Molecular Magnetism in Bielefeld

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University of Bielefeld & University of Applied Sciences Bielefeld

MAGMANet Meeting

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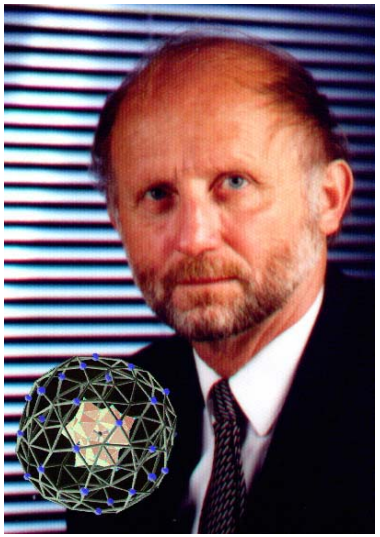
Universität Bielefeld
Fakultät für Physik

Deutsche Forschungsgemeinschaft DFG

文部科学省

The Bielefeld connection



Thorsten Glaser Christian Schröder Jürgen Schnack Achim Müller

We are part of the worldwide "Ames group"

- T. Englisch, T. Glaser, S. Leiding, A. Müller, Chr. Schröder, J. Schnack (BI)
- K. Bärwinkel, H.-J. Schmidt, M. Allalen, M. Brüger, D. Mentrup, D. Müter, M. Exler, P. Hage, F. Hesmer, K. Jahns, F. Ouchni, R. Schnalle, P. Shchelokovskyy, S. Torbrügge & M. Neumann, K. Küpper, M. Prinz (UOS);
- M. Luban, D. Vaknin (Ames Lab, USA); P. Kögerler (RWTH, Jülich, Ames)
  J. Musfeld (U. of Tennessee, USA); N. Dalal (Florida State, USA);
  R.E.P. Winpenny (Man U, UK); L. Cronin (U. of Glasgow, UK);
  H. Nojiri (Tohoku University, Japan); A. Postnikov (U. Metz)
- J. Richter, J. Schulenburg, R. Schmidt (U. Magdeburg);
  S. Blügel (FZ Jülich); A. Honecker (U. Göttingen);
  E. Rentschler (U. Mainz); U. Kortz (IUB); A. Tennant, B. Lake (HMI Berlin);
  B. Büchner, V. Kataev, R. Klingeler, H.-H. Klauß (Dresden)

We are part of the German Priority Program 1137 on Molecular Magnetism

Deutsche Forschungsgemeinschaft DFG

SPP 1137

- 2002 – 2008
- 46 projects from chemistry and physics
- 8.2 Mio. € total funding

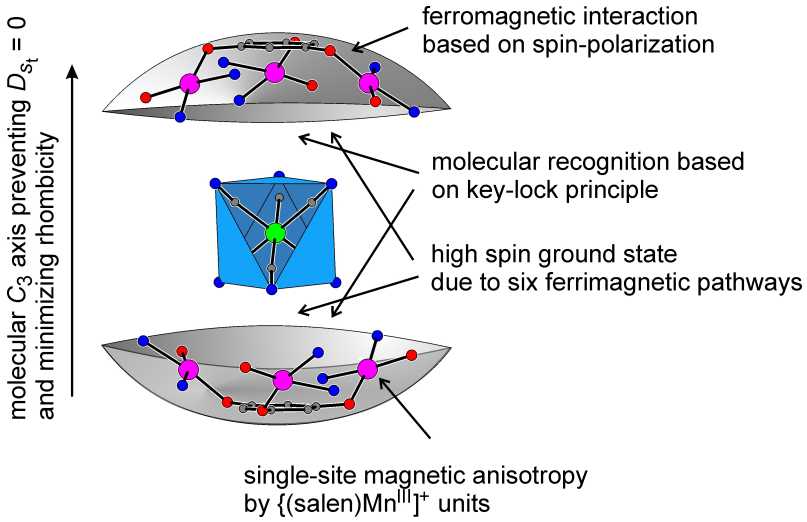
We run the . . .

German Molecular Magnetism Web

www.molmag.de

Highlights. Tutorials. Who is who. DFG SPP 1137

Research of Thorsten Glaser



Mn_6Cr

- Rational design of single-molecule magnets and ferromagnetic interactions;
- Spin-dependent electron transfer in one-dimensional systems: a molecular spintronics approach;
- Magnetic dendrimers.

T. Glaser, M. Heidemeier, T. Weyhermüller, R.-D. Hoffmann, H. Rupp, P. Müller, Angew. Chem. Int. Ed. **45**, 6033 (2006)

T. Glaser, H. Theil, I. Liratzis, T. Weyhermüller, E. Bill, Inorg. Chem. **45**, 4889 (2006)

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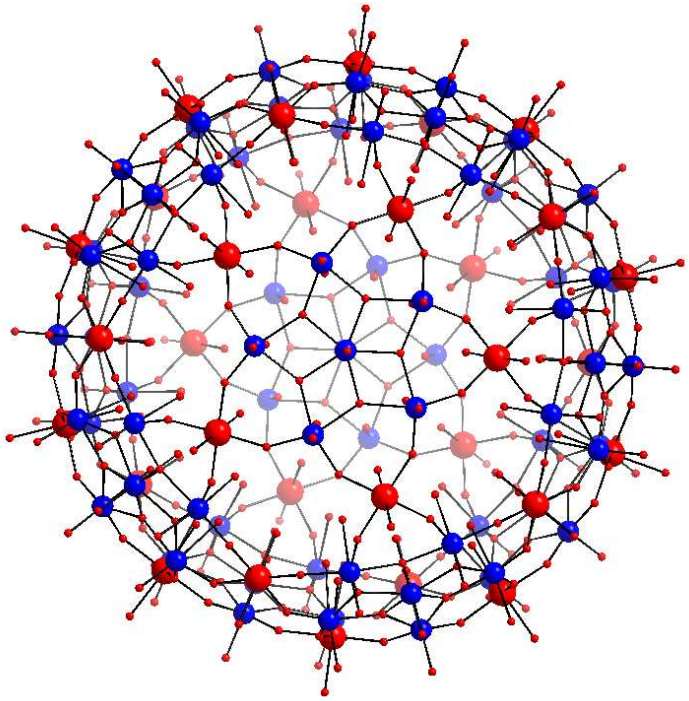
Research of Achim Müller



Fe_{30}

- Polyoxometalates;
- Porous Capsules/Artificial Cells;
- Internal and external surface functionality;
- Vesicle formed from wheel-shaped-type clusters.

A. Müller, F. Peters, M.T. Pope, D. Gatteschi, Chem. Rev. **98**, 239-271 (1998)

A. Müller, S.Q.N. Shah, H. Bögge, M. Schmidtmann, Nature **397**, 48 (1999)

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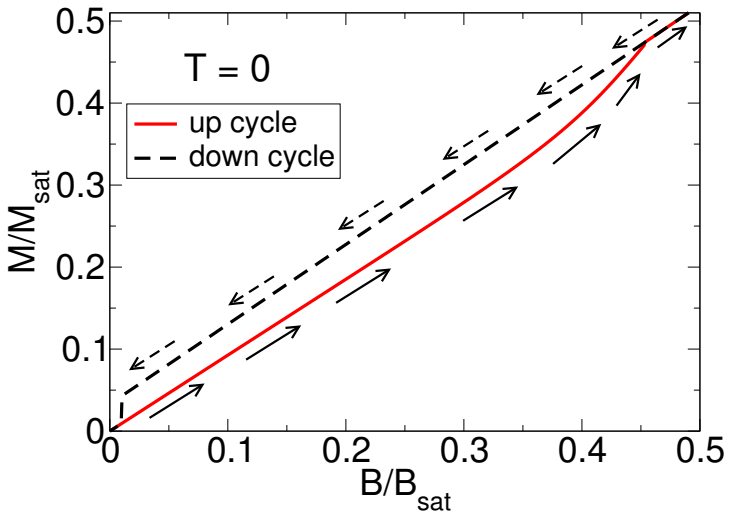
Research of Christian Schröder



Phase transition

- Classical Monte-Carlo simulations, classical heat bath techniques;
- Tera flop computing (spinhenge@home – spin.fh-bielefeld.de);
- Investigation of spin rings & solitons;
- Investigation of frustration effects, e.g. susceptibility dip and metamagnetic phase transition.

A. Müller *et al.*, Chem. Phys. Chem. **2**, 517 (2001)

C. Schröder, H.-J. Schmidt, J. Schnack, M. Luban, Phys. Rev. Lett. **94**, 207203 (2005)

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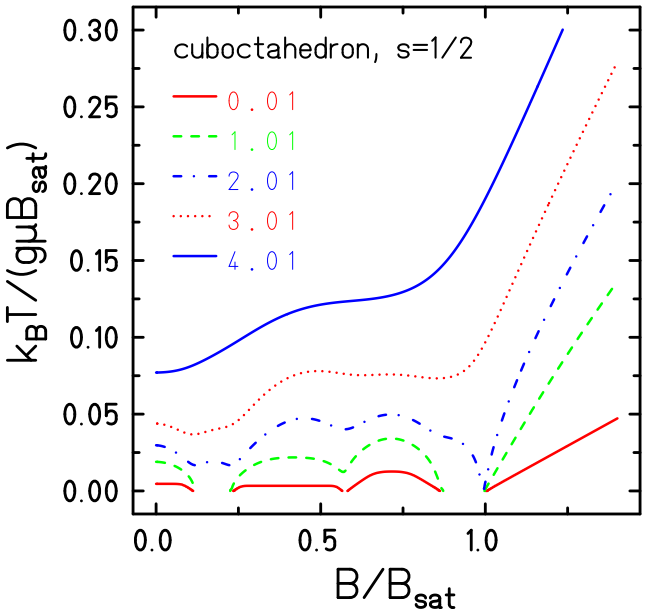
Research of Jürgen Schnack



Cuboctahedron

- Exact diagonalization, Lanczos, DMRG;
- Theorems on odd-membered af rings;
- Rotational band approximation;
- Investigation of frustration effects, e.g. independent magnons, magnetization jumps and magnetocalorics;
- Magnetostriction.

A. Müller *et al.*, Chem. Phys. Chem. **2**, 517 (2001)

J. Schnack, M. Luban, Phys. Rev. B **63**, 014418 (2001)

J. Schulenburg, A. Honecker, J. Schnack, J. Richter, H.-J. Schmidt, Phys. Rev. Lett. **88**, 167207 (2002)

J. Schnack, R. Schmidt, J. Richter, Phys. Rev. B **76**, 054413 (2007)

Bielefeld

Come to Bielefeld,

a perfect place for

molecular magnetism.