



## Ciclo de Coloquios 2017

*Charla técnica*



El Departamento de Informática de la Universidad Técnica Federico Santa María tiene el agrado de invitar a la comunidad Universitaria a su ciclo de coloquios. Esta presentación se realizará en el Auditorio Claudio Matamoros (F-106), en la Casa Central el día **Martes 4 de Julio las 12:00** y por videoconferencia a la Sala de Reuniones, Departamento de Informática, Campus San Joaquín, UTFSM.

### Título

## Dispersed Multiphase Flow Modeling: From Environmental to Industrial Applications

### Expositor



#### **Orlando Ayala, Ph.D.**

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Virginia, USA.

### Mini Bio

Dr. Ayala is currently serving as Assistant Professor of Mechanical Engineering Technology Department in the College of Engineering and Technology at Old Dominion University in Virginia (USA). Prior to joining ODU in 2013, Dr. Ayala spent 3 years as a Postdoc at University of Delaware (USA). Before that, he held a faculty position at Universidad de Oriente (Venezuela) at its Mechanical Engineering Department. Dr. Ayala received his BS in Mechanical Engineering with honors (Cum Laude) from Universidad de Oriente (Venezuela) in 1995, MS in Mechanical Engineering in 2001 and PhD in Mechanical Engineering in 2005, both from University of Delaware (USA).

He has been interested in research areas such as multiphase flows, turbulent flows, transport of particles in fluid flows, compressible flows, heat transfer, numerical modeling, and high performance parallel computing and scientific computation; using numerical techniques such as the one discussed in this talk. He has published 30 journal papers and dozens of peer-reviewed conferences papers, with an average citation per year of all his published work of over 30.

Concurrently, Dr. Ayala has worked for a number of consulting companies where has been directly involved in more than 20 different engineering projects. He is also trained to use some well-known commercial software to model industrial problems involving fluid flow. With that, he has identified and assisted in the execution of a number of process improvements to a number of industries. In addition, since 2008 he has been a member of the Committee of Spanish Translation of ASME Codes and he is currently its Chair.

### Resumen

Multiphase flows are present in almost all processing technologies in many industries and in the environment. Everyday phenomena such as rain, snow, fog, blood flow, dust in air, pneumatic conveying systems, underground flow, or even cooking eggs in boiling water, just to name a few, are familiar examples of multiphase flows. Multiphase flows can be broadly classified as disperse or separated depending on their characteristics. Disperse flows consist of a carrier fluid and another (other) phase(s) of discrete elements such as droplets, bubbles, or particles. The study of such flows is not only very interesting but also very challenging. As numerical methods have become the 3rd pillar of research (being the other two, theoretical and experimental work), I have devoted my career to using and developing numerical schemes for large-scale domain and small-scale domain to study disperse flows. In this talk, I first review the current state-of-the-art computational techniques for dispersed multiphase flows and their strengths and limitations. In doing so, I will present several case studies of my work on modeling disperse flows ranging from research-oriented work on environmental problems to the study of real industrial problems. I will present my work on simulating some cases present in nature, such as warm rain initiation and porous media flow. I will also take you through some of my work implementing well-known commercial software to solve important industrial problems involving multiphase flows—on the base of which a number of process improvements were proposed for a number of industries. I will also identify promising new opportunities for future research in the disperse flow area throughout my talk.

### Lugar y Fecha

**4 de Julio de 2017, 12:00**

Auditorio Claudio Matamoros (F-106)  
Casa Central, UTFSM.

*Esta charla es financiada por  
el Centro Científico  
Tecnológico de Valparaíso  
(CCTVal),  
Basal Project FB 0821.*



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