

MARIO CASTRO BARRERA

✉ e-mail mario.castrob@usach.cl

PRODUCTIVITY

Articles 10 · Publications with +60 citations. Highest IF article 9.161 (Phys. Rev. Lett. 2023, 131, 226801)

Dissemination 10 · International congresses.
8 · National congresses.

WORK EXPERIENCE

Adjunct Professor 2023 (2nd Semester) · Physics lessons for Engineering school, Universidad Andrés Bello.

Adjunct Professor 2022 · Physics lessons for Engineering school, Universidad Andrés Bello.

Academic Tutor 2013-2014 · Academic Tutor for the Inclusive Access, Equity and Permanence Program (PAIEP). U. de Santiago de Chile.

Lab assistant 2013 · Physics lab assistant for the engineering school. U. de Santiago de Chile.

EDUCATION

Doctor in Science - Physics 2021 - Physics department, Science School, U. de Santiago de Chile.

Physics Engineer 2017 - Physics department, Science School, U. de Santiago de Chile.

Graduate in Applied Physics 2014 - Physics department, Science School, U. de Santiago de Chile.

Post Doctoral Position 2022-2023 - Physics department, U. de Santiago de Chile.

Diplomaed 2022 "Diplomado en docencia: Especialista en primer año de educación superior" by Universidad Andrés Bello.

Diplomaed 2023 "Diplomado en DATA SCIENCE" by U. de Santiago de Chile.

EXTRA INFORMATION

ABOUT EDUCATION

Doctor in Science - Physics, Thesis **Efectos de la anisotropía magnética sobre sistemas nanométricos.**
Tutor : Prof. Sebastián ALLENDE · sebastian.allende@usach.cl

Physics Engineer Thesis **Desarrollo e implementación de un modelo para la optimización del proceso de obtención de Skyrmion tipo Bloch en discos Magnéticos.** Tutor: Prof. Sebastián ALLENDE · sebastian.allende@usach.cl

Professional Practice 2016 - Comisión Chilena de Energía Nuclear.

PUBLICATIONS

2023

doi.org/10.48550/arXiv.2308.09276 (submitted for publication)
Chiral spin-transfer torque induced by curvature gradient
Authors: G. H. R. BITTENCOURT, M. A. CASTRO, A. S. NUNEZ, D. ALTBIR, S. ALLENDE, V. L. CARVALHO-SANTOS

- 2023 doi.org/10.1103/PhysRevLett.131.226801
Physical review letters 131, 226801 (2023)(Editors' Suggestion)
A Model for Non-Relativistic Topological Multiferroic Matter
 Authors: G. SAEZ, M. A. CASTRO, S. ALLENDE, A. S. NUNEZ
- 2023 doi.org/10.3390/nano13212841
Nanomaterials 13, 2841 (2023)
Magnetic bimerons in cylindrical nanotubes
 Authors: D. GALVEZ, M. A. CASTRO, G. BITTENCOURT, V. L. CARVALHO-SANTOS,
 S. ALLENDE
- 2023 doi.org/10.1103/PhysRevB.108.094436
Physical Review B 108, 094436 (2023)
Skyrmion-bimeron dynamic conversion in magnetic nanotracks
 Authors: M. A. CASTRO, D. ALTBIR, D. GALVEZ-POBLETE, R. M. CORONA, S.
 OYARZÚN, A. R. PEREIRA, S. ALLENDE, V. L. CARVALHO-SANTOS
- 2022 doi.org/10.1038/s41598-022-15483-1
Nature - Scientific Reports 12,12030 (2022)
Mutual synchronization of spin-torque oscillators within a ring array
 Authors: M. A. CASTRO, D. MANCILLA-ALMONACID, B. DIENY, S. ALLENDE, L.
 D. BUDA-PREJBEANU, U. EBELS
- 2022 doi.org/10.1038/s41598-022-09647-2
Nature - Scientific Reports 12, 5965 (2022)
**Enhancing the magnetic response on polycrystalline nanoframes through mechanical
 deformation: correlating theory and experiments**
 Authors: M. A. CASTRO, S. E. BALTAZAR, J. ROJAS-NUNEZ, E. BRINGA, F. J.
 VALENCIA, S. ALLENDE
- 2021 doi.org/10.1063/5.0045969
Applied physics letters 118, 172407 (2021)
Skyrmion propagation along curved racetracks
 Authors: V. L. CARVALHO-SANTOS, M. A. CASTRO, D. SALAZAR-ARAVENA, D.
 LAROZE, R. M. CORONA, S. ALLENDE, D. ALTBIR
- 2020 doi.org/10.1016/j.jmmm.2020.166754
Journal of Magnetism and Magnetic Materials 507, 166754 (2020)
Magnetic ground states for bent nanotubes
 Authors: D. MANCILLA-ALMONACID, M. A. CASTRO, J.M. FONSECA, D. ALTBIR,
 S. ALLENDE, V.L. CARVALHO-SANTOS
- 2020 doi.org/10.1088/1361-648X/ab6aec
Journal of Physics: Condensed Matter 32, 175801 (2020)
Magnetostatic interaction between two bubble skyrmions
 Authors: M. A. CASTRO, D. MANCILLA-ALMONACID, J. A. VALDIVIA, S. ALLENDE
- 2019 doi.org/10.1016/j.jmmm.2019.03.118
Journal of Magnetism and Magnetic Materials 484, 55 (2019)
New magnetic states in nanorings created by anisotropy gradients
 Authors: M. A. CASTRO, A. P. ESPEJO, N. M. VARGAS, DORA ALTBIR, S. ALLENDE,
 V. L. CARVALHO-SANTOS
- 2016 doi.org/10.1016/j.jmmm.2016.05.095
Journal of Magnetism and Magnetic Materials 417, 344 (2016)
**Skyrmion core size dependence as a function of the perpendicular anisotropy and
 radius in magnetic nanodots**
 Authors: M. A. CASTRO, S. ALLENDE

CLOSE COLLABORATORS

*Collaboration stays
abroad*

2022 · SPINTEC: Spin in electronics Research.
 Dra. Ursula Ebels

SKILLS

<i>Software skills</i>	<ul style="list-style-type: none"> · OOMMF - <i>Object Oriented Micro-Magnetic Framework</i>. · Nmag: Micromagnetic Simulator · GMSH: A three-dimensional finite element mesh generator. · MuMax3: Micromagnetic Simulator. · MATLAB · Wolfram Mathematica · Comsol
<i>Programming Languages</i>	<ul style="list-style-type: none"> · Python · c

<i>Awards</i>	<ul style="list-style-type: none"> 2024 · Fondecyt Postdoctoral Fellowship. 2017 · PhD Scholarship CONICYT, 2017-2021.
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CONGRESS AND WORKSHOPS

- 2023 · Talk. Reversible Transformation Between Skyrmion and Bimeron in a Magnetic Racetrack, October 2023, XII Latin American Workshop on Magnetism, Magnetic Materials, & their Applications (LAW3M), Puerto Varas, Chile.
- 2022 · Talk. Analytical approaches to the mutual synchronization of spintorque nano-oscillators, January 2022, MMM-INTERMAG Conference (Virtual Conference).
- 2022 · Talk. Enfoques analíticos para el estudio de la sincronización mutua de nano-osciladores por transferencia de espín, December 2022, II Simposio Avances Recientes en Física de la Materia Condensada, Puerto Varas, Chile.
- 2021 · Talk. Mutual synchronization of an array of spin-torque oscillators with perpendicular polarizer, April 2021, Intermag Virtual Conference.
- 2021 · Talk. Sincronización de nano-osciladores por transferencia de espín dispuestos en un arreglo circular, September 2021, Segundo encuentro Estudiantes de Postrado, III Workshop Magíster en Ciencia con Mención en Física.
- 2020 · Poster. Mutual synchronization of spin-torque oscillators with a perpendicular polarize, November 2020, Annual Conference on Magnetism and Magnetic Materials.
- 2019 · Poster. X Taller interno del Centro para el Desarrollo de la Nanociencia y la Nanotecnología CEDENNA, Los Andes, Chile.
- 2019 · Poster. XI Workshop Chile-México, Pucón, Chile.
- 2018 · Poster. Mutual synchronization of spin-torque oscillators with a perpendicular polarize, International Conference on Magnetism, July 2018, San Francisco, EEUU.
- 2018 · Poster. Study of the Bloch magnetic skyrmion configuration in magnetic dots, June 2018, Summer School of the IEEE Magnetics Society, Quito, Ecuador.
- 2018 · Poster. IX Taller interno del Centro para el Desarrollo de la Nanociencia y la Nanotecnología CEDENNA, Los Andes, Chile.
- 2017 · Poster. Study of the Bloch magnetic skyrmion configuration in magnetic

dots, November 2017, Conference on Magnetism and Magnetic Materials, Pittsburgh, EEUU.

- . 2017 · Poster. IX Workshop Chile-Mexico, Viña del Mar, Chile.
- . 2017 · Poster. VII Taller interno del Centro para el Desarrollo de la Nanociencia y la Nanotecnología CEDENNA, Los Andes, Chile.
- . 2016 · Poster. VI Taller interno del Centro para el Desarrollo de la Nanociencia y la Nanotecnología CEDENNA, Los Andes, Chile.
- . 2016 · Poster. IEEE International Conference On Automatic ICA, Talca, Chile.
- . 2014 · Poster. Dependencia del tamaño del núcleo del skyrmion para un nanodisco magnético que presenta anisotropía uniaxial perpendicular, November 2014, XIX Simposio Chileno de Física , Concepción, Chile.
- . 2014 · Poster. VI Mini-Workshop Magnetismo BÁsico y Aplicado, Los Andes, Chile.

Languages

SPANISH · Native

ENGLISH · Intermediate.

Interests

Sports (Crossfit), Video Games, Music

REFERENCES

Dr. Sebastián Allende · sebastian.allende@usach.cl

30 de mayo de 2024