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**Alicia Manjón Sanz, Ph. D.**

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**EDUCATION**

- 2015            **Ph.D.** in Chemistry with specialization in Synthesis, Structure and Properties of Bismuth Based Electroceramic Perovskites, **The University of Liverpool**, United Kingdom.  
*Supervisor:* Matthew Rosseinsky.
- 2008            **Licenciatura** in Chemistry, **Universidad Autónoma de Madrid**, Spain.

**PROFESSIONAL APPOINTMENTS / EMPLOYMENT**

- 2020 –            **Instrument Scientist**, Neutron Scattering Division, **Oak Ridge National Laboratory**, United States.
- 2018 – 2020      **Postdoctoral Research Associate**, Experiments Division, **CELLS**, ALBA Synchrotron Light Facility, Spain.
- 2015 – 2018      **Postdoctoral Scholar**, Department of Chemistry, **Oregon State University**, United States.  
*Advisor:* Michelle Dolgos.
- 2012 – 2014      **Research Fellow**, Structural Materials Science Laboratory, **RIKEN**, SPring-8, Japan.  
*Supervisor:* Masaki Takata.
- 2009 – 2010      **Industrial Researcher**, Institute of Catalysis and Petrochemistry, **Consejo Superior de Investigaciones Científicas (CSIC)**, Spain.  
*Supervisors:* Manuel Sánchez-Sánchez and Enrique Sastre de Andrés.

**AWARDS / FELLOWSHIPS**

- 2016            Gordon Research Conference Travel Award (\$500).
- 2012 – 2014      *International Program Associate* fellowship, RIKEN Project.
- 2011 – 2012      *Marie Curie Early-Stage Researcher* fellowship, SOPRANO Project.
- 2009 – 2010      Funding from Destilerías Muñoz Gálvez S.A. (company).

**FUNDING**

“Structural characterization of piezoelectric materials using high pressure diffraction and total scattering techniques”, **Alicia Manjón Sanz** (P.I.), Catalin Popescu, François Fauth, ALBA, (15.000€) 2019-2021.

**PUBLICATIONS**

- (18) Molina Esquinas, A.; **Manjón-Sanz, A.**; Sánchez-Sánchez, M., "Insights into structural features of nanocrystalline MOFs and enzyme@MOF biocatalysts by means of Pair Distribution Function", *To be submitted to Journal of Physical Chemistry C*.
- (17) Yatskin, M.; Culberston, C.; **Manjón-Sanz, A.**; Cann, D. P.; Dolgos, M. R.; Cheong, P. H. Y., "New approach to DFT modeling of perovskite ferroelectrics: from cubic disorder to rhombohedral order-disorder", *To be submitted to Materials Research Bulletin*.
- (16) **Manjón-Sanz, A.**; Mandal, P.; Corkett, A.J.; Nishibori, E.; Takata, M.; Surta, T. W.; Pitcher, M. J.; Claridge, J. B.; Rosseinsky, M. J., "Structure of the Polar Orthorhombic Phase in lead-free  $(1-x)\text{BiTi}_{3/8}\text{Fe}_{2/8}\text{Mg}_{3/8}\text{O}_3-x\text{CaTiO}_3$  solid solutions where  $x > 0.15$ ", *under revision in Advanced Science*.
- (15) Molina Esquinas, A.; **Manjón-Sanz, A.\***; Sánchez-Sánchez, M., "On the contribution of Pair Distribution Function (PDF) to the characterization of nanocrystalline MOFs: The case of M-MOF-74", *Microporous and Mesoporous Materials*, (2021) 319, 110973.
- (14) Culberston, C; **Manjón-Sanz, A.**; Dolgos, M. R., "Order-disorder behavior in lead-free piezoelectric  $\text{BaZr}_{0.2}\text{Ti}_{0.8}\text{O}_3-x\text{Ba}_{0.7}\text{Ca}_{0.3}\text{TiO}_3$  determined by neutron total scattering", *Materials Research Bulletin*, (2021) 135, 111124 (1-7).
- (13) Sánchez-Ahijón, E.; Rainer Schmidt, R.; Marín-Gamero, R.; Molero-Sánchez, B.; Ávila-Brandé, D.; **Manjón-Sanz, A.**; Fernández-Díaz, M. T.; Morán, E.; Prado-Gonjal, J. "BaFe<sub>0.125</sub>Co<sub>0.125</sub>Zr<sub>0.75</sub>O<sub>3-δ</sub>: a highly promising mixed ionic-electronic conductor for intermediate temperature solid oxide fuel cells", *Journal of Materials Chemistry A*, 8 (2020), 3413-3420.
- (12) **Manjón-Sanz, A.**; Culberston, C; Hou D.; Jones, J. L.; Dolgos M. R., "Total scattering and diffraction studies of lead-free piezoelectric  $\text{BaZr}_{0.2}\text{Ti}_{0.8}\text{O}_3-x\text{Ba}_{0.7}\text{Ca}_{0.3}\text{TiO}_3$  deconvolute intrinsic and extrinsic contributions to electromechanical strain", *Acta Materialia*, 171 (2019), 79-91.
- (11) **Manjón-Sanz, A.**; Dolgos, M. R., "Applications of Piezoelectrics: old and new", *Invited review article, Chemistry of Materials*, 30, (2018), 8718-8726.
- (10) McQuade, R.; Rowe, T.; **Manjón-Sanz, A.**; de la Puente, L.; Dolgos, M. R., "An investigation into group 13 (Al, Ga, In) substituted  $(\text{Na}_{0.5}\text{Bi}_{0.5})\text{TiO}_3\text{-BaTiO}_3$  (NBT-BT) lead-free piezoelectrics", *Journal of Alloys and Compounds*, 762, (2018), 378-388.
- (9) Surta, T. W.; **Manjón-Sanz, A.**; Qian, E. K.; Dolgos, M. R., "Low Temperature Synthesis Route and Structural Characterization of  $(\text{Bi}_{0.5}\text{A}_{0.5})(\text{Sc}_{0.5}\text{Nb}_{0.5})\text{O}_3$  ( $\text{A} = \text{K}^+$  and  $\text{Na}^+$ ) Perovskites", *Inorganic Chemistry Frontiers*, 5, (2018), 1033-104.
- (8) Surta, T. W.; **Manjón-Sanz, A.**; Qian, E. K.; Mansergh, R. H.; Tran, T. T.; Fullmer, L. B.; Dolgos, M. R., "Dielectric and Ferroelectric Properties in Highly Substituted Aurivillius Phases-  $\text{Bi}_2\text{Sr}(\text{A})\text{TiNb}_2\text{O}_{12}$  ( $\text{A} = \text{Ca}^{2+}, \text{Sr}^{2+}, \text{Ba}^{2+}$ )", *Chemistry of Materials*, 29, (2017), 7774-7784.
- (7) **Manjón-Sanz, A.**; Berger, C.; Dolgos, M. R., "Understanding the Structure-property Relationships of the Ferroelectric to Relaxor Transition of the  $x\text{BiInO}_3\text{-(1-x)BaTiO}_3$  Lead-free Piezoelectric System", *Journal of Materials Science*, 52, (2017), 5309-5323.

- (6) **Manjón-Sanz, A.**; Surta, T. W.; McQuade, R.; Dolgos, M. R., “Piezoelectrics: Putting the squeeze on new materials”, *Abstracts of Papers of the American Chemical Society*, 251, (2016), 1319.
- (5) Mandal, P.; **Manjón-Sanz, A.**; Corkett, A. J.; Comyn, T. P.; Dawson, K.; Stevenson, T. P.; Bennett, L. F.; Henrichs, A.; Bell, A. J.; Nishibori, E.; Takata, M.; Marco Z.; Dolgos, M. R.; Adem, U.; Wan, X.; Pitcher, M. J.; Romani, S.; Tran, T. T.; Halasyamani, P. S.; Claridge, J. B.; Rosseinsky, M. J., “Morphotropic Phase Boundary in the Pb-free  $(1-x)\text{BiTi}_{3/8}\text{Fe}_{2/8}\text{Mg}_{3/8}\text{O}_{3-x}\text{CaTiO}_3$  System: Tetragonal Polarization and Enhanced Electromechanical Properties”, *Advanced Materials*, 27, (2015), 2883-2889.
- (4) Sánchez-Sánchez, M.; **Manjón-Sanz, A.**; Díaz, I.; Mayoral, A.; Sastre, E., “Micron-Sized Single-Crystal-like CoAPO-5/Carbon Composites Leading to Hierarchical CoAPO-5 with Both Inter-and Intracrystalline Mesoporosity”, *Crystal Growth and Design*, 13, (2013), 2476-2485.
- (3) Dolgos, M. R.; Adem, U.; **Manjón-Sanz, A.**; Wan, X. M.; Comyn, T. P.; Stevenson, T.; Bennett, J.; Bell, A. J.; Tran, T. T.; Halasyamani, P. S.; Claridge, J. B.; Rosseinsky, M. J., “Perovskite B-site Compositional Control of [110]p Polar Displacement Coupling in an Ambient Pressure-Stable Bismuth-based Ferroelectric”, *Angewandte Chemie-International Edition*, 41, (2012), 10770-10775.
- (2) **Manjón-Sanz, A.**; Sánchez-Sánchez, M.; Sastre, E., “Towards the Control of Intercrystalline Mesoporosity in Inorganic Microporous Materials: The Case of CoAPO-5”, *Catalysis Today*, 179, (2012), 102-114.
- (1) **Manjón-Sanz, A.**; Sánchez-Sánchez, M.; Muñoz-Gómez, P.; García, R.; Sastre, E., “Non-template Intercrystalline Mesoporosity in Heteroatom-doped AlPO<sub>4</sub>-5 using N-methyldicyclohexylamine as Structure-Directing Agent”, *Microporous and Mesoporous Materials*, 131, (2010), 331-341.

## **PRESENTATIONS**

- Jan. 2021 “Understanding the structure of  $(1-x)\text{Ba}(\text{Zr}_{0.2}\text{Ti}_{0.8})\text{O}_{3-x}(\text{Ba}_{0.7}\text{Ca}_{0.3})\text{TiO}_3$  based lead-free piezoelectric materials”, (Poster), *Electronic and Advanced Materials*, Virtual conference, United States.
- Oct. 2020 “Hacia el entendimiento de los catalizadores nanocristalinos MOF-74 a través del análisis PDF (Pair Distribution Function)”, (Poster), XXVII Congreso Iberoamericano de Catalisis 2020, Mexico.
- July 2020 “Understanding the Structure-property Relationships of the Ferroelectric to Relaxor Transition of the  $(1-x)\text{BaTiO}_3$ - $(x)\text{BiInO}_3$  Lead-free Piezoelectric System”, (Talk) *2020 American Conference on Neutron Scattering*, Virtual Conference, United States.
- May 2020 “Structure-property Relationships of Advanced Functional Materials and the POWGEN instrument”, (**Invited Virtual Seminar**) Jacob Jones Research group from the North Carolina State University, Raleigh, United States.
- Nov. 2019 “Structure-property Relationships of Advanced Functional Materials”, (**Invited Seminar**) Institute of Multidisciplinary Research for Advanced Materials, Tohoku University, Sendai, Japan.

- Oct. 2019 “Understanding nanoscaled Metal Organic Framework (M-MOF-74) materials via Pair Distribution Function analysis”, (Poster), *IX AUSE* (the Spanish Synchrotron User Association) *Conference and 4<sup>th</sup> ALBA User’s meeting*, CELLS, ALBA Synchrotron Light Facility, Cerdanyola Del Valles,
- May 2019 “La técnica de Pair Distribution Function y sus aplicaciones”, (**Invited Seminar**) *ECS Student Chapter*, Chemistry Department, Universidad Complutense de Madrid, Madrid, Spain.
- Apr. 2019 “La fuente de luz sincrotrón ALBA y sus aplicaciones”, (**Invited Talk**) *III Workshop Química Sostenible*, Instituto de Tecnología Química, Universitat Politècnica de Valencia, Valencia, Spain.
- March 2019 “Deconvolved intrinsic and extrinsic contributions to electrostrain in high performance  $(1-x)\text{Ba}(\text{Zr}_{0.2}\text{Ti}_{0.8})\text{O}_3-x(\text{Ba}_{0.7}\text{Ca}_{0.3})\text{TiO}_3$  piezoceramics“, (Poster) *School and Conference on Analysis of Diffraction Data in Real Space*, Institut Laue-Langevin and The European Synchrotron, Grenoble, France.
- Apr. 2018 “Understanding the Structure-property Relationships in Advanced Functional Materials”, (**Invited Seminar**) *Institute of Catalysis and Petrochemistry*, Consejo Superior de Investigaciones Científicas (CSIC), Madrid, Spain.
- Feb. 2018 “Synthesis and Structure-property Relationships in Lead-free Piezoelectric Ceramics“, (**Invited Seminar**) *Materials Science Department*, Oregon State University, Corvallis, Oregon, United States.
- Jan. 2018 “Study of Domain Wall Motion and Local Structure Under Application of Electric Fields of  $\text{BaZr}_{0.2}\text{Ti}_{0.8}\text{O}_3-x\text{Ba}_{0.7}\text{Ca}_{0.3}\text{TiO}_3$ “, (Talk) *Electronic and Advanced Materials*, Florida, Orlando, United States.
- Nov. 2017 “Importance of Piezoelectric Materials“, (Talk) *Oregon State University / University of Oregon PostDoc Research Symposium*, University of Oregon, Eugene, Oregon, United States.
- Aug. 2017 “Structure-property Relationships in Novel Ferroelectric and Piezoelectric Perovskites“, (Poster) *North American Solid State Chemistry Conference*, University of California Santa Barbara, Santa Barbara, California, United States.
- June 2017 “Study of the Structure-property Relationship of the Piezoelectric System  $x\text{BiInO}_3-(1-x)\text{BaTiO}_3$ “, (Talk) *72<sup>nd</sup> Northwest Regional Meeting*, Oregon State University, Corvallis, Oregon, United States.
- May 2017 “Temperature Dependence of Local Structure of Lead-free Piezoelectric:  $\text{BaZr}_{0.2}\text{Ti}_{0.8}\text{O}_3-x\text{Ba}_{0.7}\text{Ca}_{0.3}\text{TiO}_3[\text{BZT}-x\text{BCT}]$ “, (Poster) *US School on Total Scattering Analysis*, Oak Ridge National Labs, Tennessee, United States.
- Jan. 2017 “Understanding the Structure-property Relationship of the Piezoelectric System  $x\text{BiInO}_3-(1-x)\text{BaTiO}_3$ “, (Poster) *Electronic Materials and Applications*, Florida, Orlando, United States.

- July 2016 “Structure-property Relationship of a Lead-free Piezoelectric Material Synthesized at Ambient Pressure“, (Poster) *Gordon Research Conference on Solid State Chemistry*, New London, United States.
- July 2016 “Settling a Scientific Debate by Investigating the Structure-Property Relationships of Disordered Aurivillius Phases“, (Poster) *American Conference on Neutron Scattering*, Long Beach, California, United States.
- Oct. 2015 “New Lead-free A-site Based Piezoelectric Materials Synthesized at Ambient Pressure with Potential as Actuators“, (Poster) *Oregon State Postdoctoral Association Annual Research Poster Session*, Oregon State University, Corvallis, Oregon, United States.
- Apr. 2012 “A lead-free A-site Based Perovskite Synthesized at Ambient Pressure“, (Poster) *SOPRANO-Marie Curie FP7 meeting*, Max Planck Institute for Solid State Research, Stuttgart, Germany.
- Oct. 2011 “Structural Studies on Functional Lone Pair oxides“, (Talk) *SOPRANO-Marie Curie FP7 meeting*, The University of Liverpool, Liverpool, United Kingdom.
- Apr. 2011 “Structural Studies on Functional Lone Pair oxides“, (Talk) *SOPRANO-Marie Curie FP7 meeting*, Timisoara, Romania.
- July 2010 “Commercial Carbon Templating Mesoporosity in CoAPO-5“, (Poster) *16<sup>th</sup> International Zeolite Conference*, Sorrento, Italy.

## **RESEARCH SKILLS**

### **Synthesis**

Solid state synthesis  
Hydrothermal methods

### **Ceramic processing**

Ball milling  
Vibratory milling  
Cold isostatic pressing  
Density analysis

### **Structural analysis**

Powder X-ray and neutron diffraction  
X-ray and neutron total scattering  
Electron diffraction

Rietveld analysis

Maximum Entropy Method / Rietveld analysis

Solving crystal structures

### **Electrical properties characterization**

Dielectric measurement  
Polarization versus electric field  
Strain versus electric field  
Berlincourt strain measurements

### **Software**

POWDERCELL (competent)  
Topas Academic (proficiency)  
Fullprof (basic)  
ENIGMA (competent)  
Fit2D (competent)  
PDFgetX3 (competent)  
xPDFsuite (competent)  
PDFgui (proficiency)  
VESTA (proficiency)  
Mercury (proficiency)

### **Other characterization**

Scanning Electron Microscopy  
Energy Dispersive Spectroscopy  
Thermal Analysis

**CAREER AND SKILLS DEVELOPMENT**

- March 2021 *Women's leadership workshop*, Oak Ridge National Laboratory, Oak Ridge, United States.
- March 2021 *How to build an instrument*, Oak Ridge National Laboratory, Oak Ridge, United States.
- March 2019 *School and Conference on Analysis of Diffraction Data in Real Space*, Institut Laue-Langevin and The European Synchrotron, Grenoble, France.
- June 2018 *Python Introduction Course*, CELLS, ALBA Synchrotron Light Facility, Cerdanyola Del Valles, Spain.
- Jan. 2018 *Tuesday Teaching Talks*, The 90 Minute Certificated Series, Oregon State University, Corvallis, Oregon, United States.
- June 2017 *Grant Writing Workshop*, Oregon State University, Corvallis, Oregon, United States.
- Aug. 2016 *Postdoc Research Writing Workshop*, Oregon State University, Corvallis, Oregon, United States.
- July 2016 *Pacific Northwest Women in Science Retreat*, Oregon, United States.
- Apr. 2012 *XII School about the Rietveld method*, Universidad Jaume I, Castellón, Spain.
- March 2012 *Single Crystal X-Ray Structure Analysis*, University of Liverpool, Liverpool, United Kingdom.
- June 2010 *Introduction to the Characterization of Adsorbents and Catalysts*, CSIC, Cáceres, Spain.
- Nov. 2009 *Techniques for the Study of Solid Materials* (second edition), CSIC, Madrid, Spain.
- June 2009 *Techniques for the Study of Solid Materials* (first edition), CSIC, Madrid, Spain.

**TEACHING EXPERIENCE / SERVICE**

2015 – 2018 **Mentor** of Ph. D. students and undergraduate students. (\*students with published publications under my supervision)

Ph. D. graduates / candidates / students

- |   |                       |
|---|-----------------------|
| (1) Wesley T. Surta*, <i>Ph. D. graduate</i> , currently at University of Liverpool | Mar. 2015 – Mar. 2018 |
| (2) Ryan McQuade*, <i>Ph. D. graduate</i> , currently at Oregon State University    | Mar. 2015 – Mar. 2018 |
| (3) Charles Culberston*, <i>Ph. D. graduate</i>                                     | Oct. 2015 – Mar. 2018 |
| (4) Alyssa Adams, <i>Ph. D. track</i>   | Oct. 2016 – Mar. 2018 |

Undergraduate students

- |  |                       |
|--|-----------------------|
| (1) Lilibel de la Puente*, currently COO at Beaker & Wrench                      | Oct. 2015 – Apr. 2016 |
| (2) Caitlin Berger*, current Oregon State University undergraduate               | Oct. 2015 – June 2016 |
| (3) Alexander S. Edgar, currently at University of Oregon Masters Intern Program | Nov. 2016 – Mar. 2017 |
| (4) Ally Mallone, currently at Oregon State University grad school – education   | Jan. 2017 – Mar. 2017 |
| (5) Eric K. Qian*, current Oregon State University undergraduate                 | Jan. 2017 – Mar. 2018 |

- 2017 **Co-Instructor:** “Workshop on The Analysis of Total Scattering Data Using the Pair Distribution Function“, 72<sup>nd</sup> Northwest Regional Meeting, Oregon State University, Corvallis, Oregon, United States (with partial support from Rigaku America).
- 2015 – 2016 **Mentor** of two International Exchange Undergraduate Students, *International Student Peer Mentoring Program*, Oregon State University, Corvallis, Oregon, United States.
- 2017 – **Reviewer** of *Chemistry of Materials*, *Journal of Materials Science*, *Materials*, *Applied Sciences*, and *Symmetry*.
- 2019 **Volunteer** at the ALBA OPEN DAY, ALBA, Cerdanyola Del Valles, Spain
- 2021 **Co-chair** of Women in Neutron Sciences, Oak Ridge National Laboratory, United States.
- 2021 Neutron Special Interest Group (SIG) **Chair Elect 2021/SIG Chair 2022** for the *American Crystallographic Association*.

## **LANGUAGES**

<b>Spanish</b>	Native
<b>English</b>	Proficient (Reading, Speaking, and Writing)
<b>French</b>	Basic (Reading and Writing with dictionary)
<b>Japanese</b>	Basic (Speaking conversational)

## **PROFESSIONAL AFFILIATIONS**

*The American Ceramic Society, Neutron Scattering Society of America, American Crystallographic Association and Materials Research Bulletin.*

## **REFERENCES**

**Michelle Dolgos**, Postdoctoral Scholar Advisor  
Department of Chemistry, University of Calgary  
2500 University Drive NW, Calgary, Alberta, Canada, T2N 1N4  
Phone: +1-403-220-7877  
E-mail: [michelle.dolgos1@ucalgary.ca](mailto:michelle.dolgos1@ucalgary.ca)

**Matthew Rosseinsky**, Ph.D. Supervisor  
Department of Chemistry, University of Liverpool  
Crown Street, Liverpool, L69 7ZD, United Kingdom  
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**Masaki Takata**, Co-Ph.D. Supervisor

Institute of Multidisciplinary Research for Advanced Materials (IMRAM), Laboratory of Synchrotron Radiation  
Soft X-ray Microscopy

Executive Advisor to the President: SLiT-J Project Tohoku University

Visiting Group Director Materials Visualization Photon Science Group RIKEN SPring-8 Center

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**Manuel Sánchez-Sánchez**, Supervisor at Institute of Catalysis and Petrochemistry

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