



Proceedings of the European Conference
Physics of Magnetism 2017 (PM'17)

Poznań, Poland, June 26–30, 2017

Faculty of Physics
Adam Mickiewicz University in Poznań

Institute of Molecular Physics
Polish Academy of Sciences



Editors of the Proceedings:

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Preface

The European Conference PHYSICS OF MAGNETISM 2017 (PM'17) was the fifteenth in the series of conferences that have been organized jointly by the Faculty of Physics of the Adam Mickiewicz University and the Institute of Molecular Physics of the Polish Academy of Sciences every three years since 1975 in Poznań. From the early beginning, the conferences were meant as an international forum for the presentation and discussion of novel scientific ideas and results in the field of broadly understood magnetic phenomena, including the new materials. The present Conference covered the subjects ranging from novel metallic oxides and anomalous magnetoresistive materials, low dimensional quantum magnets, heavy fermions, fluctuating valence and Kondo systems, magnetic multilayers, surfaces, nanostructures, magnonic crystals, to the high temperature superconductors and electronic structure.

As for the earlier conferences of this series, the venue of the fifteenth PM'17 conference held on June 26-30, 2017 was again the modern buildings of A. Mickiewicz University in Poznań, offering excellent conference facilities.

The PM'17 Conference was divided into several sessions chaired by scientists from the Conference Programme and Advisory Committees. The program of the Conference consisted of 29 invited talks, which were presented by distinguished physicists from Europe, USA, Canada, and Japan.

The invited speakers (in alphabetical order):

Ian Affleck (Canada) — *Field-induced phase transition in Haldane gap spin chains*
Arun Bansil (USA) — *Topological phases of quantum matter as novel platforms for fundamental science and applications*
Kevin Bedell (USA) — *Non-equilibrium quantum spin systems: Fermi liquids out of their fields*
Antonio Bianconi (Italy) — *Lattice complexity and Fano resonances near a Lifshitz transition in strongly correlated systems*
Paolo Bortolotti (France) — *RF applications based on spintronics: latest results and future developments*
Bogdan Dąbrowski (USA) — *Single-phase and single-ion displacive-type manganese perovskite multiferroics*
Tomasz Dietl (Poland) — *Electric-field control of magnetism by piezoelectric effects*
Stefan Eisebitt (Germany) — *Field-free deterministic creation and inertial properties of single skyrmions*
Thomas Fischer (Germany) — *Floquet topological crystalline colloidal transport*
Raymond Frésard (France) — *On superconducting stripes of the two-dimensional Hubbard model*
Jorge E. Hirsch (USA) — *Spinning superconductors and ferromagnets*
Björgvin Hjörvarsson (Sweden) — *Designing magnetic meta-materials using finite size effects*
Maciej Krawczyk (Poland) — *Spin wave dynamics in magnonic crystals, quasicrystals and areas of graded refractive index*
Maciej Lewenstein (Spain) — *Quantum magnetism and ultracold atoms*
Gilbert Lonzarich (United Kingdom) — *Kondo lattice systems and reconsideration of the Doniach phase Diagram*
Frédéric Mila (Switzerland) — *Edge states and exact zero modes in topological 1D quantum magnets*
Rafał Oszwaldowski (USA) — *Magnetic polarons in semiconductor quantum dots*
Stuart S.P. Parkin (Germany) — *Spin orbitronics for advanced magnetic memories*
Peter Prelovšek (Slovenia) — *Many-body localization in disordered spin and Hubbard chains*
Jan Ruzs (Sweden) — *Towards quantitative magnetic measurements with sub-nanometer lateral resolution*
Józef Spałek (Poland) — *Universal properties of high-temperature superconductors from real-space pairing: Comparison with experiment*
Frank Steglich (Germany) — *Emergence of superconductivity due to nuclear antiferromagnetic order*
Henryk Szymczak (Poland) — *Strain modulated microwave spectroscopy as a sensitive method to study mechanisms responsible for spin-lattice coupling in ferromagnets*
Gen Tatara (Japan) — *Doppler shift picture of the Dzyaloshinskii-Moriya interaction and light propagation in systems with broken inversion symmetry*
John M. Tranquada (USA) — *Probing intertwined orders in cuprate superconductors*
Boris Tsukerblat (Israel) — *A paradigm of quantum cellular automata: implementation of molecular magnets*
Maciej Urbaniak (Poland) — *Co based multilayer systems for controllable domain wall positioning*
Piotr Wiśniewski (Poland) — *Rare-earth based half-Heusler phases and mononictides - magnetotransport, superconductivity and antiferromagnetism*
Vitalii Zablotskii (Czech Republic) — *How cells respond to high-gradient magnetic fields*

Apart from these lectures, 347 contributions were presented in either oral (82 short talks) or poster form.

The papers, which were submitted and accepted for publication after the review procedure, are now published in the conference proceedings.

The success of PM'17 was due to the contribution of 382 participants from many different countries. The collaboration with the Editorial Staff of *Acta Physica Polonica A* was efficient and fruitful for both sides. The Guest Editors wish to thank the staff members for their effort and enthusiasm.

Finally, we would like to use this opportunity to thank our colleagues from the Programme, Advisory and Organizing Committees, as well as the referees, who have ensured high scientific quality of the conference and the proceedings. Our special thanks are also due to all the Sponsors of the Conference (see the relevant list).

Editors

R.J. Wojciechowski, L. Smardz, I. Weymann,
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The European Conference
PHYSICS OF MAGNETISM 2017

June 26 – 30, 2017, Poznań, POLAND



In Memoriam
Professor Stanisław Robaszkiewicz (1947–2017)



Prof. Stanisław Robaszkiewicz, an outstanding physicist passed away on June 7th, 2017. Born on September 25th, 1947 in Myślubórz, he graduated with MSc in 1970, got PhD degree in 1976, Dr. hab. degree in 1986 at the Adam Mickiewicz University, and became a Professor in 1991. Since 1989 he was the head of the Division of Electronic States of Solids.

His scientific interests were very broad, and included strongly correlated electronic systems, phase transitions, mixed valence compounds, electron-phonon interactions, low dimensional systems, superconductivity, magnetism, charge orderings and phase separations. He published over 140 papers, among them the highly cited paper: *Rev. Mod. Phys.* **62**, 113 (1990). He gave over 100 conference presentations, including 30 invited talks. Prof. S. Robaszkiewicz had coauthored the theory of superconductivity and electron orderings in narrow band systems with local attractive interactions, with the application to high T_c superconductors, as well as developed the theory of local pair (bipolaronic) superconductivity and “hole superconductivity” and pioneered the theory of systems of co-existing charged bosons and itinerant electrons.

Prof. Robaszkiewicz paid research visits to the University of Linköping, Sweden (collaboration with K.A. Chao); ICTP Trieste, Italy; University of Grenoble; the Institute Laue-Langevin, Grenoble; CNRS Grenoble, France (longstanding collaboration with J. Ranninger, 1984–2000); Low Temperature Lab., Kharkiv University, Ukraine; Institute for Scientific Interchange, Torino, Italy. For his scientific achievements he was honored with the Maria Skłodowska-Curie Award in Physics of Polish Academy of Sciences (1989); nine awards of the Minister of Education; Scientific Secretary of Polish Academy of Sciences Award (1988), as well as several awards of the Rector of Adam Mickiewicz University. Prof. S. Robaszkiewicz took part in organization of a whole series of the Physics of Magnetism conferences and gave the invited talk at PM’93.

He educated several generations of Poznan physicists. In his lectures he covered the most difficult problems of contemporary condensed matter theory concentrating on the core of physical ideas rather than on mathematical details. The students admired him also by his kindness and his willingness to discuss their personal matters. Among his apprentices there are four doctors, two of them later became professors.

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