Jeremy Oliver Marston, Ph.D.

Dept. Chemical Engineering
Texas Tech University
Lubbock, TX 79409-3121
6th St & Canton Ave
United States

Email: jeremyom@hotmail.com
jeremy.marston@ttu.edu

MAJOR ACHIEVEMENTS

- 30 scientific publications.
- Featured in Nature Physics, New Scientist, *Focus on Fluids* in Journal of Fluid Mechanics and twice on front-cover of Journal of Fluid Mechanics.
- Prize winner in APS Gallery of Fluid Motion
- Awarded SGD 370,000 for previous research projects in Singapore.
- Complete set-up of new research laboratory in Saudi Arabia.
- Complete set-up of high-speed imaging facility in Singapore.

PRINCIPAL RESEARCH AREAS

- Hydrodynamic drag reduction.
- Water-entry problems**.**
- Squeeze flows and cavitation.
- Granular impact phenomena.
- Liquid drop – powder interaction.
- Coating flows and instability

PREVIOUS APPOINTMENTS

2009-2014: Research Scientist, King Abdullah University of Science and Technology, KSA

- Initiated new, collaborative research projects in experimental fluid dynamics, multilayer coating applications and granular impact phenomena.
- Teaching duties for courses in Fluid Mechanics, designing experimental setups for experiment-led course.
- Primary supervisor and Principal Investigator for 7 postgraduate students at MSc and PhD level.
- Responsible for coordinating setup of new research laboratory for high-speed imaging and experimental fluid mechanics with budget of $5 million, overseeing budgets, installation and commissioning. Liaise with project management team and procurement on equipment issues.
- Writing technical reports, grant reviews and manuscripts for journal publications.

2008 - 2009: Research Fellow, A-STAR Institute of Chemical and Engineering Sciences, Singapore

- Coordinated setup of new high-speed imaging facilities within the institute.
- Principal investigator of research project: “High-speed imaging of collision dynamics in wet particulate systems”.
- Successfully initiated collaborative research project with local (National University of Singapore) and overseas (University of Birmingham, UK) institutions.
- Secured grant application funding for project to the sum of SGD 370,000.

EDUCATION

2004 – 2007: Doctor of Philosophy in Chemical Engineering, University of Birmingham, UK

- Thesis title: "Hydrodynamic assist, hysteresis and non-uniqueness of instabilities in curtain coating".
- Development of new experimental methods for analysis of instability in curtain coating flow.
- High-speed imaging of granular jet formation.
- Collaborative projects between mathematics (modeling) and engineering (experimental).
- Tutor for undergraduate courses in the Department of Chemical Engineering: Fluid flow, Heat transfer, Thermodynamics, Introduction to MATLAB.
- Tutor for undergraduate courses in the School of Mathematics: Mathematics for Engineers, Applied & Computational Mathematics and Probability & Statistics.

2000 – 2004: Master of Science in Mathematical Science, University of Birmingham, UK

- Class I with honors.
- Dissertation title: "Trajectory and stability of spiraling liquid jets".
- Mathematical modeling of liquid jet trajectory and break-up (joint project with Norsk Hydro, Norway).
- Taught modules from Applied, Pure and Statistical Mathematics.

INVITED TALKS

- ***"Drop impact onto powder surfaces"***, *KAUST Days in OCCAM, Oxford, UK 2012.*
- ***"Experiments on drop impact onto hydrophobic powder: freezing drop oscillations"***, *Workshop on the Micromechanics of Wetting & Coalescence, Oxford, UK, 2012.*

PUBLICATIONS

SUBMITTED:

1. Henry, D., Uddin, J., Marston, J.O., Thoroddsen S.T., Thompson, J.T. & Blyth, M.G. (2014)
Multi-layer film flow down an incline plane: An experimental investigation
Submitted to Exp. Fluids., March 2014.

PUBLISHED:

30. Marston, J.O., Thoroddsen, S.T., Thompson, J., Blyth, M., Henry, D. & Uddin, J. (2014)
Experimental investigation of hysteresis in the break-up of liquid curtains
Chem. Eng. Sci., 117, 248-263.

29. Marston, J.O. & Thoroddsen, S.T. (2014)
Ejecta evolution during cone impact
J. Fluid Mech., 752, 410-438.

28. Marston, J.O., Riker, P.W. & Thoroddsen, S.T. (2014)
Generation of ultrasound during tape peeling
Sci. Reports, 4, 4326.

27. Mansoor, M.M., Marston, J.O., Vakarelski, I.U. & Thoroddsen, S.T. (2014)
Water entry without surface seal: extended cavity formation
J. Fluid Mech., 743, 295-326.

26. Mansoor, M.M., Uddin, J., Marston, J.O. & Thoroddsen, S.T. (2014)
The onset of cavitation during the collision of a sphere with a wetted surface
Exp. Fluids, 55, 1648.

25. Marston, J.O., Zhu, Y., Vakarelski, I.U. & Thoroddsen, S.T. (2013)
Freezing drops with powders
Phys. Fluids, 25, 091107 (Gallery of Fluid Motion issue)

24. Vakarelski, I.U., Chan, D.Y.C., Marston, J.O. & Thoroddsen, S.T. (2013)
Dynamic air layer on textured superhydrophobic surfaces
Langmuir, 29, 11074-11081.

23. Vakarelski, I.U., Marston, J.O. & Thoroddsen, S.T. (2013)
Foam-film-stabilized liquid bridge networks in evaporative lithography and wet granular matter
Langmuir, 29, 4966-4973.

22. Marston, J.O., Mansoor, M.M. & Thoroddsen, S.T. (2013)
Impact of granular drops
Phys. Rev. E. 88, 010201.

21. Lee, S., Li, E-Q., Marston, J.O, Bonito, A. & Thoroddsen, S.T. (2013)
Leaping shampoo glides on a lubricating air layer
Phys. Rev. E. 87, 061001.

20. Marston, J.O., Sprittles, J.E., Zhu, Y., Li, E.Q., Vakarelski, I.U. & Thoroddsen, S.T. (2013)
Drop spreading and penetration into pre-wetted powders
Powder Tech. 239, 128-136.

19. Vakarelski, I.U., Teramoto, N., McNamee, C.E., Marston, J.O. & Higashitani, K. (2013)
Ionic enhancement of silica surface nanowear in electrolyte solutions
Langmuir 28(46), 16072-16079.

18. Marston, J.O., Vakarelski, I.U. & Thoroddsen, S.T. (2012)
Sphere impact and penetration into wet sand
Phys. Rev. E, 86, 020301(R).

17. Vakarelski, I.U., Patankar, N.A., Marston, J.O., Chan, D.Y.C. & Thoroddsen, S.T. (2012)
Stabilization of Leidenfrost Vapour Layer by Textured Superhydrophobic surfaces
Nature 489, 274-277.

16. Uddin, J., Marston, J.O. & Thoroddsen, S.T. (2012)
Squeeze flow of a Carreau fluid induced by sphere impact
Phys. Fluids 24, 073104.

15. Marston, J.O., Zhu, Y., Vakarelski, I.U. & Thoroddsen, S.T. (2012)
Deformed liquid marbles: Freezing drop oscillations with powders *(featured in New Scientist, Winner APS GFM)*
Powder Tech. 228, 424-428.

14. Marston, J.O., Li, E.Q. & Thoroddsen, S.T. (2012)
Evolution of fluid-like granular ejectas generated by sphere impact *(front cover & Focus on Fluids, issue 704)*
J. Fluid Mech. 704, 5-36.

13. Marston, J.O., Vakarelski, I.U. & Thoroddsen, S.T. (2012)
Cavity formation by the impact of Leidenfrost spheres *(front cover, issue 699)*
J. Fluid Mech. 699, 465-488.

12. Marston, J.O., Vakarelski, I.U. & Thoroddsen, S.T. (2011)
Bubble entrapment during sphere impact onto quiescent liquid surfaces
J. Fluid Mech. 680, 660-670.

11. Vakarelski, I.U., Marston, J.O., Chan, D.Y.C. & Thoroddsen, S.T. (2011)
Drag reduction by Leidenfrost vapour layers
Phys. Rev. Lett. 106, 214501.

10. Marston, J.O., Yong, W., Ng, W.K., Tan, R.B.H. & Thoroddsen, S.T. (2011)
Cavitation Patterns formed during the rebound of a sphere from a wetted surface
Exp. Fluids 50(3), 729-746.

9. Marston, J.O., Thoroddsen, S.T., Ng, W.K. & Tan, R.B.H. (2010)
Experimental study of liquid drop impact onto a powder surface
Powder Tech. 203(2), 223-236.

8. Marston, J.O., Yong, W. & Thoroddsen, S.T. (2010)
Direct verification of the lubrication force on a sphere travelling through a viscous film upon approach to a solid wall
J. Fluid Mech. 655, 515-526.

7. Marston, J.O., Hawkins, V., Simmons, M.J.H. & Decent, S.P. (2009)
Influence of surfactant upon air entrainment hysteresis in curtain coating
Exp. Fluids 46(3), 549-558.

6. Marston, J.O. & Thoroddsen, S.T. (2008)
Apex Jets from impacting drops
J. Fluid Mech. 614, 293-302.

5. Marston, J.O., Simmons, M.J.H., Seville, J.P.K., Cheun, Y-V., Ingram, A. & Decent, S.P. (2008)
Granular jetting from solid sphere entry into aerated and fluidised beds
Phys. Fluids. 20, 023301.

4. Marston, J.O., Decent, S.P. & Simmons, M.J.H. (2008)
Experimental evidence of non-unique solutions to a steady non-linear coating flow
IMA J. Appl Math. 73, 698-702.

3. Marston, J.O., Simmons, M.J.H. & Decent, S.P. (2007)
Influence of viscosity and impingement speed on intense hydrodynamic assist in curtain coating
Exp. Fluids 42(3), 483 - 488.

2. Marston, J.O., Decent, S.P. & Simmons, M.J.H. (2006)
Hysteresis and non-uniqueness in the speed of the onset of instability in curtain coating
J. Fluid Mech. 569, 349 - 363.

1. Marston, J.O., Simmons, M.J.H., Decent, S.P. & Kirk, S.P. (2006)
Influence of the flow field in curtain coating onto pre-wet substrates
Phys. Fluids 18, 112102.