

# Mauro Perfetti

## Curriculum Vitae

Stadens Vaenge 3, 2100

Copenhagen, Denmark

☎ (+45) 42438488

✉ mauro.perfetti@chem.ku.dk

Date of birth: 16/10/1988



### Education and Training

03/2017–  
present **Post Doc**, *University of Copenhagen*, Copenhagen, Denmark.

Title: *1D and 2D spin architectures based on 4f and 5f elements.*

Group leader: Professor Jesper Bendix

12/2015–  
02/2017 **Post Doc**, *University of Stuttgart*, Stuttgart, Germany.

Title: *Magnetic and spectroscopic investigations on Uranium- and Lanthanide-based complexes.*

Group leader: Professor Joris van Slageren

#### PhD

12/2012–  
11/2015 **PhD in Chemical Science**, *Università degli Studi di Firenze*, Firenze, Italy.

Title: *Cantilever Torque Magnetometry: a powerful tool to investigate magnetic anisotropy in crystals and thin films*

Supervisor: Professor Roberta Sessoli

#### Scholarship

06/2012–  
11/2012 **Scholarship**, *Università degli Studi di Firenze*, Firenze, Italy.

Title: *Functionalization of Gold Nanoparticles with Single Molecule Magnets*

Supervisor: Doctor Claudio Sangregorio

#### Master Degree

10/2010–  
02/2012 **Master Degree in Chemical Science**, *Università degli Studi di Firenze*, Firenze, 110/110 *Cum Laude*.

Title: *Experimental methodologies for anchoring Single Molecule Magnets on Gold Nanoparticles*

Supervisor: Doctor Claudio Sangregorio

#### Bachelor Degree

10/2007–  
07/2010 **Bachelor Degree in Chemistry**, *Università degli Studi di Firenze*, Firenze, 110/110 *Cum Laude*.

Title *Anisotropic complexes of lanthanide ions with macrocyclic DOTA ligand: a study on the magnetization dynamics at low temperatures*

Supervisor: Professor Roberta Sessoli

## Scientific Publications

Number of scientific publications: 22

Total number of citations: 1014

H-index: 11

ORCID identifier: 0000-0001-5649-0449

### Books and Book Chapters

- Year: 2016 **Luminescent Molecular Magnets**, *M. Perfetti, F. Pointillart, O. Cador, L. Sorace and L. Ouahab*, Wiley VCH, Chapter 14 in: *Molecular Magnetic Materials*.
- Year: 2014 **Thermal Properties of solids at Room and Cryogenic Temperatures**, *G. Ventura and M. Perfetti*, Springer Books.

### Articles

- Year: 2018 **Chemical tunnel-splitting-engineering in a dysprosium-based molecular nano-magnet**, *M. Sørensen, U.B. Hansen, M. Perfetti, K.S. Pedersen, E. Bartolomé, G.G. Simeoni, H. Mutka, S. Rols, M. Jeong, I. Zivkovic, M. Retuerto, A. Arauzo, J. Bartolomé, S. Piligkos, H. Weihe, L. H. Doerrer, J. van Slageren, H. M. Rønnow, K. Lefmann and J. Bendix*, *Nature Communications*, Accepted.

**Exchange Coupling and Single Molecule Magnetism in Redox-active Tetraoxolene-bridged Dilanthanide Complexes**, *P.Zhang, M. Perfetti, M. Kern, P.P. Hallmen, L. Ungur, S. Lenz, M.R. Ringenberg, W. Frey, H. Stoll, G. Rauhut and J. van Slageren*, *Chemical Science*, **9**,1221-1230.

- Year: 2017 **Cantilever torque magnetometry on coordination compounds: from theory to experiments**, *M. Perfetti*, *Coordination Chemistry Reviews*, **348C**,171-186.

**Formation of TbPc<sub>2</sub> Single Molecule Magnets Covalent 1D Structures via Acyclic Diene Metathesis**, *A. Pedrini, M. Perfetti, M. Mannini and E. Dalcanale*, *ACS Omega*, **2**,517-521.

**Magnetic Anisotropy in Pentacoordinate Ni(II) and Co(II) Complexes: Unraveling Electronic and Geometrical Contributions**, *B. Cahier\*, M. Perfetti\*, G. Zakhia\*, D. Naoufal, F. El-Khatib, R. Guillot, E. Rivière, R. Sessoli, A. Barra, N. Guihéry and T. Mallah*, *Chemistry a European Journal*, **23** 3648-3657.

\* These authors have equally contributed to this work.

- Year: 2016 **Spin Helicity in Chiral Lanthanide Chains**, *I. Mihalcea, M. Perfetti†, F. Pineider, L. Tesi, V. Mereacre, F. Wilhelm, A. Rogalev, C.E. Anson, A.K. Powell and R. Sessoli*, *Inorganic Chemistry*, **55**,10068-10074.

† Corresponding author

**Coupling molecular spin centers to microwave planar resonators: toward integration of molecular qubits in quantum circuits**, *C. Bonnizzoni, A. Ghirri, K. Bader, J. van Slageren, M. Perfetti, L. Sorace, Y. Lan, O. Fuhr, M. Ruben and M. Affronte*, *Dalton transactions*, **45**,16596-16603.

- Molecular order in buried layers of TbPc<sub>2</sub> Single-Molecule Magnets detected by torque magnetometry**, *M. Perfetti, M. Serri, L. Poggini, M. Mannini, D. Rovai, P. Sainctavite, S. Heutz and R. Sessoli*, *Advanced Materials*, **28**, 6946-6951.
- Diamondoid Structure in a Metal-Organic Framework of Fe<sub>4</sub> Single-Molecule Magnets**, *L. Rigamonti, C. Cotton, A. Nava, H. Lang, T. Ruffer, M. Perfetti, L. Sorace, A-L. Barra, Y. Lan, W. Wernsdorfer, R. Sessoli and A. Cornia*, *Chemistry a European Journal*, **22**, 13705-13714.
- Relaxation dynamics and magnetic anisotropy in a low symmetry Dy(III) complex**, *E. Lucaccini, M. Briganti, M. Perfetti, L. Vendier, J.P. Costes, F. Totti, R. Sessoli and L. Sorace*, *Chemistry a European Journal*, **22**, 5552-5562.
- Quantum Coherence in a processable vanadyl complex: new tools for the search of molecular spin qubits**, *L. Tesi, E. Lucaccini, I. Cimatti, M. Perfetti, M. Mannini, M. Atzori, E. Morra, M. Chiesa, A. Caneschi, L. Sorace and R. Sessoli*, *Chemical Science*, **7**, 2074-2083.
- Year: 2015 **Commentary on: An intermediate state between the kagome-ice and the fully polarized state in Dy<sub>2</sub>Ti<sub>2</sub>O<sub>7</sub>**, *M. Perfetti*, *Papers in Physics*, **7**, 070010.
- Determination of magnetic anisotropy in the LnTRENAL complexes (Ln=Tb,Dy,Er) by cantilever magnetometry**, *M. Perfetti, E. Lucaccini, L. Sorace, J.P. Costes and R. Sessoli*, *Inorganic Chemistry*, **54**, 3090-3092.
- Year: 2014 **Angular resolved magnetometry beyond triclinic crystals part II: Torque magnetometry of Cp\*ErCOT Single-Molecule Magnets**, *M. Perfetti, G. Cucinotta, M.E. Boulon, F. El Hallak, S. Gao and R. Sessoli*, *Chemistry: a European Journal*, **20**, 14051-14056.
- Mapping of single-site magnetic anisotropy tensors in weakly coupled spin clusters by torque magnetometry**, *L. Rigamonti, A. Cornia, A. Nava, M. Perfetti, M.E. Boulon, A.L. Barra, X. Zhong, K. Park, K. and R. Sessoli*, *Physical Chemistry Chemical Physics*, **16**, 17220-17230.
- Beyond the anisotropy barrier: slow relaxation of the magnetization in both easy-axis and easy-plane Ln (trenal) complexes**, *E. Lucaccini, L. Sorace, M. Perfetti, J.P. Costes and R. Sessoli*, *Chemical Communications*, **50** (14), 1648-1651.
- Grafting Single Molecule Magnets on Gold Nanoparticles**, *M. Perfetti, F. Pineider, L. Poggini, E. Otero, M. Mannini, L. Sorace, C. Sangregorio, A. Cornia and R. Sessoli*, *Small*, **10** (2), 323-329.
- Year: 2013 **Magnetic Anisotropy and Spin Parity Effect Along the Series of Lanthanide Complexes with DOTA**, *M.E. Boulon, G. Cucinotta, J. Luzon, C. Degl'Innocenti, M. Perfetti, K. Bernot, G. Calvez, A. Caneschi and R. Sessoli*, *Angewandte Chemie International Edition*, **125** (1), 368-372.
- Year: 2012 **Magnetic Anisotropy in a Dysprosium/DOTA Single-Molecule Magnet: Beyond Simple Magneto-Structural Correlations**, *G. Cucinotta, M. Perfetti, J. Luzon, M. Etienne, P.E. Car, A. Caneschi G. Calvez, K. Bernot and R. Sessoli*, *Angewandte Chemie International Edition*, **51** (7), 1606-1610.

Year: 2011 **Giant field dependence of the low temperature relaxation of the magnetization in a dysprosium(III)-DOTA complex**, *P.E. Car*<sup>\*</sup>, *M. Perfetti*<sup>\*</sup>, *M. Mannini*, *A. Favre*, *A. Caneschi* and *R. Sessoli*, *Chemical Communications*, **47** (13), 3751-3753.

<sup>\*</sup> These authors have equally contributed to this work.

---

## Teaching

- 2017 **Methods and modelling**, *University of Copenhagen*.
- 2016 **Laboratory of Physical Chemistry III: Statistical Thermodynamics**, *University of Stuttgart*.
- 2014–2015 **Assistant of Professor R. Sessoli. Course of General and Inorganic Chemistry**, *Università degli Studi di Firenze*.
- 2012–2015 **Chemistry course for preparation to Medicine test**, *Association NAJS*.
- 2012–2015 **Coordinator of "Open Lab", Chemistry area**, *"Open Lab"-Università degli Studi di Firenze*.
- 2011–2015 **Teaching lessons in chemistry in schools and laboratories for undergraduate students**, *"Open Lab"-Università degli Studi di Firenze*.

---

## Skills

### Computer skills

- Advanced Mercury, Vesta, Origin, Microsoft Office, FORTRAN, L<sup>A</sup>T<sub>E</sub>X, MatLab, Easy Spin
- Basic Diamond, Avogadro

### Technical skills

- Advanced Advanced writing and use of simulation and fitting programmes. Independent use of Cantilever Torque Magnetometers, SQUID and PPMS magnetometers, NMR spectrometers (solution measurements), UV-Vis spectrophotometers, IR spectrometers, TEM microscopes. Experience in the study of magnetic anisotropy, crystal field and dynamic properties of metal complexes (transition metals, lanthanides and actinides). Experience in the study of optical and magnetic properties of nanoparticles functionalized with single molecule magnets.
- Basic Synthesis of organic ligands and complexes of transition metals and lanthanides. Synthesis and functionalization of metal nanoparticles and metal oxides. Anchorage of magnetic molecules on surfaces and nanostructures.

---

## Participation at Conferences

### Oral Contributions

- 10–14 Sep. **26<sup>th</sup> Conference of the Italian Chemical Society**, *Paestum*, Italy.  
2017  
Title: *Layer by layer order of molecular thin films detected by Torque Magnetometry*
- 27–31 Aug. **6<sup>th</sup> European Conference on Molecular Magnetism**, *Bucharest*, Romania.  
2017

- Title: *Symmetry and magnetism: easy axis to easy plane anisotropy conversion via temperature change*
- 2–5 Jul. 2017 **Invited talk at: 4<sup>th</sup> European Inorganic Chemistry Conference, Copenhagen, Denmark.**
- Title: *On the thermal plasticity of magnetic anisotropy*
- 24–26 Nov. 2016 **Invited Talk, Brno, Czech Republic.**
- Title: *Cantilever torque magnetometry: a powerful tool to characterize magnetic anisotropy*
- 18–23 Nov. 2016 **Invited Talk, Olomouc, Czech Republic.**
- Title: *Cantilever torque magnetometry: a powerful tool to characterize magnetic anisotropy*
- 6–10 Sep. 2015 **5<sup>th</sup> European Conference on Molecular Magnetism, Saragozza, Spain.**
- Title: *Cantilever magnetometry: a unique experimental tool to characterize magnetic anisotropy*
- 3–10 Jul. 2014 **14<sup>th</sup> International Conference on Molecular Magnetism, Saint Petersburg, Russia.**
- Title: *Magnetic and electrical properties of a new hybrid material combining single-molecule magnets and gold nanoparticles*
- 6–10 Oct. 2013 **4<sup>th</sup> European Conference on Molecular Magnetism, Karlsruhe, Germany.**
- Title: *Grafting Single Molecule Magnets on Gold Nanoparticles*
- 29 Jun.–3 Jul. 2013 **IX Meeting INSTM for Science and technology of materials, Bari, Italy.**
- Title: *Synthesis and characterization of a novel SMM-NPs hybrid material*
- [Posters](#)
- 27–31 Aug. 2017 **6<sup>th</sup> European Conference on Molecular Magnetism, Bucharest, Romania.**
- Title: *Complete Magnetic and spectroscopic characterization of a Dysprosium-based SMM buiding block*
- 4–8 Sept. 2016 **15<sup>th</sup> International Conference on Molecular Magnetism, Sendai, Japan.**
- Title: *How to map the magnetic anisotropy of magnetic chains, metal organic frameworks and thin films*
- 17–19 Feb. 2015 **Magnet 2015: 4<sup>th</sup> Italian conference on magnetism, Bologna, Italy.**
- Title: *Detecting magnetic anisotropy by using torque magnetometry: from crystals to thin films*

20–22 Feb. **Magnet 2013: 3<sup>rd</sup> Italian conference on magnetism**, Napoli, Italy.  
2015

Title: *Ln(DOTA) complexes: a model system to investigate the role of the number of 4f electrons on the magnetic anisotropy and SMM behaviour*

## — Languages\*

\*Self Assessment following Common European Framework of Reference for Languages

Italian **Mothertongue**

English **Comprehension, Speaking and Writing: C2 Level**

French **Comprehension: C1 Level; Speaking and Writing: B1 Level**