



Dr. Hab. Rodolphe Clérac

Born the 18th of July 1971
at Versailles - France.
Married, two children.

Distinguished SCF member
Fellow of the European Academy of Sciences



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Professional Experience & Education:

- **Since October 2008:** Senior CNRS researcher (DR2 then in 2018, DR1) at the Centre de Recherche Paul Pascal (France) **and since January 2001**, Head of the "Molecular Materials & Magnetism" (M₃) team composed of Dr. E. Hillard (CNRS Res.), Dr. F. Durola (CNRS Res.), Dr. H. Bock (CNRS Res.), Dr. P. Dechambenoit (Assist. Prof), M. Rouzières (AI CNRS), 4 Post-docs and 6 PhD students. The M₃ team is currently interested in the synthesis and physical studies of molecular materials including (i) polyaromatic molecules, (ii) molecule-based magnets, single-molecule and single-chain magnets (and their derivatives) with high blocking temperatures or photoswitching properties, (iii) spin-crossover and paramagnetic metal-metal bonded complexes, and (iv) magnetic and/or electroactive solutions and liquid crystals.
- **September 2000 - September 2008:** Associate Professor at IUT Bordeaux I and Centre de Recherche Paul Pascal (CRPP UMR 5031).
- **September 1999 - August 2000:** Research Associate at Texas A&M (College Station, USA): "New materials: clusters, chains and extended networks" under the supervision of Prof. K.R. Dunbar and in collaboration with Prof. F.A. Cotton.
- **April 1998 - September 1999:** Research Associate at Michigan State University (East Lansing, USA): "Synthesis, characterization and physical properties of molecular materials" under the supervision of Prof. K.R. Dunbar.
- **September 1997 - April 1998:** Assistant Professor at the Université Bordeaux I: "New cyano-based magnets" under the supervision of Prof. O. Kahn (ICMCB, Pessac).
- **1995-1997:** Student-Teacher at the Université Bordeaux I.
- **1994-1997:** Physical Chemistry Thesis at the Université Bordeaux I: "Physical properties of antiferromagnetic molecular materials" under the supervision of Prof. C. Coulon (CRPP Pessac), Grade: "Très Honorable et Félicitations du Jury".

Responsibilities & Funded Proposals:

- **2008-2011:** Head of the Chemistry laboratory facility of the CRPP, composed of four engineers and technicians.
- **2014-2017:** P.I. of the MagnLC project ("Magnetic Liquid Crystals"), funded by the ANR PDOC program 2013 (370 k€).
- **2013-2015:** Co-P.I. of the CrEMM project ("Crystal Engineering of Multifunctional Molecule-Based Materials"), funded by the ANR International "White" program 2012 (570 k€).
- **2013-2015:** P.I. of the PhotoSCM project ("Photomagnetic Single-Chain Magnets"), funded by the ANR PDOC program 2012 (353 k€).

- **2009-2012:** P.I. of the AC-MAGnets project (Controlled Association of SMMs), funded by the 2009 ANR "White" program (500 k€).
- **Since 2008:** Member of the CRPP scientific committee (UPR 8641).
- **2005-2008:** Contact person for the CRPP (UPR 8641) for the European Network Of Excellence REX MAGMANet.

Awards & Honors:

- 2017:** France-Berkeley Fund Award
- 2009-2020:** French national award of scientific excellence (PES).
- 2014-2017:** National Chinese Award of the "1000 Talents Program" at Central China Normal University, Wuhan (China).
- 2009:** Young Researcher award of the "Division de Chimie-Physique (DCP)", a joint division of the Société Chimique de France (SCF) and the Société Française de Physique (SFP)
- Visiting Professor:** Univ. of Ottawa (07/2017); Moldova State Univ. (03/2012; 10/2012); Univ. of Costa Rica, San José (05/2009); Univ. of Otago, New-Zealand (10/2010; 09/2011); Northeast Normal Univ., Changchun, China (06/2008).

Key Publications (h-index: 77):

- R. Clérac,* H. Miyasaka, M. Yamashita, C. Coulon, "Evidence for "Single-Chain Magnet" behavior in a Mn^{III}-Ni^{II} chain designed with high spin magnetic units: a route to high temperature metastable magnets" *J. Am. Chem. Soc.* (2002) 124, 43, 12837.
- O. Roubeau, A. Colin, V. Schmitt, R. Clérac* "Thermoreversible gels as magneto-optical switches" *Angew. Chem. Int. Ed.* (2004) 43, 3283.
- M. Ferbinteanu, H. Miyasaka,* W. Wernsdorfer, K. Nakata, K. Sugiura, M. Yamashita, C. Coulon, R. Clérac* "Single-chain magnet (NEt₄)[Mn₂(5-MeOsalen)₂Fe(CN)₆] made of Mn-Fe-Mn trinuclear single-molecule magnet with an S_T = 9/2 spin ground state" *J. Am. Chem. Soc.* (2005) 127, 3090.
- L. Lecren, W. Wernsdorfer, Y.-G. Li, A. Vindigni, H. Miyasaka, R. Clérac* "One-dimensional supramolecular organization of Single-Molecule Magnets" *J. Am. Chem. Soc.* (2007) 129, 5045.
- D. Li, R. Clérac,* O. Roubeau, E. Harté, C. Mathonière, R. Le Bris, S. M. Holmes, "Magnetic and optical bistability driven by thermally and photoinduced intramolecular electron transfer in a molecular Cobalt-Iron Prussian blue analogue" *J. Am. Chem. Soc.* (2008) 130, 252.
- C. Coulon, R. Clérac, W. Wernsdorfer, T. Colin, H. Miyasaka, "Realization of a Magnet Using an Antiferromagnetic Phase of Single-Chain Magnets" *Phys. Rev. Lett.* (2009) 102, 167204.

A few numbers:

h = 77, 21433 citations
Publications: 496 including
12 review articles. Most recent:

- H. Miyasaka, M. Julve, M. Yamashita, R. Clérac, "Slow Dynamics of the Magnetization in One-Dimensional Coordination Polymers: Single-Chain Magnets", *Inorg. Chem. (Forum Article)*, (2009) 48, 8, 3420
- I.-R. Jeon, R. Clérac, "Controlled association of single-molecule magnets into coordination networks: towards a new generation of magnetic materials", *Dalton Trans.* (2012), 41, 9569
- K. Pedersen, J. Bendix, R. Clérac, "Single-molecule magnet engineering: building-block approaches", *Chem. Commun.* (2014), 50, 4396
- C. Coulon, V. Pianet, M. Urdampilleta, R. Clérac, "Single-Chain Magnets and Related Systems", *Structure and Bonding* (2015), 164, 143
- K. S. Pedersen, D. N. Woodruff, J. Bendix, R. Clérac, "Experimental Aspects of Lanthanide Single-Molecule Magnet Physics", *Lanthanides and Actinides in Molecular Magnetism*; Ed. Layfield & Murugesu ; 2015 Wiley, 125.
- D. Aguila, Y. Prado, E. S. Koumoussi, C. Mathonière, R. Clérac, "Switchable Fe/Co Prussian blue networks and molecular analogues", *Chem. Soc. Rev.* (2016), 45, 203
- K. S. Pedersen, A. Vindigni, R. Sessoli, C. Coulon, R. Clérac, "Single-Chain Magnets" in *Molecular Magnetic Materials Concepts and Applications*, Wiley (2017), 131

Communications:

Posters/co-worker Talks: 309
Talks: 155 (including 65 invited lectures in conferences, 58 invited seminars in laboratories and 18 invited teaching lectures)

Research work management:

Professor: 1
Assistant Professor: 2
CNRS Researcher: 3
Engineer / Postdoc: 2 / 31
Ph-D / Master students: 24 / 20
Undergraduated students: 24
Foreign students: 45

- Y. Zhang, D. Li, R. Clérac,* M. Kalisz, C. Mathonière,* S. M. Holmes,* "Reversible thermally and photoinduced electron transfer in a cyano-bridged {Fe₂Co₂} square complex" *Angew. Chem. Int. Ed.* (2010) 48, 3752.
- R. Ababei, C. Pichon, O. Roubeau, Y.-G. Li, N. Bréfuel, L. Buisson, P. Guionneau, C. Mathonière,* R. Clérac* "Rational Design of a Photomagnetic Chain: Bridging Single-Molecule Magnets with a Spin-Crossover Complex" *J. Am. Chem. Soc.* (2013) 135, 14840.
- E. S. Koumoussi, I.-R. Jeon, Q. Gao, P. Dechambenoit, D. N. Woodruff, P. Merzeau, L. Buisson, X. Jia, D. Li,* F. Volatron, C. Mathonière,* R. Clérac* "Metal-to-Metal Electron Transfer in Co/Fe Prussian Blue Molecular Analogues: The Ultimate Miniaturization" *J. Am. Chem. Soc.* (2014) 136, 15461.
- K. S. Pedersen,* J. Bendix,* A. Tressaud, E. Durand, H. Weihe, Z. Salman, T. J. Morsing, D. N. Woodruff, Y. Lan, W. Wernsdorfer, C. Mathonière, S. Piligkos, Sophia I. Klokishner, S. Ostrovsky, K. Ollefs, F. Wilhelm, A. Rogalev, R. Clérac* "Iridates from the molecular side", *Nat. Commun.* (2016) 7:12195 ; DOI: 10.1038/ncomms12195.
- D. Rosario,* P. Dechambenoit, A. Bentaleb, M. Rouzières, C. Mathonière, R. Clérac* "Multistability at Room Temperature in a Bent-Shaped Spin-Crossover Complex Decorated with Long Alkyl Chains" *J. Am. Chem. Soc.* (2018) 140, 98.
- X. Ma, E. A. Sutura, S. De, P. Négrier, M. Rouzières, R. Clérac,* P. Dechambenoit,* "Redox-Active Bridging Ligand as a Tool to Promote Spin Delocalization, High Spin Complexes and Magnetic Multi-Switchability", *Angew. Chem. Int. Ed.* (2018) 57, 7841.
- K. S. Pedersen,* P. Perlepe, M. L. Aubrey, D. N. Woodruff, S. E. Reyes-Lillo, A. Reinholdt, L. Voigt, Z. Li, K. Borup, M. Rouzières, D. Samohvalov, F. Wilhelm, A. Rogalev, J. B. Neaton, J. R. Long, R. Clérac,* "A Redox-Active Coordination Chemistry Approach to 2D Conductive Magnets Exemplified by CrCl₂(pyrazine)₂", *Nat. Chem.* (2018) 10, 1056.
- X. Ma, E. A. Sutura, M. Rouzières, M. Platunov, F. Wilhelm, A. Rogalev, R. Clérac* et P. Dechambenoit,* "Using Redox-Active π Bridging Ligand as a Control Switch of Intramolecular Magnetic Interactions", *J. Am. Chem. Soc.* (2019), 141, 7721.

Recent Invited Lectures:

- Novembre 2018, **The Indo–French Conference on the Magnetism of Molecular Systems**, (Bangalore, India)
- May 2019, **Inter. Conf. on Phase Transition and Dynamical Properties of Spin Transition Materials, PDSTM-2019**, (Gainesville, USA)
- May 2019, **8th Workshop on "Current trends in Molecular and Nanoscale Magnetism"**, (Rhodes, Grèce).
- June 2019, **102nd Canadian Chemistry Conference (Quebec City, Canada)**
- in 2018-19: Northwestern Univ, Michigan State Univ., Indiana Univ., Barcelona, JNCASR (Bangalore, Inde), Nanjing...

Expert & Referee Activities:

About 40 to 50 articles per year for the following scientific journals: **ACS**: J. Am. Chem. Soc., Inorg. Chem.; **RSC**: Chem. Sci., Chem. Commun., Dalton Trans., New J. Chem.; **Wiley**: Angew. Chem. Int. Ed., Chem. Eur. J., Eur. J. Inorg. Chem.; **Nature**, **Nature Chemistry**; **Nature Commun.**

Also for research agencies: ERC, ANR (France), Régions (France), NSF, DOE and PRF-ACS (USA), FONDECYT (Chili), NCR (Roumania), Czech Science Found., Poland Nat. Science Centre, Swiss Nat. Science Found., MBIE (NZ), CEFIPRA (India), DFG (Germany) and JSPS (Japan).

Main Collaborations (in total: 75 research teams in 28 different countries):

In France:

- **Prof. C. Mathonière**, ICMCB UPR 9048-Pessac
- **Dr. W. Wernsdorfer**, LLN, CNRS, Grenoble
- **Prof. J. M. Lehn**, ISIS, Univ. Strasbourg.
- **Dr M. Fourmigué**, Institut de Chimie de Rennes
- **Dr. A. Rogalev**, ESRF, Grenoble
- **Dr. N. Avarvari**, Université d'Angers

In the USA :

- **Prof. J. Long**, University of California, Berkeley
- **Prof. J. M. Smith**, Indiana University
- **Prof. K. R. Dunbar**, Texas A&M University
- **Prof. S. Hill**, NHMFL, Tallahassee
- **Prof. S. Holmes**, University of Missouri-St-Louis

In Greece:

- **Prof. S. Perlepes**, Univ. of Patras

In Spain:

- **Prof. E. Ruiz**, Universitat de Barcelona

In Germany:

- **Prof. S. Dehnen**, Universität Marburg

In Denmark:

- **Prof. J. Bendix**, University of Copenhagen
- **Dr. K. Pedersen**, Technical Univ. of Denmark

In Finland:

- **Prof. T. Heikki**, University of Jyväskylä

In Italy:

- **Prof. A. Cornia**, University of Modena

In Moldova:

- **Dr. O. Palamarciuc**, State University of Moldova

In Ireland:

- **Prof. W. Schmitt**, The University of Dublin

In Roumania:

- **Prof. M. Andruh**, University of Bucharest

In Japan:

- **Prof. H. Miyasaka**, IMR & Tohoku University

In Chile:

- **Prof. D. Venegas-Yazigi**, Santiago de Chile

In China:

- **Prof. D. Li**, Central China Normal Univ., Wuhan
- **Prof. X. Bao**, Nanjing Univ. of Science and Tech.
- **Prof. M.-L. Tong**, Sun Yat-Sen Univ. Guangzhou

In Canada:

- **Dr. M. Murugesu**, University of Ottawa
- **Dr. K. Preuss**, University of Guelph

In India:

- **Dr. A. Mondal**, IIS, Karnataka, Bengaluru

in New-Zealand:

- **Prof. P. Kruger**, University of Canterbury

A selection of recent collaborative publications:

- N. Lichtenberger, R. J. Wilson, A. R. Eulenstein, W. Massa, R. Clérac, F. Weigend, S. Dehnen, "Main Group Metal–Actinide Magnetic Coupling and Structural Response Upon U⁴⁺ Inclusion Into Bi, Tl/Bi, or Pb/Bi Cages" *J. Am. Chem. Soc.* (2016) 138, 9033.
- D. G. Branza, F. Pop, P. Auban-Senzier, R. Clérac, P. Alemany, E. Canadell, N. Avarvari, "Localization versus Delocalization in Chiral Single Component Conductors of Gold Bis(dithiolene) Complexes" *J. Am. Chem. Soc.* (2016) 138, 6838.
- A. Srinivasan, M. Cortijo, V. Bulicanu, A. Naim, R. Clérac, P. Sainctavit, A. Rogalev, F. Wilhelm, P. Rosa, E. A. Hillard, "Enantiomeric resolution and X-ray optical activity of a tricobalt extended metal atom chain", *Chem. Sci.* (2018) 9, 1136.
- M. B. Mills, T. Wohlhauser, B. Stein, W. R. Verduyn, E. Song, P. Dechambenoit, M. Rouzières, R. Clérac, K. E. Preuss, "Magnetic Bistability in Crystalline Organic Radicals: The Interplay of H-bonding, Pancake Bonding, and Electrostatics in 4-(2'-Benzimidazolyl)-1,2,3,5-dithiadiazolyl", *J. Am. Chem. Soc.* (2018) 140, 16904.
- S. Dhers, A. Mondal, D. Aguilà, J. Ramírez, S. Vela, P. Dechambenoit, M. Rouzières, J.R. Nitschke, R. Clérac, J.-M. Lehn, "Spin State Chemistry: Modulation of Ligand pK_a by Spin State Switching in a [2×2] Iron(II) Grid-Type Complex", *J. Am. Chem. Soc.* (2018) 140, 8218.
- M. Urdampilleta, C. Ayela, P.-H. Ducrot, D. Rosario-Amorin, A. Mondal, M. Rouzières, P. Dechambenoit, C. Mathonière, F. Mathieu, I. Dufour, R. Clérac, "Molecule-based microelectromechanical sensors", *Sci. Rep.* (2018) 8, 8016.
- S. F. Jafri, E. S. Koumoussi, M. A. Arrio, A. Juhin, D. Mitcov, M. Rouzières, P. Dechambenoit, D. Li, E. Otero, F. Wilhelm, A. Rogalev, L. Joly, J. P. Kappler, C. Cartier dit Moulin, C. Mathonière, R. Clérac, P. Sainctavit, "Atomic Scale Evidence of the Switching Mechanism in a Photomagnetic CoFe Dinuclear Prussian Blue Analogue", *J. Am. Chem. Soc.* (2019) 141, 3470.