

## Jorge Crespo Mena

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### RESEARCH INTERESTS

I am interested in the research of magmatic-hydrothermal deposits, studying the geochemistry and mineralogy of ore and gangue minerals, that contribute to the formation of ore deposits within in different geological settings. Developing new knowledge of mineral-chemistry and water-rock interactions will allow us to understand what were the geological processes involved in the formation of mineral deposits.

Also, I feel drawn to performed research in new sources of critical metals, either in waste rock, tailings or slags in old mines facilities. Either in recovering unused commodities that were not recovered in the past due to a lack of technological advances, or in turn giving them a commercial use.

My purpose is to contribute and generate new ideas regarding the ore deposits genetic models, search for new exploration targets, as well as the prospecting of critical metals used in new technologies necessary for modern society.

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### CONTACT INFORMATION

FIRST NAME: JORGE AURELIO  
LAST NAME: CRESPO MENA  
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### APPOINTMENTS

- 2023-now      **Research Assistant Professor**  
**University of Nevada Reno**  
**Nevada Bureau of Mines and Geology**

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### EDUCATION

- 2015-2019      **Ph.D., University of Chile**  
*"Origin and distribution of silver in the porphyry copper-molybdenum deposit, Rio Blanco, Central Chile"*  
Advisor: Dr. Martin Reich.
- 2005-2007      **M.Sc., Central University of Ecuador**  
*"Master of Environmental Management and Audit with emphasis on the Oil Industry"*
- 1998-2004      **B.Sc., Central University of Ecuador**  
*"Geology Engineering"*

## TEACHING EXPERIENCE

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- 2023 Lectures on Porphyry Copper Deposits and Introduction to Geological Exploration in the Mining Geology module (Spring 2023, Colorado School of Mines – Department of Mining Engineering)
- 2018 Teaching Assistant in the Economic Geology module (Spring 2018, University of Chile - Department of Geology)
- 2017-2018 Teaching Assistant in the Introduction to Optical Mineralogy module (Autumn 2017-Autumn 2018, University of Chile - Department of Geology)
- 2016 Teaching Assistant in the Mineral Deposits module (Spring 2016, University of Chile - Department of Geology)
- 2003-2005 Assistant Geologist. Central University of Ecuador.
- 2002 Voluntary Assistant of the Department of Paleontology, for two semesters at the Central University of Ecuador.
- 2001 Fellow of the Museum of Earth Sciences, Faculty of Geology and Mining Engineering at the Central University of Ecuador.

## EMPLOYMENT HISTORY

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- 2023 **University of Nevada Reno**  
Nevada Bureau of Mines and Geology  
Research Assistant Professor  
Mentor: Dr. Simon Jowitt
- 2019 – 2023 **Colorado School of Mines**  
Mining Engineering Department  
Postdoctoral Research  
Mentor: Dr. Elizabeth Holley.
- 2012 – 2015 **National Mining Company (Ecuador)**  
Senior Exploration Geologist  
Exploration of metal ores. (Cu-Mo)
- 2007 – 2011 **CECAL CIA. LTDA.**  
Head of the Environmental Department and Community Relations,  
Mocoral Mine, Cia CECAL Farm Project Open Pit Limestone in the  
Province of Imbabura, Otavalo city.
- 2006 – 2007 **CURIMINING S.A.**  
Exploration Geologist of metal ores.

## PEER-REVIEWED PUBLICATIONS

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1. 2024 **Crespo, J.**, Holley, E., Pfaff, K., Thompson, J.A., Fulton, A., Jilly-Rehak, C., Guillen, M., and Huamani, R. Characteristics and evolution of quartz-calcite-sulfide veins in the Nazca-Ocoña belt, Perú. (***Ore Geology Reviews*, 105895**).
2. 2024. Simon, I. J., Pfaff, K., Navarre-Sitchler, A., **Crespo, J.**, Holley, E., Vanzin, G., ... & Sharp, J. O. (2024). Geological and anthropogenic contributions of metal (loid)s in the artisanal and small-scale mining-impacted Ocoña watershed of Arequipa, Peru. ***Applied Geochemistry*, 168**, 106028.

3. 2024 Gisella Martínez, Pablo A. Garcia-Chevesich \*, Madeleine Guillen, Teresa Tejada, Kattia Martínez, Sergio Ticona, Hector Mayol Novoa, **Jorge Crespo**, Elizabeth A. Holley, John E McCray Urban Stormwater Quality in Arequipa, Southern Peru: An Initial Assessment **Water** **2024**, *16*, 108.
4. 2023 **Crespo, J.**, Holley, E., Guillen, M., Lizaga, I., Ticona, S., Simon, I., Garcia-Chevesich, P., Martinez, G. Tracking sediment provenance applying a linear mixing model approach using R's FingerPro package, in the mining-influenced Ocoña watershed, southern Peru. **Sustainability**, *15*(15), 11856
5. 2020 **Crespo, J.**, Holley, E., Pfaff, K., Guillen, M., and Huamani, R. Ore Mineralogy, trace element Geochemistry and geochronological constraints at the Mollehuaca and San Juan de Chorunga Au-Ag vein deposits in the Nazca-Ocoña metallogenic belt, Arequipa, Peru. **Minerals**, *10*(12), 1112.
6. 2020 **Crespo, J.**, Reich, M., Barra, F., Verdugo, J.J., Martinez, C., Leinsen, M., Romero, R., Morata, D., and Marquardt, C. "Occurrence and distribution of silver in the world-class Río Blanco porphyry Cu- Mo deposit, Chile". **Economic Geology**, *115* (8): 1619-1644.
7. 2018 **Crespo, J.**, Reich, M., Barra, F., Verdugo, J.J., and Martinez, C., "Critical metal particles in ore sulfides from the Río Blanco porphyry Cu-Mo deposit, Chile". **Minerals**, v. 8, p. 519.

#### SUBMITTED PUBLICATIONS AND SPECIAL PUBLICATIONS

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1. 2025 **Crespo, J.**, Jowitt, S.M., Muñoz-Saenz, C., Burns, R., 2025, Rare earth Minerals on Lithium clay deposits: insights from the Thacker Pass Deposit, Northern Nevada, USA. (*in review on Economic Geology*)
2. 2024 Jowitt, S.M., Henry, C.D., **Crespo Mena, J.**, Lindsey, C.R., Darin, M.H., Saftner, D.M., Heintz, K.M., and Hershey, R.L., 2024, Lithium in Nevada—origins, extent, role in the energy transition, and implications for economic development and national security: Nevada Bureau of Mines and Geology Special Publication 40, 48 p.

#### CONFERENCE ABSTRACTS

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1. 2023 **Crespo, J.**, Holley, E., Pfaff, K., Thompson, J.A., Huamani, R., Guillen, M. and Simon, I. Informing sustainable artisanal gold mining using a geological and geometallurgical assessment of quartz-gold veins in the Department of Arequipa, coastal Peru. *Society Mining Engineering Conference. Denver*, February 26-March 1
2. 2022 **Crespo J.**, Holley, E., Pfaff, K., Guillen, M., Ticona, S., Simon, I., Lizaga I. Tracking the Sediment Provenance in a River Basin for Mineral Exploration: The sediment fingerprinting technique. Society of Economic Geology Conference 2022. *Minerals for our future*, Denver, August 27-30.
3. 2022 **Crespo, J.**, Holley, E., Pfaff, K., Thompson, J.A., Huamani, R., Guillen, M. and Simon, I Poster presenter at Society Economic Geologist (SEG) conference: The Nazca-Ocoña Metallonegetic belt, Arequipa, Peru: Geological characteristics of quartz-calcite-sulfide veins. *Minerals for our future*, Denver, August 27-30.
4. 2022 Simon I., Pfaff, K., Navarrete-Sitchler, A., Holley, E., Vanzin, G., **Crespo, J.**, Guillen, M., Ticona, S., Sharp, J. Predicting the impact of mining on watersheds: A case study from the Ocoña watershed in Arequipa, Peru. Society of Economic Geology Conference 2022. *Minerals for our future*, Denver, August 27-30.

5. 2021 **Crespo J.**, Holley, E., Pfaff, K., Palin, R., Guillen, M., Huamani, R. Geology, Alteration and mineralization of Mollehuaca and San Juan de Chorunga projects, Arequipa, Peru. *Society Mining Engineering Annual Conference*. March 1-5, Virtual Event.
6. 2020 **Crespo J.** Speaker on the VI International Congress of Geology of Southern Perú. *University National of San Agustín Arequipa*. November 16-20.
7. 2020 **Crespo J.**, Holley, E., Pfaff, K., Palin, R., Guillen, M., Huamani, R., Gold-Silver mineralization and associated trace element geochemistry of deposits in the Nazca-Ocoña Cretaceous metallogenic belt, Arequipa, Peru, *Geological Society of America*, GSA 2020 Connects online, October 26-30.
8. 2020 Reich M., **Crespo, J.**, Barra F., Martinez, C., Verdugo, J. *How are critical elements distributed in porphyry Cu-Mo deposits?* Society of Economic Geology Conference, Whistler, Canada, September 15-18.
9. 2019 **Crespo, J.**, Reich, M., Barra, F., Verdugo, J.J., and Martinez, C., Occurrence and Distribution of Silver in the World-Class Río Blanco Porphyry Cu-Mo Deposit, Chile Society of Economic Geology Conference (Santiago de Chile, Chile)
10. 2019 **Crespo, J.**, Holley, E., Pfaff, K., Palin, R., Guillen, M., Huamani, R., *Geology, mineralization, and alteration of Mollehuaca and San Juan de Chorunga projects, Arequipa, Perú*. SME conference (Phoenix, Arizona)
11. 2019 Reich, M., **Crespo, J.**, Barra, F., Leisen, M., Romero, R., Verdugo, J.J., Martínez, C. *How are critical elements distributed in a world-class porphyry Cu deposit?* Goldschmidt Conference, Barcelona, Spain, August 18-23.
12. 2018 **Crespo, J.**, Reich, M., Barra, F. *Noble metal mineral particles in copper sulfides from the world-class Río Blanco porphyry Cu-Mo deposit, Chile*. Society of Economic Geology Conference (Keystone, Colorado).
13. 2018 **Crespo, J.**, Reich, M., Barra, F., Verdugo, J.J., and Martinez, C., “*Partículas de metales críticos en sulfuros de mena del yacimiento clase mundial tipo pórfido de Cu-Mo Río Blanco, Chile. Congreso Geológico Chileno*” (Concepción, Chile)

#### INTERNSHIPS AND OTHER RESEARCH ACTIVITIES

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| 2024 | Convener at Lithium Clays, Brines and Pegmatites in the Americas: Challenges of a Critical Metal for the Energy Transition Session (ID 208) at GSA Connects 2024, Anaheim, CA. |
| 2023 | Reviewer of Scientific articles for GSA Bulletin, Minerals and Crystals, MPDI Journals. 2018-2023  |
| 2018 | Poster presenter at Society Economic Geologist (SEG) conference: “Metals, Minerals, and Society. Keystone, Colorado, USA.  |
| 2016 | Assistance in the workshop “Characterization techniques in low dimensionality” University of Chile.  |
| 2016 | Assistance and participation in the workshop “Fluids in the earth”. Organized by the Department of Geology – University of Chile.  |
| 2010 | Chilean Geological Congress, held in La Serena – IV Región, Chile  |
| 2010 | Analysis Management and Resolution of Socio-Environmental Conflicts, Latin   |

American Institute of Sciences. Huancayo-Perú (August 23, 2010 until February 25, 2011) Duration 400 hours.

2003 Pre graduation Practices the Amazon District Petroproducción 1 month.

2002 Pre graduation Practices Alberta Energy Company Ecuador Company Ltd., for a month in the Operations Department.

#### ONGOING WORK

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I am conducting comprehensive geologic mapping, geochemical analyses, and geochronologic studies on the lithium-bearing sediments of the McDermitt Caldera in Humboldt County, Nevada. This research focuses on the magmatic evolution, structural framework, and depositional history of the region. The primary objectives of the mapping are to: (i) characterize the lithium source rocks; (ii) identify structural and stratigraphic controls on ore formation; (iii) analyze the spatial distribution of lithium-bearing sedimentary rocks in relation to their source rocks; and (iv) map regional structures and alteration features using high-resolution geophysical and DEM data. Additionally, we are compiling existing geochronologic data on volcanic rocks and acquiring new data for critical stratigraphic units. The mapping is centered on a 1:24,000 scale quadrangle in the Thacker Pass area, the southern part of the McDermitt Caldera, where the majority of lithium resources are concentrated.

#### ANALYTICAL SKILLS

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- Reflected and transmitted light microscopy
- Optical and scanning electron microscopy (SEM/FE-SEM).
- Electron probe micro analysis (EPMA).
- Laser Ablation Inductively Coupled Plasma Mass Spectrometry (LA-ICP-MS).
- ioGAS software
- ArcGIS Pro 10.3

#### AWARDS AND SCHOLARSHIPS

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2017 – 2019 CODELCO-Tech Ph.D. Scholarship – Piensa Minería program

2015 - 2016 Millennium Nucleus for Metal Tracing Along Subduction. Ph.D. Scholarship