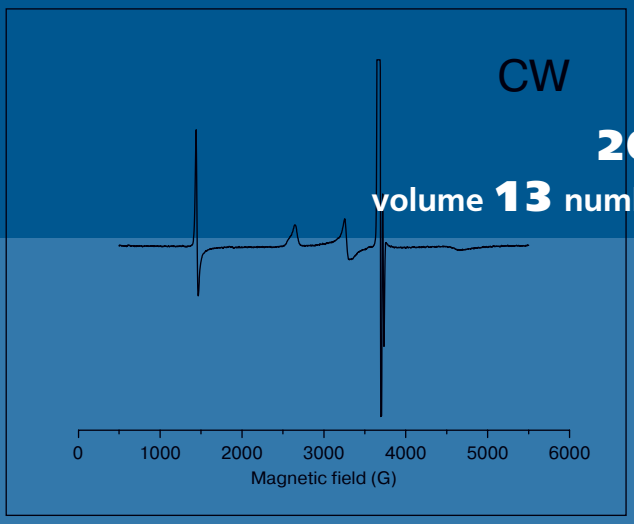
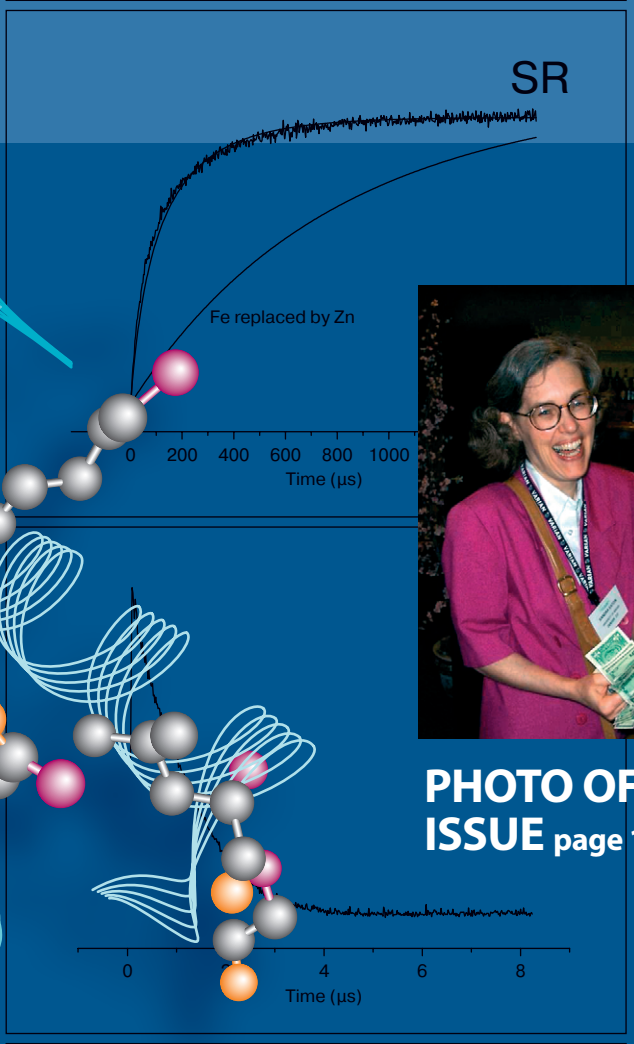
epr newsletter

2003
volume 13 number 3





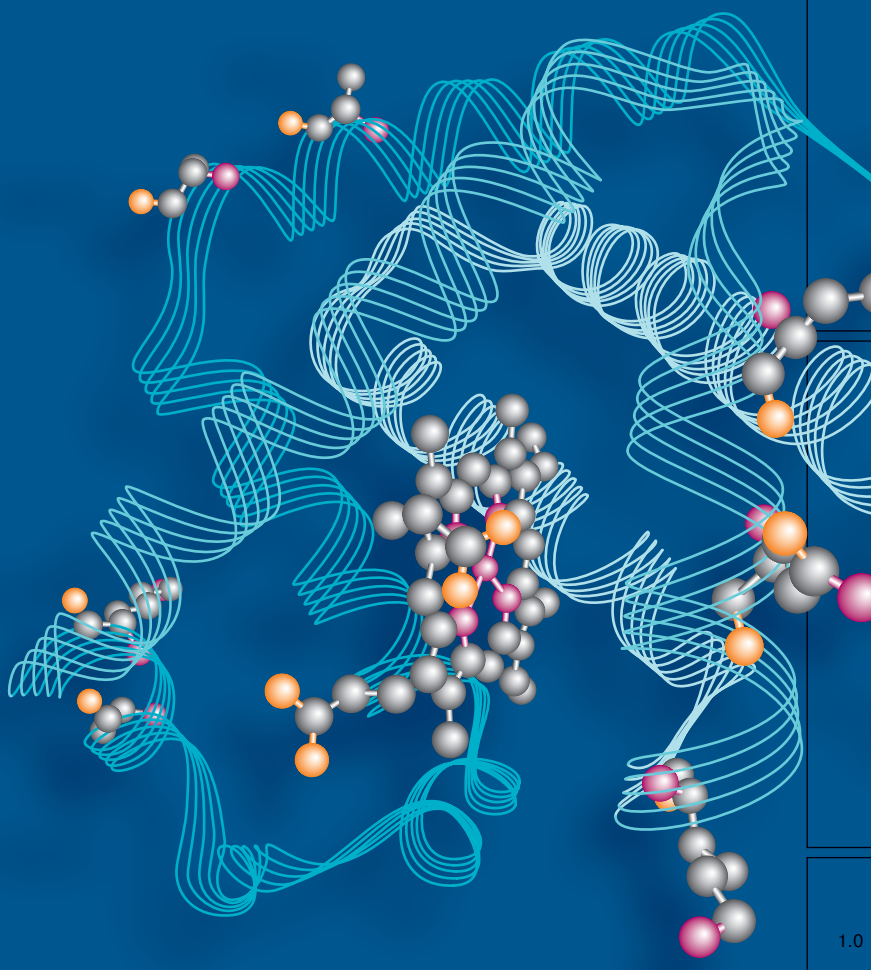
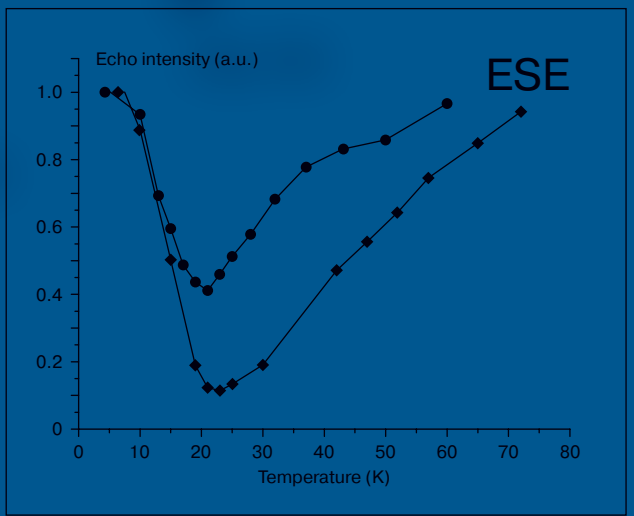


PHOTO OF THE ISSUE page 18



The Publication of the International EPR (ESR) Society

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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, 31; Summer June, 30; Fall September, 30; Winter December, 31.

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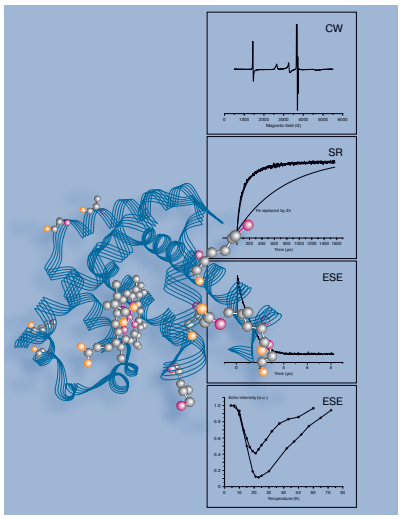

The cover picture illustrates research carried out in the group of Gareth and Sandra Eaton, the Bruker prize 2002 winners. It shows the structure of myoglobin, which is a model system for tests of methods to determine distances between the native heme center and spin labels attached to cysteines that are introduced by site-directed mutagenesis. The spectra shown with the protein structure illustrate the multiple EPR techniques that are used in the studies. CW spectra characterize the extent of spin labeling and the spin-state purity of the heme center. Saturation recovery measurements of the enhancement of the nitroxyl spin lattice relaxation time by the more rapidly relaxing heme are analyzed to determine the interspin distance. Electron spin echo decay curve shapes and intensities provide another approach to distance measurements.

epr newsletter

The Publication of the International EPR (ESR) Society

volume 13 number 3 2003

ETH
Eidgenössische Technische Hochschule Zürich
Swiss Federal Institute of Technology Zurich

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:
http://www.epr-newsletter.ethz.ch/contact.html

Editorial

Dear colleagues,

First things first, it was a pleasure to get numerous e-mail messages concerning our first double issue of the *EPR newsletter*. We are happy that you liked it. We received many comments ranging from "superb" to "a masterpiece", and are grateful to you for your high estimate of our efforts. The blush of delight is still alive on our cheeks. We do understand that these words are an encouragement to improve the newsletter. A somewhat skeptic statement: "great, but we will see if they can hold this level..." also reached our ears. It was very sobering to hear this comment.

Will we be able to improve on our previous efforts? To get the answer to this question one has to be a member of the IES. This is a necessary but not sufficient condition. IES needs money to publish the newsletter. No money, no newsletter. Thus, it is vital that the members of the IES pay their dues on time.

The minutes of the General Meeting of the IES held in July 2003 (a letter from the President, Secretary's report, Treasurer's report) are included in this issue and provide detailed information about the current condition of the IES affairs. You also will have a unique opportunity to look into the inner world of a music composer, when reading Josef Heinzer's interview "Composing Music" in the "Another Passion" column. I was fascinated to learn from this interview that inspiration does not come by itself. It needs a little help and encouragement. I made another discovery in the article by Arthur Heiss, Ralph Weber and John Weil, "Memories of the Hutchison Jr. Group", in the "*EPR newsletter* Anecdotes" column. For years I have had e-mail correspondence with Clyde A. Hutchison Jr., a member of the Zavoisky Award Committee and then a member of the Advisory Zavoisky Award Committee. It never occurred to me that the numbers 1, 3 and 7 in the first part of his e-mail address, "c137", were not just a sequence of three odd primes, but the result of his fascination for the number 137. Really, one sees only what one knows. This article is nicely written and lets you taste the atmosphere in the research group of one of our greats. You will certainly enjoy the delightful picture of Sandy Eaton on p. 18. One current idea is to have a regular slot in the *EPR newsletter* with an amusing photo. You are welcome to send us such photos. Arthur Schweiger's column "For Your Perusal" keeps you busy with surfing in the ocean of the EPR-related literature. Conference reports in the respective column provide you with a feeling of being a participant of a conference even if you were not able to attend it. This especially refers to the Chianti conference report by Thomas Prisner. In 1997 I participated in the Chianti conference and I agree with Thomas that one gets addicted to the air of the Toscana fields and even if one never returns, one's memories live forever.

Welcome to this issue! Enjoy it!

Laila Mosina

IES Annual Meeting 2003

Held at the 26th EPR Symposium at the Hyatt Regency, Denver USA on July 29th 2003 commencing 17:00.

1 Attendance (36)

Members: S. S. Eaton, G. R. Eaton, W. E. Trommer, G. R. Hanson, B. Kalyanaraman, P. Kuppusamy, G. Jeschke, A. McKinley, R. Claridge, R. Morse, K. Madden, J. Weil, C. P. Scholes, B. H. Robinson, J. Pilar, H. Utsami, G. Malovichko, V. Grachev, J. M. Canfield, G. Maresch, L. Kispert, M. Ayaluru, D. Goldfarb, H. Halpern, M. Bowman, P. Lenahan, J. Y. Han, C. Felix, S. A. Fairhurst.

Non-members: C. Elsaesser, J. Michalik, A. Marek, Y. J. Jiang, S. Yerkes, D. Meyer, L. H. Sutcliffe.

Apologies were received from Yu. Tsvetkov, R. Mason, M. Brustolon, T. Takui and J. Pilbrow.

2 The Report of the General Meeting held on 31st July 2002 was accepted without comment

3 There were no matters arising from the 2002 General Meeting Report

4 President's Report (read by S. A. Fairhurst, Secretary IES)

Dear Colleagues,

On behalf of the IES Executive Committee and myself I would like to welcome all participants to the 2003 General Meeting of the IES and the 26th International EPR Symposium in Denver. I would like to express my deep gratitude to Professors Sandra and Gareth Eaton for including the General Meeting during this Symposium.

For many years this meeting in Denver has been the forum for presenting progress made in our discipline. During this meeting the IES Executive Committee will present the results of their activities during the last year. In summary these are: the transfer of the publication of the *EPR newsletter* to Kazan, a new version of our website, changes in the Society By-Laws for the IES Awards, and the transfer of the IES Office from the Illinois ESR Research Center to the National Biomedical ESR Center in Milwaukee. The Executive Committee has to deal with the general stability of the society and the soundness of its finances.

The theory and practice of EPR spectroscopy continues to develop and progress. This is exemplified by the brilliant work of our colleagues who are the 2003 recipients of our IES medals:

Silver Medal for Chemistry: Michael K. Bowman (Pacific Northwest National Laboratory, Richland, Washington, USA)

Silver Medal for Physics/Materials Science: Edgar J. J. Groenen (Leiden University, Leiden, The Netherlands)

Silver Medal for Biology/Medicine: Michael Davies (University of Sydney, Sydney, Australia)

Young Investigator Award: Stephan G. Zech (Columbia University, New York, USA)

Fellowship: Daniel Kivelson (University of California at Los Angeles, Los Angeles, California, USA)

I wish to congratulate all the laureates of the 2003 IES medals and I hope that all the participants of this meeting find it to be both stimulating and rewarding.

Prof. Yuri Tsvetkov, IES President

5 Secretary's Report (Shirley Fairhurst)

The Secretary reported that the IES Medallists would be presented with their medals in Denver (S. Zech), Lisbon (M. K. Bowman and E. Groenen) and Seattle (M. Davies). Daniel Kivelson was informed of his Fellowship a week or two before his death. A letter of condolence was sent on behalf of the Society to his widow.

New Awards By-Laws

The secretary explained that in line with the IES Constitution (see IES Society webpage), changes to the By-Laws could be made by the Executive committee. The Executive considered that in order to maintain the high esteem of the IES Awards it was now necessary to reduce their frequency. This was particularly relevant in view of the other medals and prizes available in Magnetic Resonance such as the Bruker, Zavoisky, Voevodsky and ISMAR Awards and Prizes.

The New Awards By-Laws

(changes underlined)

1 A Gold Medal shall be awarded, normally <u>tri</u>-annually, for distinguished contributions to EPR (ESR) Spectroscopy.

2 Four Silver Medals shall be awarded, normally <u>tri</u>-annually, for significant contributions to EPR (ESR) Spectroscopy in the areas of Biology/Biomedicine, Chemistry, Physics/Materials Science and Instrumentation.

3 A Young Investigator Award shall be made, normally <u>bi</u>-annually, for outstanding contributions to EPR (ESR) Spectroscopy by a young scientist in any of the categories listed in clause 2. Nominees should be under the age of 35 years <u>on the 1st of July of the year of the award</u>. <u>The date of birth of the nominee must be included in the nomination</u>. The nominee will ordinarily be at the post-doctoral level. Only in exceptional circumstances will either doctoral candidates or junior faculty members be considered for this Award.

4 Fellowship of the Society may be conferred on individuals who have made influential and distinguished contributions to the practice of EPR (ESR) Spectroscopy and its welfare over a long period.

5 All nominations are to be sent to the President.

6 The President, the Vice-Presidents and the Immediate Past President shall together be responsible for preliminary vetting of nominations, to ensure that inappropri-

ate nominations are not pursued and that overlap between medal categories is dealt with before forwarding nominations to the separate Awards Committees.

7 Nominations shall be invited from all IES Members via the official Bulletin or *EPR newsletter* of the Society.

8 Nominations may also be sought by the Executive from one or more kindred Societies as determined from time to time.

9 All nominations must be accompanied by a 100–150 word citation in support of the nomination and, in the case of the Young Investigator Award, nominees will be asked to provided copies of two recent published papers which in their judgement represents their best work. No nomination can be considered without the citation.

10 No Award Committee Member may vote on the nomination of a collaborator or member of their own research team. Appointment to the Awards Committees is governed by Article VII, Sect. 4.

11 The Executive may, at its discretion, liaise with other Award Committees and communicate, in confidence, names of those under consideration for the IES Gold Medal award in any year.

It is noted that these By-Laws are subject to Article VI, Sect. 2 which states "The President shall have the power of veto over any Award".

Awards Committees

1 Committees for Silver Medal Awards, each consisting of a Chairperson, and three other members, shall be appointed by the Executive.

2 The Gold Medal Award Committee shall consist of a Chairperson, to be appointed by the Executive, and the Chairpersons of the Silver Medal Award Committees as ordinary members.

3 Membership of all Awards Committees shall be for a period of four years. It shall be the responsibility of the Secretary to advise members of Awards Committees as to their terms of office.

4 Members of all the above Awards Committees may be re-appointed for only one additional four-year term.

5 The Committee responsible for the Young Investigator Award and the appointment of Fellows of the Society shall consist of the President, the Vice-Presidents and the Immediate Past President.

IES Awards Schedule 2004–2009

2004 No medals
2005 Gold + Instrumentation + Young Investigator
2006 Biology/Biomedicine + Chemistry
2007 Physics/Materials Science + Young Investigator
2008 Gold + Instrumentation
2009 Biology/Biomedicine + Chemistry + Young Investigator

EPR newsletter

The new *EPR newsletter* was announced and Laila Mosina (Kazan) the new editor's first '*letter from the editor*' was presented. As this was available at the beginning of the *EPR newsletter* (13/1-2) it will not be reproduced here. The new full colour cover was shown and upcoming articles highlighted. All present were reminded that Laila relies on input from the membership and volunteers were called for to write more '*another passion*', '*hints and tips*' articles etc as well as notices of meetings and advertising of positions available. The *EPR newsletter* has its own website (http://www.epr-newsletter.ethz.ch). Special thanks go to Arthur Schweiger's group at ETH in Zurich for their efforts in setting up and operating this site which will be launched in the early August.

6 Treasurer's Report (Chris Felix)

The Treasurer noted that the IES Office has now relocated to:

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Treasurer
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Department of Biophysics
Medical College of Wisconsin
8701 Watertown Plank Road
Milwaukee WI 53226, USA
Phone: (414) 456-4008
Fax: (414) 456-6512
E-mail: cfelix@mcw.edu

He then presented the following report on the society's finances (see Table).

Chris noted that there had been some one off costs in 2003 from setting up the website and secure payment system. The financial records of the Society are currently be-

Table. Report on the IES finances.

Year 2002. Full Year Accounts (unaudited)		
Balance January 1, 2002		$ 6843.34
Income		$ 14777.18
Expenses:		
University of Illinois	$ 4685.96	
Banking expenses	$ 541.58	
Awards	$ 1000.00	
Award Costs (medals)	$ 150.00	
State of Illinois	$ 8.00	
	$ (6385.54)	
Balance December 31, 2002		$ 15234.98
Year 2003. Half Year Accounts (unaudited)		
Balance January 1, 2003		$ 15234.98
Income		$ 1805.00
Expenses:		
Newsletter	$ 2672.00	
Banking expenses	$ 257.77	
Web Gateway set up	$ 1139.25	
State of Illinois	$ 5.00	
	$ (4074.02)	
Balance June 30, 2003		$ 12965.96
Projected Budget for 2003		
Income		$ 19250.00
Expenses:		
Newsletter	$ 7000.00	
Administration	$ 7000.00	
Award Costs (medals)	$ 250.00	
Graduate Student Travel Awards	$ 5000.00	
	$ (19250.00)	

ing reviewed by an independent accountant. Results to be published later this year in the Society *EPR newsletter*.

Society's Website

Our new Society's website (ieprs.org) is about to be launched! (Note that esrsociety.org and eprsociety.org will also work.)

Features

Phase 1:

Online payment. Allows payment by members using credit card on a secure site. New members will be able to pay and become members online.

Phase 2:

Database online. Allows members to update their information online.

Secure database. Members will use passwords to log onto the private portion of the site. Member information (such as e-mail addresses) will NOT be available to non-members (less spam).

EPR newsletter access. Online access to all *EPR newsletters* for members.

7 Any Other Business

Daniella Goldfarb asked if the IES could coordinate some events targeted for students, perhaps in the form of workshops or summer schools and mentioned that over 100 students attended a recent EU School (see *EPR newsletter* 13/1-2). Could the IES have such a school – maybe every 3 years? Shirley Fairhurst said that supporting students was one of our aspirations but money had been tight in the last few years. It would be difficult for the IES to organise such a meeting with officers distributed worldwide. Chris Felix said that the new *EPR newsletter* might help attract sponsors and lead to a better cash-flow for the society. Gunnar Jeschke asked if the US could fund a school similar to the EU School. Gareth Eaton said that he was trying to obtain funding. Overall, the feeling of the meeting was that whilst the IES might be able to provide limited financial support and advertise schools and workshops it was beyond our remit to run them.

W. E. Trommer asked if it was necessary to hold a vote on the By-Law changes. Shirley Fairhurst explained that according to the IES Constitution By-Laws could be changed by the Executive without a vote, but Constitution changes required a postal/email ballot of the whole society.

Reef Morse thanked members for responding to messages on his EPR network, which would continue. To join send an e-mail to majordomo@xenon.che.ilstu.edu. In the body of the e-mail, put only the words: *subscribe epr-list*.

Shirley Fairhurst thanked Yuri Tsvetkov (President), Ron Mason, Marina Brustolon and Takeji Takui (Vice Presidents), Chris Felix (Treasurer), John Pilbrow (Past President) and Laila Mosina (*EPR newsletter* Editor). Additionally, thanks go to the Awards Committees members and chairs for their efforts, to Corporate Sponsors, to Bruker (for covering the cost of distributing the *EPR newsletter*) and to all paid up members for without you we would have no society. A special thanks to all those who attended the meeting.

The meeting closed at 17:25.

The 2003 IES Young Investigator Award to Stephan G. Zech

Stephan Zech earned his doctoral degree (*summa cum laude*) on "Pulsed and Transient Electron Paramagnetic Resonance Spectroscopy on Light-Induced Radical Pairs in Photosynthetic Reaction Centers" in 1998 at the Max-Volmer-Institute of the Technical University of Berlin, Germany. In the following year he received the Schering Prize and the Carl-Ramsauer Award in Germany for the excellent scientific results presented in his thesis. After his PhD he continued his career on a research position in the physics department of the Free University of Berlin.

Stephan Zech has contributed significantly to the understanding of structure and dynamics of light-induced radical pairs occurring in the reaction centers of bacteria and in photosystem (PS) I and II of plants. He applied and further developed laser-induced nanosecond time-resolved transient EPR at X-, Q- and W-band frequencies complemented by pulsed EPR techniques (out-of-phase electron spin echo envelope modulation) to determine relative orientations and distances in the radical pairs. He also employed these methods to investigate structural changes of the radicals in the pro-

Stephan Zech and Shirley Fairhurst at the 26th International EPR Symposium, July 27–31, 2003, Denver, Colorado, USA

cess. Experiments were performed both in frozen solutions and, for PS I, for the first time even in single crystals. Most remarkable were his experiments on PS II in liquid solution (using a flow system), in which he detected two consecutive radical pairs, living on a nano- and microsecond time scale, and determined the respective distances. This information was instrumental in the structural determination of the functional states in this highly complex membrane protein and helped in the first X-ray structure analysis of PS II published in 2001.

The list of publications and invited talks of Stephan Zech is impressive for a young scientist. He is currently continuing his scientific career at Columbia University, New York, where he is extending his field of research to the NMR study of photosystems.

The 2003 IES Silver Medal for Physics/Materials Science to Edgar J. J. Groenen

Edgar Groenen has been selected by the International EPR Society to be the 2003 Silver Medallist in Physics/Materials Science, an acknowledgement of his distinguished career in EPR theory and applications to the field of (bio)molecular physics.

Edgar Groenen was awarded his PhD degree from the University of Leiden in 1977. He then moved to the Royal Shell Laboratory in Amsterdam where he investigated photovoltaic solar cells. In 1985 he returned to Leiden, joining the staff at the Department of Molecular Physics. In 2003 he was appointed Professor of Experimental Physics, Leiden University. His research focuses on the study of electronic structure in relation to geometric structure and the change of these upon electronic excitation.

Edgar Groenen is one of the pioneers in the application of 95 GHz EPR, ENDOR and ESEEM spectroscopy. Two outstanding results have been obtained, in two very different fields of research employing these new techniques. Firstly, from a profound study of the photo-excited triplet state of C_{60} and C_{70} molecules he could deduce the character of the electronic excitation and the geometrical distortion of these molecules. Secondly, he investigated the electronic structure of the copper site in blue-copper proteins in single crystalline form. The results of this study demonstrate the power of 95 GHz EPR, ENDOR and ESEEM techniques for elucidating the structure of these metalloproteins. The expectation is that eventually the results of this project will lead to a quantum-mechanical description of the electron-transfer process in which the copper site in blue-copper proteins is involved.

Edgar Groenen (left) and Michael Bowman (right) at the 5th Meeting of the European Federation of EPR Groups, September 7–11, 2003, Lisbon, Portugal

The 2003 IES Silver Medal for Chemistry to Michael K. Bowman

Michael K. Bowman has been selected by the International EPR Society to be the 2003 Silver Medallist in Chemistry, an acknowledgement of his distinguished career in EPR theory, instrumentation, and applications to the field of chemistry and biological chemistry.

After receiving his undergraduate degree at the University of Kansas, Mike did his PhD work (1971–1975) with Larry Kevan at Wayne State University, where he began his career in rigorous EPR studies, focusing largely on trapped electrons and hydrogen atoms in glasses. Mike then took an NSF Postdoctoral Fellowship at Argonne National Laboratory working with James Norris and coworkers. It was at Argonne where Mike began to apply advanced EPR methods to the study of photosynthetic radicals and radical pairs. Following this initial postdoctoral appointment, Mike stayed at Argonne as a research scientist, and in this period he greatly advanced our knowledge of the primary events in photosynthesis through pioneering applications of pulsed EPR, RYDMR, and related advanced EPR methods. Since 1975 Mike has had constant collaboration with Novosibirsk scientists on the applications of modern pulsed ESR to chemical problems.

In 1992 Mike moved to the Pacific Northwest National Laboratory, where he contin-

ues to pioneer pulsed EPR methods and the associated spin physics theory with applications to interesting biological systems such as the Rieske Fe-S cluster of cytochrome b6f and bc1 oxidoreductases.

In addition to his direct scientific contributions, Mike has greatly aided the EPR community through his many collaborations and by the willing advice he has provided to so many of us over the years.

Mike's long-time colleague James Norris nicely summarizes why Mike so richly deserves the Silver Medal in Chemistry: "*What really separates Mike from the crowd is his deep, combined theoretical understanding of spin dynamics, spin chemistry and magnetic resonance instrumentation. In that broad arena, Mike has no equal*".

The 2003 IES Silver Medal for Biology/Medicine to Michael Davies

Michael Davies' Silver Medal for Biology/Medicine is presented at the 10th Annual Meeting of the Society for Free Radical Biology and Medicine, November 20–24, 2003, Seattle, Washington, USA. Full citation for it will be given in a future issue of the *EPR newsletter*.

Etienne Goovaerts – the New President of the European Federation of EPR Groups

At the 5th Meeting of European Federation of EPR Groups (EFEPR) in Lisbon Etienne Goovaerts was elected as the new President of the EFEPR. Etienne Goovaerts, Professor in the Department of Physics at the University of Antwerp, is working with magnetic resonance and optical spectroscopical methods on the investigation of solid-state materials, such as ionic and alkali-halides crystals, photographic materials, organic semiconductors, quantum dots and high-spin organometallic complexes.

He studied physics at the University of Antwerp, where he received his PhD in 1981 for his EPR and Raman scattering investigations on point defects in alkali halides under the supervision of Dirk Schoemaker. He continued to work in this area as postdoc and research fellow and started additionally to work in the field of ultrafast pulsed laser spectroscopy in the picosecond and femtosecond range. In 2002 he was appointed Professor in the Physics Faculty of the University of Antwerp. In the end of 2002 he was strongly involved in the organisation of the last European EPR 'Summer school' held in Retie, Belgium.

Etienne Goovaerts is the successor of Daniella Goldfarb (Weizmann Institute), who was President of the EFEPR the last 3 years. The whole community thanked her very much for her very productive and successful involvements within this time, as, for example, the organization of the recent European EPR school, the Lisbon Meeting and the Web-site.

Thomas Prisner

John Maher – New Secretary of the RSC ESR Group

I became Secretary of the RSC ESR Group at the April Committee Meeting of the Group (held in Manchester), I consider this an honor. I retired from Bristol University, School of Chemistry at the end of July 2003, so that I should have more time to devote to the job than a younger person. My two main remits are to organize the Annual ESR Conferences, and also to establish a website for the ESR Group. We have registered the RSC ESR Group's name on the Internet, thus the website is now at http://www.esr-group.org.uk (also http://www.epr-group.org.uk). I'm working on the site at present and it should have details of our Warwick conference plenary lectures by the time this newsletter appears. I discovered the Web back in 1993, and ever since have been an evangelist for this amazing new medium! I'm involved with the JCAMP group on IUPAC to try to establish a standard for the storage and transfer of EMR spectra (http://www.jcamp.org), possibly causing some arguments by trying to get 'EMR' accepted as a generic name. My remaining scientific interests are: the interpretation of the ENDOR spectra of a large number of molybdenum pyrazoylborates (prepared in Bristol by Jon McCleverty and Michael Ward's students, and measured by Damien Murphy and Robert Farley in Cardiff); work with Jamie Jeremy and Nilima Shukla of the Bristol Heart Research group on the influences of caeruloplasmin on heart disease (http://www.chm.bris.ac.uk/motm/caeruloplasmin/). I have ceased experimental work but have promised to keep an eye on the aged Bristol ESP300E machine – for emergencies with the old lady! The machine is now in the very capable hands of Chris Adams. In passing, I think that this machine may now qualify for a long-running award. Since it was commissioned in January 1991, apart from occasional interruptions (a building move, various repairs, and holidays) we leave it on 24/7. Who else runs their machine in this way?

I am conducting the ESR Group business from home, so that if you phone me you may speak to my wife Geraldine. Spare time in retirement?! Cooking, cycling, Morris dance, music, reading and walking! (http://users.argonet.co.uk/users/johnmaher/)

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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.

Awards

The Nobel Prize in Physiology or Medicine 2003

Paul C. Lauterbur
University of Illinois Urbana, USA
and
Peter Mansfield
University of Nottingham, Nottingham, United Kingdom
for their discoveries concerning "magnetic resonance imaging"

The Zavoisky Award 2003

Wayne L. Hubbell
University of California Los Angeles, USA
for his work in electron paramagnetic resonance and, in particular, the development and applications of the site-directed spin-label method

Fellow of the IES 2003

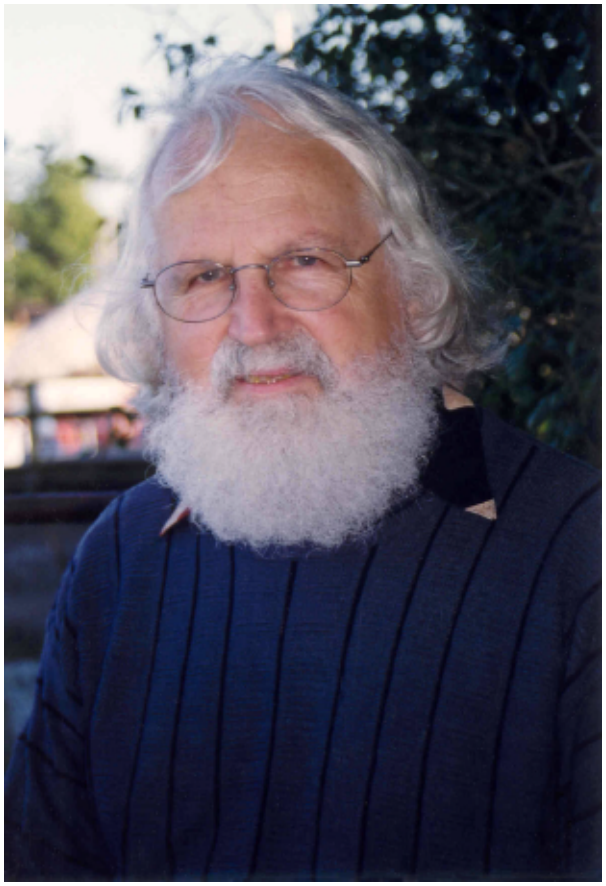
Harry Kurreck
Freie Universität Berlin, Berlin, Germany
in recognition of his outstanding contributions to EPR and ENDOR spectroscopy on organic radicals, multispin systems and radical pairs, in particular in photosynthetic electron-transfer model systems

The Bruker Prize 2004

Wayne L. Hubbell
University of California Los Angeles, USA
for his outstanding work on the technique of site-directed spin labeling, a powerful tool for the study of protein structure and dynamics, in particular his work on light-activated rhodopsin, the visual pigment in photoreceptor cells of the retina

Detailed information on these awards will be given in a future issue of the *EPR newsletter*

Many of us are familiar with the EPR work of Josef Heinzer or look back on a personal meeting with him. His paper about "Fast computation of exchange-broadened isotropic ESR spectra" published in Molecular Physics in 1971 has been cited 79 times and is considered as a key paper in the field of spectra simulation. However, since long Josef Heinzer realized that for him science cannot be the only true thing. He developed also another passion, music! Since his retirement in1994 he is in a position to address most of his time to this other passion. With the years the list of Josef Heinzer's compositions has become very impressing (see http://homepage.mac.com/josefheinzer). Without counting the early works, till now he composed 22 chamber music and 13 orchestra works including four symphonies, a concerto for cello and orchestra, two works for piano trio and orchestra, a concerto for piano and orchestra and a concerto for trumpet, bassoon and orchestra.



Another Passion

Composing Music: Josef Peter Heinzer

EPR newsletter*: *You did your graduate studies at ETH in Zurich in the research group of Fabian Gerson and finished your PhD in 1968. From 1969 till 1994 you were working at the Laboratory of Organic Chemistry at ETH in the group of Jean F. M. Oth. What was your first encounter with chemistry?

Josef Heinzer: As a young boy, when I was ill and had to stay at home, I ordered a chemistry book from the Swiss National Library and gobbled it up as if it were a novel by Karl May. Later during a chemistry lecture at high school we learned how to mix sulfur and potassium chlorate. One day I tried to do an experiment of my own and prepared black (Bertollet) silver fulminate. I better do not tell you here how this material can be produced! When I touched the black precipitation I have made, it exploded and blew the alkaline solution into my eyes. This seemed to be the trigger, spending five days in the hospital I decided to study chemistry.

How did music come into your life?

I was born in Stein am Rhein, a little town in Switzerland. Often on Sunday my father played Swiss country music on his self-constructed concert zither. I loved listening to this music and learnt also to play the instrument. In my time as a youngster (I was born in the end of the first half of the 20th century), the radio was almost the only possibility for me to listen to music. At that time, I liked Swiss country music. I even remember running home from school in order not to miss the broadcastings. Gradually my interests in music turned to Johann Strauss and to Johann Sebastian Bach, because I liked the sound of the harpsichord being similar to the one of the zither.

How did your involvement in music develop?

At first I did not like the piano. One day I came across a piano music score written by Busoni in the manner of Bach. I tried to play it on the zither, but did not succeed. At that time I went now and then to a blind gardener nearby, who was grinding astronomical telescope mirrors (Newton type)! In order to get the correct parabolic shape of the mirror he was working on, he had to have somebody to measure the difference between the radii of the inner and outer shape (Foucault method). This gardener had a piano and I asked him if he would allow me to play the instrument. He told me how to hold my hands above the keys. All the rest I had to do myself. Soon I could play the usual little piano pieces of Diabelli, Clementi, and others. After some time I wanted to have my own piano. Accidentally, I

got a chance to buy one for 50 Swiss Francs and I asked my father if I could place it in our best room. "I don't like to have a piano in my house" was his answer. However with the help of a friend I placed the piano under cover of darkness in the middle of father's workshop. After a couple of weeks my father started to become appreciative of the instrument and he even helped me to move it to our living room. Then I started to go to concerts with organ music by Bach and other old masters, and every year I visited the Bach festival in Schaffhausen. Meanwhile, I also discovered Haydn, and then Mozart.

After terminating the apprenticeship in the workshop of your father you moved to Zurich. What were you doing then?

I was controlling relays during daytime in a telephone factory and during the evenings I attended a school to prepare for the general qualification for university entrance. I always arrived too late at school because I wanted to play the piano a bit longer. Fortunately, my landlord had a piano adjacent to my room. I took piano lessons, and every evening I learnt something new. This was really a nice time. Only the chemistry teacher at school was boring. During school holidays I read the book he was teaching from, and after that I visited his lessons only when there was a chemistry test. I got away with this because I had to pay for the school myself. Later I studied chemistry at ETH (1960–1964). In order to finish the studies, one had to deliver four diploma theses (nowadays there is only one). I added a fifth private diploma thesis, my piano trio no. 0. Also during my PhD time I took piano lessons, this time with Amadeus Schwarzkopf at the Music Academy in Zurich.

How did you turn to composing music?

In 1972 I became acquainted with the violoncellist Doris Maria Sigrist. One day, Doris and I went to a concert in Zurich to listen to Bruckner's symphony no. 8. I was completely fascinated by the huge musical architecture of this symphony from the beginning to the end, and I never heard a slow movement with such a deep emotional expression. However, the real shock came after the music had stopped. I needed two years till I dared to listen to this music again. This was in the course of the time when Doris told me: "If you want to compose nine symphonies, you should start now". I started the other day and it took me five years to compose my first symphony, working on it in the evening only.

How does your mind function when you compose music?

This I do not know. But sometimes I have the feeling my brain works by itself and knows in advance what I have to compose and it stops me when I am doing something wrong or when I do not go along the lines it wants. The brain may oversee complicated situations, but it does not tell you directly what to do.

How does the inspiration come to you?

Inspiration does not come by itself, it needs a little help. When I start to compose a new piece of music I like to have something reminding me of an experience or an event, which played a more or less important role in my life. I like the underwater world very much. Being in this world is fantastic but one has to pay for it. There is always a latent feeling of an upcoming danger which might even be life-threatening. This ambivalent feelings are excellent sources for producing inspiration, at least for me. Poems or dramatic texts are very good sources of inspiration, too. Pictures, photos or even images taken from a video remind me of past experiences. I wrote some music for voice and piano trio, here the text replaced the picture. Anyway, I need something to keep my imagination going.

How do you compose music?

The beginning of a piece of music is very important. With a picture or text in front of me I start playing a few measures. Then I write the music on a sheet of paper. Usually the first impression is the best one, but there is no general rule. For an easier reading of the notes I use my computer program *ScoreEd4* (written in Java) to edit and print the notes. *ScoreEd4* cannot play the music as, for instance, the programs *Finale* or *Sibelius,* but otherwise there are no restrictions. Now the real work starts. How fast should the music be played. How is the dynamic or the weight of the first movement compared to the ones to follow. For a couple of days I try to improve what I already have written down. If there are no further corrections, I go on carefully measure by measure. This needs a lot of imagination; sometimes it looks as if there is no way to continue (is it not sometimes the same with scientific work?). The music should be emotionally and intellectually interesting to me, and of course to others as well, otherwise I would not compose.

Please, tell us about your work on your symphonies.

First I studied lots of books dealing with the different instruments, the instrumentation, the notation for the percussion, etc. Then I composed the first movement of my first symphony without measures. This was not a good idea for the orchestra to play it

Josef Heinzer composing his fifth symphony

exactly. I had to skip this movement, because I was not able to repair it. The symphony consists now of a slow movement, a scherzo, and a fast movement. In all three movements I used at some places quartertones (half of a semitone). The natural seventh (overtone no. 7) appears in the strings of the second and the alphorn fa (overtone no. 11) in the last movement. The scherzo of this first symphony is the only movement of my four symphonies, which was ever performed by an orchestra (Philharmonic Orchestra of Brasov with Ilarion Ionesco-Galati). The second symphony consists of only two movements. The third symphony has five movements corresponding to five themes taken from the underwater world. Six paintings of landscapes close to Stein am Rhein made by my father in his rare spare time served as a source of inspiration for the six movements of the fourth symphony.

What are you working on now?

Quite a while ago I began composing the fifth symphony; two movements are already finished, but then I got interrupted by other compositions, a piano quartet, a Triptichon for guitar, the duo "Formentor" for violin and viola, and the two last movements of the piano trio no. 4. Now I just finished "Alcudia" for viola and piano, ordered by my daughter Lea for her "Konzertreifediplom" next year. Now I am able to continue with my fifth symphony.

Who are your favorite composers?

When I heard Beethoven's symphony no. 7 for the first time, I was greatly impressed and asked myself, is something like this possible. For me it was a discovery. I particularly love Beethoven's piano works, his quartets, violin sonatas, cello sonatas, symphonies, and the Missa solemnis. Every note in his compositions has its meaning. This music is full of inventions and exhibits a high degree of economy in the musical means. Of course, one can say this about many other composers as well, but Beethoven's quartets show this behavior in an extreme form. Then my musical discoveries stretched out to Schubert, Rachmaninoff, and Mahler. Mahler's music can make one addicted. I was a big admirer of his music. It is full of life and is never boring. But I had to stop for quite a while listening to Mahler's music in order not to become dependent too much. Now I love it again. Shostakowich's fifth symphony was my first encounter with the symphonic work of this composer. I was very much surprised about this music, and I listened to it open-mouthed. I love his music. But after all, I am not a music scientist, and my argumentation may sound inadequate.

One of Josef Heinzer's compact discs

What are your plans for the near future?

I would like to compose a work for orchestra, choir, and solo voices, but I did not yet find a text which interests me. And I would also like to compose one more quartet. Doris wants to have some short cello solo movements as well.

Do you have any difficulties in finding an orchestra to play your music?

Yes, definitely. One has to know somebody sitting in an important position, influential and well-connected. For an outsider like me it is especially difficult to find an orchestra.

Is it possible to listen to your music?

Yes, at the moment two compact discs are available at http://swisspan.ch.

They are also listed under Heinzer, Josef Peter, Bielefelder Klassik Katalog, 1/2002:

– SP51 700. Josef Peter Heinzer chamber music for strings
String quartet 'Strait of Juan de Fuca' (1990/91) / 'Weiterdinger' duo for violin and cello (1996) / String trio for violin, viola, and cello (1998/99)
Lea Gabriela Heinzer violin, *Cordelia Hagmann* violin, viola, *Stéphanie Bozzini* viola, *Doris Maria Sigrist* cello
– SP51 708. Josef Peter Heinzer piano trios/duos
piano trio no. 1 (1986) / mosaic no. 2 for cello and piano (1985) / piano trio no. 2 (1988/89) / Mellerup for cello and piano (1998) / piano trio no. 3 (1994)
Lea G. Heinzer violin, *Doris M. Sigrist* cello, *Susy Lüthy* piano
Cover: *Cornelius M. Heinzer*

For a first impression the reader of the *EPR newsletter* can directly download a sample of Josef Heinzer's music (Lento, *La Soufrière* of the piano trio no. 2) by using the link: http://www.epr-newsletter.ethz.ch/heinzer.mp3.

70th Birthday of Yuri D. Tsvetkov

Yuri Tsvetkov has just started the second year of his presidency of the IES and follows on from John Pilbrow, the immediate past president, in providing strong leadership to the Society (see vol. 12, no. 3 for the details on Prof. Yu. D. Tsvetkov).

As president he is not only a figurehead but plays a very active part in determining the shape of our current and future activities. He chairs the Fellowship and Young Investigator Awards committees and also the vetting committee of the Gold and Silver Medal nominations and takes ultimate responsibility for the Awards process. This is no easy task and he must at times cajole decisions from the respective awards committees (who have the difficult job of determining who will receive medals).

However, he is not a dictator and works by consensus. This is exemplified by recent changes to the Awards By-Law (see this *EPR newsletter* p. 3) and by the Society's new web pages, www.ieprs.org, which have evolved through contributions and suggestions from the current and previous executive committee members and others. Yuri was instrumental in persuading Laila Mosina to take on the onerous task of following on from Linn Belford in editing the *EPR newsletter*. I am sure that we all greatly enjoyed Laila's first *EPR newsletter* and are looking forward to reading many more.

The executive takes great pleasure in congratulating Yuri and on behalf of the Society wishes him a very happy 70th birthday, and hopes that he will enjoy many more.

Shirley Fairhurst,
Secretary of the IES

70th Birthday of Robert Blinc

On October 31st 2003 Professor Robert Blinc celebrated his 70th birthday. Robert Blinc, the founder of the Slovenian Magnetic Resonance community, is a member of the Slovenian Academy of Sciences and Arts, Full Professor of Physics at the University of Ljubljana, and Head of the Condensed Matter Division of the "Jozef Stefan" Institute in Ljubljana. With more than 600 published papers in international scientific journals, two monographs, and more than 12000 citations, Robert Blinc is the most cited Slovenian scientist of the last twenty years, according to the Institute of Scientific Information (USA).

Robert Blinc was born in Ljubljana, Slovenia. He received his PhD in Physics at the University of Ljubljana in 1959, and in 1960 became a Post-doctoral fellow at M.I.T. in Cambridge, Massachusets. After returning home, he became Professor of Physics at the University of Ljubljana and the Head and founder of the Condensed Matter Division of the "Jozef Stefan" Institute in Ljubljana. He has been a Visiting Professor at several Universities and Institutes: University of Washington in Seattle, ETH Zurich, University of Vienna, University of Eindhoven, and Argonne National Laboratory. He is also Adjunct Professor at the University of Utah in Salt Lake City. As an IAEA expert, he has conducted missions in Brazil, Cuba, and Thailand.

Robert Blinc is a member of several Academies: the Slovenian Academy of Sciences and Arts (having been its Vice President in 1976–1999), the Academia Europaea (London), the Academia Scientiarum et Artium Europaea (Salzburg), the Polish Academy of Sciences (Warsaw), the Greek Academy of Sciences (Athens), the Croatian Academy of Sciences (Zagreb), the Saxon Academy of

Sciences (Leipzig), and the International Academy of Engineering (Moscow).

He has received many prizes and honors for his outstanding scientific work, among which are the Prize of the International Society of Magnetic Resonance (1977), the "Ambassador of Science of the Republic of Slovenia" Prize (1991), the Zois Prize of the Republic of Slovenia for inventions and technological developments in the field of electro-optic liquid-crystal filters (2001), and an Honorary PhD Degree of the University of Bucharest. In recognition of his excellence in NMR, Robert Blinc was chosen to be President of the Societé AMPERE (European Society of Magnetic Resonance) in the period of 1986–1994.

In the broad field of condensed matter physics, the *fil rouge* of Robert Blinc is Nuclear Magnetic Resonance (NMR) spectroscopy. He introduced NMR in the laboratories of the "Jozef Stefan" Institute in the late fifties by constructing homemade spectrometers. His NMR laboratory is now one of the world's principal laboratories for solid-state NMR.

With regard to his many scientific contributions, Robert Blinc has pioneered the development and application of NMR spectroscopic techniques to the study of structural phase transitions in ferroelectrics, incommensurate dielectrics, proton glasses, superionic conductors, fullerenes, relaxors, and liquid crystals. One of the most important of his many outstanding scientific contributions to these fields is the tunneling model of hydrogen-bonded ferroelectrics, also known as the Blinc-de Gennes pseudo-spin model of ferroelectrics. A summary of this research was published in the book by R. Blinc and B. Zeks, "Soft Modes in Ferroelectrics and Antiferroelectrics" (North Holland, 1974). This book has been translated into Russian and Chinese. Robert Blinc has also pioneered the study of collective soft modes in nematic ferroelectric liquid crystals. Together with Prof. Pincus he established experimentally the existence of order-parameter fluctuation modes in nematics by measuring the frequency-dependence of the nuclear spin-lattice relaxation rate. This mechanism is now known as the Blinc-Pincus mechanism. In addition, he predicted (together with B. Zeks) the existence of symmetry-recovering Goldstone modes (known as phasons) in ferroelectric liquid crystals. These modes, which were observed experimentally much later, are essential to the application of liquid-crystalline electro-optic devices. In the field of incommensurate systems, Robert Blinc measured by NMR the soliton density in the ground state of incommensurate dielectrics. His work in this field has resulted in a new approach to the study of nonlinear phenomena in incommensurate crystals. In the field of proton glasses, Robert Blinc developed a new experimental approach which uses NMR or EPR for the determination of the Edwards-Anderson order parameter. This parameter was previously believed to be experimentally inaccessible.

With regard to applications of NMR to technological problems, the group led by Robert Blinc developed both industrial NMR instrumentation and methods for the determination of oil content in oily plants. This turned out to be of significant importance in the selection of new plant varieties having higher nutritional values. In addition, the group of Robert Blinc was the first to develop NMR techniques for the nondestructive determination of hydration processes in cements, thereby providing a clue for developing new cements with different hardening characteristics. These technical achievements are being used in many places all over the world and are included in several international patents.

Robert Blinc's continuing enthusiasm and interest in solid-state physics as well as his inexhaustible energy guarantee a successful continuation of his fruitful scientific career.

Janez Dolinšek and David C. Ailion

65th Birthday of Jack H. Freed

In April 2003, a distinguished company of fellow researchers and friends celebrated the 65th birthday of Professor Jack H. Freed at Cornell University, Ithaca, NY, USA. Jack H. Freed is internationally recognized as a leader in efforts to bring electron spin resonance (ESR) to the forefront of techniques for the study of molecular properties of fluids and of biosystems, including the structure and complex dynamics of proteins and membranes.

Jack H. Freed graduated from Yale University in New Haven, USA, receiving the BE degree in 1958. He pursued his graduate studies at Columbia University in New York with George K. Fraenkel and received his PhD in 1962. After a brief postdoctoral position at Cambridge University, UK, he accepted a faculty appointment at Cornell University, where he has spent his subsequent career, becoming Full Professor in 1973. He is a Fellow of the American Physical Society, a member of the American Chemical Society, and a fellow of the American Academy of Arts and Sciences. He has been an Alfred P. Sloan Foundation Fellow and a John Simon Guggenheim Fellow. He has also received a number of prestigious awards including the American Physical Society's Irving Langmuir Prize in Chemical Physics, the American Chemical Society's Buck-Whitney Award, the Bruker Award of the British Chemical Society, the Gold Medal Award of the International Electron Spin Resonance Society, and the International Zavoisky Prize. Jack H. Freed, who conceived the idea of creating a national high technology ESR center at Cornell, became director of the National Biomedical Center for Advanced ESR Technology (ACERT) when it was established at Cornell in 2001 by the National Institutes of Health.

Over the years he has established and maintained at Cornell an exceptionally creative team of graduate students and postdoctoral fellows renowned for its contributions in experimental and theoretical investigations of the effects of molecular motions on ESR spectra, both in the frequency and time domains, and at conventional and very high magnetic fields. His contributions to the solution of contemporary ESR challenges are profound and extensive. Many applications of ESR, especially those involving nitroxide free radicals, would not be possible without the theoretical, computational and experimental methods developed by Jack Freed and his research group.

The main thrust of his recent activities includes path-breaking developments in double-quantum coherence ESR distance measurements, two-dimensional ESR and multifrequency ESR. The elegant application of these methods to studies of membranes and proteins makes the ESR as well as the biomedical community indebted to Jack Freed for showing that ESR spectroscopy should be considered a reliable and desirable tool for biomedical research. Many happy returns, Professor Freed!

Jozef Moscicki and Keith A. Earle,
ACERT

60th Birthday of Klaus-Peter Dinse

Klaus-Peter Dinse had his 60th birthday on December 16, 2002.

He studied physics at the Free University of Berlin and finished his PhD in 1971. After a postdoc stay in Davis with August H. Maki he returned to Berlin where he finished his habilitation in 1976. After that he continued his research career first at the well-known Max-Planck-Institute for Medical Research in Heidelberg and from 1984 on as Professor at the Physics Department of the University in Dortmund. Since 1992 he is Professor for Physical Chemistry at the Technical University of Darmstadt. Klaus-Peter Dinse is very well-known for his scientific work in the field of EPR and ENDOR spectroscopy, and its applications to photoexcited states and fullerenes. He developed and used cw- and pulsed ENDOR, stochastic EPR and 1D- and 2D FT-EPR methods for the investigation of photoexcited chemical reactions. He also used them to understand in detail the properties of encaged atoms. Besides he also worked in the field of ODMR and coherent optical photon echo spectroscopy for the characterization of molecular crystals.

In Dortmund as well as in Darmstadt, he took advantage of his sabbaticals to visit new places and to come into contact with new scientists and methods. He went to JILA in Bolder, to the Australian National University in Canberra, the University of California in Berkeley and, as visiting professor, to the Institute of Molecular Science in Okazaki, Japan. Klaus-Peter Dinse got several awards and prizes, for example, the Otto-Klung prize of the Free University of Berlin and the Silver Medal in Physics and Materials Science of the IES in 2000.

We all wish Klaus-Peter Dinse good luck and health for the future to continue his scientific work and are looking forward to his always constructive discussion contributions at meetings.

60th Birthday of Wayne L. Hubbel

On March 24, 2003, Wayne L. Hubbell celebrated his 60th birthday. This exceptionally talented biophysical chemist is internationally recognized for his numerous fundamental contributions to membrane physical chemistry and for the continued development of the spin labeling technique, since its inception.

As a graduate student with Harden McConnell at Stanford University, he used spin label technology to first describe the fluidity and fluidity gradient in biological membranes, landmark discoveries of broad impact in cell and membrane biology.

In 1970, he joined the faculty of the Department of Chemistry at UC Berkeley, where his laboratory designed new surfactants, now widely used in purification of membrane proteins, and pioneered the molecular characterization of "reconstituted" membrane proteins. Using a series of unique spin labels, he made important contributions to the current model for the transbilayer electrostatic potential profile, a concept widely used in analysis of membrane ionic permeability. Extensions of this work led to a molecular model for the early receptor potential in photoreceptors and a new model for the origin of lipid asymmetry in membranes.

In 1983, Wayne Hubbell moved his laboratory to UCLA where he became the first Jules Stein Professor of Ophthalmology and Professor of Chemistry and Biochemistry. Soon after arrival, he became aware of two important technical advancements. First, the powerful method of site-directed mutagenesis was becoming practical, and Wayne Hubbell realized that it could be used to introduce reactive amino acids at any site in a protein for attachment of spin label probes. But only microgram amounts of mutated protein could be obtained, too little for detection in conventional EPR resonators. About this time, James Hyde at the Medical College of Wisconsin and Wojciech Froncisz, visiting from the Jagiellonian University, designed a new EPR resonator that allowed for detection of picomole quantities of spin in microliter volumes. Wayne Hubbell saw the potential of these unrelated advancements and created the powerful new strategy of site-directed spin labeling (SDSL) for the determination of structure and conformational dynamics in both soluble and membrane proteins. Spectral analysis of a proper set of such modified proteins can be used to determine the three-dimensional structure of a protein at the level of the backbone fold, with a real-time resolution in the millisecond range, using only picomoles of each labeled protein.

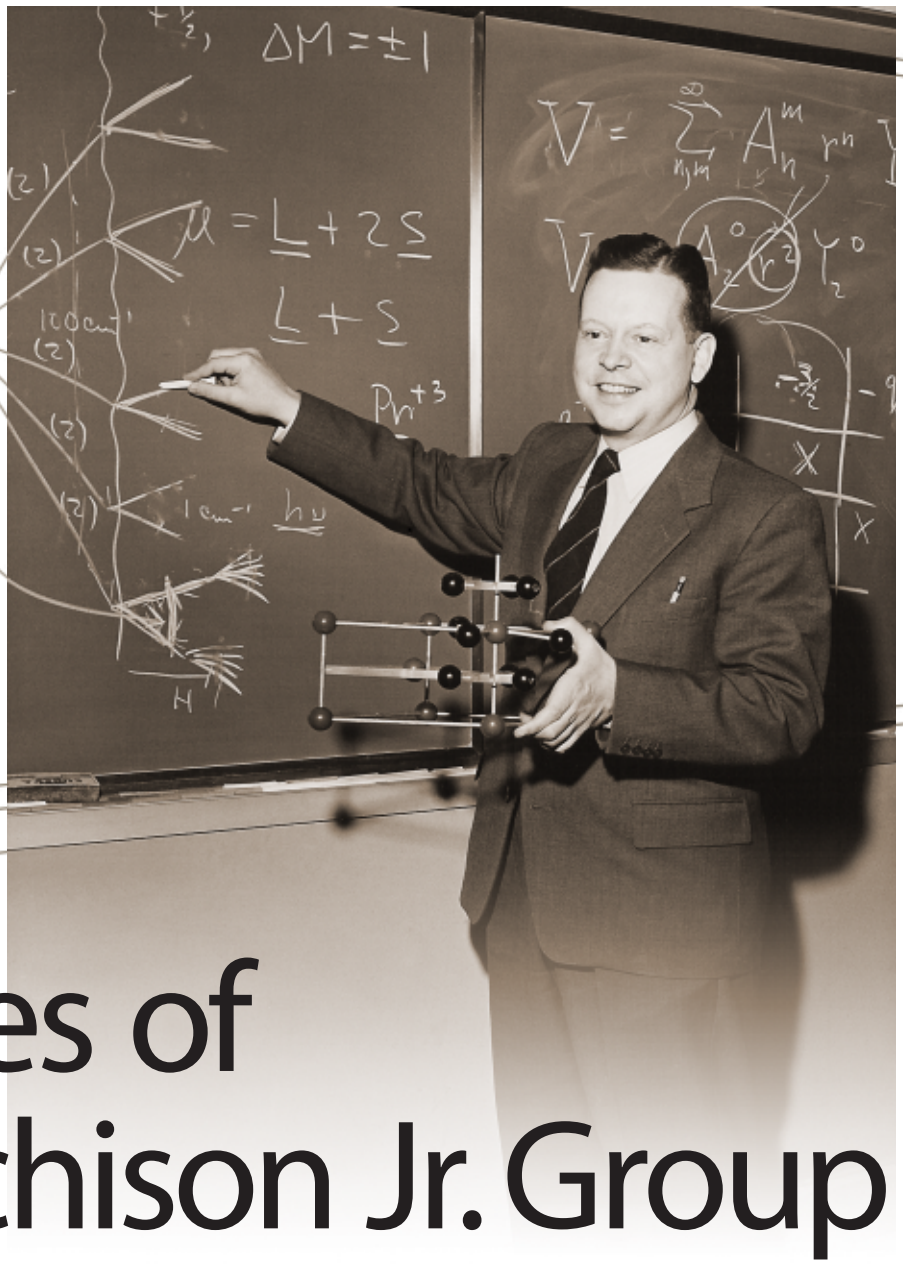
As an example of the remarkable and unique capability of SDSL, he and his collaborator H. Gobind Khorana at MIT have determined the structure of the active region of the photoreceptor rhodopsin, and shown that rigid-body motion of key α-helices underlie the activation of this receptor. This model has become the "dogma" of GPCR activation.

The SDSL technique is now in a stage of rapid growth, and a measure of its success is the increasing number of laboratories throughout the world adopting the method for application to a wide variety of proteins and nucleic acids. A new collaboration with Jack Freed at Cornell aims at exploring the application of high-field and 2D EPR methods to extract information on protein dynamics.

For his development and application of SDSL, Wayne Hubbell has received numerous honors and awards including the Gold Medal of the IES, the Zavoisky Award, the Bruker Prize (to be presented next spring), and the Elisabeth Roberts Cole from the Biophysical Society (US). He is a member of the American Academy of Arts and Sciences and was elected to the first class of fellows of the Biophysical Society. Additionally, he received an honorary doctorate from the University of Pécs, in recognition of his highly successful collaboration with Kálmán Hideg, the creator of many new spin labels used in SDSL.

On the occasion of his 60th birthday, Wayne Hubbell spent the morning riding his titanium/carbon fiber bicycle along the Malibu coast, and the afternoon putting a new spin on protein structure and dynamics at UCLA. For this spin-doctor, fine-tuning his Campy derailleur and finding the Q of his loop-gap resonator made for a perfect birthday.

We heartily wish Wayne Hubbell many more years of his research activity and all the best to him and his family.



Arthur H. Heiss,
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Memories of the Hutchison Jr. Group

Generations of young scientists, many destined to become EPR spectroscopists, grew up in the research group led by Clyde Allen Hutchison Jr. at the University of Chicago, which functioned for some four decades beginning in the late 1940s. All students built their own equipment. The early students had no textbooks or manuals, and there were only a very few publications in the field. There was very little knowledge of some of the relevant theory, say of spin-spin interactions, and the triplet state was a possible myth.

All generations of grad students took away Clyde's personal style: his attention to details in all aspects of life, his Socratic style, his wry humor, and a portion of his idiosyncracies.

As a (non-prime) example, there was his fascination for the number 137. Many know that Arthur Eddington largely created this mystique (e.g., see his "New Pathways in Science", Cambridge Press 1935, Ch. XI). To him, the fine structure constant $\alpha = 2\pi e^2/hc$ (actually 1/137.0388) was the magic bridge between atomic and radiation theory. He went so far as to postulate (pp. 232–233) that "the experimental physicist might retire and leave all the rest of physics to the mathematician", since the basic work of measuring the values of the ultimate constants of nature had been completed. This led to the postulate formulated by the grad students in Clyde's group that they really need do no actual work – refuted by their leader.

Clyde's enthusiasm for α was such that he worked (unsuccessfully) to place this number on his license plate. The "Cult of 137" manifested itself in many ways amongst the students and post-docs. Any instances of 137 in the news would be collected as well as photographs of 137 in any

road signs. John S. King presented Clyde with a sweat shirt with 137 emblazoned across the front. Weber and collaborators made T-shirts with 137 as well as the familiar HL (Hutchison Lab) logo.

Ambiguity was to be avoided at all cost. Therefore all times were expressed in 24-hour (military or European) format. If someone were to arrange an afternoon meeting at 2:00, the typical response was, "Yes, if you insist on having a meeting at that hour, but I am usually asleep then. Did you mean 14:00?".

There were certain instances where ambiguity would creep in. Being a very positive group, all questions were to be answered in the affirmative. For example, "Yes, I am not adding base to the solution.". This tradition held as well for either/or questions, yielding a very ambiguous answer. For example the question, "Are you going to grow crystals with Neodymium or Dysprosium?" must be answered with "Yes!". This response to such questions did not necessarily endear Hutchison lab members to friends and family.

Group meetings were held from 09:00 to 12:00 every Saturday morning. Unlike many research groups, we would not discuss lab business during these meetings; these meetings were strictly pedagogical. A topic was chosen such as a theorem and we would proceed to derive the theorem in the allotted three hours. One group member (the victim) was chosen to work the problem at the blackboard, while the others would feverishly write the equations in their notebooks. The victim would be advised to start as close to upper left hand corner as possible and to write compactly in order for the derivation to fit within the blackboard space of Clyde's office. With Clyde's coaxing and sometimes assistance from the audience, theorems would be derived miraculously within the allotted three hours. Many derivations are not unique and if one were in the group long enough, certain stylistics preferences could be recognized. One challenge was to arrive at the correct conclusion but not in accordance with Clyde's meticulous notes. The experience of deriving these theorems at the blackboard in front of an audience fostered the ability to think on our feet. It also fostered in many of us sufficient confidence to admit when we didn't know the answer. In the early days, the aftermath generally was a high-spirited group luncheon at some appropriate restaurant.

Clyde now lives in retirement near the University of Chicago. All his students remember fondly and with gratitude the magic years of belonging to his group.

The 37th Annual International Meeting *Advanced Techniques & Applications of EPR*

Warwick Conferences, Conference Park, University of Warwick, Coventry, UK
March 28 (Sun) – April 1 (Thu), 2004
http://www.esr-group.org.uk

The meeting covers the applications and theory of EMR spectroscopy in a wide range of scientific displines, from physics, chemistry and biochemistry to biology and the medical sciences. Thus the meeting enables scientists with different interests, but held together by their common interest in the application of EMR spectroscopy, to meet, to talk, and to exchange views and ideas.

The general format of the meeting consists of a series of plenary lectures of 50 minutes duration followed by 5 to 10 min of questions and comments. The plenary lecturers are carefully chosen by the Committee who invites established scientists to describe and discuss their work, putting into perspective the important recent developments. The plenary lectures are followed by shorter talks of 20 minutes duration given by other delegates.

In addition to the plenary lectures and talks, the Conference is also the occasion for the annual award and presentation of the Bruker Lecture, sponsored by Bruker Biospin. The 2004 Bruker Lecturer is Prof. Wayne L. Hubbell, University of California (Los Angeles). He will present his lecture "Watching Proteins Move with Site-Directed Spin Labeling". We also encourage postgraduate students to present their own work during the Jeol Student Sessions, sponsored by Jeol (UK).

The First AMPERE/EENC Joint Meeting

Lille, France
September 6 (Mon) –11 (Sat), 2004
http://www.nmr2004.com

The program will consist of plenary lectures, parallel sessions and poster sessions.

It is hoped that this joint conference will gather several hundreds of scientists from all over the world so as to make it a major scientific event covering all aspects of magnetic resonance.

The conference will be co-chaired by:

Jean-Paul Amoureux (Université de Lille 1), co-Chair AMPERE and Daniel Canet (Université Henri Poincaré, Nancy 1), co-Chair EENC.

Plenary sessions as well as parallel sessions and poster sessions will be given.

Parallel sessions on the following topics will be held:

1 New liquid-state NMR experiments for biological applications
2 New solid-state NMR experiments for biological applications
3 New methodologies in solid-state NMR
4 Materials as studied by magnetic resonances
5 Magnetic resonance imaging, and transport phenomena
6 EPR
7 Calculation of NMR/EPR parameters
8 NMR in biomedicine
9 Broad-line NMR/EPR
10 Spin relaxation
11 Analytical applications of NMR
12 Paramagnetic systems
13 Emerging techniques
14 Others

The web site for this Conference contains all the presently available information. More elements will be added as the organization of the conference progresses.

photo of the issue

TAKEN BY VALENTIN GRACHEV

Sandy collects for her new spectrometer!

The 27th International EPR Symposium

University of Denver, Denver, USA
August 1–4, 2004
http://www.du.edu/~seaton/eprsym.html

The 27th International EPR Symposium will be held at the Hyatt Regency Denver. On Sunday, August 1st there will be a Tutorial Workshop at the University of Denver on EPR Imaging, which will also be the topic for a session during the Symposium. Additional topics will be announced via the web site.

For further information see the web site or contact:

Profs. Sandra Eaton or Gareth Eaton
Department of Chemistry and Biochemistry, University of Denver
Denver, CO 80208, USA
e-mail: seaton@du.edu

Conference Reports

International Symposium *ESR: New Developments* and ESR Simulation Workshop *Hands-on Learning Experience*

National Biomedical Center for Advanced ESR Technology (ACERT), Department of Chemistry and Chemical Biology, Cornell University
Ithaca, NY, USA
April 25–26, 2003

Jack Freed, director of the National Biomedical Center for Advanced ESR Technology (ACERT) at Cornell University, has been honored at an international symposium which highlighted recent developments in ESR with special emphasis on its applications to biophysical and biomedical research. The event, celebrating Freed's 65th birthday and his 40 years service to research and teaching at Cornell, took place at Cornell University last April.

Researchers from around the world attended the symposium. The lectures spanned a wide range of biophysical and related topics. They included determining the structure and function of a variety of proteins by site-directed spin labeling ESR methods (Wayne Hubbell, UC-Los Angeles, USA; Y.-K. Shin, Iowa State University, USA; Klaus Möbius, Freie Universität Berlin, Germany), the role of the prion protein in copper homeostasis within the central nervous system as determined by ESR (Glenn Millhauser, UC-Santa Cruz, USA), and the immunological identification of the myoglobin radical formed by hydrogen peroxide (Ron Mason, National Institute of Environmental Health and Safety, Research Triangle Park, NC, USA). Electron spin polarization phenomena were addressed in lectures by Haim Levanon (Hebrew University, Israel), J. Boiden Pederson (Odense University, Denmark), and Kev Salikhov (Kazan Physical-Technical Institute, Russian Academy of Sciences, Russia). Recent developments in ESR methodology were described by James Hyde (Medical College of Wisconsin, Milwaukee, USA), Al Beth (Vanderbilt University Medical School, Nashville, USA), David Budil (Northeastern University, Boston, USA), and Louis-Claude Brunel (Florida State University, Tallahassee, USA).

The symposium was preceded by an ESR Simulation Workshop which provided hands-on experience in spectral simulation, data analysis and discussions of current computational challenges. A theoretical introduction to ESR line shape fitting was given by Jack Freed. Subsequent tutorials covered selected areas of cw-ESR spectroscopy: fitting spectra at conventional frequencies (instructor: Mingtao Ge, ACERT, Ithaca, USA), fitting spectra at high frequencies (Keith Earle, ACERT, Ithaca, USA), and multi-frequency spectral fitting (Zhichun Liang, ACERT, Ithaca, USA). A tutorial on 2D-FT-ESR spectral fitting was conducted by Antonio Costa Filho (Universidàd de São Paulo, Brasìl). Roundtable discussions interspersed among the tutorial sessions allowed the workshop participants to discuss computational and related programming issues as well as new capabilities in the simulation of ESR spectra. The workshop concluded with a lecture on advanced models of molecular dynamics for studies of biosystems by Antonino Polimeno (Università degli Studi di Padova, Italy).

Jozef K. Moscicki and Keith A. Earle, ACERT

10th Chianti Workshop on Magnetic Resonance (The Neon Jubilee Edition): *Nuclear and Electron Relaxation*

San Miniato, Italy
May 25–30, 2003
Conference Chairman: Ivano Bertini, Florence and David Fushman, Maryland

Whoever went to one of the Chianti workshops knows about the very special and inspiring atmosphere there (and many seems to get addicted to it and return!). Part of it is clearly the very nice Toscana landscape, the place in the old cloister, the organizing committee, who makes it smooth but familiar. The other part is to my opinion the excellent mixture of different topics and experts in those fields, which makes it a very stimulating meeting. One of the topics which clearly showed this synergism this year was the investigation of dynamics in macromolecular systems by NMR, EPR and MD methods. Many talks centered on this interesting topic and highlighted different aspects and viewpoints, as by Rieko Ishima (Bethesda), Christian Griesinger (Göttingen), Ad Bax (Bethesda), Arthur Palmer (New York), Eva Meirovitch (Bar-Ilan), Nico Tjandra (Bethesda), Geoffrey Bodenhausen (Paris), Jack Freed (Ithaca), Erik Zuiderweg (Ann Arbor), Mickael Akke (Lund), Paola Turano (Florence), David Cowburn (New York), Ranjani Varadan (College Park), Rafael Brüschweiler (Worcester) and David Case (La Jolla). Talks by Martina Huber, Marina Bennati and Jack Freed on dipolar long-range structural constrains determined by pulsed EPR methods added to this field. This topic also demonstrated very nicely how fruitful and stimulating a discussion between scientists of the different fields (EPR, NMR, MD) can be. Clearly this topic was in the center of this Chianti workshop but other topics, such as DNP, ENDOR, high-field EPR, paramagnetic relaxation, structural and theoretical investigations on metalloenzymes were also well represented in talks and on posters. As James Emsley (Southampton) remarked in his closing lecture, the Chianti workshop is so successful because its very good mixture of the different fields, its long-term continuity guaranteed by the Italian organizers as well as by the every time special flavor added by the external chairperson, all together *a time well spent*.

Thomas Prisner

26th International EPR Symposium

Denver, Colorado, USA
July 27–31, 2003

On Sunday, July 27th a "Workshop on Measuring Electron-Electron Distances by EPR" was opened at the University of Denver. Introductory lectures on fundamental principles and measurement techniques were followed by a live demonstration of the DEER technique using the newly-available ELDOR accessory for the Bruker E580.

The conference sessions were held at the Hyatt Regency Denver. The Monday session was dedicated to the memory of Larry Kevan and included lectures covering the application of pulsed EPR in areas ranging from photosynthetic systems to zeolites. Sessions later in the week were devoted to biological applications, distance measurements,

Daniella Goldfarb, Edgar Groenen (right) and João Paulo Telo (left) in Sintra, near Lisbon, during the conference trip

and new experimental techniques. Two large poster sessions provided opportunities for extended discussions. At the Symposium dinner the EPR Society prize winners: Dr. Michael Bowman, Silver Medal in Chemistry, and Dr. Stephan Zech, Young Investigator Award, were recognized.

Sandra Eaton

5th Meeting of the European Federation of EPR Groups

Lisbon, Portugal
September 7–11 2003

The European Federation of EPR groups (EFEPR) is a non-formal organization that assembles together 13 national groups from European countries and other countries in the region. Details on EFEPR can be found at the address http://www.weizmann.ac.il/chemphys/cfdafna/efepr/.

EFEPR has been a useful tool for facilitating and encouraging during the years the communications between Western and Eastern groups in Europe. Its activities today include a triennial conference for researchers using EPR in different fields, and a tri-annial school on modern EPR methodologies.

This year the meeting has been held in Lisbon in Instituto Superior Técnico, organized with efficiency and elegance by João Paulo Telo and Bernardo Herold. The scientific committee consisted of Daniella Goldfarb, EFEPR President for the last three years, Thomas Prisner, Carlo Corvaja and João Paulo Telo. It has been attended by 150 scientists from 20 countries, the largest groups of participants coming from Italy and Germany. 36 oral talks and 80 posters on recent methodologies and applications in different fields (biological applications with a particular emphasis on distance measurements with pulsed techniques, in-vivo EPR, high-spin chemistry, catalytic systems, photoexcited states spin polarized, surface chemistry, etc.) have been presented. One particularly pleasing aspect of this meeting was the large number of students and post-docs that attended it.

During the meeting a prize-awarding ceremony to two silver medallists of the IES (E. Groenen, Leiden, Holland, Silver medal for Physics/Materials Science, and M. Bowman, Richmond, USA, Silver medal for Chemistry, 2003) has been held. The two scientists received the medals from the President of the IES Yuri Tsvetkov.

The general meeting of EFEPR, chaired by Daniella Goldfarb, Weizmann Institute, Israel, has taken place. The new elected President was Etienne Goovaerts, Antwerp, Belgium.

The 6th meeting of EFEPR will be in Spain, 2006 and a school is planned for 2005.

Marina Brustolon

Specialized Colloque AMPERE 2003 *NMR and EPR of Broad-Line Solids*

Bernardin-Portorož, Slovenia
September 8–12, 2003

*Dedicated to **Professor Robert Blinc** on the occasion of his 70th birthday*

The specialized Colloque AMPERE on NMR and EPR of broad-line solids was held at the Convention center of Grand Hotel Emona in the Bernardin Hotel complex at Portorož, Slovenia, from 8th to 12th September 2003. The Colloque was organized in recognition of the scientific work of Professor Robert Blinc on the occasion of his 70th birthday. Robert Blinc is one of the most active members of the Groupement AMPERE, being its president in the period 1988–1994. Altogether this was the sixteenth meeting in the series of Specialized Colloques AMPERE.

The Conference was organized by the members of the Solid State Physics department at the Jozef Stefan Institute, Ljubljana. Janez Dolinšek was the Chairman of the Organizing Committee, whereas the members were (in alphabetical order) Tomaz Apih, Joze Gasperic, Peter Jeglic, Martin Klanjsek, Gojmir Lahajnar, Urska Mikac, Milan Rozmarin, Ana Sepe, Janez Slak, Zora Skraba (secretary), Bostjan Zalar and Aleksander Zidansek. Robert Blinc was the Honorary Chairman.

The meeting attracted 125 registered participants from 21 countries with the following structure: Austria (1), Belgium (3), Czech Republic (1), France (2), Greece (3), Croatia (5), Italy (2), Israel (4), Japan (3), Korea (2), Hungary (3), Germany (18), The Netherlands (1), Poland (6), Romania (3), Russia (18), Slovenia (26), Switzerland (10), Ukraine (1), United Kingdom (2), USA (11). Emphasis was put to attract young scientists by organizing a special Young Scientists session.

The scientific program was dedicated to broad-line NMR and EPR spectroscopy of solid materials, where resonance lines are too broad to be detected by conventional pulsed techniques and standard spectrometers. As this scope was rather narrow (which is a tradition of Specialized Colloques AMPERE), there were also other contributions presented at the meeting, reporting new techniques and applications of magnetic resonances to new materials. Altogether 46 invited talks and 13 contributed talks were presented. The

Thursday (Sept. 11) afternoon session was dedicated to Young Scientists presentation (young scientists who just finished PhD or are close to finish it) with 8 papers. Two poster sessions were also organized with 56 posters presented. The Specialized Colloque AMPERE was followed by a Satellite Workshop "Phase Transitions in Complex Systems: from Liquid Crystals to Nanotubes" on Friday, Sept. 12, in the afternoon. This Workshop was organized by the same Organizing Committee under the Chairmanship of Bostjan Zalar, with 12 oral presentations.

The scientific contributions of the meeting are collected in the Book of Abstracts, delivered to the participants upon registration and also accessible on-line (.pdf format) on the Conference web page (http://ampere2003.ijs.si). Full papers will be published in a special issue of the journal *Applied Magnetic Resonance*.

On Sunday, Sept. 7, the Conference was opened by a get-together party. The official opening ceremony was held on Monday morning (Sept. 8) by the welcome speeches of Zoran Stancic, the State Secretary at the Slovenian Ministry of Education, Science and Sports and by Hans W. Spiess, the President of the Bureau AMPERE. The scientific part of the meeting was opened by the lectures of J. Jeener and E. L. Hahn. Apart from its scientific contents, the meeting was also an opportunity to gather the scientists involved in NMR and EPR since the early days of these techniques, so that participants could enjoy the lectures of C. P. Slichter, J. S. Waugh, M. Mehring, R. Kind, J. L. Bjorkstam and D. Brinkmann, among others.

The Tuesday (Sept. 9) morning session was dedicated to the recognition of the scientific work of Robert Blinc, who was the last speaker of that session. The session was followed by a social event, where a number of participants congratulated Robert Blinc for his forthcoming anniversary and recognized his outstanding contribution to the development and application of NMR.

Wednesday afternoon was a traditional half-day excursion event. Participants were offered two destinations – the Cave of Postojna and the Lipica stud farm with Lipizaner horses. Both groups then merged together for a Conference dinner at the countryside restaurant Hudicevec.

The organizers would again like to thank the speakers, the session chairs and the poster presenters, who all made the conference successful and memorable.

Janez Dolinšek, Chairman

■

Specialized Colloque Ampere 2003 in Portorož (Slovenia) provided opportunities for specialists in many different fields of solid-state NMR and EPR to interact. It was dedicated to the 70th anniversary of Robert Blinc, The contributions and achievements made by Robert Blinc and his group in the last five decades are of the highest professional quality. They won universal recognition from the EPR/NMR world community. As a result, the "Josef Stefan" Institute in Ljubljana became an important center of magnetic resonance studies. Robert Blinc approves of cooperation and maintains it with scientists of many countries.

Robert Blinc with Hans Wolfgang Spiess, the AMPERE President

A very interesting program of this Colloque Ampere stimulated extended discussions devoted to a number of significant topics, such as magnetic resonance of extremely broad resonance lines, line narrowing techniques, new aspects in organic and inorganic nanotubes, fullerene derivatives, etc. The memorable weather was quite nice to display the beauty of the Adriatic Sea and its environments, however, it could not lure the conference participants away from the excellent lectures, discussions and posters.

Finally, I thank all organizers who made the atmosphere of our work and stay in Portoroz beautiful und successful.

Vladimir A. Ivanshin, participant

Annual Meeting of the German Research Society Priority Program ***High-Field EPR in Physics, Chemistry and Biology***

Hirschegg, Austria
September 21–24, 2003
Organization:
Rüdiger Eichel and Klaus-Peter Dinse, Darmstadt

The annual report meeting of this Priority Program of the DFG (German Research Society), which exists already 5 years, took place in Hirschegg, Kleinwalsertal, a small valley in the Alpes. The 20 German research groups that participate in this joint research program, as well as invited scientists from Europe and US reported on new technical, methodical and theoretical aspects as well as on applications, ranging from catalysis to biological systems. The progress in this field over this last 5 years was impressing, as it was demonstrated in this meeting. Whereas still new instruments emerge (remarkable: Jan Schmidt's 280 GHz pulsed EPR spectrometer), the theoretical interpretation of g-tensors is fast progressing and the number of applications on inorganic metal complexes, metalloenzymes, semiconductors and other solid-state systems is rapidly increasing. Especially high-field ENDOR seems to open a new dimension of applications, in particular for low-gyromagnetic-ratio nuclei. One evening session of the meeting was devoted to the celebration of Klaus-Peter Dinse's (one of the coordinators of this Priority Program) 60th birthday.

Thomas Prisner

For Your Perusal

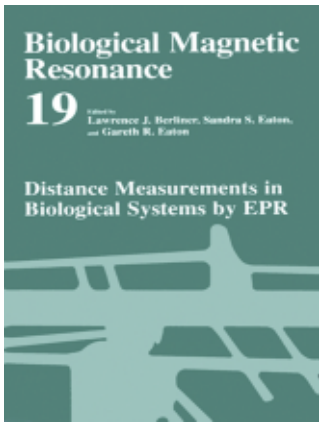
Collected by Arthur Schweiger

In this column, new books, journals and reviews on EPR, or literature closely related to EPR, are presented and briefly reviewed. The column covers material published starting from 2000 up to date; completeness is not claimed.

BOOKS

Biological Magnetic Resonance, Volume 19: Distance Measurements in Biological Systems by EPR

L. J. Berliner, S. S. Eaton, and G. R. Eaton (Editors)
Price: $ 179 (Hardcover)
Publication date: March, 2001
Publisher: Kluwer Academic/Plenum Publishers
614 pages, ISBN 0-306-46533-7



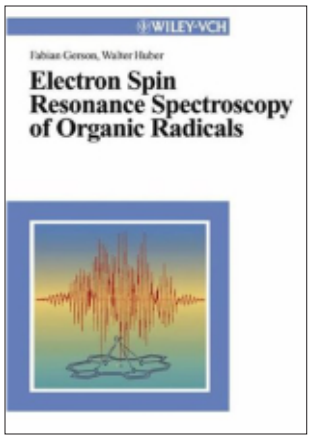
Volume 19 of the book series *Biological Magnetic Resonance* is devoted to distance measurements between electron spins. This field of research has undergone a renaissance due to recent developments in pulse sequence design which now allow for distance determinations between electron spins of up to 7 nm. The techniques based on EPR have become particularly important, since not many alternative techniques exist to get such data from disordered systems. The book, which covers all aspects of distance determination using EPR, gives an excellent overview of the state-of-the-art of this important application of EPR spectroscopy.

Editorial review: The foundation for understanding the function and dynamics of biological systems is knowledge of their structure. Many experimental methodologies are used for determination of structure, each with special utilities. The volumes in this series on Biological Magnetic Resonance emphasize the methods that involve magnetic resonance. This volume seeks to provide a critical evaluation of EPR methods for determining the distances between two unpaired electrons. The editors invited the authors to make this a very practical book, with specific numerical examples of how experimental data are worked up to produce a distance estimate, and realistic assessments of uncertainties and of the range of applicability, along with examples of the power of the technique to answer biological problems.

Contents:
Distance measurements by cw and pulsed EPR *by S. S. Eaton, G. R. Eaton*
Relaxation times of organic radicals and transition metal ions *by S. S. Eaton, G. R. Eaton*
Structural information from cw-EPR spectra of dipolar coupled nitroxide spin labels *by E. J. Hustedt, A. H. Beth*
Determination of protein folds and conformational dynamics using spin-labeling EPR spectroscopy *by H. S. Mchaourab, E. Perozo*
EPR Spectroscopic ruler: the deconvolution method and its applications *by Wenzhong Xiao, Yeon-Kyun Shin*
TOAC: The rigid nitroxide side chain *by J. C. McNulty, G. L. Millhauser*
Depth of immersion of paramagnetic centers in biological systems *by G. I. Likhtenshtein*
Determination of distances based on T_1 and T_m effects *by S. S. Eaton, G. R. Eaton*
Double-quantum ESR and distance measurements *by P. P. Borbat, J. H. Freed*
'2+1' Pulse sequence as applied for distance and spatial distribution measurements of paramagnetic centers *by A. Raitsimring*
Double electron-electron resonance *by G. Jeschke, M. Pannier, H. W. Spiess*
Electron paramagnetic resonance distance measurements in photosynthetic reaction centers *by K. V. Lakshmi, G. W. Brudvig*
Photo-induced radical pairs investigated using out-of-phase electron spin echo *by S. A. Dzuba, A. J. Hoff*

Electron Spin Resonance Spectroscopy for Organic Chemists

Fabian Gerson and Walter Huber
Price: $ 115 (Paperback)
Publication date: September, 2003
Publisher: VCH Publishing
463 pages, ISBN 3-527-30275-1



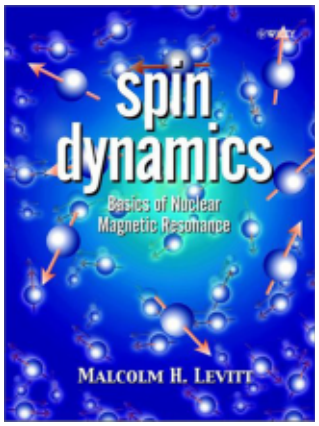
Most of us are acquainted with the monograph *High-Resolution ESR Spectroscopy* by Fabian Gerson, published in 1970. A new edition was long overdue, since there is no comparable textbook available that covers all aspects of EPR on organic radicals so comprehensively! Luckily enough for the EPR community, after his retirement in 1997, Fabian Gerson decided to write together with Walter Huber not only an updated version of his first monograph, but a virtually completely new textbook. In the General Part, the authors give an excellent introduction to the subject and in the Special Part they present a very extended review of EPR studies on organic radicals. The book is a must for EPR spectroscopists and a real quarry for everybody interested in radical chemistry.

Editorial review: Electron spin resonance spectroscopy is the method used to determine the structure and life expectancy of a number of radicals. Written by Fabian Gerson and Walter Huber, top experts in the field of electron spin resonance spectroscopy, this

book offers a compact yet readily comprehensible introduction to the modern world of ESR. Thanks to its comprehensive coverage, ranging from fundamental theory right up to the treatment of all important classes of organic radicals and triplet-state molecules that can be analyzed using ESR spectroscopy, this unique book is suitable for users in both research and industry. Instead of using complex mathematical derivations, the authors present a readily understandable approach to the field by interpreting sample spectra and classifying experimental data. In short, the ideal book for newcomers to the subject and an absolute must-have for everyone confronted with ESR spectroscopy and wanting to become acquainted with this widely-used method of analysis.

Spin Dynamics: Basics of Nuclear Magnetic Resonance

Malcolm H. Levitt
Price: $ 165 (Hardcover), $ 36.95 (Paperback)
Publication date: October, 2001
Publisher: John Wiley & Sons
686 pages, ISBN 0-471-48921-2
and ISBN 0-471-48922-0



Especially after the Nobel Prize announcement for medicine in 2003, nuclear magnetic resonance is omnipresent in science. Correspondingly, the NMR literature is huge and it is very difficult to keep track on all the textbooks published recently in this field. But now a new star is born: *Spin Dynamics* written by Malcolm Levitt, a jewel among the many books about NMR. Malcolm's monograph, which makes use of a didactically very sound approach, provides the reader with an excellent introduction to NMR. It is also a delight for an EPR spectroscopist to read this book.

From the back cover: Spin Dynamics, Basics of Nuclear Magnetic Resonance is a comprehensive and truly modern introduction, written to appeal to undergraduate and postgraduate students, and also active researchers in NMR, spectroscopy and quantum physics. The book focuses on those essential principles and concepts needed for a thorough understanding of the subject, rather than its practical aspects. The quantum theory of nuclear magnets is presented within a strong physical framework, supported by a large number of figures, helping to make the text accessible to a wide range of readers.

Excerpt from a book review: "Levitts *Spin Dynamics* is certainly ideal for graduate students, and not only for those committed to a specialized thesis in NMR. The book will also be much appreciated by hard-core spectroscopists. After many years during which *Principles of NMR in One and Two Dimensions* by Richard Ernst, Alexander Wokaun and the undersigned has been considered, rightly or wrongly, as un classique incontournable, it seems that finally time has come for *Principles* to retire on some remote shelf of the library. As far as I could see, there are few items contained in *Principles* that are not explained in a much clearer and authoritative fashion in Levitts *Spin Dynamics*." – *Geoffrey Bodenhausen*, Review for Chem. Phys. Chem.

REVIEWS

Electron Spin Resonance Spectroscopy Labeling in Peptide and Protein Analysis

Peter G. Fajer
in: Encyclopedia of Analytical Chemistry
R. A. Meyers (Editor)
Price: $ 7,905 (Hardcover)
Publication date: December, 2000
Publisher: John Wiley & Sons Ltd, Chichester
15 volumes, more than 14'000 pages,
ISBN 0-471-97670-9

This is a review of one of the booming fields in EPR spectroscopy: The determination of protein structure and protein dynamics by using spin labels. It describes the sample preparation, as well as the underlying methodology and required instrumentation, and gives an overview of the various applications.

Reviews on Photosynthesis

Photosynthesis is still one of the main topics of EPR and its armory of techniques. Thanks to the enormous effort made by several research groups, many of the structural and dynamic aspects of the photosynthetic reaction centers could be solved with EPR during the last two decades. Two recent issues of BBA (Biochimica et Biophysica Acta) have been devoted to photosynthesis. Both of them contain several review articles written by EPR spectroscopists, which provide the reader with a valuable compendium of recent progress in this field.

BBA - Bioenergetics

volume 1507, issue 1-3, 30 October 2001
Type 1 Photosynthetic Reaction Centres
P. Heathcote (Editor)

P700: the Primary Electron Donor of Photosystem I by Andrew N. Webber and Wolfgang Lubitz, p. 61–79

Iron-Sulfur Clusters in Type I Reaction Centers by Ilya R. Vassiliev, Mikhail L. Antonkine, and John H. Golbeck, p. 139–160

Pulsed EPR Spectroscopy on Short-Lived Intermediates in Photosystem I by Robert Bittl and Stephan G. Zech, p. 194–211

Light-Induced Spin Polarization in Type I Photosynthetic Reaction Centres by Arthur van der Est, p. 212–225

Electron Spin Echo Envelope Modulation Spectroscopy in Photosystem I by Yiannis Deligiannakis and A. W. Rutherford, p. 226–246

Electron Nuclear Double Resonance (ENDOR) Spectroscopy of Radicals in Photosystem I and Related Type 1 Photosynthetic Reaction Centres by Stephan E. J. Rigby, Michael C. W. Evans, and Peter Heathcote, p. 247–259

BBA - Bioenergetics

volume 1503, issue 1-2, 5 January 2001
Photosynthetic Water Oxidation
J. Nugent (Editor)

Comparative Studies of the S_0 and S_2 Multiline Electron Paramagnetic Resonance Signals from the Manganese Cluster in Photosystem II by Paulina Geijer, Sindra Peterson, Karin A. Åhrling, Zsuzsanna Deák, and Stenbjörn Styring, p. 83–95

For Your Perusal

New Books & Journals

EPR/ENDOR Characterization of the Physical and Electronic Structure of the OEC Mn Cluster by Jeffrey M. Peloquin and R. David Britt, p. 96–111

EPR Studies of the Water Oxidizing Complex in the S_1 and the Higher S States: the Manganese Cluster and Y_Z Radical by Hiroyuki Mino and Asako Kawamori, p. 112–122

For other recent reviews about photosynthesis, see:

Primary Processes in Photosynthesis: What do we learn from high-field EPR Spectroscopy?

Klaus Möbius

Chem. Soc. Rev. **29**, 129–139 (2000)

Pulsed and Parallel-Polarization EPR Characterization of the Photosystem II Oxygen-Evolving Complex

R. David Britt, Jeffrey M. Peloquin, and Kristy A. Campbell

Ann. Rev. Biophys. Biomol. Struct. **29**, 463–495 (2000)

Towards Artificial Photosynthesis: Ruthenium-Manganese Chemistry for Energy Production

Licheng Sun, Leif Hammarström, Björn Akermark, and Stenbjörn Styring

Chem. Soc. Rev. **30**, 36–49 (2001)

Introduction to Dynamic Spin Chemistry: Magnetic Field Effects upon Chemical and Biochemical Reactions

Hisaharu Hayashi (RIKEN, The Institute of Physical and Chemical Research, Japan)
Price: US $ 38 / £ 26
Publication date: Scheduled Spring 2004
Publisher: World Scientific Publisher (Singapore)
250 pages (approx.), ISBN 981-238-423-5

This book entitled as "Introduction to Dynamic Spin Chemistry" presents a detailed account of one of the most mysterious problems in science whether ordinary magnetic fields can exert appreciable influence on chemical reactions and biological processes. As for chemical reactions, magnetic field effects have recently been found for many reactions through radical pairs and have been successfully interpreted in terms of the so-called radical pair mechanism. A radical is any molecule or atom which possesses one unpaired electron spin. Radicals are of great importance since they often appear as intermediates in thermal, radiation, and photochemical reactions. It is noteworthy that radicals are usually produced in pairs through the above-mentioned reactions. Such a pair of radicals has been called a radical pair. Thus, radicals and radical pairs play very important roles in chemical and biochemical reactions. For example, they appear in such important processes as polymerization and combustion reactions, radiation curing and lithography, photosynthesis in plants and bacteria, autooxidation and aging of organic molecules, polymers, and living organisms, and stratospheric ozone depletion by freons.

CIDEP (Chemically Induced Dynamic Electron Polarization) and CIDNP (Chemically Induced Dynamic Nuclear Polarization) are due to non-equilibrium populations in the electron spin sub-levels of reacting radicals and in the nuclear spin sublevels of reaction products, respectively. CIDEP and CIDNP have been successfully explained by the radical pair mechanism (RPM), according to which the singlet and triplet states of radical pairs can be mixed with each other through the Zeeman interaction between radicals and the external magnetic field and the hyperfine interaction between electron and nuclear spins inside the radical pairs. Because the populations of electron and nuclear spin sub-levels can be changed by ordinary magnetic fields through the RPM, not only the yield of reaction products generated through radical pairs but also the reaction rates of radical pairs were expected to be affected by the fields. Indeed, such effects have been observed for many chemical and biochemical reactions through radical pair, being called Magnetic Field Effects (MFEs) upon chemical and biochemical reactions.

Discoveries of CIDEP, CIDNP, and MFEs through radical pairs brought about the advent of a new research field, which has been called Dynamic Spin Chemistry. Dynamic Spin Chemistry encompasses basic theoretical and experimental investigations of all phenomena in which free radicals and other species possessing unpaired electron spins occur as well as applied researches of many important subjects on biological and industrial processes. As for biological processes, however, much fewer MFEs due to the RPM

have been found for biochemical reactions such as photosynthesis and enzymatic reactions. On the other hand, it has long been a matter of dispute in biology whether magnetic fields can give appreciable influence to biological reactions or organisms. Although there has been no report of the immediate death of living organisms by magnetic fields, there have been many reports on biological effects of magnetic fields. Most of the reports, however, were lacking for experimental reproducibility and theoretical background. As an example, an increase in childhood cancer has been reported for individuals living near electric power lines. Whether environmental electromagnetic fields generated by electric power lines (50–60 Hz), mobile telephones (about 1–2 GHz), etc. are sources of illness in human beings, however, remains still a matter of dispute.

Many interesting problems including the above-mentioned ones have been left for further investigations of Dynamic Spin Chemistry in the 21th century. Because the RPM is well understood and based on established science, Dynamic Spin Chemistry is expected to provide researchers of MFEs on biological as well as other processes with a good guidance.

The first half of this book explains the following basic principles in Dynamic Spin Chemistry: magnetic properties of electron and nuclear spins (Chapter 1), ESR and NMR (Chapter 2), the RPM (Chapter 3), CIDNP (Chapter 4), CIDEP (Chapter 5), and MFEs upon chemical reactions through radical pairs (Chapter 6). The second half describes typical results of recent investigations in this field, including MFEs due to relaxation mechanisms (Chapter 7), MFEs on chemical reactions through biradicals (Chapter 8), magnetic isotope effects (Chapter 9), triplet mechanism (Chapter 10), theoretical analysis of MFEs and CIDEP with the stochastic Liouville equation (Chapter 11), effects of ultra-high magnetic fields upon chemical reactions (Chapter 12), MFEs on chemical reactions through high-spin species (Chapter 13), optically detected ESR and reaction-yield-detected ESR (Chapter 14), and MFEs upon biochemical reactions and biochemical processes (Chapter 15).

This book grew out of a lecture which was given every year from 1997 to 2001 by the author to members of the Department of Electronic Chemistry, at the Interdisciplinary Graduate School of Science and Engineering, Tokyo Institute of Technology. The first aim of this book is to introduce Dynamic Spin Chemistry to researchers and students through detailed theoretical and experimental descriptions of reaction dynamics of radicals and radical pairs in the presence and absence of an external magnetic field. This is not the first book on this topic, but most of other books were written for specialists without explaining how to derive its basic principles. This book differs from others in the emphasis placed on making it a learning text for those with a minimum knowledge in quantum mechanics, historically important papers being introduced to the beginners in this field. At the same time, this text serves a secondary but important purpose of showing many typical results of recent investigations. This will provide academic and industrial researchers with a guide to further investigations in the 21th century in the fields of dynamic spin chemistry, photochemistry, photophysics, photobiology, magnetic resonance, electromagnetism, environmental science and nano-scale technology.

Provided by Takeji Takui

Positions Available & Wanted

PRINCETON UNIVERSITY DISTINGUISHED POSTDOCTORAL FELLOWSHIPS IN EPR SPECTROSCOPY

HFSP, NIH and the Dreyfus Foundation are funding a pair of research projects at Princeton University, which supports the application of EPR spectroscopy to understanding fundamental questions in biological chemistry and materials science. Applications for a postdoctoral position are invited for an **EPR spectroscopist** with experience in pulsed EPR methods and data analysis. This person will join a team of biochemists and materials chemists in the Chemistry Department under the supervision of Charles Dismukes.

Projects:

I Distance Measurements in Proteins using ELDOR and Double Quantum Coherence ESR. This project aims to advance knowledge of the structure of biomolecules where XRD is not available. Applications to multi-subunit proteins, photosynthetic reaction centers and other biological materials.

II The Structure and Function of Enzymes and Inorganic Materials using Electron-Nuclear Double Resonance (ENDOR) and 2D-Hyperfine Sublevel Correlation Spectroscopy (HYSCORE). To determine the electronic and magnetic environments surrounding the nuclei in coordination complexes and enzymes which determine their catalytic properties.

III Functional Dynamics of Proteins and Materials by Time Resolved FT-ESR. To study transient structural changes in photochemistry of photosynthetic reaction centers and inorganic materials related to catalysis and solar energy conversion and internal dynamics with proteins.

The postdoctoral fellow will have access to two Bruker EPR spectrometers (EleXsys 585 FT-EPR/ENDOR; ESP-300 series; ENDOR and TRIPLE accessories; fitted with Oxford helium cryostats) and major research resources in the Princeton Materials Institute and the Department of Chemistry. PhD applicants are invited with training in physics or chemistry. Send your CV, list of publications and names and contact information for three referees who have first hand knowledge of your work to

Ms. Lynn Mendenko
mendenko@princeton.edu
Princeton University, Hoyt Laboratory,
Department of Chemistry
Princeton, NJ 08544, USA

A further description of the criteria for selection, benefits, and the project can be found at

http://www.princeton.edu/siteware/administration.shtml

Research Group links:

Professor G. C. Dismukes
http://www.princeton.edu/~catalase/

GRADUATE SCHOLARSHIPS IN CHEMISTRY AVAILABLE AT THE UNIVERSITY OF ILLINOIS IN URBANA-CHAMPAIGN

Predoctoral Graduate Scholarships are available for highly qualified new applicants to the PhD program in the University of Illinois Department of Chemistry. Specialty areas in this department are Physical, Analytical, Organic, and Inorganic Chemistry as well as Materials Chemistry, Chemical Biology, and Chemical Physics. Magnetic resonance is one of the traditional strengths of our department.

These Scholarships carry excellent full-year stipends and exemption from tuition and most fees. Graduate Scholars are guaranteed continued financial support until completion of the PhD degree as long as satisfactory progress toward the degree is maintained.

Applicants whose native language is not English should take the TSE as well as TOEFL and GRE tests. I can provide information and application forms if you send me an e-mail.

Please contact:
Prof. R. Linn Belford
rbelford@uiuc.edu
Department of Chemistry,
University of Illinois
Box 18-6 CLSL, 600 S. Mathews
Urbana, IL 61801, USA
phone: 217-333-2553
fax: 217-244-3186

POSTDOCTORIAL POSITION: PULSED EPR OF METALLOPROTEINS AT UNIVERSITY OF ILLINOIS

An NIH-funded postdoctoral position is available in the Illinois EPR Research Center at the University of Illinois (Urbana, USA) for research work in pulsed EPR and ENDOR spectroscopy of metalloproteins. There is a focus on ESEEM theory and on structure-function relationships in Rieske and related proteins.

Expected education: PhD or equivalent in a discipline such as chemistry, biochemistry, molecular and cellular biology, physics, or biophysics. Background should include (1) experimental and/or theoretical magnetic resonance (preferably pulsed) and/or (2) experience with protein preparations and analysis.

Interested individuals should contact Prof. R. L. Belford (rbelford@uiuc.edu). The successful candidate will report directly to Dr. S. I. Dikanov (dikanov@uiuc.edu) and may collaborate with other faculty groups. Salary will be comparable to the usual NIH postdoctoral scale. The University of Illinois is an equal-opportunity employer.

Please contact:
Prof. R. Linn Belford
Illinois EPR Research Center,
Department of Chemistry,
University of Illinois
Box 18-6 CLSL, 600 S. Mathews
Urbana, IL 61801 USA
phone: 217-333-2553
fax: 217-244-3186

JUNIOR NMR SPECTROSCOPIST NEEDED – U.S. ARMY MEDICAL RESEARCH INSTITUTE OF CHEMICAL DEFENSE

A junior NMR spectroscopist is needed at the U.S. Army Medical Research Institute of Chemical Defense (USAMRICD), Aberdeen Proving Ground, MD. Position is only open to U.S. citizens. Qualified candidate must have a strong background in NMR spectroscopy.

The successful candidate will provide guidance on the operation of a Varian 600 MHz INOVA NMR and will obtain liquid and solid-state NMR spectra to aid principal investigators in studying chemical warfare (CW) agents and pharmacological countermeasures for CW agents. As NMR administrator for the Institute, the candidate will be responsible for maintaining and troubleshooting the instrument, user training, and managing the instrument in areas of biochemistry, organic, inorganic, and protein chemistry.

Please contact:
Dr. Carmen M. Arroyo
carmen.arroyo@amedd.army.mil
USAMRICD, 3100
Ricketts Point Rd,
APG, MD 21010
phone: 410-436-4454

POSTDOCTORIAL POSITION IN PRION RESEARCH AT UC SANTA CRUZ

Recent results suggest that the prion protein's normal function is related to its ability to bind copper. Through a widely collaborative effort, the Millhauser lab has determined the features of the copper sites and is now moving on to examine potential function and how function may be lost in prion diseases.

Current work has made extensive use of EPR, protein expression and protein synthesis. Although EPR, both CW and pulsed, will be key for continued work, the research will expand by moving into cellular assays, proteomics and perhaps transgenic experiments.

The Millhauser lab is looking for an enthusiastic, recent PhD who is comfortable with EPR and interested in learning new biophysical and biological techniques.

Please contact:
Prof. Glenn L. Millhauser
glennm@hydrogen.ucsc.edu
Department of Chemistry &
Biochemistry, UC Santa Cruz
Santa Cruz, CA 95064, USA
phone: 831 459 2176
fax: 831 459 2935
http://chemistry.ucsc.edu/millhauser_g.html

POSTDOCTORAL POSITION AT RADIATION PHYSICAL CHEMISTRY OF DNA AVAILABLE AT THE UNIVERSITY OF ROCHESTER

University of Rochester is an Affirmative Action/Equal Opportunity Employer

Postdoctoral Position working on the Radiation Physical Chemistry of DNA is available at the University of Rochester Medical Center. Our research program is focused on determining the mechanisms of direct damage to DNA by ionizing radiation. Well-characterized DNA samples, in the form of films and crystals, are used to correlate free radical intermediates with stable end products. Techniques employed include EPR, GC/MS, HPLC, and gel electrophoresis. Experience in EPR, GC/MS and/or DNA chemistry is important. See my web page at dnadamage.net. The initial appointment will be for one year and is renewable. Start can be as early as January 2004. Send a complete curriculum vita, a short summary of research interests, and the names of at least three references. If possible, please use email.

Please contact: William A. Bernhard
william_bernhard@urmc.rochester.edu
Department of Biochemistry &
Biophysics, Box 712,
University of Rochester Medical Center
Rochester, NY 14642, USA

Exchange
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Sentec Model 1001, including 3 standard probes covering the range of 1 to 10 kG. In good working order, this 1981 model (uses NIM bin!) includes 7-digit display, 0.01 Gauss resolution, accuracy: 10^{-6} relative, 10^{-5} absolute, has automatic peak search feature, BCD output, etc. Can be bought with or without NIM bin and CRT display. Make an offer!

Please contact:
Prof. E. J. Knystautas
ejknyst@phy.ulaval.ca
Physics Department, University Laval
Quebec City (Quebec) G1K 7P4
phone: 1-418-656-5569
fax: 1-418-656-2040

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Chennai 600 036, India
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Please contact: James Anderson,
Research Specialties
janderson36@wi.rr.com
1030 S. Main St.,
Cedar Grove, WI 53013, USA
phone/fax: 1-920-668-9905

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Clarence Arnow, President
rii1@earthlink.net
Resonance Instruments
phone: 1-847-583-1000
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Institute of Organic Chemistry
Novosibirsk 630090, Russia
In the US **please contact:**
Dr. Sergei Dikanov
dikanov@uiuc.edu

DO YOU NEED HELP IN 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.

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rquine@du.edu
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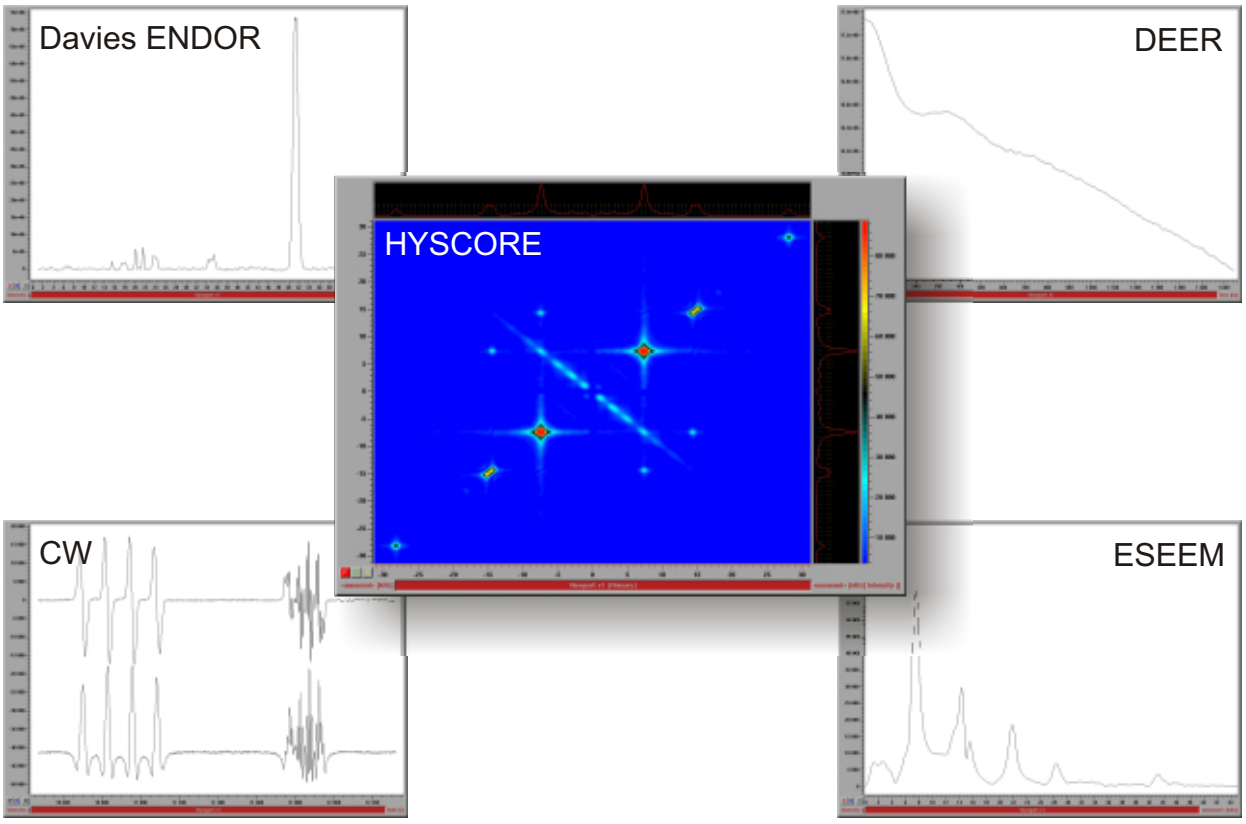

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