Curriculum Vitae

Mark M Sussman

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General Information

University address: Applied Mathematics
Department of Mathematics
College of Arts and Sciences
1017 Academic Way, 208 Love Building
Florida State University
Tallahassee, Florida 32306-4510
Phone: 412-818-9932; Fax: 850-644-4053

E-mail address: msussman@fsu.edu
sussman@math.fsu.edu

Web site: http://www.math.fsu.edu/~sussman

Professional Preparation

1994   Ph.D., University Of California-Los Angeles. Major: Mathematics.
Supervisor: Stanley Osher.

Sussman, M. (1994). *A Level Set Approach for Computing Solutions to Incompressible Two-Phase Flow*. Unpublished doctoral dissertation, University Of California-Los Angeles. Retrieved from http://www.math.ucla.edu/applied/cam/, UCLA CAM REPORT 94-13.

1989   Masters, University of California, Los Angeles. Major: Mathematics.

1986   BS, San Diego State University. Major: Applied Mathematics. *summa cum laude*.

Nondegree Education and Training

1996–1999   Visiting research assistant professor, University of California, Davis, Davis, CA; mentor: Elbridge Gerry Puckett.

1994–1996   Postdoc, Lawrence Livermore National Laboratory, Livermore, CA, mentor: John Bell.

Professional Experience

2016–present	Associate, FSU Geophysical Fluid Dynamics Institute, Florida State University.
2010–present	Professor, Applied Mathematics, Florida State University.
2018	Consultant, Sandia National Laboratory.
2011	consultant, Sandia National Laboratory. numerical simulation of diesel injectors. Atomization and spray.
2009–2011	consultant, United Technologies Research Corporation. Develop algorithms for simulating atomization and spray.
2005–2010	Associate Professor, Mathematics, Florida State University.
2007	consultant, Science Application International Corporation. Code enhancements to NFA.
1999–2005	Assistant Professor, Mathematics, Florida State University.

Honors, Awards, and Prizes

Named Professor: Christopher Hunter Professor of Mathematics, 2018-2021, Florida State University (2018). ($21,000).

Tannasawa Award, ICLASS (International Conference on Liquid Atomization and Spray Systems) paper at Heidelberg (2015). ($2,000).

Journal of Chemical Engineering Japan outstanding paper award, http://www.scej.org/jcej/outstanding.html (2012).

Computational Mechanics Achievement Award, Japan Society of Mechanical Engineers, Computational Mechanics Division 2007 (2007).

Fluid and particle processing award, society of chemical engineering, Japan, society of chemical engineering, Japan (2003).

Current Membership in Professional Organizations

American Physical Society

Teaching

Courses Taught

Numerical Analysis I (MAD3703)

Calculus with Analytic Geometry III (MAC2313)
Directed Individual Study (MAT4906)
Numerical Solution of Partial Differential Equations I (MAD5738)
Numerical Analysis II (MAD4704)
Numerical Solution of Partial Differential Equations II (MAD5739)
Calculus with Analytic Geometry II (MAC2312)
Advanced Seminar in Scientific Computing (MAD6939)
Mathematical Modeling (MAP4103)
Candidacy Prep (MAT6908)
Cav. & Fluid Struct. Interact (MAT5907)
Elementary Partial Differential Equations I (MAP4341)
Honors Work (MAT4934)
Networks/Data Assim/Level sets (MAD6939)
Opt. Numerical Methods/Engines (MAT5907)
Directed Individual Study (MAT6908)
Numerical Solution of PDE II (MAT5907)
Quantum Computing Algorithms (MAD6939)
Data Assimilation Methods/flow (MAT5907)
Wildfire Modeling (MAT4934)
Num. Analysis & Flexible Wings (MAT5907)
Cut Cell Spectral Element Meth (MAT5907)
Num. Methods for Atom & Spray (MAT5907)
Fluid Control (MAT5907)
Multimaterial Flows in Stokes (MAT5907)
Spectral Method/Model Fractal (MAD6939)
Directed Individual Study (MAT5907)
Elementary Partial Differential Equations I (MAP5345)
Elementary Partial Differential Equations II (MAP4342)
Num Meth: Deform Bound Probs (MAD6939)
Num Methods Deforming Boundary (MAP6939)
Engineering Mathematics I (MAP3305)
Ordinary Differential Equations (MAP2302)
Engineering Mathematics II (MAP3306)
Special Topics in Mathematics (MAT5933)
Foundations of Computational Mathematics II (MAD5404)
Calculus with Analytic Geometry I (MAC2311)

Doctoral Committee Chair

AbuShoshah, M. A., graduate. (2025).
Estebe, C. L., graduate. (2024).
Diao, P., graduate. (2020). *Parareal Algorithm Applied to the Stefan Problem*. Retrieved from
     http://purl.flvc.org/fsu/fd/2020_Summer_Fall_Diao_fsu_0071E_16202
Liu, F., graduate. (2019). *NOVEL NUMERICAL ANALYSIS METHODS, USING THE WENO
     AND WENO-Z ALGORITHMS, FOR COMBINING OBSERVATIONAL DATA WITH
     MODEL PREDICTIONS FOR IMPROVING FORECASTS*.

Villemarette, M. C., graduate. (2019). *SECOND ORDER DISCRETE MAXIMUM PRESERVING FINITE DIFFERENCE AND FINITE ELEMENT METHODS FOR NONLINEAR PARABOLIC EQUATIONS*.

Khanmohamadi, O., graduate. (2017). *High Order, Efficient, Numerical Algorithms For Integration in Manifolds Implicitly Defined by Level Sets*.

Jemison, M. B., graduate. (2014). *An Asymptotically Preserving Method for Multiphase Flow*.

Wang, Y., graduate. (2010). *NUMERICAL METHODS FOR TWO-PHASE JET FLOW*.

Simakhina, S. V., graduate. (2010). *LEVEL SET AND CONSERVATIVE LEVEL SET METHODS ON DYNAMIC QUADRILATERAL GRIDS*.

Kadioglu, S., graduate. (2005). *ALL SPEED MULTI-PHASE FLOW SOLVERS*.

Moradikazerouni, A., doctoral candidate.

Doctoral Committee Cochair

Provat, S., graduate. (2024).

Ream, J. A., graduate. (2023).

Liu, Y., graduate. (2020). *A NOVEL NUMERICAL METHOD FOR RESOLVING MICRO-STRUCTURE BASED ON SUPERMESH FOR MULTI-MATERIAL SYSTEMS*.

Georgiadou, A., graduate. (2019). *GLOBAL OPTIMIZATION IN STELLAR EVOLUTION APPLICATIONS*.

Pei, C., graduate. (2017). *SPACE-TIME SPECTRAL ELEMENT METHODS IN FLUID DYNAMICS AND MATERIALS SCIENCE*.

Chen, X., graduate. (2011). *4-D Var Data Assimilation and POD Model Reduction Applied to Geophysical Dynamics Models*. Retrieved from http://purl.flvc.org/fsu/fd/FSU_migr_etd-3836

Duffy, A. C., graduate. (2011). *Austen Duffy, PhD 2011, MASSIVELY PARALLEL ALGORITHMS FOR CFD SIMULATION AND OPTIMIZATION ON HETEROGENEOUS MANY-CORE ARCHITECTURES*.

Jimenez, E. N., graduate. (2009). *Uncertainty Quantification of Nonlinear Stochastic Phenomena*. Retrieved from http://purl.flvc.org/fsu/fd/FSU_migr_etd-3511

Okojunu, A., doctoral candidate.

Doctoral Committee Member

Sardelis, S., graduate. (2025).

Zhang, S., graduate. (2024).

Zhou, Y., graduate. (2023).

Wei, M., graduate. (2023).

Chandramouli, S., graduate. (2023).

Parkman, V., graduate. (2023).

Huang, H., graduate. (2021).

Li, Z., graduate. (2020).

Ozturk, D., graduate. (2020).

Dawer, G., graduate. (2018).

You, Y., graduate. (2018).

Marchand, M. S., graduate. (2017).
Han, D., graduate. (2015).
Donahue, M. R., graduate. (2014).
He, Y., graduate. (2013).
Liu, Y., graduate. (2013).
Whidden, M. E., graduate. (2013).
Li, Q., graduate. (2011).
Acosta, C., graduate. (2011).
Shen, J., graduate. (2010).
Summy, H. A., graduate. (2008).
Mihalef, V., graduate. (2007).
Akella, S. R., graduate. (2006).
Cui, Z., graduate. (2005).
Gopeesingh, R. V. D., doctoral candidate.
Lee, S., doctoral candidate.
Nguyen, D. T., doctoral candidate.
Yang, Yi-Yung, doctoral candidate.
Yeasmin, S., doctoral candidate.

Doctoral Committee University Representative

Willis, L. C., graduate. (2025).
Brooker, E., graduate. (2025).
Shahriar, A., graduate. (2024).
Song, M., graduate. (2024).
Kanai, T., graduate. (2023).
Richardson, R., graduate. (2023).
Solano, T., graduate. (2023).
Gusto, B. L., graduate. (2023). *A multiresolution approach for the efficient simulation of large-scale turbulent reactive flows*.
Stalpes, K., graduate. (2022). *Galaxy in a Box: Understanding Our Universe through Numerical Simulations*. Retrieved from http://purl.flvc.org/fsu/fd/2022_Summer_Stalpes_fsu_0071E_17327
Smith, K. L., graduate. (2021). *Measurement of J/psi and psi(2S) at forward and backward rapidity in p+p, p+Al, p+Au, and 3He+Au collisions*.
Wu, S., graduate. (2020). *Multiphase flow of passive and active particles in polymeric fluids*.
Boehner, P. S., graduate. (2018).
Deem, E. A., graduate. (2018).
Learn, R. J., graduate. (2018).
Nair, A. G., graduate. (2018).
Schneier, M. H., graduate. (2018).
Davis, T. B., graduate. (2017).
Zhao, W., graduate. (2017).
Pascioni, K. A., graduate. (2017).
Zeuch, D., graduate. (2016).
Zavala-Romero, O., graduate. (2015).

Yuan, J., graduate. (2014).
Handy, T. A., graduate. (2014).
Bollig, E. F., graduate. (2013).
Dashora, G., doctoral candidate.
Gierhan, N. V., doctoral candidate.
Maurya, G., doctoral candidate.
Mittal, A. K., doctoral candidate.
Poudel, S., doctoral candidate.
Singh, N., doctoral candidate.
Strack, J., doctoral candidate.
Taiyebah, F., doctoral candidate.

Master's Committee Chair

Zhi-Wei, R., graduate. (2003).

Master's Committee Cochair

Georgiadou, A., graduate. (2016).

Master's Committee Member

Poudel, S., graduate. (2024).
Brooker, E., graduate. (2020).
Fenn, D. S., graduate. (2014).
Modica, F., graduate. (2012).

Bachelor's Committee Chair

Spainhour, J., graduate. (2020). *Quadratic Moment-of-Fluid Interface Reconstruction*. Retrieved from http://purl.flvc.org/fsu/fd/ FSU_libsubv1_scholarship_submission_1587147272_cff86e96
McMillan, A., graduate. (2017). *Resampling Method Approach to Solving the Non-homogeneous Laplace's Equation*.
Yarboro, J., graduate. (2017). *Wildfire Modeling: Developing a computer simulation of a burning front using the reaction-diffusion equation*.
Goldsberry, B., graduate. (2012). *Using Boundary Element-Based Near-field Acoustic Holography to Predict the Source Pressures and Sound Field of an Acoustic Guitar*.

Supervision of Student Research Not Related to Thesis or Dissertation

Watkins, M. (2025–26).

Fishback, J. (2024–25).

Vargas-Torres, B. (2021–22).

Helms, T. (2014–15).

Research and Original Creative Work

Publications

Refereed Journal Articles

S. Provat, M. Sussman, & K. Shoele. (2025). Patterned electroconvection under AC and DC voltages with strong unipolar charge injection. *Journal of Applied Physics*. doi:10.1063/5.0241244

Mitsuhiro Ohta, Tetsuya Ueta, Yozo Toei, Edwin Jimenez, & Mark Sussman. (2025). Numerical simulation of bubble deformation and breakup under simple linear shear flows. *Chemical Engineering Science*. doi:10.1016/j.ces.2024.121154

Gautam Maurya, Yang Liu, Mark Sussman, & Kourosh Shoele. (2024). Drop transmission after the impact on woven fabrics. *International Journal of Multiphase Flow*. doi:10.1016/j.ijmultiphaseflow.2024.104909

Ye, Z., Estebe, C., Liu, Y., Vahab, M., Huang, Z., Sussman, M., Moradikazerouni, A., Shoele, K., Lian, Y., Ohta, M., & Hussaini, M. Y. (2023). An Improved Coupled Level Set and Continuous Moment-of-Fluid Method for Simulating Multiphase Flows with Phase Change. *Communications on Applied Mathematics and Computation*. doi:10.1007/s42967-023-00286-6

Banerjee, S., Sussman, M. M., & Lian, Y. (2023). Dimensional Analysis in Error Reduction for Prediction of Nucleate Boiling Heat Flux by artificial neural networks for limited dataset. *Journal of Heat and Mass Transfer*, *145*(6), 061602: 1-11.

Moradikazerouni, A., Solano, T., Sussman, M., & Shoele, K. (2023). Simulation of natural convection in two-phase cryogenic tanks using sparse identification of nonlinear dynamics. *AIAA Sci-Tech 2023 forum*, 1917: 1-18.

Banerjee, S., Liu, Y., Sussman, M., & Lian, Y. (2022). Depletable micro-layer for nucleate boiling simulations in micro-gravity conditions: A new approach. *International Journal of Heat and Mass Transfer*. doi:10.1016/j.ijheatmasstransfer.2022.122642

Liu, Y., Sussman, M., Lian, Y., Hussaini, M. Y., Vahab, M., & Shoele, K. (2022). A Novel Supermesh Method for Computing Solutions to the Multi-material Stefan Problem with Complex Deforming Interfaces and Microstructure. *Journal of Scientific Computing*.

doi:10.1007/s10915-022-01783-1

Banerjee, S., Lian, Y., Liu, Y., & Sussman, M. M. (2022). A New Method for Estimating Bubble Diameter at Different Gravity Levels for Nucleate Pool Boiling. *Journal of Heat Transfer*, *144*(2), 021601 (11pages).

Islam, A., Sussman, M. M., Hu, H., & Lian, Y. (2022). Simulation of drop impact on substrate with micro-wells. *Physics of fluids*, *34*, 062108: 1-16.

Vahab, M., Sussman, M. M., & Shoele, K. (2021). Fluid-structure interaction of thin flexible bodies in multi-material multi-phase systems. *Journal of Computational Physics*, *429*, 110008-1-110008-29.

Liu, Y., Sussman, M., Lian, Y., & Hussaini, M. Y. (2020). A moment-of-fluid method for diffusion equations on irregular domains in multi-material systems. *Journal of Computational Physics*, *402*, 109017 (35 pages). Retrieved from http://www.sciencedirect.com/science/article/pii/S0021999119307235 doi:https://doi.org/10.1016/j.jcp.2019.10901

Chen, Y., Islam, A., Sussman, M. M., & Lian, Y. (2020). Numerical Investigation of Surface Curvature Effect on the Self-propelled Capability of Coalesced Drops. *Physics of Fluids*, *32*(12), 122117 (11 pages). doi:10.1063/5.0026163

Pei, C., Vahab, M., Sussman, M., & Hussaini, M. Y. (2019). A Hierarchical Space-Time Spectral Element and Moment-of-Fluid Method for Improved Capturing of Vortical Structures in Incompressible Multi-phase/Multi-material Flows. *Journal of Scientific Computing*, *81*(3), 1527-1566. Retrieved from https://doi.org/10.1007/s10915-019-01087-x doi:10.1007/s10915-019-01087-x

Arienti, M., Ballard, M., Sussman, M. M., Mazumdar, Y. C., Wagner, J., Farias, P., & Guildenbecher, D. (2019). Comparison of simulation and experiments for multimode aerodynamic breakup of a liquid metal column in a shock-induced cross-flow. *Physics of Fluids*, *31*(8), 082110 1-17. Retrieved from http://dx.doi.org/10.1063/1.5099589 doi:http://dx.doi.org/10.1063/1.5099589

Pei, C., Sussman, M., & Hussaini, M. Y. (2019). A Space-Time Discontinuous Galerkin Spectral Element Method for Nonlinear Hyperbolic Problems. *International Journal of Computational Methods*, *16*(1), 1850093 (26 pages). doi:10.1142/S0219876218500937

Ohta, M., Furukawa, T., Yoshida, Y., & Sussman, M. (2019). A three-dimensional numerical study on the dynamics and deformation of a bubble rising in a hybrid Carreau and FENE-CR modeled polymeric liquid. *Journal of Non-Newtonian Fluid Mechanics*, *265*, 66 - 78. Retrieved from http://www.sciencedirect.com/science/article/pii/S0377025718301952 doi:https://doi.org/10.1016/j.jnnfm.2018.12

Pei, C., Sussman, M., & Hussaini, M. Y. (2019). New Multi-implicit Space-Time Spectral Element Methods for Advection-Diffusion-Reaction Problems. *Journal of Scientific*

Computing, *78*(2), 653-686.

Pei, C., Sussman, M., & Hussaini, M. Y. (2018). A space-time discontinuous galerkin spectral element method for the stefan problem. *Discrete and Continuous Dynamical Systems - Series B*, *23*(9), 3595-3622.

Vahab, M., Shoele, K., & Sussman, M. (2018). Interaction of an oscillating flexible plate and nucleate pool boiling vapor bubble: Fluid-structure interaction in a multimaterial multiphase system. *2018 Fluid Dynamics Conference, AIAA AVIATION Forum, (AIAA 2018-3718)*.

Arienti, M., & Sussman, M. (2017). A numerical study of the thermal transient in high-pressure diesel injection. *International Journal of Multiphase Flow*, *88*, 205-221.

Lian, Y., Liao, D., Qiu, H., Sussman, M., Vahab, M., & Hussaini, Y. (2017). Experimental and numerical investigation of icing process of a liquid droplet. *9th AIAA Atmospheric and Space Environments Conference, 2017*.

Vahab, M., Pei, C., Hussaini, M. Y., Sussman, M., & Lian, Y. (2016). An adaptive coupled level set and moment-of-fluid method for simulating droplet impact and solidification on solid surfaces with application to aircraft icing. *54th AIAA Aerospace Sciences Meeting*.

Yokoi, K., Onishi, R., Deng, X.-L., & Sussman, M. (2016). Density-Scaled Balanced Continuum Surface Force Model with a Level Set Based Curvature Interpolation Technique. *International Journal of Computational Methods*, *13*(4).

Guo, Y., Lian, Y., & Sussman, M. (2016). Investigation of drop impact on dry and wet surfaces with consideration of surrounding air. *Physics of Fluids*, *28*(7).

Arienti, M., & Sussman, M. (2015). A High-Fidelity Study of High-Pressure Diesel Injection. *SAE Technical Papers*, *2015-September(Septe*.

Jemison, M., Sussman, M., & Shashkov, M. (2015). Filament capturing with the Multimaterial Moment-of-Fluid method. *Journal of Computational Physics*, *285*, 149-172.

Li, G., Lian, Y., Guo, Y., Jemison, M., Sussman, M., Helms, T., & Arienti, M. (2015). Incompressible multiphase flow and encapsulation simulations using the moment-of-fluid method. *International Journal for Numerical Methods in Fluids*, *79*(9), 456-490.

Arienti, M., & Sussman, M. (2014). An embedded level set method for sharp-interface multiphase simulations of Diesel injectors. *International Journal of Multiphase Flow*, *59*, 1-14.

Jemison, M., Sussman, M., & Arienti, M. (2014). Compressible, multiphase semi-implicit method with moment of fluid interface representation. *Journal of Computational Physics*, *279*, 182-217.

Ohta, M., Akama, Y., Yoshida, Y., & Sussman, M. (2014). Influence of the viscosity ratio on drop dynamics and breakup for a drop rising in an immiscible low-viscosity liquid. *Journal of Fluid Mechanics*, *752*(5), 383-409.

Jemison, M., Loch, E., Sussman, M., Shashkov, M., Arienti, M., Wang, Y., & Ohta, M. (2013). A coupled level set-moment of fluid method for incompressible two phase flow. *Journal of Scientific Computing*, *54*(2-3), 454-491. doi:10.1007/s10915-012-9614-7

Arienti, M., Li, X., Soteriou, M., Eckett, C., Sussman, M., & Jensen, B. (2013). Coupled Level-Set/Volume-of-Fluid Method for simulation of Injector Atomization. *Journal of Propulsion and Power*, *29*(1), 147-157. doi:10.2514/1.B34198

Li, G., Lian, Y., & Sussman, M. (2013). Simulations of gas-liquid two-phase jet flows using the moment of fluid method. *American Society of Mechanical Engineers, Fluids Engineering Division (Publication) FEDSM*, *1 C*.

Wang, Y., Simakhina, S., & Sussman, M. (2012). A hybrid level set-volume constraint method for incompressible two-phase flow. *Journal of Computational Physics*, *231*(19), 6438-6471.

Sussman, M. (2012). A method for overcoming the surface tension time step constraint in multiphase flows II. *International Journal for Numerical Methods in Fluids*, *68*(11), 1343-1361. Retrieved from http://dx.doi.org/10.1002/fld.2557 doi:10.1002/fld.2557

Ohta, M., Hashimoto, K., Naito, K., Matsuo, Y., & Sussman, M. (2012). Numerical Analysis of Gas-Liquid Bubble Flow in a Horizontal Rectangular Channel. *Journal of Chemical Engineering of Japan (short communication)*, *45*(2), 102-106.

Ohta, M., Kimura, S., Furukawa, T., Yoshida, Y., & Sussman, M. (2012). Numerical simulations of a bubble rising through a shear-thickening fluid. *Journal of Chemical Engineering of Japan*, *45*(9), 713-720.

Ohta, M., & Sussman, M. (2012). The buoyancy-driven motion of a single skirted bubble or drop rising through a viscous liquid. *Physics of Fluids*, *24*(11), 112101.

Kadioglu, S., Knoll, D., Sussman, M., & Martineau, R. (2011). A second order JFNK-based IMEX method for single and multi-phase flows. *Computational Fluid Dynamics 2010 - Proceedings of the 6th International Conference on Computational Fluid Dynamics, ICCFD 2010*, 549-554.

Li, X., Soteriou, M. C., Arienti, M., & Sussman, M. M. (2011). High-fidelity simulation of atomization and evaporation in a liquid jet in cross-flow. *49th AIAA Aerospace Sciences Meeting Including the New Horizons Forum and Aerospace Exposition*.

Ohta, M., Kikuchi, S., Yoshida, Y., & Sussman, M. (2011). Robust numerical analysis of the dynamic bubble formation process in a viscous liquid. *International Journal of Multiphase Flow*, *37*(9), 1059-1071.

Ohta, M., Yoshida, Y., & Sussman, M. (2010). A computational study of dynamic processes of a bubble rising in Carreau model fluids. *Fluid Dynamics Research*, *42*(2), 025501-1 025501-15. doi:10.1088/0169-5983/42/2/025501

Ohta, M., Yamaguchi, S., Yoshida, Y., & Sussman, M. (2010). The sensitivity of drop motion due to the density and viscosity ratio. *Physics of Fluids*, *22*(7), 072102-1 072102-11. doi:10.1063/1.3460906

Li, X., Arienti, M., Soteriou, M. C., & Sussman, M. M. (2010). Towards an efficient, high-fidelity methodology for liquid jet atomization computations. *48th AIAA Aerospace Sciences Meeting Including the New Horizons Forum and Aerospace Exposition*.

Sussman, M., & Ohta, M. (2009). A stable and efficient method for treating surface tension in incompressible two-phase flow. *SIAM Journal on Scientific Computing*, *31*(4), 2447-2471.

Mihalef, V., Metaxas, D., Sussman, M., Hurmusiadis, V., & Axel, L. (2009). Atrioventricular blood flow simulation based on patient-specific data. *Lecture Notes in Computer Science (including subseries Lecture Notes in Artificial Intelligence and Lecture Notes in Bioinformatics)*, *5528*, 386-395.

Mihalef, V., Metaxas, D., & Sussman, M. (2009). Simulation of two-phase flow with sub-scale droplet and bubble effects. *Computer Graphics Forum*, *28*(2), 229-238.

Ohta, M., Akama, Y., Yoshida, Y., & Sussman, M. (2009). Three-dimensional simulation of the evolution process to vortex rings of falling drops in an immiscible viscous liquid. *Journal of Chemical Engineering, Japan*, *42*(9), 648-655.

Ohta, M., Onodera, K., Yoshida, Y., & Sussman, M. (2009). Three-dimensional simulations of the dynamic motion of single drops rising in viscoelastic FENE-CR model fluids. *Journal of Chemical Engineering of Japan*, *42*(10), 705-712.

Ohta, M., Akama, Y., Yoshida, Y., & Sussman, M. (2009). Three-dimensional simulations of vortex ring formation from falling drops in an immiscible viscous liquid. *Journal of Chemical Engineering of Japan*, *42*(9), 648-655.

Kadioglu, S., & Sussman, M. (2008). Adaptive solution techniques for simulating underwater explosions and implosions. *Journal of Computational Physics*, *227*, 2083-2104.

Stewart, P. A., Lay, N., Sussman, M., & Ohta, M. (2008). An improved sharp interface method for viscoelastic and viscous two-phase flows. *Journal of Scientific Computing*, *35*(1), 43-61.

Mihalef, V., Kadioglu, S., Sussman, M., Metaxas, D., & Hurmusiadis, V. (2008). Interaction of two-phase flow with animated models. *Graphical Models*, *70*(3), 33-42.

Ohta, M., Tsuji, M., Yoshida, Y., & Sussman, M. (2008). The transient dynamics of a small bubble rising in a low Morton number regime. *Chemical Engineering and Technology*, *31*(9), 1350-1357.

Ohta, M., Onodera, K., Yoshida, Y., & Sussman, M. (2008). Three-dimensional numerical simulations of a rising bubble in a viscoelastic FENE-CR model fluid. *AIP Conference Proceedings*, *1027*, 896-898.

Sussman, M. M., Smith, K. M., Hussaini, M. Y., Ohta, M., & Zhi-Wei, R. (2007). A sharp interface method for incompressible two-phase flows. *Journal of Computational Physics*, *221*(2), 469-505.

Dommermuth, D. G., O'Shea, T. T., Wyatt, D. C., Ratcliffe, T., Weymouth, G. D., Hendrikson, K. L., Yue, D. K. P., Sussman, M., Adams, P., & Valenciano, M. (2007). An application of cartesian-grid and volume-of-fluid methods to numerical ship hydrodynamics. *NSH 2007 - 9th International Conference on Numerical Ship Hydrodynamics*.

Ohta, M., Kikuchi, D., Yoshida, Y., & Sussman, M. (2007). Direct numerical simulation of the slow formation process of single bubbles in a viscous liquid. *Journal of Chemical Engineering of Japan*, *40*(11), 939-943.

Tryggvason, G., Sussman, M., & Hussaini, M. Y. (2007). Immersed boundary methods for fluid interfaces. *Computational Methods for Multiphase Flow*, 37-77.

Sussman, M., & Ohta, M. (2007). Improvements for calculating two-phase bubble and drop motion using an adaptive sharp interface method. *Fluid Dynamics and Materials Processing*, *3*(1), 21-36.

Mihalef, V., Kadioglu, S., Sussman, M., Metaxas, D., & Hurmusiadis, V. (2007). Interaction of multiphase flow with animated models. *Graphical Models*, *70*, 33-42.

VanderWyst, A., Christlieb, A., Boyd, I. D., & Sussman, M. M. (2007). Simulation of liquid metal droplets from field emission. *Communications in Computational Physics*, *2*(4), 640-661.

Mihalef, V., Metaxas, D., & Sussman, M. (2007). Textured liquids based on the marker level set. *Computer Graphics Forum*, *26*(3), 457-466.

Touil, H., Hussaini, M. Y., & Sussman, M. M. (2007). Tracking discontinuities in hyperbolic conservation laws with spectral accuracy. *Journal of Computational Physics*, *225*(2), 1810-1826.

Mihalef, V., Unlusu, B., Metaxas, D., Sussman, M., & Hussaini, M. Y. (2006). Physics based boiling simulation. *Computer Animation, Conference Proceedings*, *02-04-September-2006*, 317-324.

Vanderwyst, A., Christlieb, A., Sussman, M., & Boyd, I. D. (2006). Simulation of charge and

mass distributions of indium droplets created by field emission. *Collection of Technical Papers - 37th AIAA Plasmadynamics and Lasers Conference*, *2*, 642-660.

Ohta, M., Yoshida, Y., & Sussman, M. (2006). Three-dimensional computations of the motion of a Newtonian drop rising through immiscible quiescent shear-thinning liquids. *Journal of Chemical Engineering of Japan*, *39*(4), 394-400.

Jimenez, E., Sussman, M. M., & Ohta, M. (2005). A computational study of bubble motion in newtonian and viscoelastic fluids. *Fluid Dynamics and Materials Processing*, *1*(2), 97-108.

Ohta, M., Imura, T., Yoshida, Y., & Sussman, M. (2005). A computational study of the effect of initial bubble conditions on the motion of a gas bubble rising in viscous liquids. *International Journal of Multiphase Flow*, *31*(2), 223-237.

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Vander, A., Christlieb, A., Sussman, M., & Boyd, I. D. (2005). Boundary integral formulation of electric fields in level set simulations of charged droplets. *36th AIAA Plasmadynamics and Lasers Conference*.

Ohta, M., Haranaka, S., Yoshida, Y., & Sussman, M. (2005). Three-dimensional numerical simulations of the effect of initial bubble conditions on the motion of a bubble rising in viscous liquids. *Journal of Chemical Engineering of Japan*, *38*(11), 878-882.

Mihalef, V., Metaxas, D., & Sussman, M. (2004). Animation and control of breaking waves. *Computer Animation 2004 - ACM SIGGRAPH / Eurographics Symposium on Computer Animation*, 315-324.

Ohta, M., Haranaka, S., Yoshida, Y., & Sussman, M. (2004). Three-dimensional numerical simulations of the motion of a gas bubble rising in viscous liquids. *Journal of Chemical Engineering of Japan*, *37*(8 SPEC. ISS.), 968-975.

Sussman, M., & Hussaini, M. Y. (2003). A Discontinuous Spectral Element Method for the Level Set Equation. *Journal of Scientific Computing*, *19*(1-3), 479-500.

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Sussman, M. (2001). An adaptive mesh algorithm for free surface flows in general geometries. *Adaptive Method of Lines*, 207-231.

Sussman, M., & Puckett, E. G. (2000). A Coupled Level Set and Volume-of-Fluid Method for Computing 3D and Axisymmetric Incompressible Two-Phase Flows. *Journal of Computational Physics*, *162*(2), 301-337.

Sussman, M. M., Almgren, A., Bell, J., Colella, P., Howell, L., & Welcome, M. (1999). An Adaptive Level Set Approach for Incompressible Two-Phase Flows. *Journal of Computational Physics*, *148*, 81-124.

Colella, P., Graves, D. T., Modiano, D., Puckett, E. G., & Sussman, M. (1999). An embedded boundary/volume of fluid method for free surface flows in irregular geometries. *Proceedings of the 1999 3rd ASME/JSME Joint Fluids Engineering Conference, FEDSM'99, San Francisco, California, USA, 18-23 July 1999 (CD-ROM)*, 1.

Sussman, M., & Fatemi, E. (1999). Efficient, interface-preserving level set redistancing algorithm and its application to interfacial incompressible fluid flow. *SIAM Journal on Scientific Computing*, *20*(4), 1165-1191.

Aleinov, I. D., Puckett, E. G., & Sussman, M. M. (1999). Formation of droplets in microscale jetting devices. *Proceedings of the 1999 3rd ASME/JSME Joint Fluids Engineering Conference, FEDSM'99, San Francisco, California, USA, 18-23 July 1999 (CD-ROM)*, 1.

Sussman, M., Fatemi, E., Smereka, P., & Osher, S. (1998). An improved level set method for incompressible two-phase flows. *Computers and Fluids*, *27*(5-6), 663-680.

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Marcus, D. L., Sussman, M., & Chambers, D. (1995). Relaxation spectra of surface waves. *American Society of Mechanical Engineers, Fluids Engineering Division (Publication) FED*, *234*, 149-158.

Sussman, M. M., Smereka, P., & Osher, S. (1994). A Level Set Approach for Computing Solutions to Incompressible Two-Phase Flow. *Journal of Computational Physics*, *114*, 146-159.

Invited Book Chapters

Tryggvason, G., Sussman, M. M., & Hussaini, M. Y. (2007). Immersed boundary methods for fluid interfaces. In A. Prosperetti, & G. Tryggvason (Eds.), *Computational Methods for Multiphase Flow* (pp. 37-77). Cambridge : Cambridge University Press.

Sussman, M. M. (2000). An adaptive mesh algorithm for free surface flows in general geometries. In A. Vande Wouver, P.H. Saucez, & W.E. Scheisser (Eds.), *Adaptive Method of Lines* (pp. 207-231). Chapman and Hall/CRC Press.

Refereed Book Chapters

Sussman, M. M., & Ohta, M. (2007). High-order Techniques for Calculating Surface Tension Forces. In Isabel N Figueiredo, J.F. Rodrigues, & L. Santos (Eds.), *International Series of Numerical Mathematics, Free Boundary Problems* (pp. 425-434). Birkhauser Basel.

Refereed Proceedings

Yuhang, F., Ohta, M., Jimenez, E., & Sussman, M. (2024). Numerical simulations of drop breakup in a strong linear shear flow induced by a driven top wall and a stationary bottom wall. In *The 34th international symposium on transport phenomena*. Taoyuan, Taiwan.

Kato, A., Ohta, M., Jimenez, E., & Sussman, M. (2024). Numerical simulations of drop deformation and breakup in linear shear flows made up of shear-thinning fluids. In *The 34th international symposium on transport phenomena*. Taoyuan, Taiwan.

Ohta, M., Akama, Y., Yoshida, Y., & Sussman, M. M. (2009). The Unstable Dynamics of Single Drops Rising in Immiscible Viscous Fluids. In *Proceedings of the 8th World Congress of Chemical Engineering (WCCE8)*. WCCE, Montreal, Quebec, Canada.

Mihalef, V., Unlusu, B., Metaxas, D., Sussman, M. M., & Hussaini, M. Y. (2006). Physics-based boiling simulation. In M.-P. Cani, & J. O'Brien (Eds.), *Proceedings of the 2006 ACM SIGGRAPH/Eurographics symposium on Computer Animation* (pp. 317-324). Vienna Austria: Eurographics Association.

Mihalef, V., Sussman, M. M., & Metaxas, D. (2004). Animation and control of breaking waves. In R. Boulic, & D. Pai (Eds.), *Proceedings of the 2004 ACM SIGGRAPH/Eurographics symposium on Computer Animation* (pp. 315-324). Grenoble, France: Eurographics Association.

Nonrefereed Journal Articles

Sussman, M. M. (2001). Computing droplet break-up using an adaptive coupled level set/ volume-of-fluid method for incompressible two-phase flow in general geometries. *Computational Fluid Dynamics Journal*, *9*(1), 582-593.

Nonrefereed Proceedings

Ohta, M., Ryohei, H., Yozo, T., & Sussman, M. (2015). Numerical Simulation of Bubble

Deformation and Breakup in Simple Shear Flow. In *The 16th International Conference on Fluid Flow Technologies (CMFF'15), Budapest, Sep. 2015*. Proceedings of The 16th International Conference on Fluid Flow Technologies (CMFF'15), Budapest, Sep. 2015.

Lian, Y., Guo, Y., Li, G., & Sussman, M. (2014). Multiphase flow simulation using the moment of fluid method. In *Proceedings of the Eighth International Conference on Computational Fluid Dynamics (ICCFD8)*. Chengdu, China, July 14-18, 2014 (ICCFD8-0162).

Arienti, M., & Sussman, M. (2012). Nozzle geometry Effects on primary atomization. In *ICLASS 2012, 12th triennial international conference on liquid atomization and spray systems, Heidelberg, Germany, September, 2012*. ICLASS 2012, 12th triennial international conference on liquid atomization and spray systems, Heidelberg, Germany, September, 2012.

Ohta, M., Onodera, K., Yoshida, Y., & Sussman, M. M. (2008). Three- Dimensional Numerical Simulations of a Rising Bubble in a Viscoelastic FENE-CR Model Fluid. In *AIP Conference Proceedings: Materials Physics and Applications, 1027. The 15th International Congress on Rheology* (pp. 896-898). Monterey, California, USA.

Dommermuth, D. G., O'Shea, T. T., Wyatt, D., Sussman, M. M., Weymouth, G., Yue, D., Adams, P., & Hand, R. (2006). The numerical simulation of ship waves using cartesian-grid and volume-of-fluid methods. In *Proceedings of the twenty-sixth symposium on naval hydrodynamics* (pp. 1-17). Rome, Italy: Strategic Analysis.

Dommermuth, D. G., Sussman, M. M., Beck, R., O'Shea, T. T., & Wyatt, D. (2004). The numerical simulation of ship waves using Cartesian grid methods with adaptive mesh refinement. In *Proceedings of the twenty-fifth symposium on naval hydrodynamics* (pp. 1-13). St. John's, Newfoundland and Labrador, Canada: National Academies Press.

Ohta, M., Yoshida, Y., & Sussman, M. M. (2004). Three-Dimensional Numerical Simulations of a Drop Rising in Shear-Thinning Fluid Systems. In *Proc. of the 14th International Congress on Rheology*. Seoul.

Dommermuth, D. G., & Sussman, M. M. (2000). The numerical simulation of ship waves using cartesian grid methods. In *Proceedings of the twenty-third symposium on naval hydrodynamics* (pp. 1-18). Val-De-Reuil, France: National Academies Press.

Colella, P., Graves, D. T., Modiano, D., Puckett, E. G., & Sussman, M. M. (1999). An embedded boundary/volume of fluid method for free surface flows in irregular geometries. In *proceedings of the 3rd ASME/JSME joint fluids engineering conference* (pp. FEDSM99-7108). San Francisco, CA.

Nonrefereed Reviews

Sussman, M. (2025). Review of "A Momentum balance correction to the non-conservative one-fluid formulation in boiling flows using volume-of-fluid". *MathSciNet/Mathematical*

Reviews, MR 4 846 121.

Sussman, M. (2020). Review of "Error estimates of a regularized finite difference method for the logarithmic Schrodinger equation". *MathSciNet/Mathematical Reviews, MR 3 928 348*.

Sussman, M. (2020). Review of "Low Mach number limit of compressible two-fluid model". *MathSciNet/Mathematical Reviews, MR 4 045 129*.

Sussman, M. (2019). Review of "Construction and numerical resolution of high-order accuracy decomposition scheme for a quasi-linear evolution equation". *MathSciNet/Mathematical Reviews, MR 3 849 654*.

Sussman, M. (2018). Review of "Parameter-Robust Numerical Scheme for Time-Dependent Singularly Perturbed Reaction-Diffusion Problem with Large Delay". *MathSciNet/ Mathematical Reviews, MR 3 750 654*.

Sussman, M. (2018). Review of "Stagnation of Block GMRES and its relationship to Block FOM". *MathSciNet/Mathematical Reviews, MR 3 661 664*.

Sussman, M. (2017). Review of "Discrete Analysis of Domain Decomposition Approaches for Mesh Generation via the Equidistribution Principle". *MathSciNet/Mathematical Reviews, MR 3 557 799*.

Sussman, M. (2017). Review of "Hybrid compact-WENO finite difference scheme with conjugate Fourier shock detection algorithm for Hyperbolic conservation laws". *MathSciNet/Mathematical Reviews, MR 3 465 427*.

Sussman, M. (2016). Review of "A fast semi-implicit level set method for curvature dependent flows with an application to limit cycles extraction in dynamical systems". *MathSciNet/ Mathematical Reviews, MR 3 371 559*.

Sussman, M. (2015). Review of "A computational realization of a semi-Lagrangian method for solving the advection equation". *MathSciNet/Mathematical Reviews, MR 3 275 769*.

Sussman, M. (2015). Review of "Numerical solution of a model for turbulent diffusion". *MathSciNet/Mathematical Reviews, MR 3 128 116*.

Sussman, M. (2014). Review of "Modified characteristic finite difference fractional step method for moving boundary value problem of nonlinear percolation system". *MathSciNet/ Mathematical Reviews, MR 3 088 638*.

Sussman, M. (2013). Review of "Calculation of cell face velocity of non-staggered grid system". *MathSciNet/Mathematical Reviews, MR 3 012 418*.

Sussman, M. (2013). Review of "Numerical Approximation of the Euler-Poisson-Boltzmann model in the Quasi-neutral Limit". *MathSciNet/Mathematical Reviews, MR 2 891 946*.

Sussman, M. M. (2012). Review of ``Projection algorithms with correction'': N. Aurelian, C. Popa, and U. Rude. *MathSciNet/Mathematical Reviews , MR 2 841 410 (2012m:65101), 2012m:65101.*

Sussman, M. M. (2011). Review of "A method of projection of delta waves in a Godunov scheme and application to pressureless fluid dynamics": M. Colombeau. *MathSciNet/ Mathematical Reviews, MR 2 745 266 (2012f:65124), 2012f:65124.*

Sussman, M. M. (2011). Review of "Geometric Applications of the Split Bregman Method: Segmentation and Surface Reconstruction": T. Goldstein, X. Bresson, and S. Osher. *MathSciNet/Mathematical Reviews, MR 2 679 800 (2011k:65029).*

Sussman, M. M. (2010). Review of "A kind of double regularized GM- RES Methods": J. Liu and G. He. *MathSciNet/Mathematical Reviews, MR 2 588 757 (2011e:65048).*

Sussman, M. M. (2010). Review of "Monotone finite volume schemes of nonequilibrium radiation diffusion equations on distorted meshes" : Z. Sheng, J. Yue, G. Yuan. *MathSciNet/Mathematical Reviews, MR 2 520 305 (2010k:65178), 2010k:65178.*

Sussman, M. M. (2009). Review of "Direct methods and ADI-preconditioned Krylov subspace methods for generalized Lyapunov equations": T. Damm. *MathSciNet/Mathematical Reviews, MR 2 464 173 (2009j:65083), 2009j:65083.*

Sussman, M. M. (2009). Review of "Explicit Hybrid Finite Differ- ence Schemes From Operator Splitting for Solving Korteweg De Vries Equations": A. Koross, J. Bitok, M. Oduor, and O. Ongati. *Math-SciNet/Mathematical Reviews, MR 2 492 530 (2010b:65167), 2010b:65167.*

Sussman, M. M. (2009). Review of "Preconditioned iterative solver on the coarsest level of a multi-grid method for high frequency time harmonic electromagnetic field analysis": T. Iwashita, K. Yosui, M. Mori, E. Kobayashi. *MathSciNet/Mathematical Reviews, MR 2 395 094 (2009f:65068), 2009f:65068.*

Sussman, M. M. (2008). Review of "A study of numerical methods for the level set approach" : P.A. Gremaud, C.M. Kuster, Z. Li. *MathSciNet/Mathematical Reviews, MR 2 322 452 (2008e:65246), 2008e:65246.*

Sussman, M. M. (2008). Review of "Convergence of Implicit Difference Methods for Parabolic Functional Differential Equations": K. Kropielnicka. *MathSciNet/Mathematical Reviews, MR 2 344 423 (2008g:65110), 2008g:65110.*

Sussman, M. M. (2008). Review of "Energy properties preserving schemes for Burgers' equations": R. Anguelov, J.K. Djoko, J.M.-S. Lubuma. *MathSciNet/Mathematical Reviews, MR 2 371 347 (2008k:65159), 2008k:65159.*

Nonrefereed Reports

Duffy, A., Kuhnle, A., & Sussman, M. M. (in press). *An Improved Variable Density Pressure Projection Solver for Adaptive Meshes*. Department of Mathematics, Florida State University, Tallahassee, Florida, USA.

Sussman, M. M., & Uto, S. (1998). *Computing Oil Spreading Underneath a sheet of ice* (CAM report 98-32). Los Angeles, CALIFORNIA, USA: UCLA, Computational and Applied Math.

Presentations

Invited Papers at Conferences

Sussman, M. M. (presented 2010, March). *The development of appropriate smoothers for multigrid when used as a preconditioner for CG*. Paper presented at Japan SIAM, SIAM, Tsukuba, Ibaraki, Japan. (International)

Invited Keynote and Plenary Presentations at Conferences

Sussman, M. (presented 2017). *A hierarchical space-time spectral element method for simulating complex multiphase flows*. Keynote presentation at CFD 2017, Sintef, Trondheim, Norway. (International)

Sussman, M. M. (presented 2012). *CLSMOF for multiphase flows*. Plenary presentation at ICNMMF 2012, Penn State University, State College, Pennsylvania. (International)

Invited Keynote and Plenary Presentations at Symposia

Sussman, M. M. (presented 2009, July). Overcoming the surface tension time step constraint when computing incompressible two-phase flows. Keynote presentation in R. Rao, D. Noble, and T. Baer (Chair), *CFD for free and moving boundaries*. Symposium conducted at the meeting of USNCCM X, Columbus, Ohio, USA. (National)

Sussman, M. M. (presented 2007, December). Adaptive level set methods for ship hydrodynamics. Keynote presentation in *CFD solvers for unsteady marine applications, capabilities and challenges: Center for Ships and Ocean Structures*. Symposium conducted at the meeting of The Centre for Ships and Ocean Structures (CeSOS), Trondheim, Norway. (International)

Sussman, M. M. (presented 2007, November). An adaptive multi-phase flow solver for incompressible viscous and visco-elastic flows. Keynote presentation in *Statistical and Applied Mathematical Sciences Institute (SAMSI) workshop on interfaces*. Symposium conducted at the meeting of SAMSI, Raleigh-Durham, North Carolina, USA. (National)

Sussman, M. M. (presented 2007, June). A scalable adaptive solver for simulating the break-up of a liquid jet in a cross-flow. Keynote presentation in *Workshop on atomization and spray*. Symposium conducted at the meeting of United Technologies Research Corporation, East Hartford, Connecticut, USA. (National)

Sussman, M. M. (presented 2007, May). An adaptive multi-phase flow solver for incompressible viscous and visco-elastic flows. Keynote presentation in *Presentation at Frontiers in Applied and computation mathematics (FACM 07)*. Symposium conducted at the meeting of New Jersey Institute of Technology, Newark, New Jersey, USA. (National)

Invited Presentations at Conferences

Sussman, M. (presented 2018). *A hierarchical block structured space-time spectral element method for simulating complex multiphase flows*. Presentation at International Conference: Advances in Applied Mathematics in memoriam of Professor Saul Abarbanel, Tel Aviv University, December 18 - 20, 2018, Tel Aviv University, Tel Aviv, Israel. (International)

Sussman, M. M. (presented 2005). *High order VOF height fraction techniques for extracting curvature from the VOF function*. Presentation at conference on free boundary problems, University of Coimbra, Mathematics, Coimbra, Portugal. (International)

Invited Workshops

Sussman, M. (2019). *The Burgers' program 2019 summer research school on fluid dynamics: topics in multiphase flow and thermal transport*. Workshop delivered at University of Maryland, Maryland. (National)

Sussman, M. (2016). *complex boundary and interface problems*. Workshop delivered at CRM, Montreal, Montreal. (International)

Sussman, M. (2014). *Cartesian grid, level set and immersed boundary lecture series*. Workshop delivered at Bordeaux. (Regional)

Sussman, M. M. (2012). *Advances in Computational Mathematics*. Workshop delivered at Florida State University Engineering, Mechanical Engineering FSU. (Local)

Sussman, M. M. (2011, December). *Workshop on Transport Processes on Moving Interfaces II*. Workshop delivered at RWTH Aachen, Aachen, Germany. (International)

Sussman, M. M. (2011, September). *Workshop on Transport Processes on Moving Interfaces I*. Workshop delivered at RWTH Aachen, Heidelburg, Germany. (International)

Sussman, M. M. (2011, January). *Interface Tracking Methods*. Workshop delivered at Frontier CFD for strongly nonlinear marine hydrodynamics, Harbin, China. (International)

Sussman, M. M. (2010, April). *Interface Tracking Methods*. Workshop delivered at INDAM intensive period on fluid dynamics, Catania, Italy. (International)

Sussman, M. M. (2009, August). *An adaptive multi-phase flow solver for coupled-ocean atmosphere modeling*. Workshop delivered at Workshop on free boundary/surface problems, National Center for Atmospheric Research, Boulder, Colorado, USA. (National)

Sussman, M. M. (2007, May). *An adaptive multi-phase flow solver for incompressible viscous and visco-elastic flows*. Workshop delivered at Frontiers in Applied and computation mathematics (FACM 07), Newark, New Jersey: New Jersey Institute of Technology. (International)

Sussman, M. M. (2007). *workshop on atomization and spray*. Workshop delivered at United Technologies Research Corporation, United Technologies Research Corporation. (International)

Sussman, M. M. (2003). *Adaptive level set methods for all-speed flows*. Workshop delivered at industrial challenges in the simulation of evolving interfaces: Mathematics, Computing, and Simulation for Industry (MACSINET) workshop, Brussels, Belgium, Vrije University. (International)

Sussman, M. M. (2001). *IMA hot topics workshop: Analysis and modeling of industrial jetting processes*. Workshop delivered at An adaptive level set method for simulating ink-jet devices, Minneapolis, Minnesota: IMA. (International)

Sussman, M. M. (2001). *IPAM Workshop on Geometrically Based Motions in Image Processing, Computer Vision, and Computer Graphics*. Workshop delivered at IPAM (UCLA), Los Angeles, CA. (International)

Invited Lectures and Readings of Original Work

Sussman, M. M. (2021). *A supermesh method for complex deforming boundary problems containing microstructure*. Delivered at UCSB Engineering Seminar. (Local)

Sussman, M. (2018). *A hierarchical space-time spectral element method for simulating complex multiphase flows*. Delivered at department of mathematics, Zhejiang University, department of mathematics, Zhejiang University. (Local)

Sussman, M. (2015). *Multimaterial moment of fluid method for compressible multiphase flows and capturing filaments*. Delivered at Beijing Computational Science Research Center. (Local)

Sussman, M. (2014). *Simulating phase change using the adaptive moment of fluid method*. Delivered at University of Florida, ChemE. (Local)

Sussman, M. M. (2013). *Multimaterial moment of fluid method for multimaterial compressible and incompressible flows*. Delivered at Department of Scientific computing, FSU, Dirac Science Library. (Local)

Sussman, M. M. (2012). *coupled level set and moment of fluid method*. Delivered at CalTech math. (Local)

Sussman, M. M. (2012). *coupled level set and moment of fluid method*. Delivered at NJIT applied math. (Local)

Sussman, M. M. (2012). *coupled levelset and moment of fluid method*. Delivered at Los Alamos National Labs, LANL. (Local)

Sussman, M. M. (2012). *multimaterial moment of fluid method*. Delivered at University of Louisville, Mech. Engr. colloquium. (National)

Sussman, M. M. (2012). *multimaterial moment of fluid method*. Delivered at FSU-FAMU engineering colloquium, Engineering building. (Local)

Contracts and Grants

Contracts and Grants Funded

Paul Van Der Mark (PI), Sussman, Mark M (CO-PI), & 16 more CO-PIs. (Jan 2026–Jan 2029). *Florida State University Large Equipment Enhancement Program (LEEP)*. Funded by Florida State University. Total award $550,000.

Shoele, Kourosh (PI), & Sussman, Mark M (collaborator). (Jan 2025–Dec 2027). *Identifying the regimes and acoustics of cryogenic boiling heat transfer for accelerator applications*. Funded by Department of Energy. Total award $800,000.

Sussman, Mark M (Co-PI), Shoele, Kourosh (PI), & Guo, Wei (Co-PI). (Jan 2020–Apr 2023). *Fast Multilevel Multi-Phase CFD-Nodal Model for Cryogenic Applications*. Funded by National Aeronautics & Space Administration. (80NSSC20K0352). Total award $549,454.

Sussman, Mark M (Co-PI), & Georgiadou, Antigoni (PI). (Nov 2018–Apr 2019). *Mitigating Baryonic Effects in Weak Lensing Measurement*. Funded by Universities Research Association. (18-F-07). Total award $13,000.

Sussman, Mark M (Co-PI), & Georgiadou, Antigoni (PI). (May 2017–Jul 2017). *Simplifying The Sky: Mitigating Baryonic Effects In Cosmological Weak Lensing Measurements*. Funded by Universities Research Association. (17-S-11). Total award $6,600.

Sussman, Mark M (PI). (Aug 2016–Aug 2019). *Verification and Enhancement of a Model for*

Nucleate Pool Boiling Problems. Funded by University of Louisville. (ULRF 16-1097). Total award $92,998.

Hussaini, Mohammed Y (Co-PI), & Sussman, Mark M (PI). (Aug 2014–Jul 2018). *A Spectrally Accurate Hybrid Moment-of-Fluid and Level Set Method for Multiphase Flows*. Funded by National Science Foundation. (1418983). Total award $349,993.

Sussman, Mark M (PI), & Roper, Michael Gabriel (Co-PI). (Aug 2010–Jul 2014). *Computational Design of Microfluidic Structures*. Funded by National Science Foundation. (1016381). Total award $300,327.

Sussman, M. M. (2008–2008). *Acoustic cross-talk in jetting devices*. Funded by Kodak. Total award $5,000.

Erlebacher, Gordon (PI), Kopriva, D. A., Sussman, M. M., Wang, X., Horne, R. L., Muslimani, Z. H., & Cogan, N. G. (Aug 2007–Jul 2009). *SCREMS: High Performance Computing and Visualization*. Funded by National Science Foundation. (0724273). Total award $114,678.

Sussman, Mark M (PI). (Aug 2007–Aug 2011). *A computational Study of the Spray Characteristics of a liquid jet atomized by cross-flowing air*. Funded by National Science Foundation. (0713256). Total award $322,377.

Sussman, Mark M (PI). (Jan 2007–Mar 2007). *Code Enhancement to NFA*. Funded by Science Applications International Corporation. (4400137253). Total award $13,025.

Sussman, Mark M (PI). (Jul 2004–Mar 2006). *Numerical Modeling of Underwater Implosions*. Funded by Weidlinger Associates, Inc. (NONE). Total award $55,000.

Sussman, Mark M (PI). (May 2003–Apr 2007). *U.S.-Japan Cooperative Science Computational Study*. Funded by National Science Foundation. (INT-0242524). Total award $46,274.

Sussman, Mark M (PI). (Oct 2002–Aug 2004). *Advanced Fluid Modeling Capability for Underwater*. Funded by Weidlinger Associates, Inc. (NONE). Total award $119,944.

Sussman, Mark M (PI). (Apr 2002–Dec 2025). *SUSS-PI RESEARCH SUPPORT*. Funded by FSU. (NONE). Total award $20,576.

Sussman, M. M. (2002–2004). *Advanced Fluid Modeling Capability for Underwater shock analysis of Naval Ships, Phase II*. Funded by ONR. Total award $120,000.

Hussaini, Mohammed Y (Co-PI), & Sussman, Mark M (PI). (Sep 2001–Aug 2005). *Numerical Methods for Microscale and Nanoscale Multiphase flow*. Funded by National Science Foundation. (DMS-0108672). Total award $100,000.

Sussman, M. M. (2001–2002). *Advanced Fluid Modeling Capability for Underwater shock analysis of Naval Ships, Phase I and Phase I option*. Funded by ONR. Total award

$40,000.

Sussman, M. M. (2000–2001). *Numerical Modeling of vapor bubble creation and collapse in 3D general geometries*. Funded by XEROX. Total award $10,000.

Sussman, M. M. (2000–2001). *First-Year Assistant Professor award*. Funded by FSU. Total award $10,000.

Sussman, M. M. (1997–1998). *Mathematical Sciences Computing Research Environments*. Funded by NSF. Total award $40,000.

Sussman, M. M., & Puckett, E. G. (1997–2001). *Efficient, High Resolution, Numerical Methods for Free-boundary Problems with Surface Tension*. Funded by NSF. Total award $60,000.

Postdoctoral Supervision

Vahab, M. (2014–16).

Service

Florida State University

FSU University Service

chair, FSU graduate policy sub-committee - analyze the department of electrical and computer engineering (2019).

referee of 3 proposals, referee of CRC proposals (2012).

Committee Member, University Faculty Sabbatical Committee (2009–2010).

Member, Faculty Senate (2008–2009).

Committee Member, University Faculty Sabbatical Committee (2006–2007).

FSU Department Service

chair; aka parliamentarian, elections committee (2018–present).

Committee member, Graduate Committee (2012–present).

Committee Member, Numerical Analysis Qualifying Exams (2000–present).

chair, Christopher Hunter named professor selection committee (2024).

member, hiring committee (2013–2016).

Committee Member, Math Curriculum Committee (2008–2012).

Committee Member, Math Faculty Evaluation Committee (FEC) (2009–2011).

Scheduler, Applied Math Seminar (2007–2010).

Committee Member, Math Faculty Evaluation Committee (FEC) (2006–2007).

The Profession

Editorial Board Membership(s)

Journal of Computational Physics (2020–present).

Journal of Computational Physics, Executive Guest Editor, Special Issue (2025–2026).

Guest Reviewer for Refereed Journals

Physical Review Fluids (Nov 2019–present).

International Journal for Numerical Methods in Fluids (2010–present).

Journal of Aerospace Engineering (2010–present).

Computers and Fluids (1999–present).

International Journal of Multiphase Flow (1999–present).

Journal of Computational Physics (1999–present).

Journal of Scientific Computing (1999–present).

Physics of Fluids (1999–present).

SIAM Journal of Scientific Computing (1999–present).

ASME Journal of Heat and Mass Transfer (2024–25).

Journal of Numerical Analysis, Industrial and Applied Mathematics (JNAIAM) (2020–21).

European Journal of Mechanics-B/Fluids (2017–19).

Scientia Iranica (2018).

SIGGRAPH (2013).

Computing and Visualization in Science (2012).

Theoretical and Computational Fluid Mechanics (2012).

SIAM Journal on Multiscale Modeling and Simulation (2011–12).

Communications in Applied Mathematics and Computational Science (CAMCoS) (2010–12).

Communications in Computational Physics (2005–12).

Journal of Fluid Mechanics (1999–2012).

Chair of a Symposium

Sussman, M., & Wang, X. (Chair). (2016). *Applied math and fluid mechanics*. Symposium conducted at the meeting of SIAM-SEAS, Melbourne, Florida.

Sussman, M. (Chair). (2015). *Co-organizer SIAM mini-symposium, conference on scientific computing*. Symposium conducted at the meeting of SIAM, Salt Lake City, Utah.

Sussman, M. M. (Chair). (2013). *Co-organizer SIAM mini-symposium, conference on scientific computing*. Symposium conducted at the meeting of SIAM, Boston.

Sussman, M. M. (Chair). (2012). *ICNMMF Executive Organizing Committee*. Symposium conducted at the meeting of Penn State, State College, PA.

Sussman, M. M. (Chair). (2011). *Co-organizer SIAM mini-symposium, conference on scientific computing February, 2011 (Reno)*. Symposium conducted at the meeting of SIAM, Reno.

Sussman, M. M. (Chair). (2010). *Co-organizer SIAM mini-symposium, annual meeting July, 2010 (Pittsburgh)*. Symposium conducted at the meeting of SIAM, Pittsburgh.

Sussman, M. M. (Chair). (2004). *Co-organizer AMS mini-symposium, sectional meeting, 2004*. Symposium conducted at the meeting of AMS, Tallahassee.

Sussman, M. M. (Chair). (2001). *Co-organizer SIAM mini-symposium, annual meeting, 2001*. Symposium conducted at the meeting of SIAM.

Reviewer or Panelist for Grant Applications

DFG (2024).

NWO (Dutch research program) (2024).

NASA (2019–2023).

DFG (2005–2020).

NSF (2005–2020).

French National Research Agency (2011–2012).

DOE (2005–2012).

Netherlands Organization for scientific research (2005–2012).

NIH (2005–2012).

NSERC (Natural Sciences and Engineering Research Council of Canada) (2005–2012).

Service to Other Universities

Outside international thesis committee member/examiner for Michael Quell, *Vienna University of Technology (TU Wien)* (2022).

host to Zeyu Huang, *Aerospace Engineering, Tsingua University* (2019–2020).

External Reviewer for senior lecturer promotion (equivalent to US full professor   promotion), *Cardiff University, School of Engineering* (2020).

External Reviewer for full Professor promotion, *UTRGV Department of Mathematics* (2019).

host to Zhouteng Ye, *Ocean Engineering, Zhejian University* (2017–2018).

host to Liang Tao, *CSRC Beijing* (2017).

Habilitation committee for Dr. Sebastien Tanguy, *Institute for Fluid mechanics (IMFT)* (2015).

Lead opponent for thesis defense of Karl Yngve Lervag, *Norwegian Technical University* (2013).

Host for Eva Loch, *University of Aachen, Germany* (2011).

Host for Marcel Kwakkel, *Netherlands* (2010).

Host for Valeria Artale, *University of Catania* (2010).

Host for Dr. Nikiforakis, *Cambridge* (2008).

Host for Dr. Kensuke Yokoi, *Cambridge (at the time)* (2008).

Host for Dr. Kuniyoshi Abe, *Japan* (2008).

Host for Dr. Shin Rhee, *S. Korea* (2008).

host for Professor Mitsuhiro Ohta, *Muroran Inst. Tech (at the time)* (2002–2005).

The Community

Vice president of education, public speaking club, Toastmasters (2005–2009).