Curriculum Vitae (abridged version) of Prof. Miguel A. G. Aranda

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Personal Details

Full Name: Miguel Angel García Aranda
Working address: ALBA-CELLS synchrotron
Carretera BP 1413, Km. 3,3. 08290 Cerdanyola del Vallès, Barcelona. Spain

Date and place of birth: 8th February 1966, Málaga
Single, not children.

Education:

Degrees

1992: D. Phil. in Chemistry; University of Málaga
1988: B.A. in Chemistry; University of Málaga

Pre-doctoral experience

University of Oxford, U.K. (1989-1991). Total: 7 months in three summer research stays.

Post-doctoral experience

University of Cambridge, U.K. (1992-1993). 15 months.

Employment:

Present position:
From the 3rd of September-2012, Scientific Director of ALBA (the Spanish synchrotron source)
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(With a secondment of University of Malaga (www.uma.es) from his Chair in Inorganic Chemistry. 'Comisión de Servicios Especiales' under Spanish legislation)

In his current position as ALBA scientific director, he coordinates and supervises the user program for all techniques available at ALBA synchrotron as well as designs the future scientific use of the facility. He supervises a group of more than 50 scientists and technologists from 13 countries. ALBA synchrotron is the largest Spanish scientific infrastructures ended in 2012 with a total construction budget of 210 M€ and 20 M€ of yearly operation budget.

Since January 2014, vice-chairman of the ESRF Council. ESRF (European Synchrotron Radiation Facility) is the European synchrotron located in Grenoble (www.esrf.eu) with a yearly operation budget of 80 M€ and currently engaged in an upgrade programme (phase II) with 150 M€ of overall budget to be developed between 2015 and 2022.

Additionally: Since 2004, scientific advisor for 'Large Facilities' for the Science-Research-Innovation Department of the appropriate Spanish Ministry (evolving with time: Education/Science/Economy).

Employment national extra subsidies:
National research benefits/evaluation: **4**. 1989-1994; 1995-2000; 2001-2006; 2007-2012.

Career (previous positions)

Professor of Inorganic Chemistry at University of Málaga, June-2011 - continues.
Associate Professor at University of Málaga, 1999-2011.
Assistant Professor at University of Málaga, 1994-1999.

Summary of Current Research Interests and experience

Use of Large Facilities (synchrotron X-rays and neutrons) for studying materials. He is a crystallographer with experience in synchrotron powder diffraction techniques mainly for *in-situ* characterization of industrially-relevant materials (f.i. cements, pigments, ceramics, etc.). In addition to powder diffraction, he has also employed synchrotron single (micro)crystal approaches as well as X-ray Absorption Spectroscopy (XAS) characterization. Now he is employing High Pressure –DAC– techniques for the characterization of hydrated cements phases. Furthermore, he is also employing Coherent Diffraction Imaging (CDI) techniques for the study of defects and microstructure in cement related research: Bragg-CDI for analysis of cement microparticles and early age hydration mechanism and Forward-CDI (ptychography) for advanced microstructure quantification of cement pastes. He has also experience in other research fields like: i) archaeometry and cultural heritage; ii) solid state inorganic chemistry; iii) hybrid porous materials for hydrogen storing and (photo)catalysis; iv) Materials for solid-oxide fuel cells; and v) electron-correlated complex oxides (manganites, nickelates, and high-Tc superconductors).

Key words: Synchrotron and neutron diffraction, archaeometry, Rietveld method; industrial materials: cements, mortars, concretes, pigments, etc.; organic-inorganic hybrids; hydrogen/fuel storing, fuel cells, oxygen conductivity, proton conductivity.

Subjects taught in the last ten years at the undergraduate and graduate level:

Undergraduate: Chemistry of Materials (60 hours/year from 2000 to 2012). Advance structural techniques in inorganic chemistry (25 hours/year from 2004 to 2012).

Graduate: Material characterization by powder diffraction (30 hours/year: 2002 to 2012)

Professional Experience and Services

Ph. D. Thesis supervised: ***12.*** *He currently supervises 4 PhD students.*
Master Thesis supervised: ***14***

Honours/awards

University of Málaga award to the best Chemistry degree 1989.
University of Málaga award to the best Chemistry Doctorate Thesis, 1992.

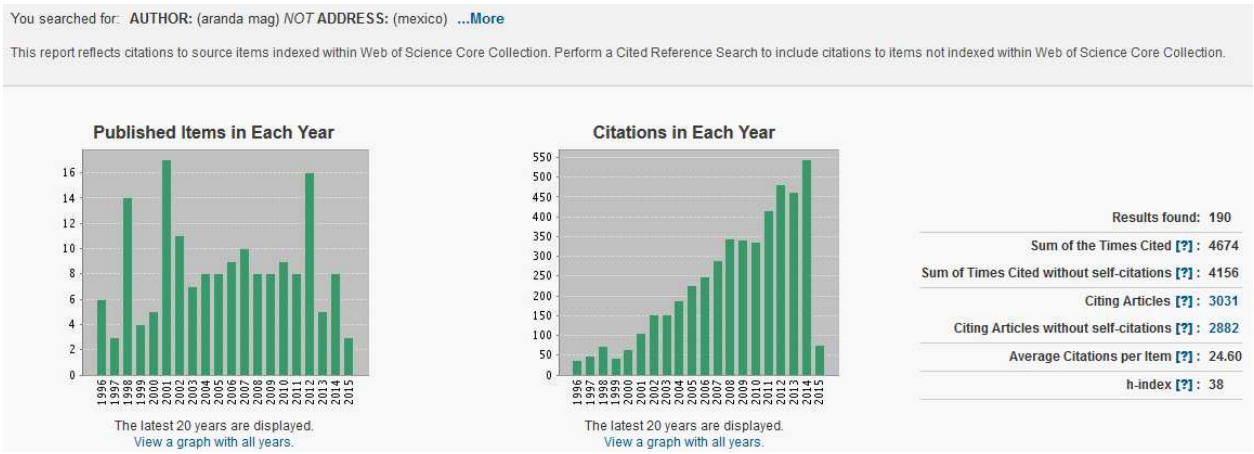
Publications:

I. Author or co-author of **8** review articles / book chapters.

II. Author or co-author of **196** reviewed scientific publications in journals gathered (or to be incorporated) in ISI Web-of-Science™; with a total number of citations in ISI Web-of-Science™: +**4750**

III. **32** publications/proceedings not indexed on ISI Web-of-Science™

Hirsh H-Index: **38**



Five selected publications representative of the research interest and experience:

1.- "$Ba_{44}Cu_{48}(CO_3)_6O_{87.9}$; the Structure of '$BaCuO_2$' from Simultaneous X-Ray and Neutron Powder Diffraction" Aranda, M.A.G.; Attfield, J.P. *Angewandte Chemie Inter. Ed. Engl.*, **1993**, *32*, 1454-1456.

Selection: Very good structural work combining X-ray and neutron powder diffraction (in the early nineties).

2.- "Commensurate Charge Modulation in $RNiO_3$ perovskites: Simultaneous Metal-Insulator and Structural Transition in $YNiO_3$" Alonso, J.A.; García-Muñoz, J.L.; Fernández-Díaz, M.T.; Aranda, M.A.G.; Martínez-Lope, M.J.; Casais, M.T. *Physical Review Letters*, **1999**, *82*, 3871-3874.

Selection: The first report of a structural phase transition in $RNiO_3$ by X-ray synchrotron diffraction.

3.- "Deprotonation of Phosphonic Acids with M^{2+} Cations for the Design of Neutral Isostructural Organic-Inorganic Hybrids" Sharma, C.V.K.; Clearfield, A.; Cabeza, A.; Aranda, M.A.G.; Bruque, S. *Journal American Chemical Society*, **2001**, *123*, 2885-2886.

Selection: Rational design of a family of organo-inorganic hybrid materials with a pre-designed framework.

4.- "Full Phase Analysis of Portland Clinker by Penetrating Synchrotron Powder Diffraction" de la Torre, A.G.; Cabeza, A.; Calvente, A.; Bruque, S. Aranda, M.A.G. *Analytical Chemistry*, **2001**, 73, 151-156.

Selection: First accurate quantitative phase analysis of a Portland clinker by the Rietveld method.

5.- "New insights on blue pigments used in 15th Century paintings by Synchrotron Radiation micro FTIR and XRD" . Salvadó, N.; Butí, S.; Aranda, M.A.G.; Pradell, T. *Analytical Methods*, **2014,** *6*, pp *3610–3621*.

Selection: A Cultural Heritage work showing the usefulness of synchrotron radiation to tackle important challenges in painting understanding which should lead to optimised restoration procedures.

Industrial contracts: Several collaboration with industries dealing with characterization of Portland cements and related materials. I can highlight the following contracts:

1.- Title "Hydration studies of AETHER^{TM} cements with Supplementary Cementing Materials". 2011/2012. **Lafarge - LCR (Lyon, France)**. Principal Investigator: Miguel Ángel García Aranda. Funding: 25.000 €.

2.- Title "Research and Development of new Surfaces for Building materials". 2008/2009. **COSENTINO S.A. (Almeria, Spain)**. Principal Investigator: Miguel Ángel García Aranda. Funding: 122.900 €.

International committee's membership/chairs

1.- Member of the Shanghai Synchrotron Radiation Facility (SSRF) Phase–II Beamline Review Panel. May-2015

2.- Spanish delegate at European-XFEL council (Hamburg, Germany); since 2009 and still on-duty.

3.- Spanish delegate at ESRF council (Grenoble, France); from 2005 to 2013.

4.- Member of the committee "Commission on Synchrotron Radiation –CSYNR–" from International Union of Crystallography; since 2011 and still on-duty. Consultant in that committee from 2005 to 2011.

5.- Observer of the SAC (Scientific Advisory Committee) of ALBA (Spanish synchrotron) during four years (2004-2007).

6.- Member of the beamtime awarding panel (chemistry) of ESRF (European Synchrotron Research Facility) synchrotron during three years (2001-2003). Also member of several beamline review panels at ESRF.

Main international research stays (after postdoc)

Organization: **BM25-ESRF**
Place: Grenoble Country: France Date: 2004 Duration (weeks): 8
Subject: Commissioning of the high-resolution powder diffractometer of BM25

Organization: **London Centre for NanoTechnology. University College of London**
Place: London Country: U.K. Date: 2009 Duration (weeks): 7
Subject: Image reconstruction of twinned nanoparticles using synchrotron X-rays coherent diffraction

Organization: **London Centre for NanoTechnology. University College of London**
Place: London Country: U.K. Date: 2010 Duration (weeks): 6
Subject: Image reconstruction of twinned nanoparticles using synchrotron X-rays coherent diffraction

Organization: **Key Laboratory of Advanced Civil Engineering Materials. Tongji University**
Place: Shanghai Country: China Date: 2010 Duration (weeks): 1
Subject: Lecturing cement quantitative phase analysis by using X-ray powder diffraction and the Rietveld method

Organization: **Key Laboratory of Advanced Civil Engineering Materials. Tongji University**
Place: Shanghai Country: China Date: 2015 Duration (weeks): 1
Subject: Lecturing cement quantitative phase analysis methodologies and synchrotron techniques

Other merits to be considered

1.- Founding president of AUSE "Asociación de Usuarios de Radiación Sincrotrón de España"; 2004-2007. The Spanish synchrotron user association.

2.- Scientific responsible of the X-ray powder diffraction service/laboratory of the University of Málaga; since its creation in 1995 to December 2012.

3.- Co-director and teacher of the Spanish summer school on the Rietveld method (Universidad Jaume I de Castellón); since its creation in 2001.

4.- Wide experience in the user of large installations for material structural characterization. I have carried out many synchrotron experiments at **SRS** (Daresbury, U.K.); **ESRF** (Grenoble, France); **MAX-Lab** (Lund, Sweden), **Diamond** (Oxfordshire, U.K.), **APS** (Chicago, USA), **SLS** (Villinguen, Switzerland) and **ALBA** (Barcelona, Spain). I have also carried out neutron powder diffraction at **ILL** (Grenoble, France); **LLB** (Paris, France); **ISIS** (Oxfordshire, U.K.); **LANSCE**, (LANL, New Mexico, USA) and **SINQ**, (PSI, Villinguen, Switzerland).

5.- Referee of scientific journals (#49):

Acta Crystallographica Section B
Advanced Energy Materials
Cement and Concrete Composites
Chemistry of Materials
Chemical Record
Chemical Reviews
Construction & Building Materials
Dalton Transactions
Environmental Science & Technology
European Journal of Inorganic Chemistry
Inorganica Chimica Acta
Journal of Alloys and Compounds
Journal of Hazardous Materials
Journal of Molecular Structure
Journal of Solid State Chemistry
Journal of the American Ceramic Society
Journal of Zhejiang University-SCIENCE A
Materials Characterization
Materials Research Bulletin
Journal of the European Ceramic Society
Microporous & Mesoporous Materials
Nuclear Instruments and Methods B
Powder Diffraction
Thermochimica Acta
American Mineralogist
Boletín Sociedad Española de Cerámica y Vidrio
Cement and Concrete Research
Ceramics International
Chemical Engineering Journal
Chemical Physics and Physical Chemistry
Crystal Engineering Communications
Crystal Growth and Design
European Journal of Mineralogy
Fuel Cells
Industrial & Engineering Chemistry Research
Inorganic Chemistry
International Journal of Applied Ceramic Technology
Journal of African Earth Sciences
Journal of Chemical Physics
Journal of Applied Crystallography
Journal of Inorganic & Organometallic Polymers & Material
Journal of Material Chemistry
Journal of Physical Chemistry
Journal of Synchrotron Radiation
Journal of the American Chemical Society
Materials Chemistry and Physics
Materials Science & Engineering A
Solid State Sciences
Zeitschrift für Anorganische und Allgemeine Chemie