

BULLETIN DU GROUPEMENT

d'informations mutuelles



Groupement  
**AMPERE**

SE CONNAÎTRE, S'ENTENDRE, S'ENTRAIDER

April to June 2022

No. 287

## Contents

<b>Editorial</b>	1
<b>Portrait</b> Quentin Stern	2
<b>AMPERE News</b> NMR Resources	4
<b>Report</b> 15 <sup>th</sup> International Conference on the Applications of Magnetic in Food Science (MRFOOD2022)	5
<b>Posterprize</b> Elham Rakhshi	7
<b>Minutes</b> of the meeting of the AMPERE Bureau	9
<b>In memoriam</b> Remembering Stefan Jurga	13
Ray Freeman	15
Executive Officers and Honorary Members of the Ampere Bureau	20
Future conferences and Ampere events	24

## Editorial



Dear members of the Groupement AMPERE,

I just came back from the AMPERE NMR School in Poznan, the first larger in-person conference I attended in the past two years. It was good to see friends and colleagues again face-to-face and discuss with them about science, politics and life in general. This school has a long tradition and was organized by Stefan Jurga who passed away suddenly this spring (see page 13 for an obituary). Stefan was a long-time vice president of AMPERE and we will keep him in our memories. It was very uplifting to see that the school with a 30-year tradition will continue because new people stepped up and will continue his work. A report of the school will appear in the next issue of the Bulletin. Sadly, Ray Freeman, another of the pioneers of magnetic resonance passed away this spring (see page 15 for an obituary). During the past two years, quite a number of the second generation magnetic-resonance scientists, who shaped the formation of Fourier and multi-dimensional spectroscopy as a tool for modern research, passed away. This also means that stories and information about the beginnings and the history of NMR are lost unless we try to actively preserve them. Maybe as a community, we should think about a good way to achieve such a goal. If you have ideas or suggestions how to achieve such a preservation of information, please contact me.

Best regards and I hope all of you can enjoy a good summer vacation,

Matthias Ernst  
Secretary General  
Groupement AMPERE

If you would like to become a member of the AMPERE Society, you can register online under: [www.ampere-society.org](http://www.ampere-society.org)

## Portrait:

### Quentin Stern

#### Why magnetic resonance and why NMR and MRI?

NMR is so versatile! Creating new NMR experiments is such a creative task! I think that's what makes it so thrilling for me. I also find amazing how NMR gives us a direct access to quantum mechanical phenomena.

#### What is your favorite frequency?

80 MHz, that of the benchtop spectrometer that I mostly used during my PhD work. This spectrometer is like my toy.

#### What do you still not understand?

Multidimensional NMR... I must admit I barely use any sort of multidimensional experiments. When I see people running 3Ds, 4Ds and more, I am simply amazed!

#### Luckiest experiment you have ever done.

It is related to the so called 'spin diffusion barrier'. There was some spectrometer time left and thought "let's try something funny". I had the pulse sequence and a hand drawing of the result I expected. The experimental results looked just like my drawing! We named this experiment the hyperpolarization resurgence (HypRes). It turned out to be the most important contribution of my PhD.

#### What was the worst mistake you have made during your lab time?

Forgetting to close the liquid nitrogen tap overnight when I was refilling a Dewar in the end of the day. I emptied the 10'000 L container, on which our whole institute relies.

#### Most memorable conference story

Meeting at the Hyp21 in person after months and months of Zoom calls due to the COVID-19 pandemic. There was something magic about all the colleagues and friends meeting again after so long. I will never forget how light and joyful people were.

#### With whom (historical person) would you like to meet?

Erwin Schrödinger. I find his iconoclastic views inspiring. Not only he was the brilliant scientist that we all know, he also was very interested in spiritual life and philosophy.

#### When do you get your best ideas?

Clearly when I allow myself to do what is NOT a priority! Otherwise in my bed, although I'd rather sleep well and have good ideas in the morning when I start my day...

#### If you had just one month time for travelling - where would you go to?

I would ride donkeys with my son and my wife in Lozère, the emptiest region of France. Mountains, lakes and forests.

#### Your idea of happiness.

Being creative in as many aspects as possible (science, music, art, education), while keeping enough time for being unproductive, for endless breakfasts on Sunday mornings and for walking aimlessly.



Position: PhD student, HMR Lab, Claude Bernard University, Lyon

#### Awards:

Prix Louis Pelet awarding the best grades of the Bachelor of Chemistry and Chemical Engineering at EPFL, Switzerland, in 2012

Medal of excellence awarding the 8% best students of the Bachelor of Chemistry and Chemical Engineering at EPFL, Switzerland, in 2012

Homepage: <https://www.researchgate.net/profile/Quentin-Stern>

#### Education:

PhD in Chemistry at Université Claude Bernard Lyon 1, France (from 2018)

Masters in Mathematics and Chemistry, not finished (2017-2018)

Masters in Chemistry at EPFL, Switzerland (2012-2014)

Erasmus at the University of Edinburgh, UK (2011-2012)

Bachelor in Chemistry and Chemical Engineering at EPFL, Switzerland (2009-2011)

#### Interests:

Music (reggae bass player and singer in the bands The I-Twins and Najavibes)

Spirituality

DIY

## AMPERE News:

### NMR resources, a webpage to discover NMR

The AMPERE bureau has welcomed two new members, Guinevere Mathies and Quentin Stern, to represent the younger generation of our community. Their first initiative was to create a page on the AMPERE website for those who want to discover NMR and learn more about it. There is a plethora of useful information throughout the web and searching for the appropriate resource can be difficult for the newcomer in our field.

The aim is to gather the information in a single place. The webpage lists introductory books as well as online lectures and tutorial videos, MOOCs and online exercise and websites and forums, all about magnetic resonance. If you think a useful resource is missing, please feel free to send an email to [contact@ampere-society.org](mailto:contact@ampere-society.org)



The Old Cincinnati Library, 1874-1955

## Report:

### 15<sup>th</sup> International Conference on the Applications of Magnetic in Food Science (MRFOOD2022)

Scientific Advisory Board

Jean-Marie Bonny, Francesco Capozzi, John van Duynhoven (chair), Søren Balling Engelsen, Gisela Guthausen, Antonio Ferreira, Corinne Rondeau-Mouro, Manfred Spraul, Hanne Bertram

Local Organizing Committee (Department of Food Science, Aarhus University, INANO, Aarhus, Denmark)

Hanne Christine Bertram, Louise Jakobsen, Henrik Max Jensen, Rikke Karlsen, Ulrik Kraemer Sundekilde, Thomas Vosegaard



inano center, Aarhus University.

The MRFOOD conference series has built a long tradition in presenting the latest innovations in magnetic resonance and in particular new applications to understanding the functionality of foods, their processing and stability and their impact on health and sensorial perception. The 15<sup>th</sup> edition of the conference was intended to be held in 2020 but due to the COVID pandemic it unfortunately needed to be postponed to 7 to 10 June 2022. The conference was organized by Department of Food Science and the iNANO centre at Aarhus University. The conference took place at the INANO centre and attracted 99 participants (among whom 38 students) from 19 countries from Europe and the Americas.

The conference was preceded by well appreciated tutorials on processing of NMR metabolic profiles (Dr. Bedkod Khakimov) and fundamental concepts in magnetic resonance and diffusometry (Prof. Bernhard Blümich). The scientific part of the

conference opened with a session on Taking NMR to the sample, with inspirational presentations of Prof. Niels Chr. Nielsen and Dr. M. Victoria Gomez. The next session dealt with FoodOmics, with Prof Carolyn Slupky featuring as keynote speaker. The sessions on Magnetic Resonance in whole meat and appetite and Food Physics and Design were respectively kicked off by Dr. Paul Smeets and Prof Alan Mackie who gave excellent overview lectures. Prof. Daniel Topgaard appeared as keynote speaker in the Water State session and gave an inspiring overview of technological advances in this area. Next, Prof. Bernhard Blümich gave a comprehensive overview of past and ongoing developments in mobile and tabletop NMR. The last sessions were dedicated to FoodOmics and Food Chemistry and were kicked off with an appealing overview of novel metabolomics technologies by Prof. Andre Simpson. An overall observation of the conference attendees is that within the established domains of low field NMR and foodomics significant technological advances continue to emerge, which keeps unlocking new application areas in food science and technology. Another observation is that magnetic resonance investigations of in vitro and in vivo digestion have become an active research field.

The scientific programme included 8 invited keynote speakers and 24 oral presentations selected from submitted abstracts. The poster session comprised 39 presentations; at the conference dinner, Mrs. Elham Rakshi (IRSTEA, Rennes) was awarded with a prize for the quality of her poster.

This conference was sponsored by NMR suppliers (Bruker, JEOL, Magritek, Nanalysis, Oxford Instruments) and companies (IFF, AAK and MDPI) and supported by grants from the Carlsberg Foundation, and Aarhus University Research Fund. Without their generous support this conference would not have been able to offer an attractive programme with low fees for students.

The venue of the 16<sup>th</sup> edition of this conference will be announced in due time. We expect to welcome (even) more participants and that current developments in the applications of magnetic resonance in food science will have come to fruition.

## Posterprize MRFOOD 2022

**Elham Rakshi, INRAE, UR OPAALE, France**

### TD-NMR investigations to understand the molecular mechanisms implied in tapioca and wheat starch gelatinization

Rakshi E., Cambert M., Diascorn Y., Lucas T., Rondeau-Mouro C.  
INRAE, UR OPAALE, 17 avenue de Cucillé, CS 64427, F-35044 Rennes, France

To provide evidence for previously proposed assumptions concerning starch gelatinization sub-mechanisms, a more detailed investigation was carried out using multi-scale analysis of a starch type selected for its marked difference, in terms of swelling and gelatinization mechanisms, from wheat starch, which is taken as a reference[3, 4]. Tapioca starch was chosen due to its cohesive/springy properties and its growing use in the food industry. Time-Domain Nuclear Magnetic Resonance (TD-NMR) was used to investigate the leaching of material, water absorption, and crystallite melting in hydrated tapioca starch (45%)[5]. The interpretation of T2 mass intensity evolutions, especially those of the (intra- and extra-granular) aqueous phases, was discussed drawing on complementary techniques such as microscopy, RVA (Rapid Visco Analysis), DSC (Differential Scanning Calorimetry), and SF (Swelling Factor) and SI (Solubility Index) measurements.

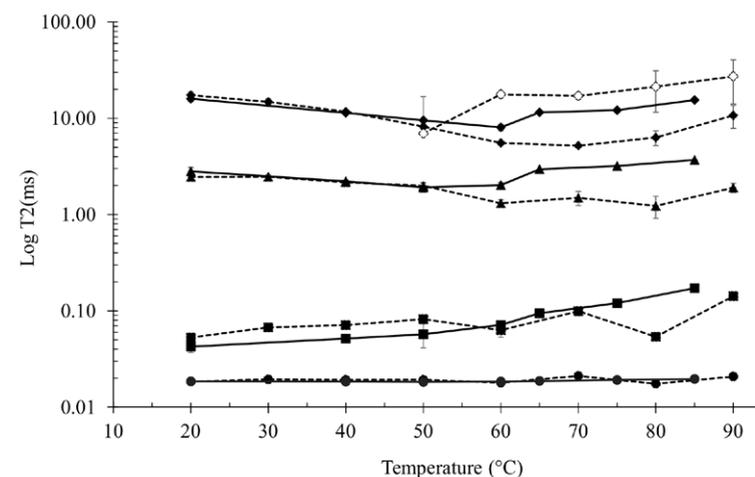


Figure 1: T2 values as function of temperature for TS45 (full lines) and WS45 (dotted lines). T2(1), T2(2), T2(3), T2(4) and T2(5) are designated by solid circle, square, triangle, diamond and outline diamond symbols respectively.

Results show that the T2 assignments usually proposed in the literature are dependent on starch origin. The differences in T2 evolutions (value and mass intensity) observed between wheat and tapioca starches at intermediate hydration levels could be linked to the different gelatinization behaviour of tapioca starch involving the latter's higher granule rupture level, higher gelatinization temperature and greater swelling power above its gelatinization temperature.

References:

- [1] Eliasson, A-C, L., K. (1993). *Cereals in Breadmaking : A Molecular Colloidal Approach* (1st ed.), Marcel Dekker, Inc, New York (USA). doi:10.1201/9781315139005
- [2] Pérez, S.; Baldwin, P. M.; Gallant, D. J. (2009). Structural features of starch granules I, *Starch*, Elsevier, 149–192. doi:10.1016/B978-0-12-746275-2.00005-7
- [3] Rondeau-Mouro, C.; Cambert, M.; Kovrljija, R.; Musse, M.; Lucas, T.; Mariette, F. (2015). Temperature-Associated Proton Dynamics in Wheat Starch-Based Model Systems and Wheat Flour Dough Evaluated by NMR, *Food and Bioprocess Technology*, Vol. 8, No. 4, 777–790. doi:10.1007/s11947-014-1445-0
- [4] Kovrljija, R.; Rondeau-Mouro, C. (2017). Hydrothermal Changes of Starch Monitored by Combined NMR and DSC Methods, *Food and Bioprocess Technology*, Vol. 10, No. 3, 445–461. doi:10.1007/s11947-016-1832-9
- [5] BeMiller, J. N.; Whistler, R. L. (2009). *Starch: Chemistry and Technology* (3rd ed.), Academic Press

## Minutes of the meeting of the AMPERE Bureau

online, on March 17, 2022

### Members present (21):

B. Blümich, A. Böckmann, G. Bodenhausen, J. Dolinšek, J.-N. Dumez, M. Ernst, S. Hiller, A. Kentgens, B.H. Meier, H. Oschkinat, G. Otting, J. Plavec, Y.-Q. Song, D. Kruk, G. Mathies, J. Parkinson, K. Szutkowski, L. Ciobanu, M. Baldus, P. Giraudeau, Q. Stern

### Excused:

T. Prisner

### Agenda:

1. Approval of the agenda.
2. Approval of the minutes of the AMPERE Bureau meeting online on June 25, 2021
3. Report on the state of the AMPERE Society (A. Böckmann)
4. Financial Report (M. Ernst)
5. Report EUROMAR Division (T. Prisner)
6. Financial report EUROMAR division (A. Kentgens)
7. Report Publication Division (Magnetic Resonance) (G. Otting)
8. Report AMPERE Videos (S. Hiller)
9. Report on Andrew prize and funds to support meetings (B. Blümich)
10. Final reports past meetings 2021:
  - EUROMAR 2021, Portoroz (Slovenia), July 4-8 (J. Plavec)
  - Biological SSNMR School, Palma (Spain), May 27-June 3 (H. Oschkinat)
  - AMPERE NMR School, Zakopane (Poland), June 23-29 (S. Jurga)
  - 16<sup>th</sup> ICMRM, Malmø (Sweden), August 3-4 (M. Ciobanu)
  - HYP20 Conference, Lyon (France), September 5-9 (G. Bodenhausen)
  - MR Food 2021, online, October 28-29 (J. v. Duynhoven)
11. Future meetings 2022:
  - AMPERE NMR School, Zakopane (Poland), June 23-29 (S. Jurga)
  - MR Food 2022, Aarhus (Denmark), July 10-14 (J. van Duynhoven)
  - EUROMAR 2022, Utrecht (Netherlands), July 3-8 (M. Baldus)
  - MRPM 2022, Hangzhou (China), August (Y.-Q. Song)
  - Alpine Conference, Chamonix (France), September 12-16 (J.-N. Dumez)
12. Election of the AMPERE Bureau and Committee at EUROMAR 2021 (B. Blümich, M. Ernst)
13. Varia
14. Date of next meeting

At 12:00 hours, Matthias Ernst opened the meeting. The meeting was overshadowed

by two events that affect the AMPERE Bureau in an unexpected manner. One is the attack of Russia on Ukraine. Second is the passing of Stefan Jurga two days prior to the meeting. He passed away on March 15 at the age of 76. Stefan had a key role in the society and would have been a participant of this meeting. D. Kruk shares some of her personal memories about S. Jurga.

**Ad 1.** The agenda was approved as is.

**Ad 2.** The minutes of the AMPERE Bureau were approved unanimously.

**Ad 3.** The president A. Böckmann also mourned the passing of Stefan Jurga and acknowledged his contributions to the society. Further notable members that had passed away in the last year include Aharon Loewenstein and Wes Anderson. They will be kept in the memory of the society members.

As a second eminent topic, the attack of Russia on the Ukraine is discussed. This is obviously a difficult issue, both in its complexity and its consequences on life. There are two particular reasons why the AMPERE society cannot stay neutral to this topic but needs to define a position and reaction. First, there are two upcoming AMPERE conference planned in Russia, the conference SPINUS in St. Petersburg and the conference "Modern Development of Magnetic Resonance" in Kazan. The bureau unanimously condemns the war and at the same time understands that the personal ties to Russian scientists are a valuable communication pathway. In particular, if these scientists are opposing the Russian politics, which is however sometimes not easy to find out for multiple reasons.

After a long and detailed discussion, the bureau votes unanimously to suspend activities with Russia on an institutional level for one year, and thus suspends to support the above-mentioned conferences in 2022. Second, the bureau decides to continue maintaining and supporting the individual and personal memberships of the Russian colleagues. Votes were 20 yes, 1 no, 1 abstention. A public statement regarding these decisions will be formulated subsequent to the meeting and posted on the AMPERE website.

A. Böckmann introduced the two young members G. Mathies and Q. Stern and asked them to introduce themselves. J. Parkinson was also welcomed, the chair of the EUROMAR 2023.

**Ad 4.** M. Ernst presented the financial report. Finances are continuing to be stable. The financial situation of all subdivisions is stable and partially very positive. The Bureau decided to support Ukrainian scientists with 5000 CHF via a charity organisation.

**Ad 5.** A. Kentgens reported on the EUROMAR division. The division has now prepared a memorandum of understanding how to plan the EUROMAR conferences.

It was suggested that there be an ex-officio member in the EUROMAR committee from the AMPERE bureau to facilitate communication between the two institutions. P. Giraudeau volunteered to do this. EUROMAR 2022 is scheduled for Utrecht and 2023 in Glasgow.

**Ad 6.** A. Kentgens reported on the finances of the EUROMAR division. Finances are stable.

**Ad 7.** G. Otting reported on the publication division. The journal Magnetic Resonance has existed for 2 years. While quality of publications is generally good, one challenge is becoming indexed on Web of Science. This procedure is in progress and will hopefully happen soon, along with an impact factor. G. Otting urges everyone to submit articles.

**Ad 8.** S. Hiller reports on the Ampere video collection. The committee has collected 12 video and has put them online on YouTube. It is more difficult than anticipated to obtain videos and the committee hopes to improve the situation with new additional members.

**Ad 9.** B. Blümich reported on the Andrew Prizes and the funds to support meetings. There are 22 nominees and 4 are considered closer. Competitive funding for a summer school has been requested. 3000 EURO have been given to the Zakopane summer school.

**Ad 10.** Final reports of past meetings:

- The report of the EUROMAR 2021 was given by J. Plavec. The conference had over 600 participants, over 130 posters, which can be considered a success for an online event. The Bureau thanked J. Plavec for the organization.
- AMPERE NMR school in Zakopane was reported by D. Kruk. The conference had 250 participants from 30 countries and many invited speakers. It was overall very successful.
- 16<sup>th</sup> ICMRM in Malmø, presented by L. Ciobanu. The conference was online with free registration.
- HYP21 reported by G. Bodenhausen. The event was in Lyon in August in person, which was very positive for all participants. The conference went very well and was well received.
- A report on the NMR Food conference had been reported in the AMPERE bulletin.

**Ad 11.** Reports of planned meetings in 2022:

- AMPERE NMR school in Zakopane reported by D. Kruk. Planning is well on the way including 20 invited speakers, and an excursion. The passing of S. Jurga poses a challenge but D. Kruk is positive she will manage.
- EUROMAR 2022 in Utrecht by M. Baldus. Organizing committees are in place. The abstract submission has just been closed and the program is assembled. It follows

established procedures. There are 12 invited plenary speakers, and 42 invited speakers from all over Europe. There will be a satellite meeting with the topic of NMR at 1.2 GHz. This is at the same time the opening of the 1.2 GHz spectrometer in Utrecht. 192 submissions of abstracts have been received so far, out of which 63 will be promoted to talks. Inspiring places for the opening and gala dinner have been found. Generally, everything looks good.

- MRPM15 in Hangzhou, China presented by Y.-Q. Song. It will be hard for external people to come into China due to the restrictive COVID policies in China. The meeting will therefore be run in hybrid format with 10 in-person speakers all from China and international speakers on zoom.

- Alpine Conference on Magnetic Resonance in Solids, Chamonix (France) by J.-N. Dumez. 9 confirmed invited speakers. Registration has opened and will close end of May. Conference is usually in odd years, currently an exception due to COVID and will continue to go to the odd years in 2023.

**Ad 12.** Future plans, G. Mathies proposes a virtual AMPERE Café as a monthly meeting point for scientists. There are several available technology platforms that offer such virtual places to meet. The bureau discusses options how to implement this.

Q. Stern proposes to establish an online list of available teaching and information resources that could be linked. Also, he would like to help in the video division. A. Böckmann suggests the establishment of a searchable member list online that is accessible to members only. Second suggestion is a monthly reader's digest list that promotes publications by members within the subdivision to other members.

**Ad 13.** There were no Varia.

**Ad 14.** The upcoming committee and bureau meetings will be at EUROMAR and in person. The general assembly shall be kept online after the EUROMAR. The envisaged date of the next spring meeting of the AMPERE Bureau: March 16, 2023, to be decided whether on Zoom or in Zurich.

The meeting closed at 15:01

Basel / the internet, 17 March 2022

Minutes: Sebastian Hiller

## In memoriam

### Remembering Stefan Jurga

August 18, 1946 - March 15, 2022

Stefan Jurga, a long time Vice President of the Groupement AMPERE (2002 – 2012) and chair of the AMPERE NMR School in Zakopane suddenly passed away in March 2022.

Stefan Jurga received his Doctorate (1974) and Habilitation (1985) from the Faculty of Physics, Adam Mickiewicz University (AMU) of Poznan and was Professor of Physics there since. His main research field was solid-state NMR spectroscopy and his mentor was Professor Zdzislaw Pajak, a long time AMPERE Committee member. Prior to his Habilitation he was my first Alexander von Humboldt postdoctoral fellow at the University of Mainz. During his stay with me, the Max Planck Institute for Polymer Research started and I became one of its three directors. The research at that Institute is highly interdisciplinary, based on physics, chemistry and computer simulation. The research is organized in interdisciplinary projects and Stefan followed this approach with great interest. His strategy in building up the new Physics Department of his University in Poznan and later the NanoBioMedical Center at AMU can be traced back to his time in Mainz. In his last letter to me at Christmas 2021, he wrote *'bringing the Centre to a high scientific level, I will get "an internal freedom" to resign from my position'*.



Stefan Jurga was an extremely innovative and successful science organizer. This made him Deputy Dean of the Faculty of Mathematics and Physics (1987–1990), Vice-rector (1990–1996) and Rector of AMU (1996–2002). In the years 2005–2007, he was the Deputy Minister for Higher Education at the Ministry of Science and Higher Education in Poland. Since 2010 until his untimely death, he

was the Director of the NanoBioMedical Center at AMU. During my term as President of the Groupement AMPERE 2002-2006 I benefitted a lot from his enthusiasm and his widespread international networking. In particular, he emphasized the European nature of the Groupement AMPERE and helped a lot in making AMPERE the 'Umbrella Organization' for Magnetic Resonance in Europe, in particular EUROMAR.

Last, but not least, Stefan Jurga was the long time chair of the AMPERE NMR School in Zakopane, which was started in 1993 by Jerzy Blicharski, Jagiellonian University, Krakow. This School addresses young scientists (post graduate students, PhD students and post-doctoral fellows) and is focused on theoretical and experimental aspects of NMR methods, as well as on application of NMR in nanoscience and nanotechnology. Stefan created a special atmosphere through social interactions among the participants, which becomes apparent in the photo from the AMERE School 2018.



On the personal side, Stefan's hospitality and care of his family, his wife Maria, his daughter Justynka and her children was legendary. Together with them and the entire AMPERE family, we mourn the loss of a great science organizer and close friend.

Hans Wolfgang Spiess

## In memoriam

### Ray Freeman

1932-2022

Ray Freeman, who died on May 1<sup>st</sup> 2022, leaves behind a deep sense of void. There are many famous scientists who advised numerous PhD students and post-docs, but I do not know any who inspired such a strong sense of shared values. Ray's former group members formed neither a family nor a community, much less a tribe: Ray would not have liked such words. It appears vain to list his numerous students and post-docs, and even less meaningful to list the second, third and fourth generations of Ray's intellectual offspring, since many of them have benefitted from cross-fertilization with other schools of thought. It would amount to betray Ray's values to add up their citation numbers. For Ray had a unique sense that *research should be a source of fun*. Although, wisely, none of his followers tried to copy his unique style of lecturing, his sense of humor, his love for cartoons, his calligraphic script, his memorable acronyms (like INEPT and INADEQUATE), all of us were deeply impressed by his imagination, his unobtrusive manner of advising his students, and his sense of humour.

One of Ray's remarkable features is that he invented so many novel things without appearing to pay much attention to any underlying theory. Ray had a remarkable intuition for the behaviour of classical magnetization vectors and their trajectories, in particular when composite pulses became fashionable. Of course, he knew about density matrices and operators, had a good feeling for electronics, and even had a brush of average Hamiltonians, but most of these concepts were incorporated into a unique sense of intuition that fueled an unbridled generation of ideas. About 'The Birth of an Idea' (recovered by James Keeler, see <http://www-keeler.ch.cam.ac.uk/freeman/>), Ray wrote: 'We touch here on one reason that research can prove attractive, productive and fun as a scientific career. Where exactly do original concepts spring from? This is distinct from the discovery of actual scientific facts. In research we seek both, but in many ways the ideas are more challenging and exciting, partly because they are basically fragile like a new-born child, needing nurturing and protection. Yet one day that child gets onto his feet, walks by himself and never looks back.'

Among Ray's magical tricks to keep up the spirit of his team and fuel its inspiration, he promoted a so-called 'Ideas Book' that, in his own words, '... avoided mention of the established mathematical nomenclature of magnetic resonance, such as density matrices and Liouville space. This may have evolved from my own belief that 'hand waving' arguments and intuition are the best generators of new concepts. The idea comes first; formal representation later. [...] The Ideas Book made it clear that everyone was involved. Every proposed new experiment could blossom through the operation of the Ideas Book, and the entire group could take credit. The key advantage is that the

stimulation pulled everyone together; this was never a one-man show. I still feel proud that so many members of our group 'graduated' and went on to form their own research enterprises, often more inventive than the original.'

Maurice Goldman remembers that, when Ray worked with Anatole Abragam, Robert Pound, Ionel Solomon and others in Saclay (1957-59), he built a delicate apparatus to stabilise a magnetic field. He wanted to attach a warning that would convey the typically British message "*Trespassers will be prosecuted*". Ray offered a mock French translation „*Les trépassés seront persécutés*“ (the deceased will be tormented). Such was Ray's sense of humour.



When I joined Ray's lab in Oxford in the beginning of 1975, after completing my diploma in chemistry at ETH in Zurich, I felt that Oxford would do me a lot of good, after the rather frigid *besserwisser* atmosphere in Zurich, where I had completed a Master's thesis on Overhauser effects under Richard Ernst's supervision. In Oxford's Physical Chemistry Laboratory (PCL), we fired up a brand-new Varian CFT 20 spectrometer, designed for carbon-13 NMR at 20 MHz, with proton decoupling at 80 MHz. This modest piece of equipment, along with a wonderful Texas Instruments analogue oscilloscope, was to be our only equipment for the next few years. It compelled us to be creative. We somehow managed to control the timing of pulse sequences. David Turner and Gareth Morris were soon to join our group, to be followed by Reinhard Niedermeyer. Malcolm Levitt joined the team shortly after I had submitted my D.Phil. thesis. Our earliest achievement was a simple sequence of equidistant pulses that would become known as 'Delays alternating with nutation for tailored excitation' (DANTE). We programmed in octal code, since there was no compiler. The entire memory of the Varian computer was limited to a mere 32 k bytes. The external Diablo disk had a capacity of 1 Mbyte, and we had to programme the addresses of the physical tracks on the disk to save and retrieve data. How salutary it is to be so impoverished! How easy it is to get distracted by today's sophisticated machines!

At the beginning of 1976 came the totally unexpected advent of two-dimensional Fourier transformations. The first pictures came to us through a TAMU newsletter by Richard Ernst. (Only many years later did we become aware of Jean Jeener's lecture in Basko Polje.) We discovered all sorts of marvels, such as artefacts that Ray affectionately dubbed 'ghosts' and 'phantoms'. The invention of phase-cycles allowed us to get rid of them. Our Exorcycle was dubbed after a silly movie called 'the Exorcist'. We also invented what later came to be known as 'time proportional phase incrementation' (TPPI).

We spent most of our time exploring 'J spectra', where the evolution period contained a refocusing pulse to remove line-broadening effects due to inhomogeneous fields. To our surprise, we discovered that spin-echo spectra could feature negative lines. Gareth did a great job in adapting spectral simulations to predict J spectra ('Son of Laocoon'). We also found some curious effects of interference with sample spinning that would later become relevant in solids.

After Maudsley and Ernst invented heteronuclear correlation spectroscopy, we reformulated this idea by invoking the role of populations of spin states, where information could be stored temporarily. Ernst had not mentioned any populations, since in his view the question in which order pulses should be applied to protons and carbon-13 nuclei was immaterial, because their propagators commute. Our understanding was not up to this level of abstraction – our ignorance would lead to many fruitful ideas!

Ray did not spend much time in the lab, for he was deeply involved in teaching 'tutorials', i.e., meetings with a handful of students, mysterious rituals that seemed quite incomprehensible by ETH standards. But Ray often came to coffee and tea breaks in the Common room of the PCL around 11 am or 4 pm, less frequently around 1 pm for lunch, consisting of a bowl of soup and a roll with cheese, all served by a charming tea lady named Gladys. It is in the Common room that most interesting discussions happened. When we were going through particularly exciting times, we would discuss non-stop from 11 am to 5 pm, over coffee, soup and tea.

Geoffrey Bodenhausen  
Ecole Normale Supérieure, Paris

# Enable Education Everywhere...



...with **EquipSent!**

## Initial Situation

In high-income countries, scientific equipment is often stored unused after its usage time in research laboratories. Older devices are eventually discarded, even though they are still functional.

In low-income countries, schools and universities are lacking the funds to acquire even the most basic devices for adequate training of talented students. The resulting 'brain-drain' to other countries hinders the self-development in such regions.

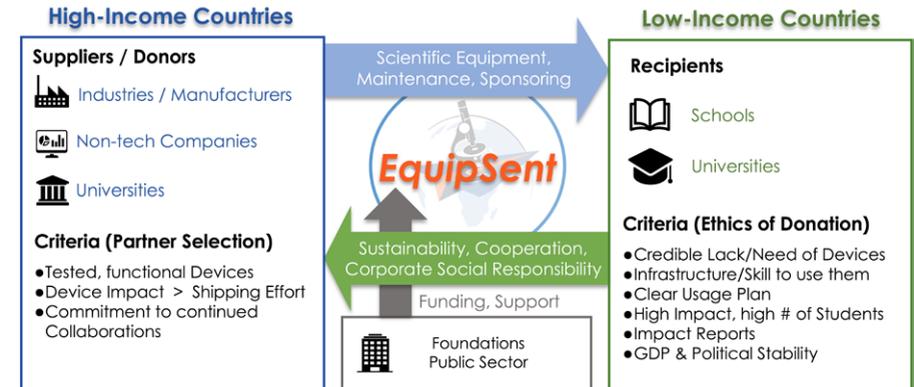
## Our Solution

EquipSent seeks to connect these two worlds by directly matching donors of scientific equipment with those in need. As an intermediary between both parties, we reduce administrative efforts and help organizing the shipping, installation and legal contracting. Expenses are shared between the recipient and the industrial sponsors in return for CSR, new markets and advertisement.

## Target Impact

- Access to Education. Students around the world will be granted access to hands-on training and education, rather than theory only.
- Collaboration and Development. The matched donor, sponsor and recipient of equipment are encouraged to collaborate on a long-term basis, which offers learning opportunities on all sides.
- Resource Efficiency & Waste Minimization. The equipment donor profits by reducing costs for space, waste and personnel, while benefitting from a positive image generated through sustainable use.

Founded by a group of ETH students, EquipSent is giving a second life to devices, promotes sustainable use and offers access to education and research to more people.



Do you know about no longer used, but functional scientific equipment in your research group or do you know of a university in need?

Do you want to learn more about what we do?

Check out our website [EquipSent.org](http://EquipSent.org) and get in touch with us!

our Partners:



## Executive Officers and Honorary Members of the AMPERE Bureau

The AMPERE BUREAU includes the executive officers (which take the responsibility and the representation of the Groupement between the meeting of the committee), the honorary members of the Bureau and the organizers of forthcoming meetings.

### President

Anja Böckmann, CNRS/University of Lyon, France  
anja.bockmann@ibcp.fr

### Vice President

Janez Dolinšek, Jožef Stefan Institute, Slovenia  
jani.dolinsek@ijs.si

### Vice President

Patrick Giraudeau, Université de Nantes  
patrick.giraudeau@univ-nantes.fr

### Secretary General

Matthias Ernst, ETH Zurich, Switzerland,  
maer@nmr.phys.chem.ethz.ch

### Executive Secretary

Sebastian Hiller, University of Basel, Switzerland  
sebastian.hiller@unibas.ch

### Young Member

Guinevere Mathies, University Konstanz, Germany  
guinevere.mathies@uni-konstanz.de

### Young Member

Quentin Stern, University of Lyon, France  
quentin.stern@protonmail.com

### EF-EPR

Sabine van Doorslaer, University of Antwerp, Belgium  
sabine.vandoorslaer@uantwerpen.be

### SRMR

Luisa Ciobanu, CEA/Neurospin, France  
luisa.ciobanu@gmail.com

### MRPM

Yi-Qiao Song, Schlumberger-Doll Research, USA  
ysong@slb.com

### MR-Food

John van Duynhoven, Wageningen University & Research, The Netherlands  
john-van.duynhoven@unilever.com

### Hyperpolarisation

Geoffrey Bodenhausen, ENS, France,  
geoffrey.bodenhausen@ens.fr

### Publication Division

Gottfried Otting, Australian National University, Australia  
gottfried.otting@anu.edu.au

### Biological Solid State NMR

Hartmut Oschkinat, Leibniz Forschungsinstitut für Molekulare Pharmakologie, Germany  
oschkinat@fmp-berlin.de

### Euromar

Thomas Prisner, Goethe University Frankfurt, Germany  
prisner@chemie.uni-frankfurt.de

### Euromar Treasurer

Arno Kentgens, Radboud University, The Netherlands  
a.kentgens@nmr.ru.nl

### Past President

Bernhard Blümich, RWTH Aachen University, Germany  
bluemich@itmc.rwth-aachen.de

### Honorary member

Beat Meier, ETH Zürich, Switzerland  
beme@nmr.phys.chem.ethz.ch

### Honorary member

Stefan Jurga, Adam Mickiewicz University, Poland  
stjurga@main.amu.edu.pl

## AMPERE Committee

**Sharon Elizabeth Marie Ashbrook** (2016-2024) University of St. Andrews, United-Kingdom

**Rolf Boelens** (2016-2024) Utrecht University, The Netherlands

**Enrica Bordignon** (2021-2025) University of Geneva, Switzerland

**Vladimir Chizhik** (2016-2024) University of St. Petersburg, Russia

**Peter Crowley** (2018-2022) National University of Ireland, Ireland

**Janez Dolinšek** (2016-2024) Institute Jozef Stefan, Slovenia

**Isabella Caterina Felli** (2016-2024) CERM, University of Florence, Italy

**Ana Maria Pissarra Coelho Gil** (2018-2022) University of Aveiro, Portugal

**Patrick Giraudeau** (2016-2024) Université de Nantes, France

**Klaartje Houben** (2021-2025) DSM, Den Haag, Nederland

**Kristaps Jaudzems** (2019-2023) University of Latvia, Latvija

**Vytautas Klimavičius** (2021-2025) Technical University Darmstadt, Germany

**Katalin Köver** (2021-2025) University of Debrecen, Hungary

**Wiktor Kozminski** (2016 - 2024) University of Warsaw, Poland

**Jose Martins** (2021-2025) Ghent University, Belgium

**Jörg Matysik** (2021 - 2025) University Leipzig, Germany

**Giulia Mollica** (2021-2025) ICR, Aix Marseille University, France

**Predag Novak** (2019-2023) University of Zagreb, Croatia

**Giacomo Parigi** (2021-2025) University of Florence, Italy

**Annalisa Pastore** (2021-2025) King's College London, England

**Miquel Pons** (2016-2024) University of Barcelona, Spain

**Indrek Reile** (2019-2023) National Institute of Chemical Physics and Biophysics, Estonia

**Frode Rise** (2018-2022) University of Oslo, Norway

**Sharon Ruthstein** (2018-2022) Bar-Ilan University, Israel

**Mariana Isabel Coutinho Sardo** (2021-2025) University of Aveiro, Portugal

**Paul Schanda** (2021-2025) The Institute of Science and Technology, Austria

**George Spyroulias** (2017-2025) University of Patras, Greece

**Ville-Veikko Telkki** (2016-2024) University of Oulu, Finland

**Christina Thiele** (2016-2024) Technische Universität Darmstadt, Germany

**Daniel Topgaard** (2017-2025) Lund University, Sweden

**Lukáš Trantírek** (2021-2025) CEITEC - Central European Institute of Technology, Czech Republic

**Jadwiga Tritt-Goc** (2021-2025) Polish Academy of Sciences, Poland

**Paul Vasos** (2019-2023) Horia Hulubei Institute for Nuclear Physics (IFIN-HH), Romania

## Honorary members

**Jean Jeener**

Université Libre, Belgium

**Karl Alexander Müller**

IBM Zurich Research Laboratory, Switzerland

**Hans Wolfgang Spiess**

Max Planck Institute for Polymer Research, Germany

**Kurt Wüthrich**

ETH Zürich, Switzerland

## Prize Committee

**President:**

**Bernhard Blümich**, RWTH Aachen University, Germany

**Members:**

**Mark E. Smith**, University of Southampton, England

**Annalisa Pastore**, King's College London, England

**Alexej Jerschow**, New York University, USA

**Enrica Bordignon**, University of Geneva, Switzerland

## Future conferences

### Ampere Event 2022

Magnetic Resonance in Porous Media	Hangzhou (China)	August 21-26
Alpine Conference on Magnetic Resonance in Solids	Chamonix (France)	September 4-8

### Ampere Event 2023

Euromar 2023	Glasgow (United Kingdom)	July 9-13
Alpine Conference on Magnetic Resonance in Solids	Chamonix (France)	September 10-14
HYP23	Leipzig (Germany)	September 24-28



Groupement  
**AMPERE**

[www.ampere-society.org](http://www.ampere-society.org)