

CURRICULUM VITAE SUMMARY (11 April 2017):



NAME: RODRIGUEZ-CARVAJAL Juan
QUALIFICATION: Doctor in Physics (Solid State),
PRESENT POSITION: Staff Scientist at ILL
LANGUAGES: Spanish, French and English.

- **Research and Teaching** experience in Condensed Matter Physics and Crystallography for thirty eight years.
- **Areas of knowledge:**
 - Powder and single crystal x-rays and neutron scattering.
 - Symmetry analysis, crystallography and magnetism.
 - Oxides presenting remarkable properties: superconductivity, giant magnetoresistance, charge, spin & orbital ordering.
 - Computer programming and data analysis.
 - Neutron diffraction instrumentation.
- **Publications:** 260 regular papers in journals, 108 papers in journals resulting from proceedings, 61 reports/book/proceedings contributions and about 290 communications in meetings. The total number of article citations is more than 15900 (Web of Science), 24200 (Google Scholar)
- **Awards:** “Award for Distinguished Powder Diffractionist” from the International Committee of the 11 European Powder Diffraction Conference (Warsaw, Poland, September 17-22, 2008). *Barrett Award* 2011 of the Denver X-ray Conference for “exceptional contributions to powder diffraction”.
- **Supervisor** of 10 doctoral theses, 26 stages and post-docs.
- **Invited** to more than 90 international events (courses and conferences).
- **Author** of FULLPROF, one of the most used powder diffraction computer programs in the world. (More than 6400 citations, WoS, of the article *Physica B* 192, 55 (1993); about 12000 citations of the use of the program in Google Scholar)
- **Working** at the Institute Laue-Langevin as Staff Scientist, <http://www.ill.fr>.
- **Web of Science h-index:** 47 (<http://www.researcherid.com/rid/C-4362-2008>)
- **Google Scholar h-index:** 57 (<https://scholar.google.fr/citations?user=mJgatLIAAAAJ&hl=fr>)

PROFESSIONAL POSITIONS HELD

1. Teaching positions in different universities (Universidad de Tarragona, Universidad de Barcelona, Universidad Politécnica de Barcelona) and temporary research positions at Laboratoire de Cristallographie in Grenoble from 1979 to 1986.
2. "Investigador Científico" at the Consejo Superior de Investigaciones Científicas. Instituto de Ciencia de Materiales de Barcelona (February 1986 to January 1988).
3. Physicist at the I.L.L. since February 1988 to 31 June 1994. Co-responsible of D4 until April 1991 and afterward co-responsible of D9. College 5B secretary ("Crystal Physics and Magnetism") from June 1990 to July 1992.
4. "Colaborateur Temporaire Etranger" at the Commissariat à l'Energie Atomique (CEA), Laboratoire Léon Brillouin (LLB) at the Centre d'Etudes de Saclay (20 August 1992 to 20 February 1993).
5. "Directeur de Recherches" Associé at the CNRS. Contract from February 20, 1993 to February 20, 1994. Research activity at LLB, Centre d'Etudes de Saclay (CEA-CNRS).
6. CEA Engineer (E6), "Physicien Chercheur" at Laboratoire Léon Brillouin, Centre d'Etudes de Saclay, from July 1, 1994 up to 28 February 2006. From January 2001 to december 2002 I was also working in the "Service de Physique Statistique, Magnétisme et Supraconductivité" of CEA/Grenoble.
7. Physicist at the Institut Laue-Langevin, Diffraction Group Leader, from March 1, 2006 to October 2013, Grenoble.
8. Staff Scientist at the Institut Laue-Langevin, from October 1, 2013, Grenoble.

MEMBERSHIP OF SCIENTIFIC INSTITUTIONS AND COMMITTEES

- Coordinator for the Structural Science and Solid State Chemistry group of the Scientific Case of the European Spallation Source project (1995-1996)
- Member of the College 5B, "Magnetism" committee, at the ILL from April 1997 to April 2000.
- Chairman of the College 5B, "Magnetism" committee, at the ILL from April 2000 to October 2001.
- Member of the Neutron Scattering Commission of the International Union of Crystallography (from August 1999).
- Member of the Instrumentation Task Group of the European Spallation Source project.
- Member of the "Comité de Programme" of the French CRG (Collaborative Research Group) beam lines at the ESRF (European Synchrotron Radiation Facility). From October 1999 to December 2003.
- Member of the Scientific Committee of the SINQ neutron facility at PSI from June 2004 to June 2006.
- Member of the AFP-I of the ISIS neutron facility at RAL, from June 2005 to November 2007.
- Member of the ORNL Neutron Scattering Science Review Committee (from October 2010)
- Member of the SAC of the European Spallation Source project (Lund, from June 2010 to January 2012).

SCIENTIFIC BACKGROUND AND RESEARCH ACTIVITIES

Experimental techniques and topics of research before moving to France (1978-1987)

- Emission Mössbauer Spectroscopy in ^{57}Co , Electron capture, after-effects, point defects. Absorption Mössbauer Spectroscopy in Spinel, Perovskites and Hexaferrites. Charge states, cationic distribution, cation coordination, anionic vacancies.
- Structure determination by X-ray, Electron and Neutron diffraction. Direct methods, Patterson, Rietveld Method, nuclear and magnetic structures.
- Magnetic properties of oxides. Anisotropy, ferrimagnetism, spin-glasses, weak ferromagnetism, small particles.
- High Resolution Electron Microscopy. Anionic Vacancy Ordering in non-stoichiometric perovskites (oxides). Lattice image simulation in HREM, order-disorder, superstructures.
- Energy, potential, electric field and electric field gradient in ionic crystals. Lattice sums, Fourier series, dipolar contribution to the EFG, Bertaut method.

Current scientific interests

1. – Data analysis and software development in Crystallography and Diffraction Physics.
2. – Theoretical analysis of magnetic Structures. Frustration and low dimensional magnetism.
3. – Physics of Transition Metal-Rare Earth and Superconducting oxides and intermetallics.
 - Metal-Insulator Transitions and Magnetic Ordering in nickel and copper oxides.
 - Magnetic structures of Rare Earth Intermetallics.
 - Structural and magnetic aspects of oxides presenting colossal magnetoresistance and charge, spin and orbital ordering phenomena.
4. – Structure, magnetism and ionic conduction in materials for energy (batteries, hydrogen storage, etc.)

15 most cited papers, with more than 100 citations (Web of Science, 11 April 2017)

- 1:** "Recent Advances in Magnetic Structure Determination by Neutron Powder Diffraction"
Juan Rodríguez-Carvajal
Physica B **192**, 55-69 (1993) **Citations 6410**
- 2:** "WinPLOTR: a Windows tool for powder diffraction patterns analysis"
T. Roisnel and J. Rodríguez-Carvajal.
Materials Science Forum **378-381**, 118-123 (2001). **Citations 653**
- 3:** "Neutron Diffraction Study of the Jahn-Teller Transition in Stoichiometric LaMnO_3 "
J.Rodríguez-Carvajal, M. Hennion, F.Moussa, A.H. Moudden, L. Pinsard and A. Revcolevschi
Physical Review B **57**, *Rapid Communications*, R3189-R3192 (1998) **Citations 438**
- 4:** "Neutron Diffraction Study on Structural and Magnetic Properties of La_2NiO_4 "
J. Rodríguez-Carvajal, M.T. Fernández and J.L. Martínez.
Journal of Physics: Condensed Matter **3**, 3215-3234 (1991) **Citations 350**
- 5:** "Neutron Diffraction Study of RNiO_3 (R=La, Pr, Nd, Sm). Electronically Induced Structural Changes Across the Metal-Insulator Transition"
J.L. García-Muñoz, J. Rodríguez-Carvajal, P. Lacorre and J.B. Torrance.
Physical Review B **46**(8), 4414-4425 (1992) **Citations 349**
- 6:** "Spin waves in the antiferromagnet perovskite LaMnO_3 : a neutron scattering study"
F.Moussa, M. Hennion, J.Rodríguez-Carvajal, L. Pinsard and A. Revcolevschi
Physical Review B **54** (21), 15149-15155 (1996) **Citations 261**
- 7:** "Electronic Crystallization in a Lithium Battery Material: Columnar Ordering of Electrons and Holes in the Spinel LiMn_2O_4 ."
J.Rodríguez-Carvajal, G. Rousse, C. Masquelier and M. Hervieu.
Physical Review Letters **81**, 4660-4663 (1998). **Citations 218**

- 8:** "Zener Polaron Ordering in Half-Doped Manganites"
A Daoud-Aladine, J. Rodríguez-Carvajal, L. Pinsard-Gaudart, M.T. Fernández-Díaz and A. Revcolevschi
Physical Review Letters **89**(9), 097205 (2002). **Citations 208**
- 9:** "Liquidlike Spatial Distribution of Magnetic Droplets Revealed by Neutron Scattering in $\text{La}_{1-x}\text{Ca}_x\text{MnO}_3$."
M. Hennion, F. Moussa, G. Biotteau, J. Rodríguez-Carvajal, L. Pinsard and A. Revcolevschi
Physical Review Letters **81**, 1957-1960 (1998). **Citations 206**
- 10:** "Magnetic structure of triphylite LiFePO_4 and its delithiated form FePO_4 "
G. Rousse, J. Rodríguez-Carvajal, S. Patoux, C. Masquelier.
Chemistry of Materials **15**(21), 4082-4090 (2003). **Citations 196**
- 11:** "Spin structure and magnetic frustration in multiferroic RMn_2O_5 (R=Tb, Ho, Dy)"
G.R. Blake, L.C. Chapon, P.G. Radaelli, S. Park, N. Hur, S-W. Cheong and J. Rodríguez-Carvajal.
Physical Review **B 71**, 214402 1-9 (2005). **Citations 188**
- 12:** "Magnetic Frustration and Lattice Dimensionality in $\text{SrCr}_8\text{Ga}_4\text{O}_{19}$ "
X. Obradors, A. Labarta, A. Isalgué, J. Tejada, J. Rodríguez and M. Pernet.
Solid State Communications **65**(3), 189-192 (1988) **Citations 167**
- 13:** "Structural Characterization of R_2BaCuO_5 (R=Y, Lu, Yb, Tm, Er, Ho, Dy, Gd, Eu and Sm) Oxides by X-Ray and Neutron Diffraction"
A. Salinas-Sánchez, J.L. García-Muñoz, J. Rodríguez-Carvajal, R. Sáez-Puche and J.L. Martínez.
Journal of Solid State Chemistry **100**, 201-211 (1992). **Citations 156**
- 14:** "Prediction of crystal structure from crystal chemistry rules by simulated annealing"
J. Pannetier, J. Bassas-Alsina, J. Rodríguez-Carvajal, V. Caignaert.
Nature **346**(6282), 343-345 (1990). **Citations 137**
- 15:** "Approach to the metal-insulator transition in $\text{La}_{1-x}\text{Ca}_x\text{MnO}_3$ ($0 \leq x \leq 0.2$): Magnetic inhomogeneity and spin-wave anomaly"
G. Biotteau, M. Hennion, F. Moussa, J. Rodríguez-Carvajal, L. Pinsard, A. Revcolevschi, Y.M. Mukovski, and D. Shulyatev.
Physical Review **B 64**, 104421 1-14 (2001). **Citations 127**

String for "Author" to be used in ISI Web of Science for *General Search* or *Cited Ref Search*:

AU=(Rodriguez-Carvajal J or RodriguezCarvajal J or Carvajal JR or (Rodriguez J and (Obradors or Pannetier or Paulus or GonzalezCalbet or Fontcuberta J or Vallet or Gali))), then eliminate biological and medical sciences. The time span should start at 1980 otherwise some wrong references appear.

FullProf Citations:

~ 12000 citations

The use of FullProf is cited in different ways. Many people cite the program in the text of the article but make no citation reference, so this cannot be accounted. Some people (mostly those working with magnetic structures) cite directly the paper *Physica B* **192**, 55-69 (1993) (with **6450 citations**), other people just cite the name of the program, the version, the manual, etc; and other makes reference to the communication: "FULLPROF: A Program for Rietveld Refinement and Pattern Matching Analysis", by J. Rodríguez-Carvajal, at the *Satellite Meeting on Powder Diffraction of the XV IUCr Congress*, 127 (1990). The current estimation of FullProf citations is around **12000**.