

CURRICULUM VITAE

Personal data

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References

- Prof. Fernando A. Saita. Senior Professor at FICH-UNL (Santa Fe, Argentina) Senior Researcher of National Research Council of Argentina (CONICET). Email: fasaita@santafe-conicet.gov.ar
- Prof. Javier Diez. Associate Professor at FCEX - UNCPBA (Tandil, Buenos Aires, Argentina). Independent Researcher of National Research Council of Argentina (CONICET). Email: jdiez@exa.unicen.edu.ar. Personal website: <http://users.exa.unicen.edu.ar/~jdiez/>
- Prof. Lou Kondic. Associate Professor at New Jersey Institute of Technology (NJIT). Email: kondic@njit.edu. Personal website: <http://m.njit.edu/~kondic/>

Education

1998: Graduated as Bioingeniero (Biomedical Engineer) from Facultad de Ingeniería (FI), Universidad Nacional de Entre Ríos (UNER), Argentina. Undergraduate Thesis: *Theoretical Modeling and Computational Analysis of Synovial Joints Oriented to Optimal Material Designs of Prosthesis*

2001: M. Sc. in Chemical Technology from Facultad de Ingeniería Química (FIQ), Universidad Nacional del Litoral (UNL), Argentina. Thesis: *Numerical implementations of the finite elements method to the solution of capillary instability problems*. Advisor: Prof. Fernando A. Saita.

2005: Ph. D. in Engineering (Mention in Computational Mechanics) from Facultad de Ingeniería y Ciencias Hídricas (FICH), UNL, Argentina. Thesis: *Numerical analysis of the effects of soluble surfactants in the processes of formation and destabilizations of liquid films in capillaries*. Advisor: Prof. Fernando A. Saita.

Employment

- 1996-1998: Student Assistant at FI-UNER.
- 1999-2006: Teaching Assistant at FI-UNER.
- 2006- : Lecturer at FI-UNER.
- 1999-2001: Graduate fellow of FOMECA program (SPU, Argentina)
- 2002-2005: Graduate fellow of National Research Council (CONICET-Argentina)
- 2005-2007: Postdoctoral fellow of National Research Council (CONICET-Argentina)
- 2008- : Assistant Researcher of National Research Council (CONICET-Argentina).

Grants

- National Research Council (CONICET-Argentina)
 - 2002-2005: Graduate Fellowship (for Ph. D. studies).
 - 2005-2007: Postdoctoral Fellowship.
- 1999-2001: Graduate fellowship of FOMECA program (SPU, Argentina).
- 1998-1999: Research Initiation Fellowship (UNER, Argentina).

Teaching

Undergraduate:

- 1996- : *Fluid Mechanics* and *Continuum Mechanics*, Biomedical Engineering career at FI-UNER, as Student Assistance, Teaching Assistance and Assistance Professor.

Graduate:

- 2000: *Fluid Mechanics*, Ms. Sc. and Ph. D. programs at FIQ-UNL. Teaching Assistance.

- 2003: *Continuum Biomechanics*, Ms. Sc. and Ph. D. programs at FI-UNER. Assistance Professor.
- 2005 and 2007: *Introduction to Finite Elements Method*, Ms. Sc. and Ph. D. programs at FI-UNER. Assistance Professor.
- 2008 and 2009: Continuum Mechanic module in *Biomechanics and Biomaterials* course, Ms. Sc. and Ph. D. programs at FI-UNER. Assistance Professor.
- 2009: *Introduction to Physics and Chemistry of Interfaces*. Ph. D. program at Faculty of Biochemistry and Biological Sciences, UNL, Argentina. Assistance Professor.

Others:

- 2003: *Introduction to GNU/Linux*, at FI-UNER.

Research Activities

Interest: Interfacial flows, surfactants effects, elasto-hydrodynamic lubrication, biological flows, finite elements method.

As member of projects in execution:

- Grant for Scientist and Technical Research PICT 212 "*Formation of thin films and surfactant effects on their thickness. Numerical Analysis*". Funds provided by Agencia Nacional de Promoción Científica y Tecnológica (ANPCyT), from June 2009 to July 2012.
- Grant for Scientist and Technical Research PID 6103 UNER "Numerical predictions oriented to design artificial synovial joint more efficient". Funds provided by UNER, from June 2009 to July 2012.

As member in finalized projects:

- Grant for Scientist and Technical Research PICTO 35854 (BID1728 OCAR) "*Numerical analysis of the transient displacement of bubble trains in capillary tubes*". Funds provided by ANPCyT, from October 2007 to July 2010.
- Grant for Scientist and Technical Research CAI+D 2006 "*Interfacial dynamics in the fluid flow and stability*". Funds provided by UNL, from June 2006 to November 2009.
- Grant for Scientist and Technical Research PICTR2002-00094 "*Interfacial flows and Surface Dynamics*". Funds provided by ANPCyT, from April 2004 to December 2008.
- Grant for Scientist and Technical Research PID 6056 UNER "*Continuum*

Biomechanics". Funds provided by UNER, from June 2005 to July 2008.

- Grant for Scientist and Technical Research PID 6072 UNER "*Computational Analysis of Blood Flows*". Funds provided by UNER, from October 2004 from October 2007.
- Grant for Scientist and Technical Research CAI+D 2002-4-26 "*Interfacial Dynamics in the Fluid Flows – Numerical Analysis*". Funds provided by UNL, from 2003 to 2006.
- Grant for Scientist and Technical Research PICT 14-04376 "*Flows dominated by Interfacial Dynamic – Numerical Analysis applied to different process*". Funds provided by ANPCyT, from April 1999 to June 2004.
- Grant for Scientist and Technical Research PIP 1998-0203 "*Flows dominated by Interfacial Dynamic – Numerical Analysis applied to different process*". Funds provided by CONICET, from April 1999 to October 2004.
- Grant for Scientist and Technical Research CAI+D 1996-017-115 "*Flows dominated by Interfacial Dynamic – Numerical Analysis applied to different process*". Funds provided by UNL, from April 1999 to December 2001.
- Grant for Scientist and Technical Research PID 6124 UNER "*Computational Biomechanics*". Funds provided by UNER, from April 1994 to December 1998.

Member of research teams:

- Member of *Fluid Flow and Interfacial Dynamics Research Team* at INTEC-CONICET-UNL, from 1999 to date. (http://www.conicet.gov.ar/php/datos_inst.php?n=05402)
- Member of *Computational Biomechanics Research Team* at FI-UNER, from 1994 to date. (<http://www.bioingenieria.edu.ar/grupos/biomecompu/index.html>)

Technical Assistance Activities

- Model of a sensor-catheter system in of an Intracranial Pressure Monitor Prototype.

Activity: Technical Assistance.

Entities: Electromedicina del Sur S.R.L. and FI-UNER.

Description: Physical and mathematical model of a pneumatic catheter-sensor system, to be used in the prediction and estimation of optimal building parameters of the prototype.

Elapsed time: November 2004 to march 2005.

Results: Included in a confidential report.

International Publications

Journals

D. M. Campana, S. Ubal, M. D. Giavedoni and F. A. Saita. Effects of insoluble surfactants on the dip-coating process. *Physics of Fluids*, in press.

D. M. Campana, S. Ubal, M. D. Giavedoni and F. A. Saita. Effects of gravity on the stability of the steady propagation of a liquid plug in a small conduit. *Journal of Physics: Conference Series*, in press.

D. M. Campana, S. Ubal, M. D. Giavedoni and F. A. Saita. Numerical prediction of the film thickening due to surfactants in the Landau-Levich problem. *Physics of Fluids*, **22**, 032103, p. 1-9, 2010.

A. G. González, J. A. Diez, R. Gratton, D. M. Campana and F. A. Saita. Instability of a viscous liquid coating on a cylindrical fiber. *Journal of Fluid Mechanics*, **651**, p. 117-143, 2010.

M E Berli, D M Campana, S Ubal and J Di Paolo. Lubrication model of a knee prosthesis, with non Newtonian fluids and porous rough material. *Latin American Applied Research*, **39**, 105-111, 2009.

S. Ubal, D. M. Campana, M. D. Giavedoni and F. A. Saita. Stability of the steady-state displacement of a liquid plug driven by a constant pressure difference along a prewetted capillary tube. *Industrial & Engineering Chemistry Research*, **47**, 6307-6315, 2008.

J Di Paolo, M E Berli, D M Campana, S Ubal and L D Cárdenes. Simulation of the filtration mechanism of hyaluronic acid in total knee prosthesis. *Journal of Physics: Conference Series*, **90**, 012051, 2007.

D. M. Campana, S. Ubal, M. D. Giavedoni and F. A. Saita. The stability of the steady motion of a liquid plug in a capillary tube. *Industrial & Engineering Chemistry Research*, **46**, 1803-1809, 2007.

D. M. Campana and F. A. Saita. Surfactant effects on the Rayleigh instability in capillary tubes - Non ideal systems. *International Journal of Multiphase Flows*, **33**, 1153-1171, 2007.

D. M. Campana and F. A. Saita. Numerical analysis of the Rayleigh instability in capillary tubes. The influence of surfactant solubility. *Physics Fluids*, **18**, **022104**, 1-14, 2006.

J. Di Paolo, G. Filipowicz, S. Ubal y D. M. Campana. Influencia del radio del catéter angioplástico sobre la caída de presión transtestenótica en arterias coronarias. Análisis numérico. *Revista Internacional de Métodos Numéricos para Cálculo y Diseño en Ingeniería*, **22(3)**, 261-275, 2006.

M. Severino, D. M. Campana and M. D. Giavedoni. Effects of a surfactant on the motion of a confined gas-liquid interface. The influence of the Peclet number. *Latin American Applied Research*, **35(3)**, 225-232, 2005.

D. M. Campana, J. Di Paolo and F. A. Saita. A 2-D Model of Rayleigh instability in capillary tubes. Surfactant effects. *International Journal of Multiphase Flows*, **30 (5)**,

431-454, 2004.

In Proceedings

M. D. Giavedoni, D. M. Campana, F. A. Saita and R. L. Cerro. On the search for numerical boundary conditions for the computation of dynamic contact lines. *15th International Coating Science and Technology Symposium (ISCST)*, September 12-15, 2010, Saint Paul, Minnesota, USA.

J. Di Paolo, M. E. Berli, D. M. Campana y S. Ubal. Modelado y simulación del contacto lubricado en una prótesis total de rodilla: metal-metal o cerámica-cerámica. *2º Encontro Nacional de Engenharia Biomcânica (ENEBI 2009)*, Florianópolis (Brasil), 2009.

D. M. Campana, S. Ubal, M. D. Giavedoni and F. A. Saita. A numerical study on the stability of the steady displacement of a liquid plug along a small conduit. *8th World Congress on Computational Mechanics and 5th European Congress on Computational Methods in Applied Sciences and Engineering (WCCM8-ECCOMAS 2008)*. Venecia (Italia), 2008.

D. Campana and F. Saita. Numerical modelling of the Rayleigh instability in capillaries under the presence of soluble surfactants. *2nd Mercosur Congress on Chemical Engineering and 4th Mercosur Congress on Process Systems Engineering*, Rio de Janeiro, Brasil, 2005.

National Publications (in Argentina)

Journals

B. Weiss, M. E. Berli, D. M. Campana, S. Ubal y J. Di Paolo. Stress analysis of hip separators for prediction of its implantation time. *Revista de la Sociedad Argentina de Bioingeniería (SABI Journal)*, in press.

J. Di Paolo, D. Campana, S. Ubal y C. Corvalán. Lubricación de articulaciones humanas. Biomecánica computacional. *Ciencia, Docencia y Tecnología*. UNER. Año XIII, **23**, 157-175, 2001.

In Proceedings

J. Di Paolo, D. M. Campana, M. E. Berli, E. Fries y J. Insfrán. Análisis computacional preliminar para el desarrollo de un mecanismo pulsátil de impulsión sanguínea a frecuencias no fisiológicas. *Mecánica Computacional XXIX*, 6509-6528, 2010.

C. Fresno Rodríguez, S. Ubal, D. M. Campana, M. E. Berli y J. Di Paolo. Estudio comparativo del flujo en arterias parcialmente obstruidas con la presencia de un catéter angioplástico: catéter finito vs. Catéter infinito. *Mecánica Computacional XXVI*, 3394-3409, 2007.

J. Di Paolo, M. E. Berli, D. M. Campana, S. Ubal y L. D. Cárdenes. Simulación del mecanismo de filtración del ácido hialurónico en una prótesis total de rodilla. *Actas de*

SABI-2007, 387-390, 2007.

J. Di Paolo, S. Ubal, D. M. Campana, M. E. Berli y C. Fresno Rodríguez. Predicciones numéricas de sobreestimaciones de presión en mediciones de flujo arterial con catéteres. *Actas de SABI-2007*, 351-354, 2007.

S. Ubal, C. Fresno, F. Bregains, M. E. Berli, D. M. Campana y J. Di Paolo. Análisis de la influencia de la frecuencia cardíaca sobre el flujo en arterias con estenosis. *Mecánica Computacional XXV*, 783-794, 2006.

D. M. Campana and F. A. Saita. Inestabilidad de Rayleigh en capilares en presencia de surfactantes. Efectos de la concentración e interacciones moleculares. *Mecánica Computacional XXV*, 109-132, 2006.

D. Campana y F. Saita. Efecto de la solubilidad de un surfactante sobre el proceso de inestabilidad de Rayleigh en capilares cilíndricos. *Mecánica Computacional XXIII*, 1587-1611, 2004.

D. Campana y F. Saita. Análisis de los Efectos de inercia sobre el desplazamiento de una burbuja larga en un capilar, en presencia de surfactantes solubles. *Mecánica Computacional XXII*, 57-71, 2003.

D. Campana, J. Di Paolo, C. Corvalán y F. Saita. Estudio numérico del efecto de agentes tensioactivos sobre el proceso de inestabilidad de Rayleigh en capilares. *Mecánica Computacional XXI*, 86-104, 2002.

D. Campana, C. Corvalán y F. Saita. El método de elementos finitos en la simulación de problemas de inestabilidad capilar. Análisis numérico para la determinación de una estrategia computacional eficiente. *Mecánica Computacional XX*, 38-45, 2001.

D. M. Campana y F. Saita. Análisis numérico de la evolución temporal de interfases líquido – gas en chorros de fluidos y en recubrimientos líquidos sobre superficies cilíndricas. *Mecánica Computacional XIX*, 85, 2000.

S. Ubal, D. M. Campana, C. M. Corvalán y J. Di Paolo. Interferencia del catéter angioplástico en el flujo a través de una arteria coronaria con estenosis. *Mecánica Computacional XIX*, 79, 2000.

Presentations

Internationals and Latin American

D. M. Campana, S. Ubal, M. D. Giavedoni and F. A. Saita. A numerical study on the stability of the steady displacement of a liquid plug along a small conduit. 8th *World Congress on Computational Mechanics and 5th European Congress on Computational Methods in Applied Sciences and Engineering (WCCM8-ECCOMAS 2008)*. Venecia (Italia), 2008.

Diego M. Campana and Fernando A. Saita. Numerical analysis of Rayleigh instability in capillary tubes in the presence of soluble surfactants. *Pan-American Advanced Studies Institute (PASI) on Interfacial Fluid Dynamics: From Theory to Applications*, Mar del Plata (Argentina), 2007.

Sebastián Ubal, Diego M. Campana, María Delia Giavedoni and Fernando A. Saita. Stability of the steady motion of a liquid plug in a capillary tube. *Pan-American Advanced Studies Institute (PASI) on Interfacial Fluid Dynamics: From Theory to Applications*, Mar del Plata (Argentina), 2007.

D. Campana and F. Saita. Numerical modelling of the Rayleigh instability in capillaries under the presence of soluble surfactants. *2nd Mercosur Congress on Chemical Engineering and 4th Mercosur Congress on Process Systems Engineering*, Rio de Janeiro, Brasil, 2005.

D. Campana, J. Di Paolo, C. Corvalán y F. Saita. Estudio Numérico del Efecto de Agentes Tensioactivos sobre el Proceso de Inestabilidad de Rayleigh en Capilares. *First South-American Congress on Computational Mechanics. MECOM 2002*, Paraná, Entre Ríos, República Argentina, 2002.

Diego M. Campana, Carlos M. Corvalán y Fernando A. Saita. Análisis Computacional de Problemas de Inestabilidad Capilar utilizando Diferentes Técnicas con el Método de Elementos Finitos. *VII International Seminar on Recent Advances in Fluid Mechanics, Physics of Fluids and Associated Complex Systems. Fluidos 2001*, Buenos Aires, Argentina, 2001.

J. Di Paolo, S. Ubal, D. Campana, y G. Filipowics. Análisis Numérico de Procedimientos Angioplásticos con Catéteres. *VII International Seminar on Recent Advances in Fluids Mechanics, Physics of Fluids an Associated Complex Systems. Fluidos 2001*. Buenos Aires, Argentina, 2001.

Nationals (in Argentina)

35 presentations in national meetings from 1998 to date (not listed for brevity).

Other selected activities

- *Member of the Engineering Ph.D. Academic Committee* of UNER, representing to FI-UNER, from April 2009.
- *Member of the Ms. Sc. Academic Committee* of FI-UNER, from February 2009.
- *Member of the Commission for the creation of the Engineering Ph.D.* at UNER, from February 2007 to April 2009.
- *Member of Faculty (FI-UNER) and University (UNER) Councils* as student, graduate and professor, from 1996 to 2006.

Arbitration

- Journals: Applied Mathematical Modelling (Elsevier)
- Undergraduate Thesis: 7 at the FI-UNER
- Teaching positions: 13 at the FI-UNER

Invited lectures and talks

8 talks on popularization on science and research in national meetings (not listed for brevity).