

Dr. Carlos Enrique Zambra Sazo

Personal Information	Birth date: 24/11/1973. Nationality: Chilean. email: czambra@utalca.cl.
Studies	<ul style="list-style-type: none">• (T5) February 2009. Short course “<i>Advanced Numerical Methods for Hyperbolic Equations and Applications</i>”, Professor Eleuterio Toro and Dr. Ing. Michael Dumbser. Università Degli Studi di Trento, Italy.• (T6) April -August 2012. Research intership at the “Laboratory of membrane Process (LabProSem)”, Universidad de Santiago de Chile (USACH), Santiago, Chile.• (T7) 18-19 April 2013. Short course: “ANSYS-FLUENT-Using UDF’s”. ESSS.
Titles	<ul style="list-style-type: none">• Licenciado en Ciencias de la Ingeniería (UNACH, Universidad Adventista de Chile).• Ingeniero Civil Agroindustrial (UNACH, Universidad Adventista de Chile)• Profesor de Educación Técnico Profesional (UMCE, Universidad Metropolitana de Ciencias de la Educación)• Doctor en Ciencias de la Ingeniería Mención Ingeniería de Procesos (USACH, Universidad de Santiago de Chile).
Work experience	<p>-2010-2014. Researcher “Centro de Investigación Avanzada y Desarrollo en Recursos Hídricos (CIDERH)”, Iquique, Chile.</p> <p>-2011-2014. Professor of the “Doctorate program of Chemical”. Universidad Arturo Prat.</p> <p>-2014 – Febrero 2017. Full time Researcher, Centro de Estudios en Alimentos Procesados, CEAP, Talca, Chile.</p> <p>-Current. Associate Professor in Department of Industrial Technologies, Engineering Faculty, Universidad de Talca.</p>
Project	<p>-March 2007-June 2010. Project FONDECYT 1070186. “Theoretical, computational and experimental study of fluid dynamics, heat and mass transfer in solid-liquid phase change problems of non Newtonian fluids”. Cargo: <i>Thesis</i>. Thesis work. “Diffusion and convection of heat and mass in the autocombustion process of solid waste and fluid transport in unsaturated porous media”.</p> <p>-October 2009-April 2010. International project: “Development of High Order ADER Schemes for Richards Equation”. University of Study of Trento, Trento; Italy. Associated researcher.</p> <p>-October 2011-September 2014. National funding: “FONDECYT de iniciación en la investigación N° 11110097”. Diffusion in Porous Media With Chemical and Biological Reactions Conjugate with Mixed</p>

Convection Applied to Self-heating and Solute Leaching Processes.
Principal investigator.

- 2014 -2015. Project for the Strengthening of Regional Centers PRFVI0007. Strengthening of the Center for Studies in Processed Foods. Associated Director.

- 2016 – 2017. National funding: “FONDEF IDEA en 2 etapas ID15I10611”. **Concentración de Extractos fenólicos y Purificación de Hidroxitirosol a Partir de RILes de la Industria Olivícola Utilizando Perstracción.**
Principal Investigator.

-2016 - 2020. National funding: “FONDECYT regular 1161093”. **Experimental, mathematical and numerical development of a membrane perstraction process for hydroxytyrosol extraction from liquid waste of manufacture olive oil.** Principal investigator

-2017-2018. National funding: “VIU FONDEF VIU17P0136”. **Desarrollo de un equipo para concentrar jugos de berries mediante destilación por membranas.** Principal investigator.

-2018-2022. International funding. Grant by the Geoscience Research Institute of the Loma Linda University, California, USA. **Mathematical modeling and computational simulation of magma chambers.** Principal investigator.

-2023 - 2024. National funding: “FIC-Maule”. **Transferencia de Microdispositivo de Alertamiento Temprano de Residuos Químicos.** Código **40.018.932-0.** Principal investigator.
www.ficagroquimicos.utalca.cl

Publications

- (P1)** Nelson Moraga, **Carlos Zambra**; 3D Self ignition in sewage sludge waste water treatment; 2008; Ingeniare. Revista Chilena de Ingeniería; 3(16); pp. 352-357. **SCIELO**.
- (P2)** Mauricio Escudey, Alvaro Arias, Juan Förster, Nelson Moraga, **Carlos Zambra** y Andrew C. Chang; Sewage sludge self-heating and spontaneous combustion. field, Laboratory and numerical studies; High Temperature Material and Processes, Num. 27(5), pp. 339-346, 2008. **ISI**.
- (P3)** Nelson Moraga, Fernando Corvalán, Mauricio Escudey, Alvaro Arias y **Carlos Zambra**; Unsteady 2D coupled heat and mass transfer diffusion in porous media with biological and chemical heat generations; International Journal of Heat and Mass Transfer, Vol. 52; 5841–5848; 2009. **ISI**.
- (P4)** **Carlos Zambra**, Michael Dumbser, Eleuterio Toro, Nelson Moraga; A novel numerical method of high order accuracy for flow in unsaturated porous media; International Journal of Numerical Method in Engineering; 89 (2); pp. 227-240; 2012. **ISI**.
- (P5)** **Carlos Zambra**, Nelson Moraga, Mauricio Escudey; Heat and mass transfer in unsaturated porous media; moisture effects in compost pile self-heating; International Journal of Heat and Mass Transfer; 54; pp. 2801-2810; 2011. **ISI**.
- (P6)** Kong Ah-Hen, **Carlos Zambra**, Juan Agüero, Antonio Vega, Roberto Lemus; Moisture diffusivity coefficient and convective drying modeling of murt influence of temperature and vacuum on drying kinetics; Food bioprocess Technology; 6(4); pp 919-930 2012. **ISI**.
- (P7)** Nelson Moraga, **Carlos Zambra**, Paul Torres, Roberto Lemus; Fluid dynamics, heat and mass transfer modeling by finite volume method for agrofood processes; Revista Dyna; 78(169); pp. 140-149; 2011. **ISI**.
- (P8)** **Carlos Zambra**, C. Rosales, N. Moraga, M. Ragazzi; Self-heating in a bioreactor: Coupling of heat and mass transfer with turbulent convection; International Journal of Heat and Mass Transfer; 54; pp. 5077-5086; 2011. **ISI**.
- (P9)** **Carlos Zambra**, Nelson Moraga, Carlos Rosales, Elizabeth Lictevout; Unsteady 3D heat and mass transfer diffusion coupled with turbulent forces convection for compost piles with chemical and biological reactions. International Journal of Heat and Mass Transfer; 55; pp. 6695-6704; 2012. **ISI**.
- (P10)** Roberto Lemus-Mondaca, **C.E. Zambra**, Antonio Vega, Nelson Moraga. Coupled 3D heat and mass transfer model for numerical analysis of drying process in papaya slices, Journal of Food Engineering; 116; pp. 109-117; 2013. **ISI**.
- (P11)** **Carlos Zambra**, N. Moraga. Heat and mass transfer in landfills: Simulation of the pile self-heating and of the soil contamination, International Journal of Heat and Mass Transfer: 66; pp. 324-333; 2013. **ISI**.
- (P12)** **Carlos Zambra**, Julio Romero, Luis Pino, Aldo Saavedra, José Sanchez. Concentration of cranberry juice by osmotic distillation process. Journal of Food Engineering; 144 pp. 58-65; 2015. **ISI**.
- (P13)** Diego A. Vasco, **Carlos Zambra**, Nelson O. Moraga. Numerical simulation of conjugate forced turbulent heat convection with induced natural laminar convection in a 2D inner cavity. International Journal of Thermal Science: 87; pp. 121-135; 2015. **ISI**
- (P14)** **C. Zambra**, J.F. Muñoz, N.O. Moraga. A 3D coupled model of turbulent forced convection and diffusion for heat and mass transfer in a bioleaching process. International Journal of Heat and Mass Transfer: 85; pp. 390-400; 2015. **ISI**.

- (P15) R.A. Lemus-Mondaca**, A. Vega-Gálvez, C.E. Zambra, N.O. Moraga. Modeling 3D conjugate heat and mass transfer for turbulent air drying of Chilean papaya in a direct contact dryer. *Heat and Mass Transfer*: 2017; DOI 10.1007/s00231-016-1799-0. **ISI**.
- (P16)** W.A. Chavez, B.A. Torres, **C.E. Zambra**. Effect of different geographic altitudes on the performance of a conventional solr still with arsenic and boron removal efficiency in an arid zone. *Ingeniería y Universidad, Enginnering for Development, Pontificia Universidad Javeriana*. 2018. In press. <http://revistas.javeriana.edu.co/index.php/iyu/information/readers>.
- SCOPUS.**
- (P17)** R. Lemus-Mondaca, **C.E. Zambra**, F. Marín, M. Pérez-Won, G. Tabilo-Munizaga. Mass transfer kinetic and quality changes during high-pressure impregnation (HPI) of jumbo squid (*dosidicus gigas*) slices. *Food and Bioprocess Technology*. 2018. <https://doi.org/10.1007/s11947-018-2122-5>. **ISI**.
- (P18)** Julio Romero, **Carlos Zambra**, Gastón Merlet, Rene Cabezas, Gonzalo Correa, Gonzalo Salinas, Johan Gonzalez, Felipe Veliz, Roberto Lemus-Mondaca. Liquid-Liquid extraction of hydroxytyrosol, tyrosol and oleuropein using ionic liquids. Pp. 1-12; 2018. <https://doi.org/10.1080/01496395.2018.1555171>. **ISI**.
- (P19) Carlos Zambra.** Simulation of mass transfer in hollow fiber used for concentration of juices by osmotic distillation. 5; 2019 *Heliyon*. <https://doi.org/10.1016/j.heliyon.2019.e01458>. Indexada **ISI**.
- (P20)** R. Lemus-Mondaca, **C. Zambra** and C. Rosales. Computational modelling and energy consumption of turbulent 3D drying process of olive-waste cake. *Journal of Food Engineering*. 2019. **ISI**.
- (P21) Carlos Zambra**, Diógenes Hernández, Hugo Reyes, Nicole Riveros, Roberto Lemus-Mondaca. Kageneckia oblonga Leaves Subjected to Different Drying Methods: Drying Kinetics, Energy Consumption and Interesting Compounds. *Frontiers in Sustainable Food Systems*. 2021. **ISI**.
- (P22) Carlos Zambra**, Luciano Gonzalez-Olivares, Johan González, Benjamin Clausen. Temporal evolution of cooling by natural convection in an enclosed magma chamber. *Processes*. 2022. **ISI**.
- (P23) Carlos E. Zambra**, Luis Puente-Díaz, Kong Ah-Hen, Carlos Rosales, Diógenes Hernandez. Experimental and Numerical Study of a Turbulent Air-Drying Process for an Ellipsoidal Fruit with Volume Changes. *Foods*. 2022. **ISI**.
- (P24)** Johan González, **Carlos E. Zambra**, Luciano González, Benjamin Clausen, Diego Vasco. Simulation of cooling in a magma chamber: Implications for geothermal fields of southern Peru. *Geothermics*. 2022. **ISI**.
- (P25)** Felipe Lozano-Steinmetz, María Paz Ramirez-Navarro, Leonardo Vivas, **Diego Vasco**, Dinesh Pratap Singh, **Carlos Zambra-Sazo**. Thermal and Rheological Characterization of Aqueous Nanofluids Based on Reduced Graphene Oxide (rGO) with Manganese Dioxide Nanocomposites (MnO₂). *Nanomaterials*. 2022. **ISI**.
- (P26) Carlos Zambra**, Benjamin Clausen, Diego Vasco, Roberto Lemus-Mondaca. Geomorphological Changes in Young Soils with Sparse Vegetation: Mathematical Modeling and Numerical Simulation. 2023, *Heliyon*. <https://doi.org/10.1016/j.heliyon.2023.e21044>.
- (P27)** Diógenes Hernandez, **Carlos Zambra**, C.A. Astudillo, D. Gabriel, J. Díaz. Evolution of Physico-chemical Parameters, Microorganism

Diversity and Volatile Organic Compound of Apple Pomace Exposed to Ambient Conditions. 2023. Heliyon.
<https://doi.org/10.1016/j.heliyon.2023.e19770>

Books Chapter

- (CH1)** Mauricio Escudey, Nelson Moraga, **Carlos Zambra** and Mónica Antilen. Sewage Sludge Disposal and Applications; Capítulo del Libro “Waste Water”, INTECH open access publisher, July 2010, ISBN 978-953-7619.
- (CH2)** Nelson Moraga, **Carlos Zambra**. On FVM Transport Phenomena Prediction in Porous Media with Chemical/Biological Reactions or Solid Liquid Phase Change; Capítulo del libro “Finite Volume Method-Power full Means of Engineering Design, INTECH open access publisher. 2012. ISBN 978-953-51-0445-2. DOI: 10.5772/38579.

Personal References

- Ph.D. Nelson Moraga B. Professor of the Mechanical Engineering Department. Universidad de la Serena. La Serena, Chile email: nmoraga@userena.cl.
- Ph.D. Benjamin Clausen. Researcher of Geoscience Research Institute. Loma Linda University, Loma Linda, California, USA. email: bclausen@llu.edu