Curriculum Vitae Professor Dr Roberta Sessoli

Image: Roberto Sessoli

Name: **Roberta Sessoli**
Date of birth: **23 June 1963**

Research Priorities: Coordination chemistry, molecular magnetism, magnetic resonances, surfaces quantum materials

Roberta Sessoli is an Italian chemistry expert. Working at the interface between chemistry and physics, she has pioneered research into magnetic bistability in molecules and quantum effects in mesoscopic materials, thus opening an entirely new field in magnetism and nanotechnology. Her current interests include the interplay between magnetism and chirality, molecules with highly coherent spin dynamics for quantum information, and magnetic molecules on surfaces to form hybrid interfaces.

Academic and Professional Career

since 2012	Professor of General and Inorganic Chemistry, University of Florence, Florence, Italy
2000 - 2011	Associate Professor of General and Inorganic Chemistry, University of Florence, Florence, Italy
1997 - 2000	Associate Researcher, University of Florence, Florence, Italy
1992	PhD in Chemistry, University of Florence, Florence, Italy

Functions in Scientific Societies and Committees

since 2019	Member, Strategic Advisory Board, Helmholtz Association of German Research Centres, Germany
since 2018	Member, Scientific Advisory Board, Center for Quantum Nanoscience, Ewha Womans University, Seoul, South Korea
2017 - 2019	Member, Scientific Advisory Board, Italian Chemical Society, Rome, Italy

2013 - 2018 Member, Scientific Advisory Board, Leibniz Institute for Solid State Research (IFW), Dresden, Germany

2013 - 2014 Member, Science and Technology Advisory Council (STAC), President of the European Commission, EU Commission, Brussels, Belgium

Project Coordination, Membership in Collaborative Research Projects

2023 - 2028 Principal Investigator, Synergy Grant "Chirality and spin selectivity in electron transfer processes: from quantum detection to quantum enabled (CASTLE)", European Research Council (ERC)

2024 - 2027 Advanced Grant "Electric control of spin for molecule-based quantum technologies", Italian Science Fund, Italy

2020 - 2023 Unit Coordinator, Project "FAult Tolerant MOLecular Spin processor (FATMOLS)", Horizon 2020, European Commission (EC)

2017 - 2020 Unit Coordinator, Project "Spinoptical nanoantenna-assisted magnetic storage at few nanometers on femtosecond timescale (FEMTOTERABYTE)", Horizon 2020, EC

2016 - 2020 Vice-Chair, Action CA15128 "Molecular Spintronics (MOLSPIN)", COST (European Cooperation in Science and Technology), EC

2010 - 2015 Advanced Grant "Molecular Nanomagnets on Surfaces: New Phenomena for Spin-Based Technologies (MolNanoM@S)", ERC

2008 - 2010 Supervisor, Marie Curie Fellowship "4FNANOMAG", 7th Framework Programme, EC

2002 - 2009 Applicant, Subproject "Synthesis and characterization of molecular materials showing slow magnetic relaxation and magnetic memory effect", Priority Programme (SPP) 1137, German Research Foundation (DFG), Germany

Honours and Awarded Memberships

since 2023 Member, German National Academy of Sciences Leopoldina, Germany

2023 Honorary Doctorate, University of Barcelona, Barcelona, Spain

2021 Galileo Galilei International Award, Rotary Italia, Italy

2020 González-Ciamician Award, Royal Chemical Society of Spain, Spain

2019 Centenary Prize, Royal Society of Chemistry, UK

2017 Visiting Professor, Johannes Gutenberg University Mainz, Mainz, Germany

2015 Distinguished Woman in Chemistry and Chemical Engineering, International Union of Pure and Applied Chemistry (IUPAC)

2015	LeCoq de Boisbaudran Award, European Rare Earth and Actinide Society (ERES)
2013	Premio Linceo per la Chimica, Accademia Nazionale dei Lincei, Italy
2013	French-Italian Award, French Society of Chemistry, France
2002	Agilent Technologies Europhysics Prize, Agilent, Santa Clara, USA
2000	Gold Medal Nasini, The best young inorganic chemist of the year, Italian Chemical Society, Italy

Research Priorities

Roberta Sessoli is an Italian chemistry expert. Working at the interface between chemistry and physics, she has pioneered research into magnetic bistability in molecules and quantum effects in mesoscopic materials, thus opening an entirely new field in magnetism and nanotechnology. Her current interests include the interplay between magnetism and chirality, molecules with highly coherent spin dynamics for quantum information, and magnetic molecules on surfaces to form hybrid interfaces.

At the start of her career, Roberta Sessoli focused primarily on magnetic materials. Her work on low dimensional molecular materials, chains, and clusters, led to the breakthrough discovery that a few paramagnetic metal ions in a molecule can behave like a magnet. These materials, known as single-molecule magnets (SMMs), have opened a completely new field in nanomagnetism, which has become a “school of physics” for the many new fundamental quantum phenomena detected in SMMs. At the same time, the potential of SMMs as ultra-miniaturized magnetic memory units has attracted the interest of many researchers.

Roberta Sessoli has been successively working on the organisation of SMMs on surfaces, which is essential to address the magnetic memory of single molecules. She and her team have shown for the first time that the memory effect can survive when suitably designed molecules are grafted to a gold surface.

Recently she has turned her attention to molecular spin systems with long spin coherence time, which are of interest for quantum information technology. The rational design of molecular qubits she has been developing takes into account not only spin degrees of freedom but also the vibrational properties of the molecules. Roberta Sessoli’s research has focused on the assembly of these molecules, either as crystals or on a surface, to form quantum gates. She is also currently interested in the interplay between magnetism and chirality, in particular as a resource for quantum technologies based on spins.