

# Dr. Juan Alcalde

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## RESEARCH

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The motivation of my research is the geological characterisation of the subsurface by means of the reflection seismic method. My research focuses in three main interrelated topics: (1) the use of this method to reveal relevant information on the depth, extension and integrity of the reservoir, seal and caprock, faults and other subsurface structures to characterise CO<sub>2</sub> geological storage sites; (2) the combination of seismics with other methods to obtain as much information of the subsurface as possible; and (3) the impact of uncertainty in all aspects of the seismic method, from the uncertainty associated to the data to the uncertainty generated during interpretation due to cognitive bias of the interpreters.

## CURRENT POSITION

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03/15 to present, **Research Fellow**, at University of Aberdeen, project: “Improving Interpretation Outcomes: quantifying biases and designing workflows for better seismic interpretation.”

10/14 to present, **panel member of the Educational Task Force**, UK Carbon Capture and Storage Research Center.

10/15 to present, **member of the Athena Swan working group**, to develop the application for the Bronze Award in gender equality, School of Geosciences, University of Aberdeen.

## PREVIOUS POSITIONS

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11/13 to 02/15, **Post-Doctoral Research Associate**, at University of Edinburgh, project planning and proposal writing for the IODP project “GlaciStore”.

09/11 to 07/14, **Ph.D. student**, at *Institute of Earth Sciences Jaume Almera ICTJA-CSIC* (Barcelona, Spain), Thesis title: [3D Seismic imaging and geological modeling of the Hontomín CO<sub>2</sub> storage site](#).

11/09 to 11/13, **CO<sub>2</sub> Geological Storage Technician**, CIUDEN Foundation (Ponferrada, Spain) and ICTJA-CSIC (Barcelona, Spain): 3D Seismic data processing, characterization and interpretation, drilling assistance, VSP survey design and acquisition, elaboration of technical reports.

02/09 to 11/09, **Land surveyor/permit man**, CGGVeritas Spain (Extensión Técnica): Participation, quality control and logistic support of the data acquisition processes and elaboration of technical reports.

## SCIENTIFIC PRODUCTION

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**Alcalde, J.**, Bond, C.E., Johnson, G., Ellis, J.F., and Butler, R.W.H. 2017. [Impact of seismic image quality on fault interpretation uncertainty](#). *GSA Today* – *In press*.

Andrés, J., **Alcalde, J.**, Ayarza, P., Saura, E., Marzán, I., Martí, D., Martínez-Catalán, J.R., Carbonell, R., Pérez-Estaún, A., García-Lobón, J.L., and Rubio, F.M. 2016. [Basement structure of the Hontomín CO<sub>2</sub> storage site \(Spain\) determined by integration of microgravity and 3-D seismic data](#). *Solid Earth*, 7, 827-841.

- Ogaya, X., **Alcalde, J.**, Marzán, I., Ledo, J., Queralt, P., Marcuello, A., Martí, D., Saura, E., Carbonell, R., and Benjumea, B. 2016. [Joint interpretation of magnetotelluric, seismic, and well-log data in Hontomín \(Spain\)](#). *Solid Earth*, 7, 943-958.
- Alcalde, J.**, Marzán, I., Saura, E., Martí, D., Ayarza, P., Juhlin, C., Pérez-Estaún, A., and Carbonell, R. 2014. [3D geological characterization of the Hontomin CO2 storage site, Spain: multidisciplinary approach from seismics, well-logging and regional data](#). *Tectonophysics* 627, pp. 6-25. DOI: 10.1016/j.tecto.2014.04.025
- Ayarza, P., Carbonell, R., Teixell, A., Palomeras, I., Martí, D., Kchikach, A., Harnafi, M., Levander, A., Gallart, J., Arboleya, M.L., **Alcalde, J.**, Charroud, M., and Amrhar, M. 2014. [Crustal thickness and velocity structure across the Moroccan Atlas from long offset wide-angle seismic reflection data: the SIMA experiment](#). *Geochemistry, Geophysics, Geosystems* 15, pp. 1-20. DOI: 10.1002/2013GC005164
- Alcalde, J.**, Martí, D., Juhlin, C., Malehmir A., Sopher, D., Saura, E., Marzán, I., Calahorrano, A., Ayarza, P., Pérez-Estaún, A., and Carbonell, R. 2013. [3D Reflection Seismic Imaging of the Hontomín structure in the Basque-Cantabrian Basin \(Spain\)](#). *Solid Earth*, 4, pp. 481-496. DOI: 10.5194/se-4-481-2013
- Alcalde, J.**, Martí, D., Calahorrano, A., Ayarza, P., Marzán, I., Carbonell, R., Juhlin, C., Pérez-Estaún, A. 2013. [Active seismic characterization experiments of the Hontomín research facility for geological storage of CO<sub>2</sub>, Spain](#). *International Journal of Greenhouse Gas Control*. Volume 19, pp. 785-795. Elsevier, 2013. ISSN 1750-5836.

## **TEACHING EXPERIENCE**

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- 03/16 Fieldwork instructor in 3<sup>rd</sup> Year Surface and Subsurface Digital Imaging. **University of Aberdeen.**
- 09/14 Primary teacher in post-graduate course: Seismic Reflection Interpretation. Level 11 (10 credits). **University of Edinburgh, UK.**
- 09/14 Practical instructor in Helmsdale 3rd Year Field Excursion and Interpretation Exercise. Level 9 (10 credits). **University of Edinburgh, UK.**
- 07/13, Primary teacher in Summer School course: Surface and subsurface monitoring of a CO<sub>2</sub> storage site: theory and practice. **Summer school in CCS, University of León, Spain.**
- 05/11, Invited lecturer in MSc course, lecture title: Caracterización Sísmica 3D del laboratorio de investigación para el Almacenamiento Geológico de CO<sub>2</sub>. Hontomín (Burgos). **MSc lecture, University of Salamanca, Spain.**

## **UNIVERSITY DEGREES**

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- Ph.D. in Geophysics 2014**, University of Barcelona, Barcelona, Spain. Thesis title: [3D Seismic imaging and geological modeling of the Hontomín CO<sub>2</sub> storage site](#). *Cum Laude* with *International Mention*.
- M.Sc. in Geophysics 2011**, University of Barcelona, Barcelona, Spain. (Duration: 1 year; average mark: 7,6/10).
- B.Sc. in Geology 2009**, University of Salamanca, Salamanca, Spain, Departament of Geology. (Duration: 5 years).

**LANGUAGE PROFICIENCY**

<b>Language</b>	<b>Speaking</b>	<b>Reading</b>	<b>Writing</b>
Spanish	Native language	Native language	Native language
English	Advanced	Advanced	Advanced
French	Basic	Intermediate	Basic
Catalan	Intermediate	Advanced	Basic

**Language proficiency certificates:**

*Cambridge Certificate in Advanced English* (CAE), C1 level certificate (CEFR scale), Cambridge University, 2009.

*Language and Comprehension TOEFL Certificate* (mark 980/1000), 2008.

**MEMBERSHIPS**

- Scottish Carbon Capture and Storage. [www.sccs.org.uk](http://www.sccs.org.uk)
- UKCCS Research Centre. [www.ukccsrc.ac.uk](http://www.ukccsrc.ac.uk)
- American Association of Petroleum Geologists – AAPG. [www.aapg.org](http://www.aapg.org)
- Athena Swan working group, School of Geosciences, University of Aberdeen. <http://www.abdn.ac.uk/geosciences>

**COURSES AND WORKSHOPS**

06/15, **Reservoir Geomechanics Course**, organized by Stanford University; Stanford Online, USA.

04/14, **Fieldwork/Outdoor First Aid**, organized by Marlin Training; obtained Level 2 Award in Emergency First Aid at Work + Outdoor First Aid; Edinburgh, United Kingdom.

09/12, **GeoEn Summer Scool**, organized by German Research Centre for Geosciences – GFZ, Potsdam, Germany.

10/11, **Ketzin Seismic Workshop**, organized by Department of Earth Sciences, Uppsala University, Uppsala, Sweden.

03/11, **Seismic Signal Processing Course**, held by the Department of Earth Sciences at Uppsala University, equivalent to 3.5 weeks of full time studies.

06/10, **Globe Claritas Seismic Processing Software Course**, organized by of Institute of Geological and Nuclear Sciences, New Zealand, CEPISA hq, Madrid, Spain.

12/10, **CO<sub>2</sub> Storage Workshop**, organized by Fundación Ciudad de la Energía, Ponferrada, Spain.

**RESEARCH STAYS**

06/12 (1 week), **Uppsala University**, Department of Earth Sciences, invited by Prof. Christopher Juhlin.

08/11-12/11, **Uppsala University**, Department of Earth Sciences, invited by Prof. Christopher Juhlin.

## ABSTRACTS AND POSTERS

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- J. Alcalde**, C. E. Bond, G. Johnson, J. F. Ellis, [Where is the Fault? – An experiment to understand differences in seismic interpretation](#), Saying goodbye to a 2D Earth, Perth, Australia, 2015.
- M. Barrio, H. A. Stewart, M. Akhurst, P. Aagaard, **J. Alcalde**, A. Bauer, T. Bradwell, A. Cavanagh, D. Evans, J. Faleide, A-K. Furre, C. Gent, H. Haflidason, S. Haszeldine, B. Hjelstuen, G. Johnson, N. H. Mondol, E. Querendez, P. Ringrose, H. Sejrup, M. Stewart, F. Uriansrud, M. Wilkinson, A. Mørk, R. di Primio, P. T. Mørkved, [Norway and UK cross-boundary initiative towards a climate motivated drilling operation in the North Sea](#), CLIMIT Summit, Oslo, Norway, 2015.
- H. A. Stewart; M. Barrio; M. Akhurst; P. Aagaard; **J. Alcalde**; A. Bauer; T. Bradwell; A. Cavanagh; M. Dillen; D. Evans; J. Faleide; A-K. Furre; C. Gent; H. Haflidason; S. Hagen; S. Haszeldine; B. Hjelstuen; H. Jahre; H. Johansen; G. Johnson; W. Kuerschner; N. Mondol; E. Querendez; P. Ringrose; H. Sejrup; M. Stewart; F. Uriansrud; M. Wilkinson, [GlaciStore: Understanding Late Cenozoic Glaciation and Basin Processes for the Development of Secure Large Scale Offshore CO<sub>2</sub> Storage \(North Sea\)](#), QRA Annual Discussion Meeting., Edinburgh, UK, 2015.
- J. Alcalde**; G. Johnson; C. Bond; J. Ellis, [Where's the Fault? Uncertainty in Seismic Interpretation of Fault Structures.](#), 16<sup>th</sup> Seismix, Casteldefells, Spain, 2014.
- S. Holloway, M. Akhurst, M. Wilkinson, H. Stewart, M. Stewart, D. Evans, **J. Alcalde**, [CO<sub>2</sub> storage in early Palaeogene and Neogene hydrogeological systems of the North Sea.](#), UKCCSRC Biannual Meeting, Cambridge, UK, 2014
- J. Alcalde**; M. Wilkinson; G. Johnson; M. Akhurst; H. Stewart; D. Evans; C. Gent, [Cross-border Geology: Understanding CO<sub>2</sub> storage in Palaeogene and Neogene systems of the North Sea.](#), 16<sup>th</sup> Seismix, Casteldefells, Spain, 2014.
- J. Alcalde**; D. Martí; C. Juhlin; I. Marzán; E. Saura; P. Ayarza; A. Pérez-Estaún; R. Carbonell, [Geologically-driven interpretation of 3D seismic reflection data in a complex fractured carbonate reservoir \(Hontomín, Spain\)](#), 16<sup>th</sup> Seismix, Casteldefells, Spain, 2014.
- J. Alcalde**; D. Martí; C. Juhlin; I. Marzán; E. Saura; P. Ayarza; A. Pérez-Estaún; R. Carbonell, [3D Multidisciplinary geological interpretation of the Hontomín CO<sub>2</sub> Storage Site, Spain](#), 16<sup>th</sup> Seismix, Casteldefells, Spain, 2014.
- J. Alcalde**; D. Martí; C. Juhlin; I. Marzán; E. Saura; P. Ayarza; A. Pérez-Estaún; R. Carbonell, [3D Seismic Characterization of the Spanish CO<sub>2</sub> Storage Site of Hontomín \(Spain\)](#), SCCS Group Meetings, Edinburgh, UK, 2014.
- J. Alcalde**, M. Akhurst, S. Holloway, I. Mann, G. Johnson, P. Parmetier. [SCCS: providing excellence in CCS research. IV Coloquio Hispano-Francés sobre Almacenamiento Geológico de CO<sub>2</sub>](#), Burgos, Spain, 2014.
- J. Alcalde**; D. Martí; C. Juhlin; A. Malehmir; D. Sopher; I. Marzán; A. Calahorrano; P. Ayarza; A. Pérez-Estaún; R. Carbonell, [3D Seismic Imaging of a Geological Storage of CO<sub>2</sub> Site: Hontomín \(Spain\)](#). European Geoscience Union General Assembly, Viena, Austria, 2013
- A. Calahorrano; D. Martí; **J. Alcalde**; I. Marzán; P. Ayarza; A. Pérez-Estaún; R. Carbonell., [Hontomín, the Spanish CO<sub>2</sub> geologic storage site: results from 2D seismic survey](#), 34th International Geological Congress, Brisbane, Australia, 2012

- J. Alcalde**; D. Martí; C. Juhlin; A. Malehmir; A. Calahorrano; P. Ayarza; I. Marzán; A. Pérez-Estaún; R. Carbonell., 3D seismic results from the Hontomín site for geological storage of CO<sub>2</sub> (Spain), 34th International Geological Congress, Brisbane, Australia, 2012
- J. Alcalde**; D. Martí; C. Juhlin; A. Malehmir; A. Calahorrano; P. Ayarza; A. Pérez-Estaún; R. Carbonell, Characterization of the Hontomin research facility for geological storage of CO<sub>2</sub>: 3D seismic imaging results, European Geoscience Union General Assembly, Viena, Austria, 2012
- A. Calahorrano; D. Martí; **J. Alcalde**; I. Marzán; P. Ayarza; R. Carbonell; A. Pérez-Estaún, The Hontomín CO<sub>2</sub> geologic storage site: results from 2D seismic survey, European Geoscience Union General Assembly, Viena, Austria, 2012
- J. Alcalde**; D. Martí; C. Juhlin; A. Malehmir; A. Calahorrano; P. Ayarza; I. Marzán; A. Pérez-Estaún; R. Carbonell., 3D seismic imaging of a geological storage of CO<sub>2</sub> site, 15th International Symposium on the Seismic Probing of the Continents and their Margins, Beijing, China, 2012
- J. Alcalde**; D. Martí; A. Calahorrano; I. Marzán; P. Ayarza; R. Carbonell; A. Pérez-Estaún, Seismic characterization of the research facility for geological storage of CO<sub>2</sub>: Hontomín (Burgos, Spain), AGU Fall Meeting, San Francisco, USA, 2011
- D. Martí; A. Calahorrano; **J. Alcalde**; R. Carbonell; P. Ayarza; A. Pérez-Estaún, Improving the seismic images of the CO<sub>2</sub> geological storage in Hontomín (Spain): structure and distribution of physical properties, AGU Fall Meeting, San Francisco, USA, 2011
- J. Alcalde**; D. Martí; A. Calahorrano; A. Ugalde; I. Marzán; P. Ayarza; R. Carbonell; A. Pérez-Estaún, Seismic experiments in the research facility of hontomín (spain), Ketzin Seismic Workshop, Uppsala, Sweden, 2011
- J. Alcalde**; D. Martí; A. Calahorrano; I. Marzán; P. Ayarza; R. Carbonell; A. Pérez-Estaún., Spanish Research Facility for Geological Storage of CO<sub>2</sub>: Processing of 3D Seismic Data From Hontomín (Spain), Uppsala University Seminars, Uppsala, Sweden, 2011
- P. Ayarza; R. Carbonell; A. Teixell; A. Kchikach; M. Harnafi; D. Martí; I. Palomeras; A. Levander; J. Gallart; M.L. Arboleya; M. Charroud; M. Amrhar; **SIMA working group**. Seismic imaging across the Moroccan Atlas (SIMA): an effort to constrain the crustal structure and topography of the Atlas Mountains, MAPG-AAPG 2nd International Convention, Marrakech, Morocco, 2011
- J. Alcalde**; D. Martí; I. Palomeras; A. Calahorrano; I. Marzán; P. Ayarza; R. Carbonell; A. Pérez-Estaún, 3D Seismic Imaging of the Research Facility for Geological Storage of CO<sub>2</sub> of Hontomín (Spain), Coloquio Hispano-Francés de Almacenamiento Geológico de CO<sub>2</sub>, Ponferrada, Spain, 2011
- A. Calahorrano; D. Martí; **J. Alcalde**; I. Palomeras; P. Ayarza; R. Carbonell; A. Pérez-Estún, First 2D-3C seismic reflection images of Hontomín (Spain) site for geologic CO<sub>2</sub> storage, Sustainable Earth Sciences 2011 (EAGE), Valencia, Spain, 2011
- J. Alcalde**; D.Martí; A. Calahorrano; I. Marzán; A. Pérez-Estaún; R. Carbonell, 3D seismic characterization of the CO<sub>2</sub> storage laboratory of Hontomín (Burgos, Spain), Sustainable Earth Sciences 2011 (EAGE), Valencia, Spain, 2011

- R. Carbonell; **J. Alcalde**; D. Martí; A. Calahorrano; I. Palomeras; P. Ayarza; A. Ugalde; A. Villaseñor; A. Pérez-Estaún, Spanish research facility for geological storage of CO<sub>2</sub> (Hontomín, Spain), European Geoscience Union General Assembly, Viena, Austria, 2011
- A. Calahorrano; D. Martí; **J. Alcalde**; I. Palomeras; P. Ayarza; R. Carbonell; A. Pérez-Estaún, Technological laboratory for geologic CO<sub>2</sub> storage in Hontomín (Spain): 2D reflection imaging, European Geoscience Union General Assembly, Viena, Austria, 2011
- J. Alcalde**; D. Martí; A. Calahorrano; I. Palomeras; P. Ayarza; R. Carbonell; A. Pérez-Estaún, 3D seismic characterization of the Spanish research facility for geological storage of CO<sub>2</sub> in Hontomín (Burgos, Spain), European Geoscience Union General Assembly, Viena, Austria, 2011
- J. Alcalde**; D. Martí; A. Calahorrano; I. Palomeras; P. Ayarza; R. Carbonell; A. Pérez-Estaún, Caracterización Sísmica 3D del laboratorio de investigación para el Almacenamiento Geológico de CO<sub>2</sub>. Hontomín (Burgos), University of Salamanca, Salamanca, Spain, 2011
- J. Alcalde**; R. Carbonell; D. Martí; I. Palomeras; A. Calahorrano; P. Ayarza; A. Pérez-Estaún, Seismic characterization and monitoring Project, Coloquio Hispano-Francés de Almacenamiento Geológico de CO<sub>2</sub>, Pau, France, 2010
- J. Alcalde**; R. Carbonell; D. Martí; I. Palomeras; A. Calahorrano; P. Ayarza; A. Pérez-Estaún, Seismic characterization of a CO<sub>2</sub> storage pilot plant in a saline aquifer (Hontomín, Spain), American Geophysical Union, Fall Meeting, San Francisco, USA, 2010
- D. Martí; A. Calahorrano; **J. Alcalde**; I. Palomeras; P. Ayarza; R. Carbonell; A. Pérez-Estaún, Geological CO<sub>2</sub> storage in a saline aquifer: the Spanish scientific pilot plant, Deep Seismic Probing of the Continents and their Margins, Cairns, Australia, 2010.