silicon, the set-up of multi-frequency and spatially resolved EDMR facilities, first 263 GHz experiments on thin film silicon materials, a refined model of light induced degradation in amorphous silicon and the first FD-FT-THz-EPR experiment based on coherent synchrotron radiation. Novel EPR tools developed within the EPR solar network were soon employed to tackle other pressing questions in energy research. In order to reflect this broader scientific scope, the organizers decided to order the workshop program around four columns: First, organic electronics and non-silicon pv materials (speakers: J. Behrends (FUB), V. Dyakonov (Uni Würzburg), E. Govaerts (Uni Antwerp), T. Schulze (HZB) and E. Lifshitz (Technion)), secondly, silicon pv (speakers: M. Fehr (UC Santa Barbara), C. Teutloff (FUB), A. Smets (Uni Delft), O. Asthakov (FZJ). T. Sontheimer (HZB), A. Stesmans (Uni Leuven), M. Brandt (TU Munich), C. Meyer (FUB), A. Blank (Technion), K. Lips (HZB) and K. Klein (TUM)), thirdly, theory (speakers: C. Freysoldt (MPIE) and U. Gerstmann (Uni Paderborn)) and fourthly, surface science and catalysis (speakers: W. Lubitz (MPI for Chemical Energy Conversion), A. Schnegg (HZB), A. Brückner (Leibniz Institute for Catalysis), A. Pöppl (Uni Leipzig) and T. Risse (FUB)). Wednesday 11th workshop participants joined the opening ceremony of the newly established Berlin Joint EPR Lab (BeJEL), which was opened with a keynote lecture by Frank Neese (MPI for Chemical Energy Conversion) on the role of advanced experimental and theoretical spectroscopic tools in energy research.

Alexander Schnegg

13th International Symposium on Spin and Magnetic Field Effects in Chemistry and Related Phenomena (SCM 2013)
Bad Hofgastein, Austria
22–26 April, 2013

The symposium was held for the first time in Austria at the Congress Center of Bad Hofgastein. Eighty eight delegates from 12 countries attended the conference. Very pleasant was the large number of young scientists participating the meeting, especially from Japan.

Scientific highlights came from plenary and invited lectures as well as form numerous communications. The plenary lectures gave a detailed overview on the various aspects of magnetic field effects in chemistry, physics and biosciences. Ron Naaman (Rehovot) talked about "Spin and Chirality from Spintronics to Biology", indicating the widespread application of magnetic field effects. "The Dynamics of Nuclear Singlets and Triplets" was reported by Malcom Levitt (Southampton) and Mike Wasielewski (Evanston) gave an interesting overview on "Spin Coherence Transfer by Optical Excitation of Spin-Correlated Radical Pairs". Eitan Ehrenfreund (Haifa) reported "Bipolar Organic Spin Valves: Magnetospectroscopy, Magnetic Field Effects in Fullerenes". Peter Hore (Oxford) and Stefan Weber (Freiburg) mainly organized the scientific program. Günter Grampp (Graz) and Stephan Landgraf (Graz) acted as the local organizers.

It was a sad obligation to hold Memorial lectures for Seigo Yamauchi (1947–2012) and Nick Turro (1938–2012). Takeji Takui and Mike Wasielewski honored these outstanding scientists in two evening lectures reporting on many personal details of these two eminent scientists.

In two evening poster sessions 29 posters were presented giving raise to lively discussions. Poster prices were celebrated to: Zhebin Fu, (Shizuoka), Olga Morozova, (Novosibirsk), Jonathan Storey, (Oxford).

The entire scientific program including the abstracts of both, talks and posters and the conference photo can be downloaded under: www.cecp.at/index.php/scm2013.

On the free afternoon delegates enjoyed the excursion to the City of Salzburg including a guided tour to the historical places of Salzburg. The organization was even extended to the weather conditions; no single cloud covered the sunny sky during the excursion.

The whole symposium was a great success and the organizer would like to thank the sponsors, especially the German Science Foundation (DFG) for financial support.

The 14th Spin Chemistry Meeting will be held in India. Samita Basu (Kolkata) will organize the symposium in 2015 in Kolkata.

Directly after the Spin Chemistry Meeting, a two days EU-COST WG3 meeting was organized by Konstantin Ivanov (Novosibirsk). 10 speakers and several posters contributions reported on long-living spin states and polarization transfer in hyperpolarization experiments.

Günter Grampp

EUROMAR 2013. AN EPR POINT OF VIEW

Yiannis Sanakis, George Mitrikas
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George Mitrikas (left) and George Papavassiliou, the chairman of EUROMAR 2013 (right).

EUROMAR is the main annual meeting of the European magnetic resonance community covering all aspects of magnetic resonance including NMR, EPR and MRI. This year EUROMAR 2013 was held in the city of Hersonissos, located in the north east part of the beautiful island of Crete, Greece from Sunday 30th of June until Friday 5th of July. The chairman of EUROMAR 2013 was Dr George Papavassiliou from NCSR Demokritos, the largest scientific research institute of Greece. Over 600 participants had the opportunity to exchange ideas on the latest scientific breakthroughs enjoying a unique Mediterranean environment. The program of EUROMAR 2013 included 3 tutorials, 14 plenary lectures, and 120 oral presentations distributed in three parallel sessions. Posters sessions were held on Monday, Tuesday and Thursday afternoons. Several satellite events took place including the Annual General Meeting of the International EPR/ESR Society.

The contribution of the international EPR community was significant with many important oral and poster presentations. As it is a tradition in EUROMAR conferences, three tutorial lectures were given in the first day of the conference, Sunday afternoon. In one of those Gunnar Jeshke, from ETH Zurich gave a thorough introduction on Double Electron Electron Resonance under the title “DEER distance measurements and data analysis”. Out of the 14 plenary lectures given, three were purely EPR-oriented: In the first one, that took place on Tuesday morning, Steve Hill from NHMFL, Florida State University, USA gave a complete introduction on the usefulness of high field EPR in characterizing molecular-based magnetic materials and focused on the study of magnetostructural correlations under the application of high hydrostatic pressures by showing two examples of oriented single-crystal samples. In the next one, given on Wednesday morning, Graham Smith from the University of St. Andrews, UK, presented the advantages of a specially designed high-power W-band spectrometer regarding PELDOR and DNP experiments. Finally, on Thursday morning Daniella Goldfarb from the Weizmann Institute of Science, Israel introduced a new family of spin labels based on Gd^{3+} chelates for DEER measurements at high microwave frequencies and demonstrated their potential with examples on rigid models, proteins, DNA and transmembrane peptides in model membranes.

Two sessions were devoted to EPR related topics under the title “EPR Methods and Applications”. The session of Monday morning chaired by Marina Bennati, was devoted to applications of EPR spectroscopy in materials science and methodology advances. Quantum information processing and spintronics were the subjects of three talks. John Morton from the London Center of Nanotechnology, UK presented characterization studies of bismuth donors in silicon showing that the so-called “EPR clock transitions” are more robust to various sources of decoherence, a property that can be used to hyperpolarize spin quantum bits. Using the same system, Gavin Morley from the University of Warwick, UK experimentally demonstrated that when the spin eigenstates approximate 50:50 superpositions of the electronic and nuclear spin states, a very fast quantum control of hybrid nuclear-electronic states is possible. Pavel Baranov from the Ioffe Physical-Technical Institute, Russia presented ODMR studies of point defects in silicon carbide showing that this system is promising for single-defect and single-photon spectroscopy in the infrared region with potential applications including quantum information processing and nanoscale magnetometry. Frederic Mentink-Vigier from the Weizmann Institute of Science, Israel showed how the accumulation of the train of echoes generated by the Carr-Purcell-Meiboom-Gill (CPMG) pulse sequence can significantly improve the signal/noise ratio and thus overcome the drawbacks of time-consuming experiments. Finally, Matvey Fedin from the International Tomography Center, Russia presented CW X/Q band and time-resolved EPR studies of “breathing” materials with nitroxides, focusing on the characteristics of light-induced spin state switching and relaxation.

The session of Thursday morning, chaired by Sushil Misra, was related to applications of EPR spectroscopy in biological systems. Vassili Petrouleas, from NCSR Demokritos, Athens Greece, gave an overview of the impact of EPR spectroscopy in the elucidation of the function and structure of a complicated biological system, namely Photosystem II. Ryszard Narkowicz from Technical University of Dortmund, Germany presented a cryogenic receiver for low temperature measurements suitable for EPR studies of small samples. Progress in the application of advanced EPR techniques in obtaining structural information from complicated biological systems was demonstrated in three talks. Jack Freed from ACERT, Cornell University, USA presented recent advances in advanced pulse EPR techniques for protein structure determination. Andriy Marco from Goethe University, Frankfurt, Germany reported on the extraction of geometrical parameters from EPR/PELDOR data and their use for the verification of molecular structure obtained by NMR. Finally, Bela Bode from St. Andrews, Scotland, UK talked about the application of PELDOR measurements for extracting multiple distances in biomacromolecules

Apart from these two EPR oriented sessions EPR related presentations were also delivered in other sessions of the conference dedicated to specialized topics. In the "Theory and Computation" session, Tuesday afternoon, Frank Neese from the Max Planck Institute for Chemical Energy Conversion, Germany, presented theoretical aspects of EPR spectroscopy relevant to open shell transition metal complexes with strong spin orbit coupling. In the "Paramagnetic Systems" session, Tuesday afternoon, Joris van Slageren from the University of Stuttgart, Germany reported on unconventional EPR investigations of Molecular Nanomagnets. In the "New Methodologies and Instrumentation Advances" session, Wednesday morning, Hitoshi Ohta from Kobe University, Japan, presented recent developments of a multi-extreme High Field ESR system and its application to a honeycomb lattice antiferromagnet. In the "Materials and Processes" session, Friday morning, Oleg Poluektov, from Argonne National Laboratory, USA, reported on light induced EPR spectroscopy combined with DFT calculations to study the mechanisms of charge separation and stabilization in organic Photovoltaic materials and correlate them with the analogous mechanisms observed in natural Photosynthesis.

Hitoshi Ohta during his lecture.

A specialized Colloque AMPERE entitled "Advances in Solid State Broadband Magnetic Resonance" ran jointly with EUROMAR 2013 aiming in bringing together scientists actively involved in the application of Magnetic Resonance techniques in Magnetism, Superconductivity, Materials and Methods in the Nanoscale, Intermetallic and Composite Materials and Spatially Resolved NMR and EPR of Solids. In the framework of this event, several EPR related presentations were given. In the "Magnetism and Superconductivity" session, Tuesday morning, Vladislav Kataev from the Leibnitz Institute for Solid State and Materials Research, Dresden, Germany reported on High Field ESR and NMR Spectroscopy of the novel low dimensional quantum magnet $BaAg_2Cu[VO_4]_2$. Sergei A. Zvyagin from the Dresden High Magnetic Field Laboratory, Dresden, Germany talked about spin dynamics in the $S = 1/2$ triangular lattice antiferromagnet Cs_3CuBr_4. In the "Spatially resolved NMR and EPR of solids" session, Thursday afternoon, Aharon Blank from the Technion Israel Institute of Technology, Israel reported on recent developments in methodologies that increase the sensitivity of ESR and enable to obtain three dimensional images with submicron resolution.

EUROMAR 2013 hosted a Round Table on NMR and EPR in ultra-high magnetic fields organized by the European Magnetic Field Laboratory (EFML). The Round Table took place on Tuesday afternoon and presented the NMR and EPR activities already running within the EMFL laboratories, as well as to identify possible areas of common and complementary interests with the community.

Beyond the scientific dimension, EUROMAR 2013 was a great opportunity for all participants to experience the natural beauty, culture and traditions of the island of Crete. In the afternoon excursion of Wednesday the participants visited historical sites such as the ancient city of Knossos one of the main cities of the Minoan era and the first European city with a palace.

On behalf of the local organizing committee we would like to thank all participants for their contribution in the success of EUROMAR 2013. Next year, EUROMAR 2014 will be held at ETH Zurich from June 29th through July 3rd (www.euromar2014.org) chaired by a member of the EPR community, Gunnar Jeshke.

International Conference on EPR Spectroscopy (EPR-2013)
Dartmouth College, Hanover, New Hampshire, USA, 24–28 June, 2013

The International Conference on Electron Paramagnetic Resonance Spectroscopy (EPR 2013) was organized by the EPR Center at the Geisel School of Medicine, Dartmouth College, New Hampshire, USA. The organizers had arranged the 41st Annual ISOTT Conference (of International Society on Oxygen Transport in Tissues) to precede the EPR conference and to have two days of overlap (June 25–26) with combined sessions focused on oxygen and EPR oximetry. A major focus of the combined meeting was to discuss the clinical aspects of oxygen and methods related to its measurement. The presentation format was planned to facilitate and promote discussions, with extensive discussion time allocated for oral presentations. There were more than 230 attendees with over 180 presentations on a variety of topics. Indicating the increasingly important role of EPR oximetry in clinical medicine, the conference also featured a full day of clinical focus with presentations of clinical relevance related to tissue oxygenation in cerebral, cardiovascular, muscular, and renal pathophysiology and treatment. A final day-long session was on EPR dosimetry, in which the EPR Center at Dartmouth has a leading role. Overall, the EPR conference brought together scientists, engineers, clinicians, and mathematicians in a unique international forum for the exchange of information, updating participants on the latest developments and techniques within the field of EPR spectroscopy including imaging, oximetry and dosimetry. Participants also enjoyed local hospitality and visits to the Dartmouth campus, including the Dartmouth-Hitchcock Medical Center and the EPR Center.

The EPR conference started off with a welcome reception/dinner in the Montshire Museum of Science (a self-guided science museum located in Norwich, Vermont). The scientific programs (June 25–28), included 11 sessions of oral presentations of 30- and 15-min duration, as well as 3 separate sessions on “Introduction to Poster” presentations, which provided an opportunity for the poster presenters to give a 2-min oral presentation highlighting the research work included in the poster.

The ISOTT/EPR combined oral presentations started off with an overview of the accomplishments and challenges of clinical EPR by Dr. Swartz followed by a number of presentations on in vivo EPR oximetry and oxygen imaging by Drs. Halpern, Gallez, and

others. The afternoon session continued on the use of EPR oximetry for a variety of applications including cancer radiation therapy, stroke, and renal diseases. The evening social program included an outdoor BBQ, balloon rides, fireworks and musical background at the Swartz/Flood home.

The day 2 of the combined ISOTT/EPR sessions were held at the Dartmouth-Hitchcock Medical Center auditorium. The morning session started off with lectures on the measurement and use of oxygenation for treating myocardial infarction (Dr. Kuppusamy), chronic versus acute hypoxia in tumors (Dr. Vaupel), use of Cerenkov emission for tissue oximetry (Dr. Pogue), and clinical measurement of tumor oxygenation (Dr. Jarvis). The highlights of the afternoon sessions include presentations on the advanced in vivo EPR methodologies including EPR imaging and dynamic nuclear polarization (DNP)-based metabolic imaging in cancer (Dr. Krishna), development of DNP-MRI (Dr. Utsumi), multifunctional imaging (Dr. Khramtsov), pH imaging (Dr. Hirata), and redox imaging (Dr. Li), and others. The combined sessions on EPR and oxygen concluded with an informative lecture on the discovery of oxygen by Dr. Severinghaus. Participants then had an opportunity to tour the new EPR Center building that opened in March, 2013.

Day 3 started off with a sessions on EPR instrumentation (by Drs. Hyde, S. Eaton, others) and quantitative EPR (by Drs. G. Eaton, Weber, and others). The afternoon sessions focused on EPR spin-trapping applications (by Drs. Kadiiska, Vasquesz-Vivar, and others) and paramagnetic probes (Drs. Kao, Towner, and others). The social event was at the Dartmouth outing club where participants enjoyed the ambience of Occum Pond and more musical entertainment.

The last day of the EPR conference was entirely devoted to EPR dosimetry, an emerging technology for measurements of radiation dose. Both the oral and poster presentations covered a range of topics including an overview of the tooth and finger-nail dosimetry developments at Dartmouth (Dr. Swartz), translation of the technology from bench to disaster site (Dr. Flood), instrumentation (Drs. Williams, Sidabras, Grinberg, Salikhov, Petryakov, Meany, and others), finger nail dosimetry (Dr. Swarts), clinical analysis of emesis (Dr. Ali), and software. Dr. Berliner provided an overview of the development of EPR imaging and concluded the session.

The conference ended with a banquet and award ceremony in the EPR Center.

Harold Swartz

EPR => Hot Science

Some time ago I wrote to Laila and suggested that we introduce a column into the *EPR newsletter* describing cutting edge EPR (spectroscopy and imaging) and its applications in the broad areas of medicine, structural biology, chemistry, earth science, physics, quantum computing, solid state-, bio- and nano-materials science. This column provides an opportunity for IES members to describe their exciting cutting edge EPR research to the EPR and broader scientific communities. I also hope that the column will encourage younger members of the community to undertake cutting edge science that will then be highlighted in this column.

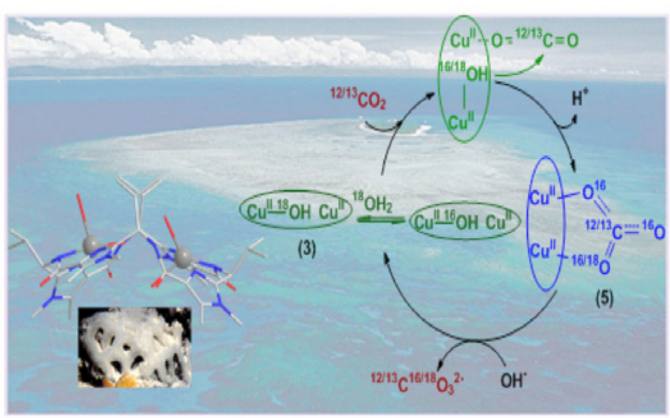
The column will showcase the very best research carried out primarily by IES members and has been published in high impact journals, typically the best journals in the appropriate field of research. In this day and age of journal impact numbers and citation counts, the best journals correspond to those within the first quartile of their research field (see *Journal Citation Reports*, *Web of Knowledge*), for example in the field of General Chemistry examples include *Nature*, *Proc. Natl. Acad. Sci. USA*, *J. Am. Chem. Soc.*, *Angew. Chem. Int. Ed.* IES members are invited and encouraged to contribute general summaries (word document) of no more than 200 words, together with an image to Graeme Hanson (Graeme.Hanson@cai.uq.edu.au).

Importantly, contributions should not violate publishers copyright! In launching the column, I have provided several examples of research from my own group and two from Oxford University. Enjoy the column and I look forward to receiving many more exciting contributions from other labs in upcoming issues of the *EPR newsletter*.

Graeme Hanson
Centre for Advanced Imaging
The University of Queensland

CO_2 fixation – A biological function for marine cyclic peptides? 1

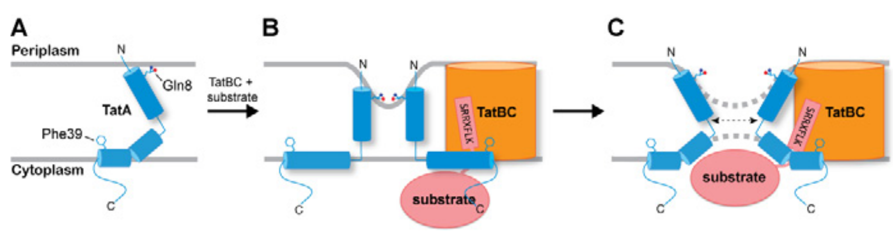
A multidisciplinary international collaboration involving researchers at the University of Heidelberg and the University of Queensland have unraveled the geometric and electronic factors governing CO_2 fixation by dinuclear Cu^{II} complexes of the naturally occurring marine cyclic pseudo-octapeptides ascidiacyclaimde (H_4asc) and patellamideD (H_4patD).



The study involved the synthesis and spectroscopic (EPR), characterization of two synthetic derivatives of these cyclic pseudo-octapeptides as well as their Cu^{II} complexes (Comba, P.; Dovalil, N.; Gahan, L.R.; Haberhauer, G.; Hanson, G.R.; Noble, C.J.; Seibold, B.; Vadivelu, P. *Chem. Eur. J.*, **2012**, 18, 2578–2590). The two cyclic peptide derivatives differ from the naturally occurring octapeptides by variation of the incorporated heterocyclic donor groups and the configuration of the amino acids connecting the heterocycles, producing more rigid macrocycles with significant differences in folding of the cyclic peptide. These structural variations allowed a detailed spectroscopic and quantum chemistry study of the geometric and electronic factors responsible for the formation of di-nuclear Cu^{II} complexes and the reactivity of the complexes towards CO_2 fixation. The results provided structure-reactivity correlations, and suggest why Nature may have chosen oxazolines and thiazoles as the incorporated heterocycles.

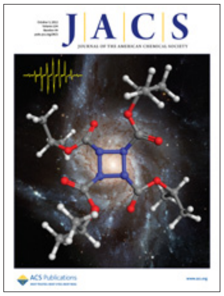
Structural model for the protein-translocating element of the twin-arginine transport system 2

The twin-arginine transport system (Tat) has the remarkable ability of transporting folded proteins across membranes while avoiding uncontrolled ion leakage. Tat is essential for plant photosynthesis and is required for bacterial pathogenesis. The mechanism by which folded proteins are translocated is poorly understood. This study presents a method to determine the structure of the TatA oligomer (A), which is responsible for the translocation step, and evaluates its impact on lipid bilayers. A combination of NMR data, distance constraints from DEER spectroscopy and molecular modelling (Rodriguez, F.; Rouse, S. L.; Tait, C. E.; Harmer, J.; De Riso, A.; Timmel, C. R.; Sansom, M. S. P.; Berks, B. C.; Schnell, J. R. *PNAS* **2013**, 110, E1092–101) suggest a mechanism of protein translocation involving thinning and perturbing the membrane bilayer (B,C). The combined experimental and theoretical approach presented herein will be useful for structural analysis of other oligomeric proteins that weakly assemble in membranes.



(A) inactive monomeric form of TatA, (B) Interactions with TatBC/substrate complex leads to thinning and distortion of the bilayer, (C) pulling of substrate protein into the membrane and rupturing the membrane (Copyright 2013 National Academy of Sciences, USA).

Formation of World's first Tetraazetidine (4-Membered Nitrogen Ring) Identified by EPR * 3

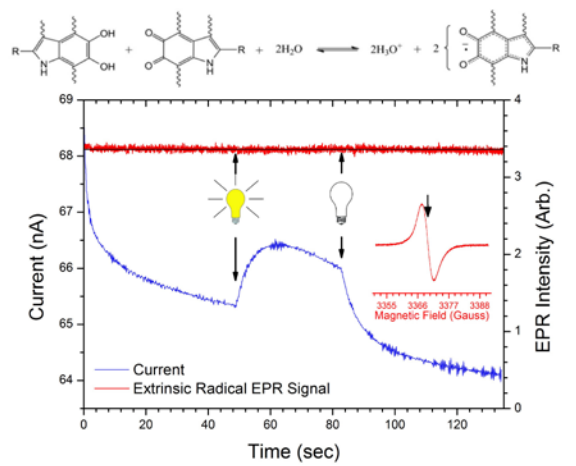


Researchers at Griffith University (David Camp, Marc Campitelli and Ian Jenkins) and the University of Queensland (Graeme Hanson) have synthesized and characterised a tetrazetidinetetracarboxylate radical cation, containing the elusive cyclic N_4 ring system. The radical is formed from diisopropylazodicarboxylate (DIAD) and triphenylphosphine (as catalyst) at 0–25 °C (*J. Am. Chem. Soc.*, **2012**, 134, 16188–16196). Electron paramagnetic resonance (EPR) spectroscopy revealed a 9-line spectrum, with hyperfine coupling constants indicative of four almost magnetically equivalent nitrogen atoms. The radical species was surprisingly long-lived, and could still be observed several hours after generation and standing at 25 °C. The structure was confirmed by DFT calculations. The lowest energy conformation of the N_4 ring was slightly puckered, with the alkyl carboxylate groups all trans and the four carbonyl groups aligned in a pinwheel arrangement around the ring. The reason for the magnetic inequivalence of the nitrogens is presented as a JACS Image Challenge. Analogous results were obtained with the original Mitsunobu reagents, Ph_3P and diethyl azodicarboxylate (DEAD), but not with Ph_3P and di-*tert*-butyl azodicarboxylate. A mechanism is proposed based on a radical version of the Rauhut-Currier or Morita-Baylis-Hillman reactions.

* Reprinted with permission from: Camp, D.; Campitelli, M.; Hanson, G.R.; Jenkins, I. *J. Am. Chem. Soc.*, **2012**, 134, 16188–16196. Copyright 2012, American Chemical Society.

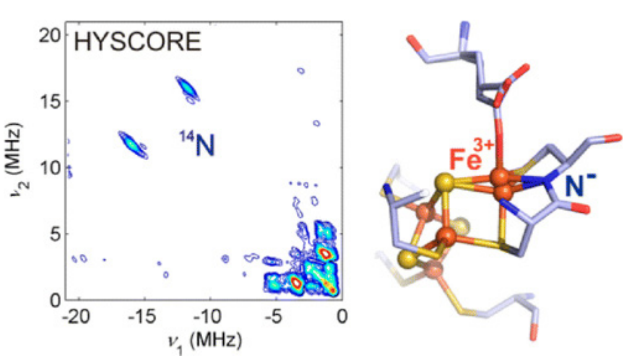
Role of semiconductivity and ion transport in the electrical conduction of melanin 4

Melanins are pigmentary macromolecules found throughout the biosphere that, in the 1970s, were discovered to conduct electricity and display bistable switching. Since then, it has been widely believed that melanins were naturally occurring amorphous organic semiconductors. An international multidisciplinary research team involving Dr. Mostert, Assoc. Prof. Powell, Prof. Hanson, Prof. Gentle and Prof. Meredith (The University of Queensland), Dr. Pratt (ISIS Facility, Rutherford Appleton Laboratory, UK) and Prof. Sarna (Jagiellonian University, Poland), have utilized electrical photo-conductivity, muon spin relaxation, and photo-EPR measurements of solid state melanin as a function of environmental humidity to show that hydration of melanin shifts the comproportionation equilibrium (below) so as to dope electrons (semiquinone) and protons into the system (Mostert, A.B.; Powell, B.J.; Pratt, F.L.; Hanson, G.R.; Sarna, T.; Gentle, I.R.; Meredith, P. *Proc. Natl. Acad. Sci. USA*, **2012**, 109, 8943–8947). The equilibrium explains why melanin at neutral pH only conducts when "wet" and suggests that both carriers play a role in the conductivity. Understanding melanin as an electronic-ionic hybrid conductor rather than an amorphous organic semiconductor opens exciting possibilities for bioelectronic applications such as ion-to-electron transduction given its biocompatibility.



EPR studies of the Fe-S clusters in the O_2-tolerant [NiFe]-hydrogenase Hyd-1 from *E. coli*, and characterization of the unique [4Fe-3S] cluster 5

The unusual [4Fe-3S] cluster proximal to the active site plays a crucial role in allowing a class of [NiFe]-hydrogenases to function in the presence of O_2 through its unique ability to undergo two rapid, consecutive one-electron transfers. This property helps to neutralize reactive oxygen species. To probe the Fe-S relay, EPR studies were conducted on the O_2-tolerant hydrogenase Hyd-1 and samples with point mutations at the clusters (Roessler, M. M.; Evans, R. M.; Davies, R. A.; Harmer, J.; Armstrong, F. A. *JACS* **2012**, 134 (37), 15581–15594). Reduction potentials determined by potentiometry implicate a mechanistic role for the medial $[3Fe\text{-}4S]^{+/0}$ in O_2-tolerance. Concurrent with the Hyd-1 crystal structure, EPR data for the 'superoxidized' P242C variant reveal two conformations of the proximal $[4Fe\text{-}3S]^{5+}$ cluster, with X-band HYSCORE showing a large ^{14}N hyperfine coupling attributed to one conformer that characterizes an unusual bond between one Fe (Fe_4) and the backbone amide-N of cysteine-20, providing conclusive evidence for a valence-localized Fe^{3+} in the superoxidized state, whose formation permits an additional electron to be transferred rapidly back to the active site during O_2 attack.



BeJEL –
Berlin's new EPR hub

BeJEL initiators (from left to right) FUB's executive vice president Monica Schäfer-Korting, Robert Bittl, Klaus Lips, Thomas Risse and HZB's scientific manager Anke Kaysser-Pyzalla during the lab opening ceremony.

April 11th 2013 EPR researchers from Free University Berlin (FUB) and Helmholtz Centre Berlin for Energy and Material Research (HZB) were celebrating the opening of the Berlin Joint EPR Lab (BeJEL). Dedicated to EPR research on energy materials and proteins, BeJEL, will merge long standing EPR competence and world wide unique EPR instrumentation up to THz frequencies.

Berlin's reputation as focus of fascinating EPR research has found its institutional equivalent in the foundation of BeJEL. During the last decades EPR groups at Berlin's universities continued to play a leading role in the development of novel EPR methods and their application in physical chemistry and protein research. This progress was paralleled by Berlin based non-university research centres Fritz Haber Institute and HZB, who started somewhat later their own dedicated EPR programs on surface and photovoltaic research. Parallel development of novel EPR approaches in bio and material sciences lead to stunning progress in the respective fields of applications.

In live sciences the advent of high resolution pulsed multi frequency and multi resonance EPR methods in combination with novel density functional theory methods lead to important new insight into the structure function relationship of vital proteins. At the same time material scientists were able to unravel crucial details about function determining paramagnetic sites in catalytic and photovoltaic materials by the employment of dedicated EPR experiments at high temperatures or very low pressures, novel synchrotron based broadband EPR methods and indirect detection techniques like pulsed optically and electrically detected magnetic resonance. Only very recently these strong communities formed networks and joint research programs for the development and application of novel EPR approaches. The vision of BeJEL is to take up this momentum, bundle methodological breakthroughs in different fields of EPR spectroscopy and create an interdisciplinary platform for EPR researchers, where novel experimental EPR approaches can be developed and applied. The vision and need of such an approach involving cutting edge spectroscopy and theory was outlined in an intriguing keynote lecture by Frank Neese, director at the newly founded Max Planck Institute for Chemical Energy Conversion.

Within BeJEL new synergetic routes of research may now be pursued, based on the complementary competence of the BeJEL groups headed by Robert Bittl, Klaus Lips and Thomas Risse in the fields of protein, semiconductor and catalysis research. "The common know-how, which will be bundled in the new lab significantly strengthens Berlin's leadership in material and energy research" Anke Kaysser-Pyzalla, HZB's scientific manager, stated during the opening ceremony. BeJEL's infrastructure provides the possibility to carry out experiments on more than a dozen EPR spectrometers including cutting edge pulsed/cw S-, X-, Q-, W-band and 263 GHz EPR/ENDOR and EDMR spectrometers and a world wide unique Frequency-Domain Fourier-Transform THz-EPR spectrometer based on coherent synchrotron radiation. In the lab opening FUB's executive vice president Monica Schäfer-Korting outlined that the new laboratory will strengthen FUB's and HZB's research and teaching profile and attract further outstanding scientists. In a first recruiting initiative the BeJEL partners will hire a new junior professor for EPR research in photovoltaic and photocatalysis research.

Alexander Schnegg

Are you interested to become a member of the International EPR (ESR) Society? Please find the registration/information form for new/continuing members of the IES and non-credit-card payment instructions for individual members on this Web site: www.epr-newsletter.ethz.ch/contact.html

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

IXth International Workshop on EPR in Biology and Medicine
Krakow, Poland, 7–10 October, 2013

www.eprworkshop.mol.uj.edu.pl

The Workshop will review progress in EPR instrumentation and methodology and cover selected topics of biomedical applications of advanced EPR spectroscopy, such as metals in biology, distance measurements by site-directed spin labeling, synthesis and use of new spin labels and spin traps in biological research, reactive oxygen and nitrogen species and oxidative damage, EPR imaging, oximetry, free radicals and excited state in photobiology.

Preliminary program:

- Recent advances in EPR instrumentation and methodology – organized by W. Froncisz
- Metals in Biology – organized by W. Lubitz
- Distance measurements by site-directed spin labeling – organized by G. Jeschke
- New spin traps, spin probes and fluorescent probes for detecting reactive oxygen species – organized by A. Sikora
- Spin trapping studies: an update – co-organized by M. Davies and R. Mason
- Hyperpolarized MRI and Metabolomics – co-organized by C. M. Krishna and B. Kalyanaraman
- Advances in lipids and membrane biophysics – organized by W. K. Subczynski
- In vivo EPR imaging and EPR oximetry – co-organized by H. J. Halpern and P. Kuppusamy
- Oxidative stress –modification of proteins and other biomolecules – organized by G. Bartosz
- Free radicals and excited states in photobiology and photomedicine – co-organized by T. Sarna and L. Weiner
- Detection of Reactive Oxygen and Nitrogen Species – organized and chaired by E. Ruuge

The meeting should provide great opportunities for exchanging new ideas and research experience and facilitate participation of students and post-doctoral fellows in this important scientific event. We look forward to meeting you in Krakow in October!

Conference Co-Chairs:

Prof. Balaraman Kalyanaraman, Medical College of Wisconsin, Milwaukee, WI, USA; Prof. Wolfgang Lubitz, Max Planck Institute for Chemical Energy Conversion, Mulheim, Germany; Prof. Tadeusz Sarna, Jagiellonian University, Krakow, Poland

42nd Southeastern Magnetic Resonance Conference
Florida State University, Tallahassee, Florida, October 11–13, 2013

http://semrc2013.magnet.fsu.edu

Southeastern Magnetic Resonance Conference is held every year and rotates among various locations in the southeastern United States and has a long history of bringing together leading scientists to discuss the latest developments in NMR, EPR, and MRI. The focus of the conference is the exchange of ideas and recent magnetic resonance research highlights, including new applications and technique development. Particular emphasis is placed on activities in the region. Traditionally, the SEMRC puts a special emphasis on the participation of young scientists (students and postdocs) and provides excellent opportunities to exchange new exciting results with their peers as well as with the leaders in the field.

The 2012 SEMRC was hosted by North Carolina State University in conjunction with the Southeastern Regional Meeting of the American Chemical Society (SERMACS-2012) and held in Raleigh, North Carolina. The National High Magnetic Field Laboratory, along with Florida State University, are pleased to bring SEMRC back to Florida and to support the conference again, as it did in 1995, 1999, 2003 and 2008.

Conference Organizing Chairs: Sam Grant, Steve Hill, Likai Song, Timothy Cross, and Sungsool Wi

Conference Organizing Committee: Karol Bickett, Kim Mozolic, Alison Johnson, and Colleen Davis

Email: semrc2013@magnet.fsu.edu

POSITIONS

Postdoctoral Associateships in Magnetics at NIST

We offer postdoctoral opportunities in magnetics at the National Institute of Standards and Technology in Boulder, Colorado, USA. Annual salary is $65,600 plus benefits. Appointments are for two years. Application deadlines are 1 February and 1 August annually (but inquire earlier).

The application process is competitive. Typical successful applicants have a strong research background and academic record. Letters of reference and an original research proposal are required.

U.S. citizenship and a background investigation are required (no exceptions).

www.nist.gov/pml/electromagnetics/magnetics

Ohio State University – EPR Center Molecular Imaging Program

A postdoctoral position is available working on the synthesis of molecular probes utilizing stable radicals for biomedical spectroscopy and imaging.

Strong background in synthetic chemistry, compound purification and characterization required. Knowledge of radical chemistry and EPR spectroscopy desirable.

Please send CV, select publications, and statement of research interests to Jay.Zweier@osumc.edu. OSU is an Equal Opportunity Employer.

Ohio State University – EPR Center

A position is open for an electrical engineer with experience in EPR equipment construction and repair. Ongoing projects include development and construction of in vivo EPR systems, EPR/NMR coimaging and PEDRI.

Strong background in electrical engineering, and RF/microwave electronics required. Knowledge of CW and pulsed EPR spectroscopy is desirable.

Please send CV, select publications, and statement of research interests to Jay.Zweier@osumc.edu. OSU is an Equal Opportunity Employer.

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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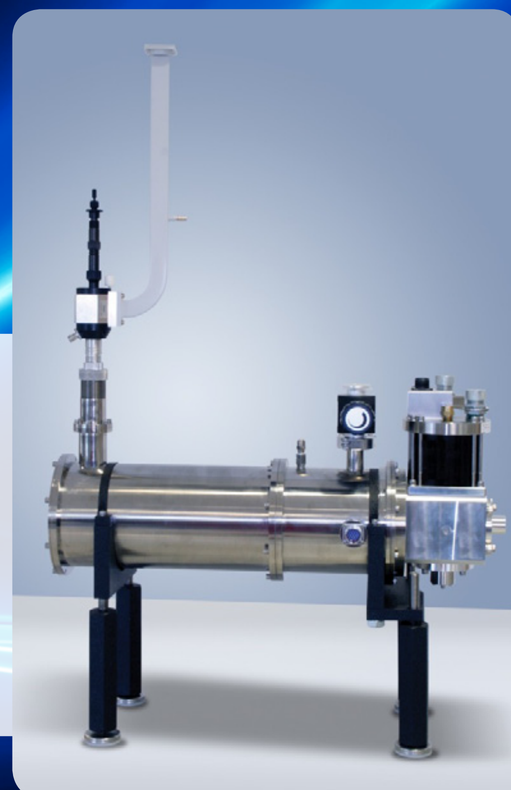
Cryogen Free EPR VT Systems

Cryogen-free EPR sample cryostats for variable temperature operation are now available for X-Band waveguide cavities and for Flexline probes with base temperature options down to 4 K

Flexline cryostat



Waveguide cavity cryostat

- All systems allow rapid sample exchange
- Variable temperature range: base – 300K
- Rapid cool down (<60 min to base temperature)
- Optical access
- Vibration isolation for CW Spectroscopy
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