

CURRICULUM VITAE

G. Gilou Agbaglah, Ph.D.

Assistant Professor
Wayne State University
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PRESENT POSITION

Assistant Professor, Mechanical Engineering August 2019 - Present
Wayne State University Detroit, MI, USA

EDUCATION

Ph.D., Mechanical Engineering October 2008 - Septembre 2012
Université Pierre et Marie Curie Paris, France

M.S., Mechanical Engineering, with honours September 2007 - September 2008
Université Pierre et Marie Curie Paris, France
· Focus: Fluid dynamics

M.S., Mathematics, with honours September 2005 - September 2006
Université de Lomé Lomé, Togo
· Focus: Algebraic structures and numerical optimization

B.S., Mathematics, with honours September 2002 - June 2005
Université de Lomé Lomé, Togo
· Minor: Mathematics

RESEARCH EXPERIENCE

Postdoctoral Fellow 2016 - 2019
University of Ottawa (Department of Mechanical Engineering) Ottawa, ON, CANADA
· Direct numerical simulations of transition mechanisms in flows past a square cylinder and aircraft wings (using spectral element code *Nek5000*).
· Algebraic Multigrid preconditioner for the Poisson solver in Discontinuous Galerkin Method.

Postdoctoral Fellow 2014 - 2016
Cornell University (Sibley School of Mechanical and Aerospace Engineering) Ithaca, NY, USA
· CFD formulation and analysis of air-blast atomization.
· Surface tension effects on a turbulent interface in two phase flows.

Postdoctoral Fellow 2012 - 2014
University of Michigan (Physics Department) Ann Arbor, MI, USA
· Numerical and theoretical investigations of the impact of a drop on the same liquid.
· Applied the fingering instability theory to the drop impact problem.

Graduate Research Assistant 2008 - 2012
Université Pierre et Marie Curie Paris, France
· Advised by Prof. Stéphane Zaleski and Dr. Christophe Josserand
· Studied the capillary retraction of a thin liquid sheet (asymptotic theory and simulations)
· Performed linear stability analysis of the fingering instabilities of a thin liquid sheet
· Applied a Red-Black Gauss-Seidel smoothing in multigrid for solving Poisson equation (in the *Gerris* code)
· CFD simulations of atomizing coaxial gas-liquid jets.
· Errors estimation of the parallel version of the Poisson solver in the *Gerris* code.

TEACHING EXPERIENCE

<i>Instructor</i> <i>Wayne State University</i> · 46h, 30 students · <i>Numerical Methods for Engineering Applications</i>	2019 - Present Detroit, USA
<i>Instructor</i> <i>Wayne State University</i> · 46h, 30 students · <i>Introduction to Multiphase Flows</i>	2018 - Present Detroit, USA
<i>Instructor</i> <i>University of Ottawa</i> · 36h, 22 students · <i>Multiphase flows</i>	2018 - 2019 Ottawa, Canada
<i>Teaching assistant</i> <i>Université Pierre et Marie Curie</i> · 4×30h, 60 students · <i>Introduction to fluid dynamics</i>	2008 - 2012 Paris, France
<i>Instructor</i> <i>Engineering school SUPII MECAVENIR</i> · 30h, 20 students · Taught mathematics and mechanical engineering courses · Practiced interactive teaching methods to motivate and engage students	2008 - 2009 Paris, France
<i>High school teacher</i> <i>Lycée ALPHA</i> · 9×40h, 35 students · Taught mathematics and physics courses	2006 - 2007 Lomé, Togo
<i>Tutor</i> <i>Université Pierre et Marie Curie</i> · Tutored individual students in fluids mechanics and mathematics	2008 - 2011 Paris, France

SELECTED HONORS AND AWARDS

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- 2009 paper: “Numerical Simulation Of Droplets, Bubbles And Waves: State Of The Art” (Fluid Dynamics Research. Vol. 41, pp 065001-065045, (2009)) selected as one of the five “Research Highlights of 2009” in Fluid Dynamics Research.
 - Excellence graduate fellowship MESR, September 2008, Université Pierre et Marie Curie.
 - Valedictorian of the Université de Lomé, Dept. of Mathematics, September 2006.

SERVICE AND OUTREACH

<i>ILASS conference</i> · Session chair	May 2015
<i>Journal reviewer</i> · Physics of Fluids · Journal of Fluid Mechanics · Comptes rendus Mecanique · Journal of Propulsion and Power	2010-Present
<i>Volunteer</i> <i>Gerris code debugging group</i> · Met weekly with a group of 4 faculty members to work on the bugs posted on the <i>Gerris</i> code mailing list.	2009 - 2012 Université Pierre et Marie Curie

2004 - 2006

Tutor of female students in mathematics

Un

iversité de Lomé

- Tutored a group of female students in the department of Mathematics to help promote Togolese females in mathematics.

ADVISOR/MENTOR FOR STUDENT PROJECTS

Research project

- Numerical simulations of a falling drop. Comparion between *Gerris*, *Fluent* and Experiments. Financed by PSA Peugeot Citroën Automobile Company, France.

Students under tutelage

- Wassila Chibane - Master's (2012), Université Pierre et Marie Curie.
- Remi Goulet - Master's (2012), Université Pierre et Marie Curie.
- Benjamin Seguin -Undergraduate (2018), University of Ottawa.

REFEREED JOURNAL ARTICLES

- **G. Agbaglah** and C. Mavriplis (2019) "Three-dimensional wakes behind cylinders of square and circular cross-section: early and long-time dynamics", *J. Fluid Mech*, 2019, doi:10.1017/jfm.2019.265.
- N. Chalmers, **G. Agbaglah**, M. Chrust and C. Mavriplis (2019) "A Parallel hp-adaptive high order discontinuous Galerkin method for the incompressible Navier-Stokes equations", *Journal of Computational Physics: X*, Volume 2, 2019, 100023.
- **G. Agbaglah** and C. Mavriplis (2017) "Computational analysis of physical mechanisms at the onset of three-dimensionality in the wake of a square cylinder", *J. Fluid Mech.* vol. 833, pp. 631-647.
- **G. Agbaglah**, R. Chiodi and O. Desjardins (2016) "Numerical simulation of the initial destabilization of an air-blasted liquid layer", *J. Fluid Mech.* Vol. 812, pp. 1024-1038.
- **G. Agbaglah**, M.-J. Thoraval, S. T. Thoroddsen, L. V. Zhang, K. Fezzaa, R. D. Deegan (2015) "Drop impact into a deep pool: vortex shedding and jet formation", *J. Fluid Mech.* 764, R1 doi:10.1017/jfm.2014.723.
- **G. Agbaglah**, R. D. Deegan (2014) "Growth and instabilty of the liquid rim in the crown splash regime", *J. Fluid Mech.* Vol. 752, pp. 485-496.
- **G. Agbaglah**, C. Josserand and S. Zaleski (2013) "Longitudinal instability of a liquid rim", *Phys. Fluids*, 25: 022103.
- L. Gordillo, **G. Agbaglah**, L. Duchemin, C. Josserand (2011) "Asymptotic behavior of a retracting two-dimensional fluid sheet", *Phys. Fluids* 23, 122101.
- **G. Agbaglah**, S. Delaux, D. Fuster, J. Hoepffner, C. Josserand, S. Popinet, P. Ray, R. Scardovelli and S. Zaleski (2011) "Parallel simulation of multiphase flows using octree adaptivity and the volume-of-fluid method", *C. R. Acad. Sci. Paris*, 339, Pages 194-207.
- D. Fuster, **G. Agbaglah**, C. Josserand, S. Popinet and S. Zaleski (2009) "Numerical Simulation Of Droplets, Bubbles And Waves: State Of The Art", *Fluid Dynamics Research.* Vol. 41, pp 065001-065045.

REFEREED CONFERENCE PROCEEDINGS

- **G. Agbaglah**, C. Mavriplis (2017) "Shear layer instability of the wake of a square cylinder", 25th Annual CFDSC Conference, Windsor, ON, Canada.
- **G. Agbaglah**, C. Mavriplis (2016) "A Numerical Examination of the Onset of Three-Dimensional Instability in the Wake of a Square Cylinder", 24th Annual Conference of the CFD Society of Canada, Kelowna, BC, Canada.

- R. Chiodi , **G. Agbaglah**, O. Desjardins (2016), “Validation and analysis of air-blast atomization simulations”, ILASS Americas 28th Annual Conference on Liquid Atomization and Spray Systems, Dearborn, MI, May 2016.
- **G. Agbaglah**, O. Desjardins (2015) “Numerical simulations of air-blast atomization of a liquid layer”, ILASS Americas 27th Annual Conference on Liquid Atomization and Spray Systems, Raleigh, NC, May 2015.
- **G. Agbaglah**, C. Josserand and S. Zaleski (2011) “Numerical simulations of the liquid fingers formation”, *Congrès Français de Mécanique*, Besançon, France.
- **G. Agbaglah**, C. Josserand and S. Zaleski (2009) “Numerical simulations of a retracting liquid sheet”, *Congrès Français de Mécanique*, Marseille, France.

NON-REFEREED CONFERENCE PROCEEDINGS AND PRESENTATIONS

- S. Wang, **G. Agbaglah**, O. Desjardins (2016) “Computational modeling of droplet coalescence in complex geometries”, ICMF 2016 International Conference on Multiphase Flow Firenze, Italy, May 22 - 27, 2016.
- **G. Agbaglah**, C. Mavriplis (2016) “Computational study of physical mechanisms at the onset of three-dimensional instability in the wake of a square cylinder”, 5th Nek5000 Users & Developers Meeting, Cambridge, MA, USA.
- **G. Agbaglah**, O. Desjardins (2015) “Numerical simulations of air-blast atomization of a liquid layer”, 68th Annual Meeting of the APS Division of Fluid Dynamics, Boston, MA, USA.
- **G. Agbaglah**, R. Deegan (2014) “Growth and instability of the liquid rim in the crown splash regime”, 33th Dynamics Days US, Atlanta, GA, USA.
- **G. Agbaglah**, R. Deegan (2013) “Drop impact: regular crown splash toward a *two jets* regime”, Mathematics of splashing, ICMS, Edinburgh, Scotland.
- **G. Agbaglah** (2013) “Numerical simulations of atomizing coaxial gas-liquid jets”, *Journée scientifique du ANR VAA et MODEMI*, Rouen, France.
- **G. Agbaglah**, S. Zaleski (2012) “An aerodynamic mechanism for the splashing-up of the ejecta sheet in high-velocity impacts”, 65th Annual Meeting of the APS Division of Fluid Dynamics, San Diego, CA, USA.
- **G. Agbaglah**, C. Josserand and S. Zaleski (2011) “Longitudinal instability of a liquid rim”, 64th Annual Meeting of the APS Division of Fluid Dynamics, Baltimore, MD, USA.
- **G. Agbaglah**, C. Josserand and S. Zaleski (2011) “3D Numerical simulations of a liquid rim: liquid finger formation”, Gerris Users Meeting, Paris, France.
- **G. Agbaglah**, C. Josserand and S. Zaleski (2010) “Capillary retraction of a liquid sheet”, 63st Annual Meeting of the APS Division of Fluid Dynamics, Long Beach, California, USA.
- **G. Agbaglah**, C. Josserand and S. Zaleski (2010) “Asymptotic behavior of a retracting two-dimensional fluid sheet”, Hydrodynamic instabilities and non-linear waves Meeting, Peyresq, France.

INVITED SEMINARS AND LECTURES

- G. Agbaglah, (2017) “Impact of a single drop on the same liquid: formation, growth and disintegration of jets.”, Dept. of Mathematics & Stats, University of Ottawa, Ottawa, CANADA.
- G. Agbaglah, (2017) “Impact of a single drop on the same liquid: formation, growth and disintegration of jets.”, Département de Génie Mécanique, Polytechnique Montréal, Montréal, CANADA.
- G. Agbaglah, (2015) “Two-Dimensional Thin Liquid Sheet Dynamics”, Sibley School of Mechanical and Aerospace Engineering, Cornell University, NY, USA
- G. Agbaglah, (2014) “Impact of a single drop on the same liquid: formation, growth and disintegration of jets”, Department of Mathematical Sciences, New Jersey Institute of Technology, NJ, USA

- G. Agbaglah, (2014) “Liquid rim instabilities” Sibley School of Mechanical and Aerospace Engineering, Cornell University, NY, USA

PROFESSIONAL AND HONOR SOCIETIES

- American Physical Society (APS)
- Institute for Liquid Atomization and Spray Systems (ILASS)
- Association Française de Mécanique (AFM)