

Lucía Alejandra Villar Muñoz

Geodynamic Researcher



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Date of Birth: 24th March 1979

Nationality: Chilean

PROFESSIONAL PROFILE

I am an outgoing and energetic scientist with a keen interest in deep-sea natural resources, looking for a collaborative job that fits my professional skills: I have worked on the thermal regime around Chile (BSR-derived heat flow and hydrothermal circulation), on gas hydrates in an active continental margin, on seismic processing and, lately, I have participated in a private environmental project on polymetallic nodules in the Clarion-Clipperton Fracture Zone (CCZ). In addition, I have extensive experience aboard scientific vessels, mainly assisting in the deployment and recovery of oceanographic and geophysical equipment. Finally, my PhD in marine geosciences at GEOMAR (Germany) was focused on the gas hydrate exploration over the Chilean continental margin. Currently, I am working on deep-sea marine mineral resources offshore Chile, potential methane release in Chile and the geomorphology of the Chilean fjords.

EDUCATION

GEOMAR | Helmholtz Centre for Ocean Research Kiel, Germany

2019 **PhD Marine Geosciences**

Thesis Title: "Gas hydrate in sediments on the Southern Chile continental slope" (https://oceanrep.geomar.de/48653/1/Lucia_Villar.pdf)

Pontificia Universidad Católica de Valparaíso (PUCV), Chile

1997- 2003 **Bachelor in Oceanography**

SKILLS

Communicate clearly in writing and orally

During my Bachelor, PhD studies, internships, and work experiences, I had to make many presentations about my research and use English as a day-lenguaje. Besides, I write in scientific articles, mostly of them in English.

Languages

Spanish (Mother tongue), English (High level), Portuguese (Medium level)
German (Basic level).

Adapt easily to a wide range of activities and unexpected changes

I lived in Germany for four years (during my PhD), with a different language and culture. I immediately felt adapted in their society, having new friends and colleagues that we still collaborate with today. Moreover, during my internships in different countries (such as Japan and USA), I improved my network of contacts as I am a very proactive and easy to work.

Software

Microsoft Office (Word, Excel, Power Point), Corel Draw, GMT (Generic Mapping Tool), Seismic Unix, Kingdom Suite, Windows, and Linux OS.

Other skills

Ability to motivate others, in addition to being permanently motivated. I am a proactive person, with positive attitude and good presentation. Furthermore, I have experience as a community manager and social media.

WORK EXPERIENCE

Co-Investigator

2022-Present Postdoctoral researcher at the Universidad de Chile, Department of Geophysics (DGF). FONDECYT project 3220003.

2021 Researcher at the Universidad de Chile. Collaborating in the Department of Geophysics (DGF).

Principal Investigator

2020 Researcher at the “Fundación San Ignacio de Huinay” (PUCV-Chile). Collaborating in the Department of Marine Geology.

Offshore Scientific Lead

2019-Present Offshore Scientific Assistant, The Metals Company (TMC) project: Baseline environmental studies in NORI-D CCZ.

Co-Investigator

2014-2020 Researcher at the Universidad Andres Bello (UNAB-Viña del Mar). Collaborating in the Department of Geology, mainly in gas hydrates estimations and helping with some lectures.

Co-Investigator

Aboard many research cruises, assisting mainly in seismic reflection and bathymetry data, as well as oceanographic and geophysical equipment deployments:

- MS Maersk Launcher, The Metals Company Inc. baseline project, Polymetallic nodules in the Clarion Clippertone Zone.
- R/V Maria Merian, SAMPLE: South Atlantic Margin Processes and Links with onshore Evolution
- R/V Mirai, SORA: South Pacific Ocean Research Activity
- R/V James Cook, JC23: Subduction Fluids-Volatiles-Hazards
- R/V Meteor, M64: Chile Margin Survey, Talcahuano – Balboa
- R/V Sonne, SO181: TIPTEQ Valparaíso-Puerto Montt
- R/V Vidal Gormaz, VG02: “Hidratos de gas, una nueva fuente de energía para el siglo XXI”

Scientific Consultant

2008-2009 Dirección Nacional de Fronteras y Límites del Estado (DIFROL). Ministry of Foreign Affairs. Chile.

Co-Investigator

2006-2008 FONDEF Project D0411111: “Submarine Gas Hydrates: Analysis of the Exploration and Production Scenarios as a Contribution for the Chilean National Energy Matrix”. PUCV, Chile.

Co-Investigator

2005-2006 FONDEF Project D0011104: “Submarine Gas Hydrates: A New Source of Energy for the XXI Century”. PUCV, Chile.

PUBLICATION

1. **Villar-Muñoz, L.**; Behrmann, J.H.; Diaz-Naveas, J.; Klaeschen, D.; Karstens, J. Heat flow in the southern Chile forearc controlled by large-scale tectonic processes. *Geo-Mar. Lett.* **2014**, 34, 185-198, doi:10.1007/s00367-013-0353-z.
2. Vargas-Cordero, I.; Tinivella, U.; **Villar-Muñoz, L.**; Giustiniani, M. Gas hydrate and free gas estimation from seismic analysis offshore Chiloé island (Chile). *Andean Geol.* **2016**, 43 (10), 263-274. doi: 10.5027/andgeoV43n3-a02.
3. Vargas-Cordero, I.; Tinivella, U.; **Villar-Muñoz, L.** Gas Hydrate and Free Gas Concentrations in Two Sites inside the Chilean Margin (Itata and Valdivia Offshores). *Energies.* **2017**, 10(12), 2154, doi:10.3390/en10122154.

4. **Villar-Muñoz, L.**; Bento, J.P.; Klaeschen, D.; Tinivella, U.; Vargas-Cordero, I.; Behrmann, J. H. A first estimation of gas hydrates offshore Patagonia (Chile). *Mar. Petrol. Geol.* **2018**, *96*, 232-239. doi: 10.1016/j.marpetgeo.2018.06.002.
5. Vargas-Cordero, I.; Tinivella, U.; **Villar-Muñoz, L.**; Bento, J.P. High Gas Hydrate and Free Gas Concentrations: An Explanation for Seeps Offshore South Mocha Island. *Energies*. **2018**, *11*(11), 3062, doi: 10.3390/en11113062.
6. **Villar-Muñoz, L.**; Vargas-Cordero, I.; Bento, J.P.; Tinivella, U.; Fernandoy, F.; Giustiniani, M.; Behrmann, J.H.; Calderon-Diaz, S. Gas Hydrate Estimate in an Area of Deformation and High Heat Flow at the Chile Triple Junction. *Geosciences*. **2019**, *9*(1), 28; doi: 10.3390/geosciences9010028.
7. Vargas-Cordero, I.; Tinivella, U.; **Villar-Muñoz, L.** et al. Gas hydrate versus seabed morphology offshore Lebu (Chilean margin). *Scientific Report*. **2020**, *10*, 21928. doi: 10.1038/s41598-020-78958-z.
8. Vargas-Cordero, I.; Giustiniani, M.; Tinivella, U.; **Villar-Muñoz, L.**; Alessandrini, G. Gas Hydrate System Offshore Chile. *Energies*. **2021**, *14*, 709. doi: 10.3390/en14030709.
9. Vargas-Cordero, I.; **Villar-Muñoz, L.**; Tinivella, U.; Giustiniani, M.; Bangs, N.; Bento, J.P.; Contreras-Reyes, I. Gas origin linked to paleo BSR. **2021**. *Scientific Reports*. **2021**, *11*, 23960. doi: 10.1038/s41598-021-03371-z.
10. **Villar-Muñoz, L.**; Kinoshita, M.; Bento, J.P.; Vargas-Cordero, I.; Contreras-Reyes, E.; Tinivella, U.; Giustiniani, M.; Abe, N.; et al. High heat flow anomaly on the accretionary toe at the Chile Triple Junction: A cold seep encouraged by the hot subducted ridge. *Scientific Reports*. **2021**, *11*, 20923. doi: 10.1038/s41598-021-00414-3.

LAST CONFERENCES (ORAL PRESENTATION)

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| 2020 | Japan Geoscience Union (JpGU) Landslide Session 2 (online): “Landslides along the Chilean margin”. |
| 2019 | Japan Geoscience Union (JpGU) Session MIS21-11: “All about gas hydrates and heat flow offshore Chile”. |

- 2018 Reunion Anual de la Geofísica Mexicana (RAUGM) Session EG-5: “Estimación de hidrato de gas en el triple punto de Chile”.
- 2017 Congresso Latinoamericano de Ciências do Mar (COLACMAR). Sala 02: “Potential geohazard into the patagonian sediments: a rough estimation of gas hydrates offshore Chile”.

GRANTS

- 2021 IILA-MAECI/DGCS 2020-2021 (Italy) for a seismic program training at the OGS, Trieste.
- 2020 ISA-JOGMEC to be part as a trainee to exploration for marine mineral resources cobalt-rich and ferromanganese crusts.
- 2019 ISA-NORI to be part as a trainee of to the NORI-D Metocean and Seasonal Studies Surveys.
- 2019 University of Tokyo Grant - Earthquake Research Institute (ERI): Short-term visiting program.
- 2010 DAAD Scholarship (Germany) to make my PhD at GEOMAR.
- 2011 ECORD Grant (Germany) to attend to the Summer School 2011: Sub-seafloor fluid flow and gas hydrates in MARUM, University of Bremen.
- 2002 FULLBRIGHT-MECESUP Grant (Chile) to make an Internship in Louisiana State University (LSU).

HOBBIES

Snorkeling & Diving
CEO of my online store (www.morenamonoi.cl)
Travel around the world! (I've visited >35 countries!)

REFERENCES

Prof. Dr. Jan Behrmann (PhD Supervisor): jbehrmann@geomar.de

Dr. Umberta Tinivella (Supervisor- OGS): utinivella@inogs.it

Dr. Juan Lorenzo (Internship Supervisor- LSU): gllore@lsu.edu

CHRISTIAN ALBRECHTS UNIVERSITY OF KIEL, GERMANY



The Faculty of Mathematics and Natural Sciences,
under the Dean

Professor Dr. Frank Kempken,

based on the doctoral degree regulations, grants to

Ms. Lucía Alejandra Villar Muñoz

born on March 24, 1979 in Puente Alto, Chile

the academic degree

**Doctorate in Natural Sciences
(Doctor rerum naturalium)**

with all the rights and privileges, pertaining to this degree.

Her Dissertation entitled

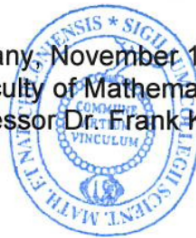
**Gas hydrate in sediments
on the Southern Chile continental slope**

was graded **good +**.

Her Defense and Oral Examination were graded **good**
proving her Scientific Competence and giving the Cumulative Grade
good (cum laude).

Kiel, Germany, November 14, 2019

Certified, the Dean of the Faculty of Mathematics and Natural Sciences
signed Professor Dr. Frank Kempken



Die Urschrift, deren Abschrift bzw. Kopie hiermit
beglaubigt wird, hat mir vorgelegen.

Kiel, den 15. November 2019

Kobers, Angelika
(Name und Dienststellung)