Curriculum Vitae of

Stergios Yiantsios

Chemical Engineer, M.Sc., Ph.D.

ADDRESS:

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STUDIES:

B.Sc in Chem. Eng.:	Dept. of Chem. Eng., Aristotle University of Thessaloniki, Greece, 1983.
M.Sc. in Chem. Eng:	University of California, Davis, 1986.
Ph.D. in Chem. Eng: Thesis title:	University of California, Davis, 1989. *Hydrodynamic Stability of Superposed Fluids and Thin Films.*

ACADEMIC EXPERIENCE:

03/1989- 02/1990: *Post-Doctoral Research Assistant*, Department of Chemical Engineering and Center for Low-Gravity Fluid Mechanics and Transport Phenomena, University of Colorado, USA. (Συνεργασία με τον καθηγητή R.H. Davis).

10/1991- 03/1998: *Research Assistant*, ΙΤΧΗΔ/ΕΚΕΤΑ

04/1998- 12/2001: *Associate Researcher*, ΙΤΧΗΔ/ΕΚΕΤΑ

01/2002- 09/2006: *Researcher*, ΙΤΧΗΔ/ΕΚΕΤΑ

09/2006- 07/2016: *Associate Professor*, Dept. of Chemical Engineering, A.U.Th.

07/2016 - Today: *Professor*, Dept. of Chemical Engineering, A.U.Th.

AREAS OF SCIENTIFIC AND TECHNOLOGICAL INTERESTS:

- **Transport phenomena, Numerical analysis, Colloidal Systems**

1. Interfacial flow dynamics, thin films

Free surface flows, thin-film flows, Marangoni phenomena on polymer solutions and colloidal suspensions, spinodal decomposition in polymer mixtures, emulsion flows, droplet coalescence-breakage. Analysis on the basis of stability theory and direct numerical simulations.

2. Dynamics of multiphase particle-laden flows

Analysis of flow, heat and mass transfer in particle suspensions (sedimentation, fluidization, hydraulic and pneumatic transport, rheology of dense suspensions of spherical and non-spherical particles, flow in porous media). Direct numerical simulations on the basis of the Distributed Lagrange Multiplier/Fictitious Domain Method.

3.Computational Fluid Dynamics and Parallel processing

Development of computational techniques on the basis of the finite element method, spectral and boundary integral methods). Development of algorithms for parallel processing on the basis of the MPI communication protocol and exploitation of many – core architectures (CUDA capable graphics processors).

- **Membrane processes, water treatment.**

1.Membrane fouling. Development of prediction techniques. Process development, design and optimization.

2.Membrane treatment of surface, brackish and sea water for potable water production.

3.Municipal wastewater treatment for water reuse.

4.Industrial wastewater treatment for water and materials recovery.

- **Heat Exchangers**

1.Fouling of heat exchanger surfaces by suspended solids and scaling salts.

2.Heat exchanger performance optimization

TEACHING:

• Cources taught at the Department of Chemical Engineering, A.U.Th.

- Transport Phenomena I
- Transport Phenomena II
- Chemical Engineering Laboratory I
- Introduction to computational analysis in chemical engineering with the finite element method
- Advanced Transport Phenomena (graduate course)

FELLOWSHIPS-DISTINCTIONS:

1980: Fellowship from the Foundation of State Fellowships (I.K.Y.), Greece.

1986: Fellowship from the University of California, Davis.

1987: Fellowship from the University of California, Davis.

1988: Award of Merit, Dept. of Chemical Engineering, University of California, Davis.

1995: Best Essay Award, IDA World Congress, Abu Dhabi, UAE.

1997: Best Technical Paper Presentation Award, IDA World Congress, Madrid, Spain.

2002: Invitation from G.S.R.T. in a technology transfer workshop for the presentation of the results of the project "*Development of membrane methods treatment of wastewater streams and reclamation of water and materials*", as one of the most successful projects in the P.A.V.E. program, Volos, Greece.

2006: Invitation for lecture at the Department of Chemical Engineering, University of Colorado, Boulder, USA, Sept. 2006.

2012: Invitation for lecture at the summer school "Wave Patterns and Interactions in Advection-Dominated Flows" in the frame of Marie-Curie Initial Training Network MULTIFLOW, Volos, Greece, July, 2012.

2012: Invitation for lecture at the Laboratoire FAST - UMR 7608 (UPMC-UPS-CNRS), Orsay, France, December, 2012.

2014: Invitation for lecture at the Laboratoire FAST - UMR 7608 (UPMC-UPS-CNRS), Orsay, France, January, 2014.

2014: Visiting Professor at Laboratoire FAST - UMR 7608 (UPMC-UPS-CNRS), Orsay, France, January-February, 2014.

- Reviewer for the following journals (33):

  Physics of Fluids, J. Fluid Mechanics, Physical Review-Fluids, Physical Review-E, Int. J. Multiphase Flow, J. Engineering Mathematics, Fluid Dynamics Research, Langmuir, Colloids and Surfaces-A, J. Colloid Interface Science, Chemical. Engineering Science, J. Membrane Science, Desalination, Computer Methods in Biomechanics and Bioengineering, Computers & Fluids, J. Applied Math. & Computing, Computers & Chem. Eng., Chemical Engineering Research and Design, Chemical Engineering Technology, Developments in Chem. Eng. & Minerals Processing, Desalination and Water Treatment, Water Science and Technology, Microfluidics and Nanofluidics, Surface Science, European Physical Journal, Applied Thermal Engineering, Colloid and Interface Science Communications, International Journal of Heat and Mass Transfer, International

Communications of Heat and Mass Transfer, Experimental Thermal and Fluid Science, Soft Matter, Physical Review E,Fluids

- Reviewer of research proposals (Petroleum Research Fund, Kentucky State Research Fund, Research Committee, A.U.Th.)
- About 3000 citations according to Scopus, (h-index: 28).

PUBLICATIONS IN REFEREED JOURNALS:

1: **S.G.Yiantsios** and B.G.Higgins, "Analysis of superposed fluids by the finite element method: Linear stability and flow development", *Int. J. Num. Meth. Fluids*, **7**, 247-261 (1987).

2: **S.G.Yiantsios** and B.G.Higgins, "Numerical Solution of eigenvalue problems using the compound matrix method", *J. Comput. Phys.*, **74**, 25-39 (1988).

3: **S.G.Yiantsios** and B.G.Higgins, "Linear stability of superposed fluids in plane Poiseuille flow", *Phys. Fluids*, **31**, 3225-3238 (1988).

4: **S.G.Yiantsios** and B.G.Higgins, "Rayleigh-Taylor instability in thin viscous films", *Phys. Fluids A*, **1**, 1484-1501, (1989).

5: **S.G.Yiantsios** and R.H.Davis, "On the buoyancy driven motion of a drop towards a rigid surface or a deformable interface", *J. Fluid Mech.*, **217**, 547-573 (1990).

6: **S.G.Yiantsios** and R.H.Davis, "Close approach and deformation of two viscous drops due to gravity and Van Der Waals forces", *J. Colloid. Interface Sci.*, **144**, 412-433 (1991).

7: **S.G.Yiantsios** and B.G.Higgins, "Rupture of thin films: nonlinear stability analysis", *J. Colloid. Interface Sci.*, **147**, 341-350 (1991).

8: **S.G.Yiantsios** and A.J.Karabelas, "Fouling of tube surfaces: modeling of removal kinetics", *A.I.Ch.E. J.*, **40**, 1804-1813 (1994).

9: **S.G.Yiantsios** and A.J.Karabelas, "Detachment of spherical microparticles adhering on flat surfaces by hydrodynamic forces", *J. Colloid Interface Sci.*, **176**, 74-85 (1995).

10: A.J.Karabelas, **S.G.Yiantsios**, B.Thonon, and J.M.Grillot, "Liquid side fouling of heat exchangers. An integrated R & D approach for conventional and novel designs", *Applied Thermal Eng.*, **17**, 727-737 (1997).

11: A.S.Kyriakides, **S.G.Yiantsios**, and A.J.Karabelas, "A study of colloidal particle aggregation by light scattering techniques", *J. Colloid Interface Sci.*, **195**, 299-306 (1997).

12: **S.G.Yiantsios** and A.J.Karabelas, "The effect of gravity on the deposition of micron-sized particles on smooth surfaces", *Int. J. Mult. Flow*, **24**, 283-293 (1998).

13: **S.G.Yiantsios** and A.J.Karabelas, "The effect of colloid stability on membrane fouling", *Desalination*, **118**, 143-152 (1998).

14: M. Rumyantsev, A. Shauly, **S.G.Yiantsios**, D.Hasson, A.J.Karabelas, and R.Semiat, "Parameters affecting the properties of dynamic membranes formed by Zr hydroxide colloids", *Desalination*, **131**, 189-200 (2000).

15: A.J.Karabelas, **S.G.Yiantsios**, Z.Metaxiotou, N.Andritsos, A.Akiskalos, G.Vlachopoulos, and S.Stavroulias. "Water and materials recovery from fertilizer industry acidic effluents by membrane processes", *Desalination*, **138**, 93-102 (2001).

16: **S.G.Yiantsios** and A.J.Karabelas, "An experimental study of humic acid and powdered activated carbon on UF membranes and their removal by backwashing ", *Desalination*, **140**, 195-209 (2001).

17: **S.G.Yiantsios** and A.J.Karabelas, "An assessment of the Silt Density Index based on RO Membrane Colloidal Fouling experiments with Iron Oxide", *Desalination*, **151**, 229-238 (2002).

18: N.Andritsos, **S.G.Yiantsios** and A.J.Karabelas, "Calcium Phosphate scale formation from simulated milk ultrafiltrate solutions", *IChemE Transactions Part C - Food and Bioproducts Processing*, **180**, 223-230 (2002).

19: **S.G.Yiantsios** and A.J.Karabelas, "Deposition of micron-sized particles on flat surfaces: effects of hydrodynamic and physicochemical conditions on particle attachment efficiency", *Chem. Eng. Sci.*, **58**, 3105-3113 (2002).

20: O.Santos, T.Nylander, R.Rosmaninho, G.Rizzo, **S.Yiantsios**, N.Andritsos, A.Karabelas, H.Muller-Steinhagen, L.Melo, L.Boulange-Petermann, C.Gabet, A.Braem, C.Tragarth, and M.Paulsson, "Modified stainless steel surfaces targeted to reduce fouling- Surface characterization", *J. Food Eng.*, **64**, 63-79 (2004).

21: C.P.Koutsou, **S.G.Yiantsios**, and A.J.Karabelas, "Numerical simulation of the flow in a plane-channel containing a periodic array of cylindrical turbulence promoters", *J. Membrane Sci.*, **231**, 81-90 (2004).

22: **S.G.Yiantsios**, D.Sioutopoulos, and A.J.Karabelas, "Colloidal fouling of RO membranes: an overview of key issues and efforts to develop improved prediction techniques", *Desalination.*, **183**, 257-273, (2005).

23: K.Katsoufidou, **S.G.Yiantsios**, and A.J.Karabelas, "A Study of Ultrafiltration Membrane Fouling by Humic Acids and Flux Recovery by Backwashing: Experiments and Modeling", *J. Membrane Sci.*, **266**, 40-50, (2005).

24: **S.G. Yiantsios**, "An application of domain decomposition methods with non-conforming spectral element/Fourier expansions for the incompressible Navier-Stokes equations", *Computers and Fluids*, **35**, 1302-1315, (2006).

25: **S.G. Yiantsios** and B.G.Higgins, "Marangoni flows during drying of colloidal films", *Phys. Fluids*,**18**, 082103, (2006).

26: **S.G. Yiantsios**,"Plane Poiseuille flow of a sedimenting suspension of Brownian hard-sphere particles: Hydrodynamic stability and direct numerical simulations", *Phys. Fluids*,**18**, 054103, (2006).

27: K. Katsoufidou, **S.G. Yiantsios**, and A.J. Karabelas, "Experimental study of ultrafiltration membrane fouling by sodium alginate and flux recovery by backwashing**,**. *J. Membrane Sci.*, **300**, 137-146, (2007).

28: Ch. Tzotzi. T. Pahiadaki, **S.G. Yiantsios**, A.J. Karabelas, and N. Andritsos, "A study of CaCO3 scale formation and inhibition in RO and NF membrane processes", J. Membrane Sci., **296**, 171-184, (2007).

29: C.P. Koutsou, **S.G. Yiantsios**, and A.J. Karabelas "Direct numerical simulation of flow in spacer-filled channels: Effect of spacer geometrical characteristics" *J. Membrane Sci*., **291**, 53-69, (2007).

30: R. Rosmaninho, O.Santos, T. Nylandeer, M. Paulsson, M. Beuf, T. Benezech, **S.G. Yiantsios**, N. Andritsos, A.J. Karabelas, G. Rizzo, H. Muller-Steinhagen, and L.F. Melo, "Modified stainless steel surfaces targeted to reduce fouling - Evaluation of fouling by milk components", *J. Food Eng.*,**80**, 1176-1187, (2007).

31: K. Katsoufidou, **S.G. Yiantsios**, and A.J. Karabelas, "An experimental study of UF membrane fouling by humic acid and sodium alginate solutions: the effect of backwashing on flux recovery", *Desalination*, **220**, 214-228, (2007).

32: S.T. Mitrouli, **S.G. Yiantsios**, A.J. Karabelas, M. Mitrakas, M. Follesdal and P. Kjolseth, "Pretreatment for desalination of seawater from an open intake by dual-media filtration:Pilot testing and comparison of two different media", *Desalination*, **220**, 24-37, (2007).

33: D. Joksimovic, D.A. Savic, G.A. Walters, D. Bixio, K. Katsoufidou, **S.G. Yiantsios**, "Development and validation of system design principles for water reuse systems", *Desalination*, **218**, 142-153, (2008).

34: S.T. Mitrouli, A.J. Karabelas, **S.G. Yiantsios**, and P. Kjolseth, "New granular materials for dual-media filtration of seawater: Pilot testing", *Separation Purification Tech.*,**65**, 147-155, (2009).

35: C.P. Koutsou, **S.G. Yiantsios**, and A.J. Karabelas "A numerical and experimental study of mass transfer in spacer-filled channels: Effects of spacer geometrical characteristics and Schmidt number" *J. Membrane Sci*., **326**, 234-251, (2009).

36: D.Sioutopoulos, **S.G.Yiantsios**, and A.J.Karabelas, "Relation between fouling characteristics RO and UF membranes in experiments with colloidal organic and inorganic species", *J. Membrane Sci*., **350**, 62-82, (2010).

37: **S.G. Yiantsios** and B.G. Higgins, "A mechanism of Marangoni instability in evaporating thin viscous films due to soluble surfactant", *Phys. Fluids,* **22**, 022102, (2010).

38: D.C. Sioutopoulos, **S.G. Yiantsios**, and A.J.Karabelas, "Organic fouling of RO membranes: Investigating the correlation of RO and UF fouling resistances for predictive purposes", *Desalination*, **261** , 272-283, (2010).

39: K.Katsoufidou,, D.C. Sioutopoulos, **S.G. Yiantsios**, and A.J.Karabelas, "UF membrane fouling by mixtures of humic acids and sodium alginate Fouling mechanisms and reversibility" *Desalination*, **264** , 220-227, (2010).

40: E. Papista, D. Dimitrakis, and **S.G. Yiantsios.** "Direct numerical simulation of incipient sediment motion and hydraulic conveying",*I&E C Research,* **50**, 630-638, (2011).

41: **S.G. Yiantsios** "On the Distributed Lagrange Multiplier/Fictitious Domain Method for rigid-particle-laden flows: a proposition for an alternative formulation of the Lagrange multipliers", *Int. J. Numer. Meth. Fluids*, **70**, 1027-1047, (2012).

42: S.K. Serpetsi and **S.G.Yiantsios** "Stability characteristics of solutocapillary Marangoni motion in evaporating thin films", *Phys. Fluids* **24**, 122104, (2012)

43: **S.G.Yiantsios,** S.K.Serpetsi, F.Doumenc, and B.Guerrier, **"**Surface deformation and film corrugation during drying of polymer solutions induced by Marangoni phenomena", *Int. J. Heat Mass Transfer*, **89**, 1083–1094, (2015).

44: P.Saliakellis and **S.G.Yiantsios, "**Macroscopic characteristics of heavy particle resuspension obtained from direct numerical simulations of pressure driven channel flow", *Int. J. Multiphase Flow*, , **84**, 188–203, (2016).

45: G.A.Zoumpouli and **S.G.Yiantsios**, "Hydrodynamic effects on phase separation morphologies in evaporating thin films of polymer solutions", *Phys. Fluids*, **28**, 82108, (2016).

46: I. Kouroudis, P.Saliakellis and **S.G.Yiantsios, "**Direct numerical simulation of natural convection in a square cavity with uniform heat fluxes at the vertical sides: Flow structure and transition", *Int. J. Heat Mass Transfer*, **115**, 428-438, (2017).

47: N. Charitou, L I. Kolitsi, M. Stoukides and **S. G. Yiantsios, "**An Integrated Model of Electrochemical Cells with Co-ionic Solid Electrolyte Membranes: Coupling of Membrane Charge-Carrier Transport and Multiple Reactions at the Triple-Phase Boundaries", *Ind. Eng. Chem. Res.*, **58** (37), 17277-17288, (2019).

48: L I. Kolitsi and **S. G. Yiantsios, "**Effects of artery size on the hydrodynamic diffusivity of red cells and other contained particles", *Phys. Rev. Fluids*, **4**, 113103, (2019).

49: L I. Kolitsi and **S. G. Yiantsios, "**Transport of nanoparticles in magnetic targeting: Comparison of magnetic, diffusive and convective forces and fluxes in the microvasculature, through vascular pores and across the interstitium", *Microvasc. Res*, **130**, 104007, (2020).