

# ESR Spectroscopy Group

Founded January 1969

<http://www.esr-group.org>



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## CONFERENCE REPORT 2019

The 52<sup>nd</sup> Annual International Meeting of the ESR Spectroscopy Group of the Royal Society of Chemistry was masterfully organised by Stephen Sproules in Glasgow in April 2019. The attention to detail was unprecedented – there were taxis waiting at Glasgow airport at the exact time of arrival of each of the participants, and the seemingly omniscient Stephen and his team were there at the hotel entrance to personally greet everyone. The carefully scripted programme featured a ceilidh – a Scottish dance roughly comparable to running a marathon on a Moebius strip; it took the breath away from your intrepid correspondent. At about 5:30 one morning, a very British waiter surveyed a collection of napkins covered in equations and pulse sequences that had accumulated through the night, and inquired “would ladies and gentlemen like some more wine?” We did.



No trip to Scotland is ever complete without a visit to one of its famous whisky distilleries. The programme included a trip to Auchentoshan, which translates from Gaelic as “corner of the field”; it was less than two miles away from the Conference hotel. The guided tour of the distillery ended with a tasting of their signature single malts.

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## Bruker Prizes

Since 1986, Bruker Corporation has generously sponsored an annual lectureship and prize, given to a scientist who has made a major contribution to the application of ESR spectroscopy in chemical or biological systems. The Bruker Prize 2019 was awarded to Marina Bennati of the Max Planck Institute for Biophysical Chemistry for her outstanding work in ESR instrument development (dual mode cavity for W-band, rapid freeze quench for multi-frequency ESR, *etc.*), theoretical and methodological research (CP-ENDOR, orientation selection, *etc.*) and biophysical applications that also included the neighbouring NMR and DNP spectroscopies.



Prof Marina Bennati

The other annual EPR prize sponsored by Bruker is the Thesis Prize, set up to recognise outstanding work by PhD students in the field of ESR Spectroscopy. The Committee received twelve (a record so far) applications from the students who had submitted their thesis in the previous two years. By reading the summaries and the support letters from supervisors and examiners the Committee narrowed the field down to three submissions, and then asked external experts to read and assess each thesis in depth.



Dr Claire Motion

The winner was Dr Claire Motion for her thesis completed at the University of St Andrews, supervised by Prof Graham Smith. To quote our expert reviewer panel:

*Dr Motion has significantly enhanced sensitivity of a cutting-edge spectrometer and has demonstrated an incredible sensitivity improvement in low-spin Fe(III)-nitroxide DEER, which no expert would have predicted. This was not just a matter of luck, but a result of meticulous preparation and deep understanding. [...] the thesis of Dr Motion is a convincing demonstration of scholarship [...] it is very impressive how many journal articles she managed to publish.*

All attendees were very impressed and noted, with gratitude, that Bruker was again a major force behind making the Conference a success.

## JEOL and IES prizes

In the long history of the RSC ESR Group, one of the best predictors of an excellent scientific career is the JEOL Medal: many past winners are currently holding faculty posts at universities across the world. All student abstracts were considered for the short-list, the authors of the best six were invited to give a talk. Two presentations stood out – an applications talk by Sonia Chhabra (*“Application of EPR Methodology Towards Cr/PNP Based Ethylene Tetramerisation Catalysis”*) and a methodology talk by Frauke Breitgoff (*“Pushing for Longer Distances: Frequency-Swept Excitation in Distance Measurements of Spin-1/2 Systems”*). By a very tight margin, the second presentation won the JEOL Medal. A representative of the JEOL Corporation presented the medal during the drinks reception that the company also sponsored.

The International EPR Society has expanded its presence at the Conference this year, awarding not only its traditional poster prizes, but also the Silver Medal. The poster prizes went to Luis Fabregas Ibanez (for a poster titled *“Hyscorean: Measurement, Processing and Analysis of Non-Uniform Sampled HYSORE”*) and Benjamin Tucker (for a poster titled *“An Investigation of Refocused Out of Phase DEER and RIDME”*).

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The IES Silver Medal was awarded to Robert Bittl of the Free University of Berlin. The award was presented by Thomas Prisner (IES President) with the following laudation:

*The IES Silver Medal in Physics for 2019 is awarded to Professor Robert Bittl in recognition of his many fundamental contributions to the understanding of the spin physics of EPR spectroscopy with application in biophysics and solar energy materials. Prof Robert Bittl studies natural paramagnetic species in important protein complexes. Within these studies, he works on the theoretical and conceptual understanding of time-resolved and pulsed EPR experiments and contributes to their methodological developments. One of his long-standing topics is the understanding of light-driven electron transfer processes in proteins. He explored the electron spin polarisation and coherence induced by such processes and their appearance in time-resolved or pulsed EPR experiments. Furthermore, he explored the effects arising from high-spin centres and from delocalized spin systems in EPR experiments. He pioneered the detection of natural occurring paramagnetic species in living cells by EPR and explored the use of microresonators to increase the sensitivity for such size-limited samples. Further experimental developments are in high-field / high-frequency EPR technology up to the Terahertz region. As a second direction, Professor Robert Bittl studies fundamental photo-physical processes in solar cells and light-driven electron transfer reactions in artificial and natural photosensors by EPR. With his spectroscopic work and the descriptions of the underlying fundamental spin physics, he contributed greatly to a detailed molecular understanding of the functional properties in both fields.*



*Prof Robert Bittl (left) and Prof Thomas Prisner*

## Committee

The following committee members have served their full term of office: Alice Bowen, Bela Bode, Maxie Roessler, Enrico Salvadori, Eric McInnes – the former four were warmly thanked for their service, the latter had a dinner speech by Christiane Timmel dedicated entirely to himself, detailing his very impressive accomplishments as Chair, as well as the long history of the McInnes clan.

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Christiane Timmel was unanimously elected Chair for the next three years, Eric McInnes and David Collison (the organisers of the Manchester conference) received their seats *ex officio*. Floriana Tuna (Manchester University) and Paul Jonsen (Talavera Science Ltd.) were elected Ordinary Committee Members by a majority vote.

## Next conference

Eric McInnes, David Collison, and Floriana Tuna are organising the next conference in Manchester between 29<sup>th</sup> March 2<sup>nd</sup> April 2020. See <http://www.esr-group.org/conferences/2020-conference-manchester/> for further information.

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