



Carlos Pimentel Guerra

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Summary of CV

This section describes briefly a summary of your career in science, academic and research; the main scientific and technological achievements and goals in your line of research in the medium -and long- term. It also includes other important aspects or peculiarities.

I started my scientific career in 2010 as research assistant at the Department of Crystallography and Mineralogy at the Complutense University of Madrid, and as a member of the Planetary Sciences Group at the same university. As a result of these collaborations, I co-authored two papers, one on dolomite and other on the surface of Venus. In 2012, I started my Ph. D. Thesis entitled: “ **Synthesis and reactivity of minerals of the dolomite group and analogous phases**”, funded by a grant from the Spanish Government (**FPU-2012 grant**). I defended my Ph. D. Thesis on the 12th of May of 2017 and it was qualified **Summa cum laude with European mention**. During my pre-doctoral time, I spent three months at the Institute of Material Science of Mulhouse, France (2014) and three months at the McGill University in Montreal, Canada (2015). Both research stays, related to the topic of my Ph. D. Thesis, were funded by the Spanish Ministry for Education, Culture and Sport (short stays FPU programme). Previously, I had spent two weeks at Institute of Material Science of Mulhouse, funded by Campus France (PHC Nano Espagne). During this research stay, I investigated the manipulation of nanoparticles on surfaces. In addition, I have collaborated in the performance of two synchrotron measurement runs conducted using two synchrotron lines at the ESRF in Grenoble, France. These experiments were addressed to in situ investigate the formation of analogous phases of dolomite. The results of my investigations in collaboration with several research groups have been published in scientific Journals on Crystallography, Mineralogy, Material Science and Geochemistry. To date, I have published **16 articles in SCI journals** (10 of them Q1), and **2 chapters in books**. According to Scopus, my publications have been received 92 citations until the end of 2018 and my **H-index is 6**. I have also presented the results of my research in national and international conferences and I have been member of the organising committees of two of them. The results of my investigations are relevant for the study of mineral reactivity at ambient conditions and for the study of crystalline surfaces at the nanoscale.

Regarding of my teaching experience, I had supervised 12 Master's Theses at Universidad Internacional de La Rioja in education masters. During my pre-doctoral time, I have given 108 hours of practical lessons on Crystallography and Mineralogy. I have also participated in four projects on innovative teaching funded by the Complutense University. In the context of science dissemination, I am co-author of a microphotograph included in the book of FOTCIENCIA13, edited by the Spanish Foundation for Science and Technology (FECYT). In addition, I have participated as supervisor in the First Crystallisation Contest at the School, supported by the Complutense University. Furthermore, I am a coauthor of a book about minerals in science fiction and fantasy ("Pequeña guía de minerales inexistentes") and I was a curator in two exhibitions about minerals in science fiction ("Minerales inexistentes") in 2019.

Nowadays, I am working as a researcher at the Polytechnic University of Madrid in the Escuela Técnica Superior de Ingeniería de Montes, Forestal y del Medio Natural.



Carlos Pimentel Guerra

Surname(s): **Pimentel Guerra**
 Name: **Carlos**
 ORCID: **0000-0002-5400-9102**
 ScopusID: **35368901800**
 ResearcherID: **J-9977-2019**

Current professional situation

Employing entity: FUNDACION CONDE DEL VALLE DE SALAZAR

Department: Escuela Técnica Superior de Ingeniería de Montes, Forestal y del Medio Natural (UPM)

Professional category: Titulado Superior

Start date: 01/12/2018

Type of contract: Temporary employment contract

Dedication regime: Full time

Performed tasks: Postdoctoral contract for the study of the interaction of inorganic foliar fertilizers with plant leaves at the Escuela Técnica Superior de Ingeniería de Montes, Forestal y del Medio Natural (UPM).

Employing entity: Universidad Complutense de Madrid **Type of entity:** University

Department: Petrology and Mineralogy Department, Facultad de Ciencias Geológicas

Professional category: Honorary collaborator

Start date: 01/09/2017

Type of contract: honorary collaborator

Previous positions and activities

	Employing entity	Professional category	Start date
1	Universidad Internacional de La Rioja	Master's Thesis supervisor	12/03/2018
2	Universidad Complutense de Madrid	Fellow of "Formación de Profesorado Universitario (FPU)"	11/03/2013
3	FUNDACIÓN IMDEA NANOCIENCIA	Research Fellow	11/2012
4	FUNDACIÓN IMDEA NANOCIENCIA	Research Fellow	07/2012
5	Consejo Superior de Investigaciones Científicas	Research Fellow	07/2010

1 **Employing entity:** Universidad Internacional de La Rioja **Type of entity:** University

Professional category: Master's Thesis supervisor

Start-End date: 12/03/2018 - 21/02/2019

Type of contract: Temporary



Performed tasks: Master's Thesis supervisor in "Master Degree in training teachers for secondary and sixth-form teaching, vocational training and language teaching" and "Master Degree in Didactic of Mathematics in Preschool and Primary Education" Participant as a member of master's tribunals in "Master Degree in training teachers for secondary and sixth-form teaching, vocational training and language teaching", "Master Degree in Didactic of Mathematics in Preschool and Primary Education" and "Master Degree in Didactic of Mathematics in Secondary education"

- 2** **Employing entity:** Universidad Complutense de Madrid **Type of entity:** University
Department: Departamento de Cristalografía y Mineralogía, Facultad de Ciencias Geológicas
City employing entity: Madrid, Community of Madrid, Spain
Professional category: Fellow of "Formación de Profesorado Universitario (FPU)" **Educational Management (Yes/No):** No
Start-End date: 11/03/2013 - 10/03/2017 **Duration:** 4 years
Type of contract: Grant-assisted student (pre or post-doctoral, others)
- 3** **Employing entity:** FUNDACIÓN IMDEA NANOCIENCIA
Professional category: Research Fellow
Start-End date: 11/2012 - 01/2013 **Duration:** 3 months
- 4** **Employing entity:** FUNDACIÓN IMDEA NANOCIENCIA
Professional category: Research Fellow
Start-End date: 07/2012 - 09/2012 **Duration:** 3 months
- 5** **Employing entity:** Consejo Superior de Investigaciones Científicas **Type of entity:** State agency
Professional category: Research Fellow
Start-End date: 07/2010 - 09/2010 **Duration:** 2 months



Education

University education

1st and 2nd cycle studies and pre-Bologna degrees

1 University degree: Master

Name of qualification: Master Degree in training teachers for secondary and sixth-form teaching, vocational training and language teaching

Degree awarding entity: Universidad Complutense de Madrid **Type of entity:** University

Date of qualification: 2017

2 University degree: Master

Name of qualification: Master Degree in Environmental Geology and Geologic Resources

Degree awarding entity: Universidad Complutense de Madrid **Type of entity:** University

Date of qualification: 2012

3 University degree: Higher degree

Name of qualification: Degree in Geology

Degree awarding entity: Universidad Complutense de Madrid **Type of entity:** University

Date of qualification: 2011

Doctorates

Doctorate programme: Ph. D. in Geology and Geological Engineering

Degree awarding entity: Universidad Complutense de Madrid **Type of entity:** University

Date of degree: 12/05/2017

European doctorate: Yes

Date of certificate: 29/10/2007

Thesis title: Synthesis and reactivity of minerals of dolomite group and analogue phases

Thesis director: Carlos Manuel Pina Martínez

Thesis co-director: Enrico Gnecco

Obtained qualification: Summa Cum Laude

Recognition of quality: Yes

Specialised, lifelong, technical, professional and refresher training (other than formal academic and healthcare studies)

- 1 Training title:** Publons Academy Practical Peer Review
Awarding entity: Publons.com **Type of entity:** Business
End date: 27/12/2018 **Duration in hours:** 10 hours
- 2 Type of training:** Course
Training title: Seminario práctico de análisis de datos geológicos
Awarding entity: Universidad Complutense de Madrid **Type of entity:** University
End date: 01/2016 **Duration in hours:** 8 hours
- 3 Type of training:** Course
Training title: Curso de Posgrado de Difracción de Rayos X por el método del Polvo (DRXP)
Awarding entity: Instituto de Ciencias de la Tierra **Type of entity:** State agency
Jaume Almera
End date: 05/2013 **Duration in hours:** 14 hours
- 4 Type of training:** Course
Training title: Curso de Posgrado de Espectrometría de Masas con fuente de Plasma de Acoplamiento Inductivo (ICP-MS)
Awarding entity: Instituto de Ciencias de la Tierra **Type of entity:** State agency
Jaume Almera
End date: 05/2013 **Duration in hours:** 20 hours
- 5 Type of training:** Course
Training title: Curso de Posgrado de Espectroscopias de Fotoelectrones y Electrones Auger (XPS / AES)
Awarding entity: Instituto de Ciencia de Materiales de **Type of entity:** State agency
Madrid
End date: 03/2013 **Duration in hours:** 30 hours

Attended advanced, improvement and innovative teacher training and new technology courses and seminars focused on improving teaching

- 1 Title of course/seminar:** Técnicas y habilidades para el director de TFG y TFM
Organising entity: Universidad Internacional de La **Type of entity:** University
Rioja
Faculty, institute or centre: Vicerrectorado de Profesorado
Duration in hours: 25 hours
Start-End date: 08/01/2019 - 14/01/2019
- 2 Title of course/seminar:** Modelos centrados en aprendizaje: diseño instrucción y flipped
Organising entity: Universidad Internacional de La **Type of entity:** University
Rioja
Faculty, institute or centre: Vicerrectorado de Profesorado
Duration in hours: 25 hours
Start-End date: 07/11/2018 - 28/11/2018



- 3 Title of course/seminar:** Técnicas de relajación y control del estrés
Organising entity: Universidad Internacional de La Rioja **Type of entity:** University
Faculty, institute or centre: Vicerrectorado de Profesorado
Duration in hours: 4 hours
Start-End date: 21/05/2018 - 21/05/2018
- 4 Title of course/seminar:** Diseño de materiales didácticos
Organising entity: Universidad Internacional de La Rioja **Type of entity:** University
Faculty, institute or centre: Vicerrectorado de Profesorado
Duration in hours: 12 hours
Start-End date: 10/04/2018 - 19/04/2018

Teaching experience

General teaching experience

- 1 Name of the course:** Crystallography
University degree: Geology Degree
Start date: 10/2016 **End date:** 02/2017
End date: 02/2017
Entity: Universidad Complutense de Madrid **Type of entity:** University
Faculty, institute or centre: Facultad de Ciencias Geológicas
- 2 Name of the course:** Crystallography and Mineralogy
University degree: Geological Engineering Degree
Start date: 02/2016 **End date:** 06/2016
End date: 06/2016
Entity: Universidad Complutense de Madrid **Type of entity:** University
Faculty, institute or centre: Facultad de Ciencias Geológicas
- 3 Name of the course:** Geology
University degree: Chemistry Degree
Start date: 02/2016 **End date:** 06/2016
End date: 06/2016
Entity: Universidad Complutense de Madrid **Type of entity:** University
Faculty, institute or centre: Facultad de Ciencias Químicas

Experience supervising doctoral thesis and/or final year projects

- 1 Project title:** Aprendizaje de la Cinemática en 1º de Bachillerato desde la Metodología Flipped Learning
Type of project: Master thesis
Entity: Universidad Internacional de La Rioja **Type of entity:** University
Student: Belén Relloso Horna
Obtained qualification: 8.3
Date of reading: 29/03/2019



- 2** **Project title:** Propuesta de Intervención para Incrementar la Motivación en el Aula, de Física y Química de 4º de la ESO, Considerando las Distintas Capacidades de Aprendizaje del Alumnado
Type of project: Master thesis
Entity: Universidad Internacional de La Rioja **Type of entity:** University
Student: María Sánchez Arenillas
Obtained qualification: 7.0
Date of reading: 29/03/2019
- 3** **Project title:** Divulgación Científica de Química Orgánica por Redes Sociales como Producto Final del Aprendizaje Cooperativo
Type of project: Master thesis
Entity: Universidad Internacional de La Rioja **Type of entity:** University
Student: Miriam Martínez Couso
Obtained qualification: 6.3
Date of reading: 26/03/2019
- 4** **Project title:** Enseñanza de los Movimientos de Física de 4º ESO a Través de los Deportes Mediante Aprendizaje por Descubrimiento.
Type of project: Master thesis
Entity: Universidad Internacional de La Rioja **Type of entity:** University
Student: Sofía Roura García
Obtained qualification: 9.0
Date of reading: 28/02/2019
- 5** **Project title:** Desarrollo del Método Científico a Través de la Investigación Dirigida y el Aprendizaje Cooperativo en 2º ESO.
Type of project: Master thesis
Entity: Universidad Internacional de La Rioja **Type of entity:** University
Student: Miguel Maceda Blanco
Obtained qualification: 9.2
Date of reading: 27/02/2019
- 6** **Project title:** Aprende con Energía Usos en Nuestra Sociedad. Asignatura de Física y Química en 3º ESO
Type of project: Master thesis
Entity: Universidad Internacional de La Rioja **Type of entity:** University
Student: Araceli López Noguero
Obtained qualification: 7.0
Date of reading: 25/02/2019
- 7** **Project title:** Aprendizaje Cooperativo en Termoquímica Química en Segundo de Bachillerato
Type of project: Master thesis
Entity: Universidad Internacional de La Rioja **Type of entity:** University
Student: Laura Jiménez Herrero
Obtained qualification: 8.2
Date of reading: 25/02/2019
- 8** **Project title:** El Aprendizaje Basado en Problemas Aplicado a la Gastronomía y Cocina Vascas
Type of project: Master thesis
Entity: Universidad Internacional de La Rioja **Type of entity:** University
Student: Marta Anza Hortalá
Obtained qualification: 9.1



Date of reading: 25/02/2019

- 9** **Project title:** Simulación de Procesos Químicos Enseñanza de Física y Química en Tercero de Educación Secundaria Obligatoria
Type of project: Master thesis
Entity: Universidad Internacional de La Rioja **Type of entity:** University
Student: Alba Juan Pérez
Obtained qualification: 9.0
Date of reading: 25/02/2019
- 10** **Project title:** Análisis de los temas de geometría impartidos en 2º de primaria, a partir de la comparación de 4 textos escolares
Type of project: Master thesis
Entity: Universidad Internacional de La Rioja **Type of entity:** University
Student: Francy Alejandra Cruz Mahecha
Obtained qualification: 6.3
Date of reading: 19/11/2018
- 11** **Project title:** Diseño de una unidad didáctica para aumentar la motivación de los estudiantes en el tema de fuerzas en 1º de Bachillerato mediante el uso de las TIC
Type of project: Master thesis
Entity: Universidad Internacional de La Rioja **Type of entity:** University
Student: Arnau Grané Masfret
Obtained qualification: 8.0
Date of reading: 07/11/2018
- 12** **Project title:** El Aprendizaje Basado en Problemas como técnica para desarrollar el Método Científico en 3º ESO
Type of project: Master thesis
Entity: Universidad Internacional de La Rioja **Type of entity:** University
Student: Rosa González Serrano
Obtained qualification: 8.1
Date of reading: 06/11/2018
- 13** **Project title:** Metodologías Activas para la Enseñanza de las Ciencias Experimentales en Bachillerato
Type of project: Master thesis
Entity: Universidad Internacional de La Rioja **Type of entity:** University
Student: Amalia Latorre Lavena
Obtained qualification: 7.4
Date of reading: 06/11/2018
- 14** **Project title:** Las matemáticas artísticas en Educación Infantil
Type of project: Master thesis
Entity: Universidad Internacional de La Rioja **Type of entity:** University
Student: María Dolores Pérez Montoya
Obtained qualification: 7.5
Date of reading: 19/10/2018
- 15** **Project title:** Enseñanza de la Química y su importancia para un futuro sostenible. Propuesta de intervención con alumnos de 3º de ESO de Física y Química
Type of project: Master thesis
Entity: Universidad Internacional de La Rioja **Type of entity:** University



Student: Ana María Alonso Lobo
Obtained qualification: 7.3
Date of reading: 28/09/2018

- 16** **Project title:** El uso de las experiencias de cátedra en una unidad didáctica de química
Type of project: Master thesis
Entity: Universidad Internacional de La Rioja **Type of entity:** University
Student: Joan Luque Cabecerans
Obtained qualification: 7.5
Date of reading: 25/09/2018
- 17** **Project title:** Introducción de los laboratorios virtuales en el aula de Física y Química de 1º de Bachillerato en la Unidad Didáctica de Cinemática
Type of project: Master thesis
Entity: Universidad Internacional de La Rioja **Type of entity:** University
Student: Cristina Martín Escura
Obtained qualification: 6.6
Date of reading: 25/09/2018
- 18** **Project title:** Propuesta de empleo del Pensamiento Visual como herramienta facilitadora del aprendizaje para la Unidad Didáctica de Modelos Atómicos de 4º curso de Educación Secundaria Obligatoria
Type of project: Master thesis
Entity: Universidad Internacional de La Rioja **Type of entity:** University
Student: Javier Gómez Martínez
Obtained qualification: 8.3
Date of reading: 25/09/2018
- 19** **Project title:** Concienciación energética mediante enfoque 'Ciencia, Tecnología y Sociedad'
Type of project: Master thesis
Entity: Universidad Internacional de La Rioja **Type of entity:** University
Student: Aitor Godoy Onda
Obtained qualification: 7.7
Date of reading: 24/09/2018
- 20** **Project title:** El modelo Flipped Classroom como herramienta en la enseñanza del equilibrio de solubilidad en 2º de Bachillerato
Type of project: Master thesis
Entity: Universidad Internacional de La Rioja **Type of entity:** University
Student: Encarnación Iglesias Haro
Obtained qualification: 9.6
Date of reading: 24/09/2018
- 21** **Project title:** El Sistema Periódico en 3º de la ESO desde un enfoque CTS y un aprendizaje participativo
Type of project: Master thesis
Entity: Universidad Internacional de La Rioja **Type of entity:** University
Student: Sara Fernández Hernández
Obtained qualification: 8.6
Date of reading: 24/07/2018



Teaching experience in courses and seminars for university teacher training

Type of event: COST Training School

Name of the event: Instrumental Techniques for Characterization of Solids

Organising entity: Instituto Andaluz de Ciencias de la Tierra **Type of entity:** State agency

Hours of teaching: 1,5

Teaching language: English

Teaching date: 06/11/2019

Educational or pedagogical publications, books, articles, etc.

- 1** José M. Llorens; Carlos Pimentel; Carlos M. Pina. Determinación experimental de las dimensiones de una red bidimensional mediante difracción. Reduca (Geología). Serie Cristalografía.. 10 - 1, pp. 1 - 15. 2018. Available on-line at: <<http://www.revistareduca.es/index.php/reduca-geologia/article/view/1957/1951>>. ISSN 1989-3620

Name of the materials: Crystallography

Format: Article(s)

- 2** Carlos Pimentel; Carlos M. Pina. Proyección de estructuras minerales mediante el programa Vesta. Reduca (Geología). Serie Cristalografía.. 11 - 1, pp. 1 - 15. 2019. Available on-line at: <<http://www.revistareduca.es/index.php/reduca-geologia/article/view/1959/1950>>. ISSN 1989-3620

Name of the materials: Crystallography

Format: Article(s)

Participation in innovative teaching projects

- 1** **Project title:** Design of crystallographic models for 3D printers

Type of participation: Team member

Funding entity: Universidad Complutense de Madrid **Type of entity:** University

Start-End date: 01/09/2019 - 30/06/2020 **Duration:** 10 months

- 2** **Project title:** Crystals, crystallization and diffraction: New audiovisual resources for teaching crystallography

Type of participation: Team member

Funding entity: Universidad Complutense de Madrid **Type of entity:** University

Start-End date: 01/09/2018 - 30/06/2019 **Duration:** 10 months

- 3** **Project title:** New audiovisual resources for teaching crystallography: Crystals and diffraction in videoclips

Type of participation: Team member

Funding entity: Universidad Complutense de Madrid **Type of entity:** University

Start-End date: 01/09/2017 - 30/06/2018 **Duration:** 10 months

- 4** **Project title:** Crystallographic lattice models

Type of participation: Team member

Time of working relationship: For a limited time

Funding entity: Universidad Complutense de Madrid **Type of entity:** University

Start-End date: 2015 - 2015 **Duration:** 1 year



Other activities/achievements not included above

- 1** **Description of the activity:** Member of the master's theses evaluation committee of the Master's Degree in Didactic of Mathematics in Secondary Education (October 2019). Evaluation of 5 manuscripts and defenses.
Organising entity: Universidad Internacional de La Rioja **Type of entity:** University
End date: 11/10/2019
- 2** **Description of the activity:** Member of the master's theses evaluation committee of the Master Degree in training teachers for secondary and sixth-form teaching, vocational training and language teaching (July 2019). Evaluation of 4 manuscripts and defenses.
Organising entity: Universidad Internacional de La Rioja **Type of entity:** University
End date: 18/07/2019
- 3** **Description of the activity:** Member of the master's theses evaluation committee of the Master's Degree in Didactic of Mathematics in Secondary Education (May 2019). Evaluation of 2 manuscripts and defenses.
Organising entity: Universidad Internacional de La Rioja **Type of entity:** University
End date: 06/05/2019
- 4** **Description of the activity:** Member of the master's theses evaluation committee of the Master Degree in training teachers for secondary and sixth-form teaching, vocational training and language teaching (February and March 2019). Evaluation of 13 manuscripts and defenses.
Organising entity: Universidad Internacional de La Rioja **Type of entity:** University
End date: 01/03/2019
- 5** **Description of the activity:** Member of the master's theses evaluation committee of the Master's Degree in Didactic of Mathematics in Pre-school and Primary Education (November 2018). Evaluation of 18 manuscripts and defenses.
Organising entity: Universidad Internacional de La Rioja **Type of entity:** University
End date: 22/11/2018
- 6** **Description of the activity:** Member of the master's theses evaluation committee of the Master's Degree in Didactic of Mathematics in Pre-school and Primary Education (October 2018). Evaluation of 10 manuscripts and defenses.
Organising entity: Universidad Internacional de La Rioja **Type of entity:** University
End date: 18/10/2018
- 7** **Description of the activity:** Member of the master's theses evaluation committee of the Master's Degree in Didactic of Mathematics in Secondary Education (October 2018). Evaluation of 5 manuscripts and defenses.
Organising entity: Universidad Internacional de La Rioja **Type of entity:** University
End date: 17/10/2018
- 8** **Description of the activity:** Member of the master's theses evaluation committee of the Master Degree in training teachers for secondary and sixth-form teaching, vocational training and language teaching (September 2018). Evaluation of 25 manuscripts and defenses.



Organising entity: Universidad Internacional de La Rioja

Type of entity: University

End date: 13/09/2018

- 9 Description of the activity:** Member of the master's theses evaluation committee of the Master Degree in training teachers for secondary and sixth-form teaching, vocational training and language teaching (July 2018). Evaluation of 8 manuscripts and defenses.

Organising entity: Universidad Internacional de La Rioja

Type of entity: University

End date: 19/07/2018

- 10 Description of the activity:** Member of the master's theses evaluation committee of the Master's Degree in Didactic of Mathematics in Pre-school and Primary Education (June 2018). Evaluation of 6 manuscripts and defenses.

Organising entity: Universidad Internacional de La Rioja

Type of entity: University

End date: 13/06/2018

- 11 Description of the activity:** Member of the master's theses evaluation committee of the Master's Degree in Didactic of Mathematics in Pre-school and Primary Education (May 2018). Evaluation of 9 manuscripts and defenses.

Organising entity: Universidad Internacional de La Rioja

Type of entity: University

End date: 10/05/2018

- 12 Description of the activity:** Member of the master's theses evaluation committee of the Master's Degree in Didactic of Mathematics in Pre-school and Primary Education (April 2018). Evaluation of 9 manuscripts and defenses.

Organising entity: Universidad Internacional de La Rioja

Type of entity: University

End date: 11/04/2018

Scientific and technological experience

Scientific or technological activities

R&D projects funded through competitive calls of public or private entities

- 1 Name of the project:** Understanding mineral nucleation and precipitation in environmental and porous media

Entity where project took place: ISTerre

Type of entity: Public Research Body

Name principal investigator (PI, Co-PI...): Alejandro Fernández Martínez

N° of researchers: 12

Funding entity or bodies:

CENTRE NATIONAL DE LA RECHERCHE SCIENTIFIQUE (CNRS)

City funding entity: France

Start-End date: 02/02/2015 - 31/12/2016



- 2** **Name of the project:** Friction on the Atomic Scale: Anisotropy Effects and Influence of Mechanical Excitations
Entity where project took place: FUNDACIÓN IMDEA NANOCIENCIA
City of entity: Madrid, Community of Madrid, Spain
Name principal investigator (PI, Co-PI...): Enrico Gnecco
Start-End date: 2013 - 2015

R&D non-competitive contracts, agreements or projects with public or private entities

Name of the project: Analysis of the physico-chemical properties and permeability of the Samples for the use as foliar fertilizers
Degree of contribution: Researcher
Name principal investigator (PI, Co-PI...): Victoria Fernández
Participating entity/entities: FUCOVASA; Omya; Universidad Politécnica de Madrid
Funding entity or bodies:
Omya **Type of entity:** Business
City funding entity: Oftringen, Switzerland
Start date: 20/11/2018 **Duration:** 1 year
Total amount: 91.955 €

Supervised artistic projects

- 1** **Description:** Exhibition on non-existent minerals to divulge mineralogy, in particular, and science in general from the minerals that appear in science fiction and fantasy (e.g., books, films, comics...)
Name of the exhibition: Minerale Inexistentes
Authors (by signature order): Carlos M. Pina; Carlos Pimentel
City activity: Madrid, Spain
Exhibiting forum: María Zambrano Library (Complutense University of Madrid)
Curator: Yes
Start date: 09/11/2019
- 2** **Description:** Exhibition on non-existent minerals to divulge mineralogy, in particular, and science in general from the minerals that appear in science fiction and fantasy (e.g., books, films, comics...)
Name of the exhibition: Minerale Inexistentes
Authors (by signature order): Carlos M. Pina; Carlos Pimentel
City activity: Madrid, Spain
Exhibiting forum: José Luis Amorós Library (Complutense University of Madrid)
Curator: Yes
Start date: 06/03/2019



Scientific and technological activities

Scientific production

H index: 6

Date of application: 03/12/2019

Publications, scientific and technical documents

- 1** Koishi A.; Fernandez-Martinez A.; Van Driessche A.; Michot L.; Pina C.; Pimentel C.; Lee B.; Montes-Hernandez G. Surface Wetting Controls Calcium Carbonate Crystallization Kinetics. *Chemistry of Materials*. 31, pp. 3340 - 3348. 2019. ISSN 08974756
DOI: 10.1021/acs.chemmater.9b00417
Type of production: Scientific paper **Format:** Journal
- 2** C. Pimentel; E. Gnecco; C.M. Pina. Epitaxial Growth and Frictional Response of Otavite and Sphero-cobaltite on Dolomite (10.4) Surfaces. *Journal of Physical Chemistry C*. 122 - 39, pp. 22487 - 22493. 2018. Available on-line at: <<https://www.scopus.com/inward/record.uri?eid=2-s2.0-85053879074&doi=10.1021%2facsc.jpcc.8b05963&partnerID=40&md5=7bb92f281a26dccb9ef182d9cad62646>>.
Type of production: Scientific paper **Format:** Journal
- 3** L. Agmon; I. Shaha; D. Yosufov; C. Pimentel; C. M. Pina; E. Gnecco; R. Berkovich. Estimation of interaction energy and contact stiffness in atomic-scale sliding on a model sodium chloride surface in ethanol. *Scientific Reports*. 8, pp. 4681. 2018.
Type of production: Scientific paper **Format:** Journal
Corresponding author: No
- 4** Ángel Crespo; Carlos Pimentel; Patricia Pedraz; Carlos M. Pina. First occurrence of the rare mineral slavikite in Spain. *Journal of Iberian Geology*. 43 - 3, pp. 487 - 495. 09/2017. Available on-line at: <<https://doi.org/10.1007/s41513-017-0030-6>>. ISSN 1886-7995
Type of production: Scientific paper **Format:** Journal
Corresponding author: No
- 5** R. Álvarez-Asencio; J.S. Moreno-Ramírez; C. Pimentel; S. Casado; M. Matta; J. Gierschner; L. Muccioli; S.-J. Yoon; S. Varghese; S.Y. Park; E. Gnecco; C.M. Pina. Molecular-scale shear response of the organic semiconductor ?-DBDCS (100) surface. *Physical Review B*. 96 - 11, pp. 115422. 2017. Available on-line at: <<https://www.scopus.com/inward/record.uri?eid=2-s2.0-85030108885&doi=10.1103%2fPhysRevB.96.115422&partnerID=40&md5=ff987b1f0c474ed0201037a7ddc9faf1>>
Type of production: Scientific paper **Format:** Journal
Corresponding author: No
- 6** Tamara González Illanes; Maria Teresa Borrero; Miriam M. Herráez; Carlos Pimentel Guerra; Carlos M. Pina. Pseudomorphic replacement of Mg-Ca carbonates after gypsum and anhydrite. *ACS Earth and Space Chemistry*. 1, pp. 168 - 178. ACS, 2017.
Type of production: Scientific paper **Format:** Journal
Corresponding author: No



- 7** J.G. Vilhena; C. Pimentel; P. Pedraz; F. Luo; P.A. Serena; C.M. Pina; E. Gnecco; R. Pérez. Atomic-Scale Sliding Friction on Graphene in Water. *ACS Nano*. 10, pp. 4288 - 4293. ACS, 2016. Available on-line at: <<http://www.scopus.com/inward/record.url?eid=2-s2.0-84968918636&partnerID=MN8TOARS>>.
Type of production: Scientific paper **Format:** Journal
Source of citations: SCOPUS **Citations:** 10
- 8** C. Pimentel; C.M. Pina. Reaction pathways towards the formation of dolomite-analogues at ambient conditions. *Geochimica et Cosmochimica Acta*. 178, pp. 259 - 267. 2016. Available on-line at: <<http://www.scopus.com/inward/record.url?eid=2-s2.0-84958211669&partnerID=MN8TOARS>>.
Type of production: Scientific paper **Format:** Journal
Source of citations: SCOPUS **Citations:** 2
- 9** C. Pimentel; S. Varghese; S.-J. Yoon; S.Y. Park; J. Gierschner; E. Gnecco; C.M. Pina. Sub-nanometer resolution of an organic semiconductor crystal surface using friction force microscopy in water. *Journal of Physics: Condensed Matter*. 28, pp. 134002. 2016. Available on-line at: <<http://www.scopus.com/inward/record.url?eid=2-s2.0-84960391921&partnerID=MN8TOARS>>.
Type of production: Scientific paper **Format:** Journal
Corresponding author: No
- 10** C. Pimentel; E. Gnecco; C.M. Pina. High-resolution imaging of (100) kyanite surfaces using friction force microscopy in water. *Surface Science*. 635, pp. 123 - 127. 2015. Available on-line at: <<http://www.scopus.com/inward/record.url?eid=2-s2.0-84922232513&partnerID=MN8TOARS>>.
Type of production: Scientific paper **Format:** Journal
Source of citations: SCOPUS **Citations:** 1
- 11** E. Gnecco; P. Nita; S. Casado; C. Pimentel; K. Mougín; M.C. Giordano; D. Repetto; F.B.D. Mongeot. Channeling motion of gold nanospheres on a rippled glassed surface. *Nanotechnology*. 25, pp. 485302. 2014. Available on-line at: <<http://www.scopus.com/inward/record.url?eid=2-s2.0-84911127339&partnerID=MN8TOARS>>.
Type of production: Scientific paper **Format:** Journal
- 12** P. Nita; C. Pimentel; F. Luo; B. Milián-Medina; J. Gierschner; C.M. Pina; E. Gnecco. Molecular resolution friction microscopy of Cu phthalocyanine thin films on dolomite (104) in water. *Nanoscale*. 6, pp. 8334 - 8339. 2014. Available on-line at: <<http://www.scopus.com/inward/record.url?eid=2-s2.0-84903650328&partnerID=MN8TOARS>>.
Type of production: Scientific paper **Format:** Journal
Source of citations: SCOPUS **Citations:** 6
- 13** C. Pimentel; C.M. Pina. The formation of the dolomite-analogue norsethite: Reaction pathway and cation ordering. *Geochimica et Cosmochimica Acta*. 142, pp. 217 - 223. 2014. Available on-line at: <<http://www.scopus.com/inward/record.url?eid=2-s2.0-84908137897&partnerID=MN8TOARS>>.
Type of production: Scientific paper **Format:** Journal
Source of citations: SCOPUS **Citations:** 4
- 14** R. Benages-Vilau; T. Calvet; M.A. Cuevas-Diarte; C. Pimentel; C.M. Pina. Epitaxial crystal growth of nitratine on calcite (10.4) cleavage faces at the nanoscale. *Crystal Growth and Design*. 13, pp. 5397 - 5403. 2013. Available on-line at: <<http://www.scopus.com/inward/record.url?eid=2-s2.0-84889787627&partnerID=MN8TOARS>>.
Type of production: Scientific paper **Format:** Journal
Source of citations: SCOPUS **Citations:** 3



- 15** C. Pimentel; C.M. Pina; E. Gnecco. Epitaxial growth of calcite crystals on dolomite and kutnahorite (104) surfaces. *Crystal Growth and Design*. 13, pp. 2557 - 2563. 2013. Available on-line at: <<http://www.scopus.com/inward/record.url?eid=2-s2.0-84878668228&partnerID=MN8TOARS>>.
Type of production: Scientific paper **Format:** Journal
Source of citations: SCOPUS **Citations:** 9
- 16** C.M. Pina; C. Pimentel; M. García-Merino. High resolution imaging of the dolomite (104) cleavage surface by atomic force microscopy. *Surface Science*. 604, pp. 1877 - 1881. 2010. Available on-line at: <<http://www.scopus.com/inward/record.url?eid=2-s2.0-77957166017&partnerID=MN8TOARS>>.
Type of production: Scientific paper **Format:** Journal
Source of citations: SCOPUS **Citations:** 5
- 17** C. Fernández; F. Anguita; J. Ruiz; I. Romeo; A.I. Martín-Herrero; A. Rodríguez; C. Pimentel. Structural evolution of Lavinia Planitia, Venus: Implications for the tectonics of the lowland plains. *Icarus*. 206, pp. 210 - 228. 2010. Available on-line at: <<http://www.scopus.com/inward/record.url?eid=2-s2.0-75949090335&partnerID=MN8TOARS>>.
Type of production: Scientific paper **Format:** Journal
Source of citations: SCOPUS **Citations:** 4
- 18** Carlos M. Pina; Carlos Pimentel. Formation of dolomite analogues at ambient conditions. *Dolomite: Formation, characteristics and environmental impact*. pp. 115 - 140. Nova Science Publishers, 2017.
Type of production: Book chapter **Format:** Book
Corresponding author: No
- 19** C.M. Pina; C. Pimentel; E. Gnecco. Friction and wear of mineral surfaces in liquid environments. pp. 157 - 173. Springer, 2015. Available on-line at: <<http://www.scopus.com/inward/record.url?eid=2-s2.0-84921643862&partnerID=MN8TOARS>>.
Type of production: Scientific book or monograph **Format:** Book
- 20** Carlos M. Pina Martínez; Carlos Pimentel. Pequeña guía de minerales inexistentes. *Pequeña guía de minerales inexistentes*. Ediciones Complutense, 02/2019.
Type of production: Book **Format:** Book

Works submitted to national or international conferences

- 1** **Title of the work:** Cation Ordering and Crystallinity of Dolomites in the Geological Record
Name of the conference: Goldschmidt Conference 2019
Type of event: Conference
Type of participation: Participatory - oral communication
Corresponding author: No
City of event: Barcelona, Spain
Date of event: 2019
Organising entity: Goldschmidt Conference
Carlos M. Pina; Carlos Pimentel; Ángel Crespo.
- 2** **Title of the work:** Geochemical Modelling of Inorganic Foliar Fertilizers
Name of the conference: Goldschmidt Conference 2019
Type of event: Conference
Type of participation: 'Participatory - poster
Corresponding author: Yes

City of event: Barcelona, Spain
Date of event: 2019
Organising entity: Goldschmidt Conference
Carlos Pimentel; Carlos M. Pina; Victoria Fernández.

3 **Title of the work:** Minerals in Science Fiction
Name of the conference: Goldschmidt Conference 2019
Type of event: Conference
Type of participation: 'Participatory - poster
Corresponding author: No
City of event: Barcelona, Spain
Date of event: 2019
Organising entity: Goldschmidt Conference
Carlos M. Pina; Carlos Pimentel.

4 **Title of the work:** Caracterización y origen del sulfato Eslavikita de la Mina Pastora, Aliseda (Cáceres)
Name of the conference: Reunión de la Sociedad Española de Mineralogía
Type of event: Conference
Type of participation: 'Participatory - poster
Corresponding author: No
City of event: Oviedo, Principality of Asturias, Spain
Date of event: 04/07/2017
End date: 07/07/2017
Organising entity: Sociedad Española de Mineralogía
Type of entity: Associations and Groups
Ángel Crespo; Carlos Pimentel; Patricia Pedraz; Carlos M. Pina. En: Macla. 22, pp. 31 - 32.

5 **Title of the work:** Carbonatación de cristales de yeso y anhidrita en presencia de magnesio
Name of the conference: Reunión de la Sociedad Española de Mineralogía
Type of event: Conference
Type of participation: 'Participatory - poster
Corresponding author: No
City of event: Oviedo, Principality of Asturias, Spain
Date of event: 04/07/2017
End date: 07/07/2017
Organising entity: Sociedad Española de Mineralogía
Type of entity: Associations and Groups
Tamara González-Illanes; Maria Teresa Borrero; Miriam M. Herráez; Carlos Pimentel; Carlos M. Pina. En: Macla. 22, pp. 61 - 62.

6 **Title of the work:** Cristalización de zabuyelita (Li_2CO_3) sobre las superficies (10.4) de dolomita y kutnohorita
Name of the conference: Reunión de la Sociedad Española de Mineralogía
Type of event: Conference
Type of participation: Participatory - oral communication
Corresponding author: Yes
City of event: Oviedo, Principality of Asturias, Spain
Date of event: 04/07/2017
End date: 07/07/2017
Organising entity: Sociedad Española de Mineralogía
Type of entity: Associations and Groups



Carlos Pimentel; Enrico Gnecco; Karine Mougin; Carlos M. Pina. En: Macla. 22, pp. 103 - 104.

- 7** **Title of the work:** Formation of metal-bearing overgrowths on dolomite surfaces
Name of the conference: Goldschmidt Conference 2015
Type of event: Conference
Type of participation: Participatory - oral communication
City of event: Praga, Praha, Czech Republic
Date of event: 2015
Organising entity: Goldschmidt Conference
Carlos M. Pina; Carlos Pimentel; Enrico Gnecco. "Formation of metal-bearing overgrowths on dolomite surfaces".
- 8** **Title of the work:** Synthesis of dolomite analogues at ambient conditions
Name of the conference: Goldschmidt Conference 2015
Type of event: Conference
Type of participation: Participatory - oral communication
Corresponding author: Yes
City of event: Praga, Praha, Czech Republic
Date of event: 2015
Organising entity: Goldschmidt Conference
Carlos Pimentel; Carlos M. Pina. "Synthesis of dolomite analogues at ambient conditions".
- 9** **Title of the work:** Síntesis del Compuesto Homotipo de la Dolomita $PbMg(CO_3)_2$ a Temperatura Ambiente
Name of the conference: Reunión de la Sociedad Española de Mineralogía 2015
Type of event: Conference
Type of participation: Participatory - oral communication
City of event: Huelva, Andalusia, Spain
Date of event: 2015
Organising entity: SOCIEDAD ESPAÑOLA DE MINERALOGIA
Carlos Pimentel; Carlos M. Pina. "Síntesis del Compuesto Homotipo de la Dolomita $PbMg(CO_3)_2$ a Temperatura Ambiente".
- 10** **Title of the work:** Análisis Cristalográfico y Tratamiento Térmico de Algunas Dolomitas Naturales
Name of the conference: Reunión de la Sociedad Española de Mineralogía 2015
City of event: Huelva, Andalusia, Spain
Date of event: 2015
Organising entity: SOCIEDAD ESPAÑOLA DE MINERALOGIA
Ángel Crespo; Carlos Pimentel; Carlos M. Pina. "Análisis Cristalográfico y Tratamiento Térmico de Algunas Dolomitas Naturales".
- 11** **Title of the work:** Formación de Minerales Análogos a la Dolomita
Name of the conference: Reunión de la Sociedad Española de Mineralogía 2014
City of event: Granada, Andalusia, Spain
Date of event: 2014
Organising entity: SOCIEDAD ESPAÑOLA DE MINERALOGIA
Carlos Pimentel; Carlos M. Pina. "Formación de Minerales Análogos a la Dolomita".
- 12** **Title of the work:** Towards Nano-Morphology Screening of Organic Semiconductors: Molecular Level Resolution of a Single Crystal in Water using Friction Force Microscopy
Name of the conference: The first European Workshop on Understanding and Controlling Nano and Mesoscale Friction



City of event: Can Picafort, Balearic Islands, Spain

Date of event: 2014

Organising entity: COST ACTION MP1303

Carlos Pimentel; Shinto Varghese; Jorge Moreno; S.-J. Yoon; S. Y. Park; Enrico Gnecco; Carlos M. Pina; Johannes Gierschner. "Towards Nano-Morphology Screening of Organic Semiconductors: Molecular Level Resolution of a Single Crystal in Water using Friction Force Microscopy".

13 Title of the work: Estudio Nanotribológico de Superficies Minerales en Condiciones Acuosas

Name of the conference: Reunión de la Sociedad Española de Mineralogía 2013

City of event: Caravaca de la Cruz, Region of Murcia, Spain

Date of event: 2013

Organising entity: SOCIEDAD ESPAÑOLA DE MINERALOGIA

Carlos Pimentel; Carlos M. Pina; Enrico Gnecco. "Estudio Nanotribológico de Superficies Minerales en Condiciones Acuosas".

14 Title of the work: Molecular-scale friction microscopy of calcite and copper phthalocyanine islands on dolomite (104) in water

Name of the conference: Conference on Friction and Energy Dissipation in Man-made and Biological Systems 2013

City of event: Trieste, Friuli-Venezia Giulia, Italy

Date of event: 2013

Pawel Nita; Carlos Pimentel; Feng Luo; Carlos M. Pina; Enrico Gnecco. "Molecular-scale friction microscopy of calcite and copper phthalocyanine islands on dolomite (104) in water".

15 Title of the work: Nanotribology of Mineral Surfaces in Aqueous Environments

Name of the conference: Goldschmidt Conference 2013

City of event: Florencia, Toscana, Italy

Date of event: 2013

Organising entity: Goldschmidt Conference

Carlos M. Pina; Carlos Pimentel; Enrico Gnecco. "Nanotribology of Mineral Surfaces in Aqueous Environments".

16 Title of the work: Study of Surfaces of Al₂SiO₅ Minerals by Lateral Force Microscopy

Name of the conference: Goldschmidt Conference 2013

City of event: Florencia, Toscana, Italy

Date of event: 2013

Organising entity: Goldschmidt Conference

Carlos Pimentel; Carlos M. Pina; Enrico Gnecco. "Study of Surfaces of Al₂SiO₅ Minerals by Lateral Force Microscopy".

17 Title of the work: Crecimiento Epitaxial de Calcita sobre las Caras (104) de Dolomita y Kutnahorita

Name of the conference: Reunión de la Sociedad Española de Mineralogía 2012

City of event: Bilbao, Basque Country, Spain

Date of event: 2012

Organising entity: SOCIEDAD ESPAÑOLA DE MINERALOGIA

Carlos Pimentel; Carlos M. Pina; Enrico Gnecco. "Crecimiento Epitaxial de Calcita sobre las Caras (104) de Dolomita y Kutnahorita".

18 Title of the work: Epitaxy of calcite on dolomite and kutnahorite (104) surfaces

Name of the conference: Goldschmidt Conference 2012

City of event: Montreal, Canada

Date of event: 2012



Organising entity: Goldschmidt Conference

Carlos M. Pina; Carlos Pimentel; Enrico Gnecco. "Epitaxy of calcite on dolomite and kutnahorite (104) surfaces".

19 Title of the work: Growth and nanomanipulation of calcite islands on dolomite-type (104) surfaces in aqueous solutions

Name of the conference: 3rd European nanomanipulation workshop

City of event: Madrid, Community of Madrid, Spain

Date of event: 2012

Organising entity: FUNDACIÓN IMDEA NANOCIENCIA

City organizing entity: Madrid, Community of Madrid, Spain

Carlos M. Pina; Carlos Pimentel; Enrico Gnecco. "Growth and nanomanipulation of calcite islands on dolomite-type (104) surfaces in aqueous solutions".

20 Title of the work: Wyspy CuPc na powierzchni dolomitu. Badania AFM w cieczy

Name of the conference: VII Seminarium Badania prowadzone metodami skaningowej mikroskopii bliskich oddziaływań - STM/AFM 2012

City of event: Zakopane, Malopolskie, Poland

Nita Pawel; Luo Feng; Carlos Pimentel; Carlos M. Pina; Enrico Gnecco. "Wyspy CuPc na powierzchni dolomitu. Badania AFM w cieczy".

Other dissemination activities

Title of the work: Some applications for mineralogy of the atomic force microscope in liquids

Type of event: Conferences given

Reasons for participation: Upon invitation

Corresponding author: Yes

City of event: Barcelona, 13/12/2017, Spain

Date of event: 13/12/2017

Organising entity: Facultat de Ciències de la Terra (UB) – Institut de Ciències de la Terra Jaume Almera (CSIC)

Type of entity: University

Carlos Pimentel.

Other achievements

Stays in public or private R&D centres

1 Entity: European Synchrotron Radiation Facility

City of entity: Grenoble, Rhône-Alpes, France

Start-End date: 03/03/2016 - 08/03/2016

Duration: 6 days

Goals of the stay: Guest

Provable tasks: Investigación

2 Entity: McGill University

Type of entity: University

Faculty, institute or centre: Earth and Planetary Sciences Department

City of entity: Montreal, Canada

Start-End date: 01/09/2015 - 30/11/2015

Duration: 3 months

Goals of the stay: Doctorate



Provable tasks: Investigación

- 3** **Entity:** European Synchrotron Radiation Facility
City of entity: Grenoble, Rhône-Alpes, France
Start-End date: 11/07/2015 - 14/07/2015 **Duration:** 4 days
Goals of the stay: Guest
Provable tasks: Investigación
- 4** **Entity:** Institut de Science des Matériaux de Mulhouse
City of entity: Mulhouse, Alsace, France
Start-End date: 01/09/2014 - 30/11/2014 **Duration:** 3 months
Goals of the stay: Doctorate
Provable tasks: Investigación
- 5** **Entity:** Institut de Science des Matériaux de Mulhouse
City of entity: Mulhouse, Alsace, France
Start-End date: 02/12/2013 - 15/12/2013 **Duration:** 14 days
Goals of the stay: Doctorate
Provable tasks: Investigación

Obtained grants and scholarships

- 1** **Name of the grant:** Fellow of "Formación de Profesorado Universitario (FPU)"
Aims: Pre-doctoral
Awarding entity: Ministerio de Educación, Cultura y Deporte **Type of entity:** State agency
Duration: 4 years
End date: 10/03/2017
Entity where activity was carried out: Universidad Complutense de Madrid
Faculty, institute or centre: Facultad de Ciencias Geológicas
- 2** **Name of the grant:** Research Fellow
Aims: Introduction to research
Awarding entity: IMDEA Nanociencia **Type of entity:** R&D Centre
Duration: 3 months
End date: 31/01/2013
Entity where activity was carried out: IMDEA Nanociencia
- 3** **Name of the grant:** Research Fellow
Aims: Introduction to research
Awarding entity: IMDEA Nanociencia **Type of entity:** R&D Centre
Duration: 3 months
End date: 30/09/2012
Entity where activity was carried out: IMDEA Nanociencia
- 4** **Name of the grant:** JAE-Intro Research Fellow
Aims: Introduction to research
Awarding entity: Consejo Superior de Investigaciones Científicas **Type of entity:** Public Research Body
Duration: 2 months



End date: 30/09/2010

Entity where activity was carried out: Consejo Superior de Investigaciones Cientificas

Prizes, mentions and distinctions

Description: Extraordinary doctorate award

Awarding entity: Universidad Complutense de Madrid

Type of entity: University

City awarding entity: Madrid, Community of Madrid, Spain

Conferral date: 18/09/2018

Obtained accreditations/recognitions

1 Description: Associate Professor

Accrediting entity: Agencia Nacional de Evaluación de la Calidad y Acreditación

Type of entity: Agencia

Date of recognition: 05/06/2019

2 Description: Assistant Professor

Accrediting entity: Agencia Nacional de Evaluación de la Calidad y Acreditación

Type of entity: Agencia

City accrediting entity: Spain

Date of recognition: 31/01/2018