FULBRIGHT Chile

# Partner Brief

# Universidad Andrés Bello

## Overview

Universidad Andrés Bello (UNAB) is recognized as one of the most important universities in the country. At the undergraduate and graduate level, it is the university with the most enrolled students in Chile, with a presence in the country's three main cities, Santiago, Concepción and Viña del Mar.

In addition, it is nationally and internationally recognized as one of the four Chilean universities with the highest scientific production, conducting excellent research in all disciplinary areas. Its seal of excellence and pluralistic, secular, and inclusive orientation are differentiating elements that help graduates succeed and stand out in the work environment.

UNAB was one of the first private universities to voluntarily adhere to the Chilean accreditation system. It was later the first non-traditional private university to accredit its research quality. In addition, it was the second university in Chile to obtain institutional accreditation from the prestigious US-based Middle States Commission on Higher Education (MSCHE).

## Research

### Astronomy

The Institute of Astrophysics at Universidad Andrés Bello (UNAB) conducts cutting-edge research across a wide range of topics in observational, theoretical, and computational astrophysics. Its work spans from the study of the formation and evolution of stars and galaxies — including globular clusters, dwarf galaxies, and the Magellanic Clouds — to cosmology and galaxy evolution at high redshifts.

Researchers also focus on gravitational lensing, active galactic nuclei, and supermassive black holes, as well as numerical simulations that explore the nature of dark matter and dark energy. Additional lines of inquiry include exoplanets, protoplanetary disks, astrobiology, and radio astronomy, bridging stellar and planetary science.

This broad expertise positions UNAB as a leading institution in Chile for advancing astrophysical knowledge and international collaboration in frontier areas such as cosmology, galaxy evolution, and stellar physics.

### Antarctic Sciences

At Universidad Andrés Bello (UNAB), research in Antarctic sciences brings together experts from diverse disciplines who address key questions about biodiversity, climate change, and environmental sustainability in polar regions. Although the university does not have a dedicated Antarctic research center, several research groups contribute actively to advancing knowledge in this field.

Current studies focus on the genetic and morphological adaptations of native and non-native terrestrial and marine species, as well as the evolutionary and biogeographic processes that shape Antarctic ecosystems. Complementary research in climate and earth sciences examines atmospheric circulation, recent climate variability, and paleoclimate reconstruction through the analysis of ice cores and stable isotopes.

In addition, innovative work in environmental engineering explores advanced oxidation and water treatment technologies designed for extreme environments, including potential applications for Antarctic research stations and aquaculture systems.

Through this multidisciplinary approach, UNAB contributes to a deeper understanding of Antarctica's role in global climate dynamics and the sustainable management of its ecosystems, strengthening international collaboration in polar research.

# CENTERS AND INSTITUTES

## Quintay Marine Research Center (CIMARQ)

**Faculty of Life Sciences**

| Research Lines | Website | Director |
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| • Coastal Ecology and Ecophysiology<br>• Climate Change, Coastal Ecology, and Marine Pollution<br>• Fisheries Biology and Trophic Ecology<br>• Algal Biotechnology and Cultivation<br>• Marine Biotechnology Cultivation<br>• Artisanal Fisheries and Extreme Zones<br>• Biology, Reproduction, and Pathology in Aquaculture<br>• Cultivation and Restocking of Marine Fish and Invertebrates | https://cimarq.unab.cl | Juan Manuel Estrada |

## Plant Biotechnology Center (CBV)

**Faculty of Life Sciences**

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|---|---|---|
| • Plant–Pathogen Interaction<br>• Plant Signaling and Development<br>• Genome Regulation<br>• Plant Cell Wall<br>• Sustainability | https://cbv.unab.cl | Ariel Orellana |

## Center for Sustainability Research (CIS)

**Faculty of Life Sciences**

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| • Global Change<br>• One Health<br>• Biodiversity Conservation | https://cis.unab.cl | Claudio Azat |

## Center for Bioinformatics and Integrative Biology (CBIB) — Faculty of Life Sciences

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| • Bionanotechnology and Microbiology<br>• Genomic Bioinformatics<br>• Protein Engineering<br>• Chemical Synthesis and Drug Discovery<br>• Molecular Physiology | https://vinculacion.unab.cl/servicios/cbib-centro-de-bioinformatica-y-biologia-integrativa/ | Fernando Danilo González |

## Center for Systems Biotechnology (CSB) — Faculty of Life Sciences

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| • Environmental Management<br>• Animal and Plant Health<br>• Agricultural Ecosystems<br>• Bioproducts | https://csb.unab.cl | Pilar Parada |

## One Health Institute (OHI) — Faculty of Life Sciences

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| • Emerging Diseases<br>• Global Change and Climate Crisis<br>• Biodiversity Conservation | https://facultades.unab.cl/cienciasdelavida/investigacion/instituto-one-health/ | Claudio Azat |

## Transportation and Logistics Center (CTL) — Faculty of Engineering

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| • Urban Logistics Laboratory<br>• Sustainable Transportation<br>• Network Design Laboratory<br>• Data Science and Artificial Intelligence Laboratory<br>• Logistics in Emergencies and Natural Disasters | https://ctl.unab.cl | Julio Villalobos |

## Energy Transformation Center (CTE) — Faculty of Engineering

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| • Renewable Energies<br>• Energy Transformation and Control<br>• Electromobility and Energy Storage Systems<br>• Power Electronics<br>• Intelligent Autonomous Systems | https://cte.unab.cl | Freddy Flores |

## Institute of Health and Well-being Innovation Technology (ITISB) — Faculty of Engineering

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|---|---|---|
| • Internet of Things and Cyber-Physical Systems<br>• Digital Transformation and Software Architecture<br>• Applied Artificial Intelligence<br>• Cognitive Systems | https://itisb.unab.cl | Carla Taramasco |

## Center for Theoretical and Experimental Particle Physics (CTEPP) — Faculty of Exact Sciences

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|---|---|---|
| • Theoretical High-Energy Physic<br>• Experimental Data Analysis<br>• Big Data and Grid Computing Applications<br>• Design, Construction, and Testing of Particle Detectors<br>• Phase I & II ATLAS (CERN) Upgrades<br>• Applied Physics: Detectors for Medical Physics, Mining, and Geophysics<br>• Detectors for High-Energy Gamma-Ray Astronomy (CTA Observatory) | https://ctepp.unab.cl | Sergey Kuleshov and Jilberto Zamora |

## Center for Materials Design Research (CEDEM) — Faculty of Exact Sciences

| | | |
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| • Development of New Materials for Advanced Technological Applications<br>• Theoretical and Computational Modeling<br>• Simulation of Material Properties | N/A | William Tiznado |

## Institute of Astrophysics (IA) — Faculty of Exact Sciences

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|---|---|---|
| • Planetary Sciences<br>• Stellar Astrophysics<br>• Galactic Astrophysics<br>• Extragalactic Astrophysics<br>• Cosmology<br>• Gravitational Waves | https://astrounab.cl | Matías Gómez |

## Institute of Biomedical Sciences (ICB) — Faculty of Medicine

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| • Mechanisms of Neuronal Plasticity<br>• Mechanisms Linked to Neurological and Neurodegenerative Disease<br>• Epigenetic Control of Cell Differentiation and Development<br>• Molecular Bases of Learning and Memory<br>• Mitochondrial Function and Metabolic Reprogramming<br>• Cell Therapy in Disease Treatment<br>• Genomic and Epigenetic Editing in Relevant Pathologies<br>• Mechanisms of Pathogenic Intestinal Bacterial Infection<br>• Intracellular Signaling and Gene Regulation<br>• Identification of New Natural Bioactive Molecules<br>• Influence of Viruses and Viral-like Sequences on Hosts<br>• Epigenetic Control of Transposable Elements and Heterochromatin in Disease Development<br>• Roles of Non-coding RNAs in Pathology | https://icb.unab.cl | Martín Montecino |

**Institute of Exercise and Rehabilitation Sciences (ICER)** — **Faculty of Rehabilitation Sciences**

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| • Musculoskeletal Rehabilitation<br>• Neurorehabilitation<br>• Exercise Sciences for Health<br>• Rehabilitation in Mental Health and Cognition | https://www.linkedin.com/company/instituto-de-ciencias-del-ejercicio-y-la-rehabilitaci%C3%B3n-unab/ | Rodrigo Araneda |

**Institute for Health Care Research (IICS)** — **Faculty of Nursing**

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| • Health Systems: Evaluation and Innovation to Strengthen Humanized and Digital Health Systems, Including Workforce Care<br>• Non-Communicable Chronic Diseases (NCDs): Prevention and Intervention Strategies for Healthy Aging<br>• Mental Health: Analysis and Promotion of Protective Factors for Mental Health in Adults and Older Adults | N/A | Naldy Febre |

# DOCTORAL PROGRAMS

**Astrophysics** — **Director: Timo Anguita** — https://investigacion.unab.cl/doctorados-eng/astrophysics/

**General Objective**: To provide an excellent doctoral-level education, preparing its graduates to perform original and independent research whose results provide an important contribution to astronomical knowledge. Their research will also contribute to the development of the country and of science, making use of Chile's relative advantages in access to international astronomical observatories with state-of-the-art instruments.

**Molecular Biosciences** — **Director: Maria Francisca Blanco** — https://investigacion.unab.cl/doctorados-eng/molecular-biosciences/

**General Objective**: To train autonomous researchers with an advanced level of theoretical and practical knowledge in Molecular Bioscience, that allows them to solve complex scientific problems, creating new knowledge in the discipline.

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| **Bioinformatics and Systems Biology** | **Director: Fernando González** | https://investigacion.unab.cl/doctorados-eng/bioinformatics-and-systems-biology/ |

**General Objective**: To provide graduate students with advanced scientific training and skills to develop independent research at different levels of biological organization, deepening our understanding of molecular mechanisms in biological systems and contributing to the development and implementation of quantitative methods for large-scale data analysis and the generation of new knowledge.

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| **Biomedicine** | **Director: Gloria Arriagada** | https://investigacion.unab.cl/doctorados-eng/biomedicine/ |

**General Objective**: To train researchers with leadership skills for interdisciplinary work, to produce, in an autonomous way, original science-based knowledge in biomedical sciences, specifically in the research lines: neuroscience and nervous system diseases, stem cells and cell reprogramming, cell signaling in pathophysiology and molecular basis for metabolic diseases.

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| **Biotechnology** | **Director: Iván Calderón** | https://investigacion.unab.cl/doctorados-eng/biotechnology/ |

**General Objective**: To provide a doctoral education of excellence and multidisciplinary, which enables its graduates to address biotechnological problems and propose solutions through advanced knowledge and skills in Life Sciences and in the generation of bio-based technologies, developed through systematic, autonomous and original research, communicating the findings, particularly in the lines of Biomedical and Animal Biotechnology, Microbial Biotechnology and/or Plant Biotechnology, integrating knowledge in intellectual property and patenting, bioethics and bio-business.

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| **Nursing Science** | **Director: Alejandra Araya G.** | https://investigacion.unab.cl/doctorados-eng/phd-in-nursing-science/ |

**General Objective**: To train autonomous researchers who develop knowledge as a contribution to the Nursing discipline and related sciences, and therefore impacting people, families and communities' health.

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| **Rehabilitation Sciences** | **Director: Luis Peñailillo Escárate** | https://investigacion.unab.cl/doctorados/doctorado-en-ciencias-de-la-rehabilitacion/ |

**General Objective**: To train advanced human capital with a high level of scientific integrity and social ethics, capable of generating knowledge that contributes to the Rehabilitation Sciences through human movement as a fundamental tool to improve functional performance and health-related quality of life throughout the life cycle.

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| **Physical Sciences** | **Director: Walter Orellana** | https://investigacion.unab.cl/doctorados-eng/physical-sciences/ |

**General Objective**: To perform independent and collaborative research at the highest intellectual and technical level, contributing to the development of new knowledge in the research lines of High Energy Physics and Gravitation, Condensed Matter Physics, Particle Physics, and Plasma Physics.

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| **Education and Society** | **Director: Juan Carlos Oyanedel** | https://investigacion.unab.cl/doctorados-eng/education-and-society/ |

**General Objective**: Training independent researchers, with high levels of analysis in the links between Education and Society. Students will learn communication skills to present their work orally and in written, as well as leadership to direct multidisciplinary research teams.

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| **Molecular Physical Chemistry** | **Director: Dayan Páez** | https://investigacion.unab.cl/doctorados-eng/molecular-physicochemistry/ |

**General Objective**: To train students for a successful career as independent researchers. Our graduates would be able to conduct high-quality research, and to establish effective collaborative networks.

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| **Applied Humanities** | **Director: María José Correa** | https://investigacion.unab.cl/doctorados/humanidades-aplicadas/ |

**General Objective**: To train researchers capable of conducting independent humanistic research that addresses the needs of contemporary society, within the lines of study defined by the program, through a multidisciplinary approach that draws on the methodological strategies and knowledge provided by history, literature, and philosophy.

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| **Advanced Systems Engineering** | **Director: Hernán Astudillo** | https://investigacion.unab.cl/doctorados/ingenieria-de-sistemas-avanzados/ |

**General Objective**: To train independent researchers with critical analytical skills and solid scientific and technological knowledge, capable of developing tools for advanced systems engineering to address industrial and societal challenges through high-level research in the program's areas of specialization.

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| **Conservation Medicine** | **Director: Claudio Azat** | https://investigacion.unab.cl/doctorados-eng/conservation-medicine/ |

**General Objective**: To understand, deepen and develop original and autonomous research, in relation to the interactions between the variables of global change, that is, environmental changes resulting from anthropogenic activities, in order to determine their impact on human health, animals, plants, and ecosystems, as well as the conservation of the living beings that inhabit them, communicating their results to the public.

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| **Critical Theory and Contemporary Society** | **Director: Mauro Basaure** | https://investigacion.unab.cl/doctorados-eng/critical-theory-and-current-society/ |

**General Objective**: To produce excellent and independent researchers, trained in generating and communicating new knowledge via the design and implementation of research projects and the production of publications that express original knowledge in their research area. These research and communication skills are framed by a critical perspective that is concerned with the key issues facing contemporary societies and is based in complex approaches to these issues. This perspective is the result of an open dialogue between different disciplines of the Humanities and Social Sciences.

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| **Translational Dentistry** | **Director: Denisse Bravo** | https://investigacion.unab.cl/doctorados/odontologia-traslacional/ |

**General Objective**: To provide doctoral training of excellence that enables its graduates to address oral and maxillofacial health issues through the design, execution, and dissemination of original translational research and innovation. The program offers a solid scientific and technological foundation and promotes multidisciplinary teamwork skills, allowing graduates to make significant contributions to the advancement of knowledge and technological transfer in the field of dental sciences.

## Contact

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