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Academic Employment

Douglass M. and Nola Leishman Professor of Cardiovascular Diseases, Stanford University, 2022 - present.

Professor, with tenure, Departments of Pediatrics, Bioengineering, Institute for Computational and Mathematical Engineering, and, by courtesy, of Mechanical Engineering, Stanford University, 2020 - present.

Associate Professor, with tenure, Departments of Pediatrics, Bioengineering, Institute for Computational and Mathematical Engineering, and, by courtesy, of Mechanical Engineering, Stanford University, 2015 - 2020.

Associate Professor, with tenure, Mechanical and Aerospace Engineering Department, University of California San Diego, 2013 - 2015.

Assistant Professor, Jacobs School of Engineering Faculty Fellow, Mechanical and Aerospace Engineering, University of California San Diego, 2007 - 2013.

Education

Postdoctoral Fellow, Departments of Pediatrics and Bioengineering, Stanford University, 2005- 2007.

Stanford University, Ph.D., Mechanical Engineering, 2005.

Stanford University, M.S.E., Mechanical Engineering, 2000.

Princeton University, B.S.E., Mechanical and Aerospace Engineering, 1998. With Honors.

Honors and Awards

Van C. Mow Medal American Society of Mechanical Engineers, 2023.

Open Science Champion Award, Stanford Center for Open and Reproducible Science, 2022.

Fellow, Biomedical Engineering Society, 2021.

Fellow, American Physical Society Division of Fluid Dynamics, 2020.

Fellow, American Institute for Medical and Biological Engineering, 2018.

Fellow, Society for Industrial and Applied Mathematics, 2018.

Vera Moulton Wall Center Scholar, Stanford University School of Medicine, 2015 -

Teacher of the Year Award, Mechanical and Aerospace Engineering Dept., UCSD, 2014-2015.

UCSD Graduate Student Association Faculty Mentor Award, 2014.

UCSD Panhellenic Society Outstanding Professor Award, 2013.

NSF CAREER Award, Office of Cyberinfrastructure, 2012.

Burroughs Wellcome Fund *Career Award at the Scientific Interface* 2007-2012.

American Heart Association Postdoctoral Fellowship Funding period: July 2006 - June 2008.

Dean's Postdoctoral Fellowship Stanford University Medical School, 2005-2006.

Zonta International Amelia Earhart Award for aeronautics research, 2003-04.

Journal Articles - Published

(Marsden lab trainees in bold)

1. Marsden, A. L., Vasilyev, O. V. and Moin, P., "Construction of commutative filters for LES on unstructured meshes." *Journal of Computational Physics*, Vol. 175(2), pp. 584–603, (2002).

2. Marsden, A. L., Wang, M., Dennis, J. E. Jr., and Moin, P., "Optimal aeroacoustic shape design using the surrogate management framework." *Optimization and Engineering*, Vol. 5(2), pp. 235-262, (2004). Special Issue on "Surrogate Optimization."

3. Marsden, A. L., Wang, M., Dennis, J. E. Jr., and Moin, P., "Suppression of vortex-shedding noise via derivative-free shape optimization" *Physics of Fluids*, Vol. 16(10), pp. L83-L86, (2004).

4. Marsden, A. L., Wang, M., Dennis, J. E. Jr., and Moin, P., "Trailing-edge noise reduction using derivative-free optimization and large-eddy simulation" *Journal of Fluid Mechanics*, Vol. 572, pp. 13-36, (2007).

5. Marsden, A. L., Vignon-Clementel, I. E., Chan, F., Feinstein, J. A., and Taylor, C. A., "Effects of exercise and respiration on hemodynamic efficiency in CFD simulations of the total cavopulmonary connection" *Annals of Biomedical Engineering,*, Vol. 35(2): 250-263, (2007).

6. Ihme, M., Marsden, A. L., and Pitsch, H., "Generation of optimal artificial neural networks using a pattern search algorithm: application to approximation of chemical systems" *Neural Computation,* Vol. 20, pp. 573-601, (2008).

7. Marsden, A. L., Feinstein, J. A., and Taylor, C. A., "A computational framework for derivative-free optimization of cardiovascular geometries" *Computer Methods in Applied Mechanics and Engineering,* Vol. 197(21-24), pp. 1890-1905, (2008).

8. Marsden, A. L., Bernstein, A. J., Reddy, V. M., Shadden, S., Spilker, R., Chan, F. P., Taylor, C. A. and Feinstein, J. A., "Evaluation of a Novel Y-Shaped Extracardiac Fontan Baffle Using Computational Fluid Dynamics" *Journal of Thoracic and Cardiovascular Surgery*, Vol. 137, pp. 394-403 (2009).

9. del Alamo, J.C., Marsden, A.L. and Lasheras, J., "Recent Advances in Computational Mechanics for the Diagnosis and Treatment of Cardiovascular Disease", *Revista Espanola de Cardiologia,* Vol. 62(7), pp. 781-805, (2009).

10. Bazilevs, Y, Hsu, M.-C., Benson, D.J., **Sankaran, S.** and Marsden, A.L., "Computational Fluid-Structure Interaction: Methods and Application to a Total Cavopulmonary Connection," *Computational Mechanics.* Vol. 45(1) pp. 77-89, (2009).

11. Marsden, A. L., Reddy, V. M., Shadden, S. C., Chan, F. P., Taylor, C. A., and Feinstein, J. A., " A new multiparameter approach to computational simulation for Fontan assessment and redesign," *Congenital Heart Disease.* Vol. 5(2), pp. 104-117, (2010).

12. **Sankaran, S.**, Audet, C., and Marsden A. L. "A method for stochastic constrained optimization using derivative-free surrogate pattern search and collocation," *Journal of Computational Physics,* Vol. 229(12), pp. 4664-4682, (2010).

13. **Yang, W.**, Feinstein, J.A. and Marsden, A.L., "Constrained Optimization of an idealized Y-shaped baffle for the Fontan surgery at rest and exercise," *Computer Methods in Applied Mechanics and Engineering,* Vol. 199, pp. 2135-2149, (2010).

14. **Sankaran, S.** and Marsden, A. L., "The impact of uncertainty on shape optimization of idealized bypass graft models in unsteady flow," *Physics of Fluids,* Vol. 22, 121902, (2010).

15. de Zelicourt, D.A., Marsden, A.L., Fogel, M.A., Yoganathan, A.P., "Imaging and patient-specific simulations for the Fontan surgery: current methodologies and clinical applications," *Progress in Pediatric Cardiology,* Vol. 30 (1-2), pp. 31-44, (2010).

16. Vignon-Clementel, I.E., Marsden, A.L., Feinstein, J.A., "A Primer on Computational Simulation in Congenital Heart Disease for the Clinician," *Progress in Pediatric Cardiology,* Vol. 30 (1-2), pp. 3-13, (2010).

17. Lesshafft, L., Meiburg, E., Kneller, B., and Marsden, A. L., "Towards inverse modeling of turbidity currents: the inverse lock-exchange problem," *Computers & Geosciences,* Vol. 37(4), pp. 521-529, (2011).

18. **Sankaran, S.** and Marsden, A.L., "A stochastic collocation method for uncertainty quantification and propagation in cardiovascular simulations," *J. Biomech. Eng.* Vol. 133(3) 031001, (2011).

19. Baretta A., Corsini C., **Yang W.**, Vignon-Clementel I.E., Marsden A.L., Feinstein J.A., Hsia T.-Y., Dubini G., Migliavacca F., Pennati G. "Virtual surgeries in patients with congenital heart disease: a multiscale modelling test case," *Phil. Royal Soc. Trans. A*, , Vol. 369(1954), pp. 4316-4330 (2011).

20. **Esmaily Moghadam, M.**, Bazilevs, Y., Hsia, T.-Y., Vignon-Clementel, I. and Marsden, A.L., "A comparison of outlet boundary treatments for prevention of backflow divergence with relevance to blood flow simulations," *Computational Mechanics,* Vol. 48, pp. 277-291, (2011).

21. **Yang, W.**, Vignon-Clementel, I.E., Troianowski, G., Reddy, V.M., Feinstein, J.A., Marsden, A.L., "Hepatic blood flow distribution and performance in traditional and Y-graft Fontan Geometries: A Case Series Computational Fluid Dynamics Study," *Journal of Thoracic and Cardiovascular Surgery*, Vol. 143(5), pp. 1086-1097, (2012).

22. Feinstein JA, Benson DW, Dubin AM, Cohen MS, Maxey DM, Mahle WT, Pahl E, Villafañe J, Bhatt AB, Peng LF, Johnson BA, Marsden AL, Daniels CJ, Rudd NA, Caldarone CA, Mussatto KA, Morales DL, Ivy DD, Gaynor JW, Tweddell JS, Deal BJ, Furck AK, Rosenthal GL, Ohye RG, Ghanayem NS, Cheatham JP, Tworetzky W, Martin GR, "Hypoplastic Left Heart Syndrome: Current Considerations and Expectations: A JACC White Paper," *J Am Coll Cardiol.* Vol. 59(1S), pp. S1-S42, (2012).

23. **Sengupta, D.**, Kahn, AM, Burns, JC, **Sankaran, S.**, Shadden, S. and Marsden, A.L., "Image-based modeling of hemodynamics and coronary artery aneurysms caused by Kawasaki disease," *Biomechanics and Modeling in Mechanobiology,* Vol. 11(6), pp. 915-932, (2012).

24. **Esmaily Moghadam, M.**, Migliavacca, F., Vignon-Clementel, I.E., Hsia, T.-Y., and Marsden, A.L., "Optimization of shunt placement for the Norwood surgery using multi-domain modeling," *J. Biomech. Eng.*, Vol. 134(5), (2012).

25. **Long, C.C.**, Hsu, M.-C., Bazilevs, Y., Feinstein, J.A., Marsden, A.L., "Fluid-structure interaction simulations of the Fontan procedure using variable wall properties," *International Journal of Numerical Methods in Biomedical Engineering*, Vol. 28(5), pp. 513-527, (2012).

26. **Sankaran, S., Esmaily Moghadam, M.**, Kahn, A.M., Guccione, J., Tseng, E., and Marsden, A.L., "Patient-specific multiscale modeling of blood flow for coronary artery bypass graft surgery," *Annals of Biomedical Engineering* Vol. 40(10), (2012).

27. Gundert, T.J., Marsden, A.L., **Yang, W.**, Marks, D.S., and LaDisa, Jr., J.F., "Identification of Hemodynamically Optimal Coronary Stent Designs Based on Vessel Caliber," *IEEE Transactions in Biomedical Engineering,* Vol. 59(7), pp. 1992-2002, (2012).

28. Gundert, T.J., Marsden, A.L., **Yang, W.**, and LaDisa, Jr., J.F., "Optimization of Cardiovascular Stent Design Using Computational Fluid Dynamics," *J. Biomech. Eng*, Vol. 134(1), (2012).

29. **Oakes, J.M.**, Scadeng, M., Breen, E., Marsden, A.L., Darquenne, C. "Rat airway morphometry measured from in-situ MRI-based geometric models," *Journal of Applied Physiology*, Vol. 112(11), pp. 1921-1931, (2012).

30. Baretta, A., Corsini, C., Marsden, A.L., Vignon-Clementel, I.E., Hsia, T.-Y. Dubini G., Migliavacca, F., Pennati, G., "Respiratory effects on hemodynamics in patient-specific CFD models of the Fontan circulation under exercise conditions" *European Journal of Mechanics B/Fluids,* Vol. 35, pp. 61-69, (2012).

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32. **Esmaily Moghadam, M.**, Vignon-Clementel, I.E., Figliola, R., and Marsden, A.L., "A modular numerical method for implicit 0D/3D coupling in cardiovascular finite element simulations," *Journal of Computational Physics,* Vol. 244, pp. 63-79, (2013).

33. **Yang, W.**, Feinstein, J.A., Shadden, S.C., Vignon-Clementel, I.E., and Marsden, A.L., "Optimization of a Y-graft design for improved hepatic flow distribution in the Fontan circulation," *J. Biomech. Eng.*, Vol. 135(1), (2013).

34. Duvernois, V., Marsden, A.L. and Shadden, S.C., "Lagrangian analysis of hemodynamics data from FSI simulation," *International Journal for Numerical Methods in Biomedical Engineering,* Vol. 29(4), pp. 445-461, (2013).

35. **Sankaran, S.**, Humphrey, J.D., Marsden, A.L., "Optimization and parameter sensitivity analysis for arterial growth and remodeling computations," *Computer Methods in Applied Mechanics and Engineering,* Vol. 256, pp. 200-210, (2013).

36. **Kung, E.O.**, Baretta, A., Baker, C., Arbia, G., Biglino, G., Corsini, C., Schievano, S., Vignon-Clementel, I.E., Dubini, G., Pennati, G., Taylor, A., Dorfman, A., Hlavacek, A.M., Marsden, A.L., Hsia, T.-Y. Migliavacca, F., "Predictive modeling of the virtual Hemi-Fontan operation for second stage single ventricle palliation: two patient-specific cases," *Journal of Biomechanics*, Vol. 46, pp. 423-429, (2013).

37. **Esmaily Moghadam, M.**, Hsia, T.Y., Marsden, A.L., "A non-discrete method for computation of residence time in fluid mechanics simulations," *Physics of Fluids,* Vol. 25, 110802, (2013).

38. Steinman, D. et al. " Variability of CFD Solutions for Pressure and Flow in a Giant Aneurysm: The SBC2012 CFD Challenge," *Journal of Biomechanical Engineering*, Vol. 135, (2013).

39. Lee, J., **Esmaily Moghadam, M., Kung, E.**, Cao, H., Beebe, T., Miller, Y., Roman, B.L., Lien, C., N.C. Chi, Marsden, A.L., Hsiai, T.K., "Moving Domain Computational Fluid Dynamics to Interface with an Embryonic Model of Cardiac Morphogenesis," *PLOS one* Vol. 8(8), (2013).

40. Marsden, A.L., "Simulation based planning of surgical interventions in pediatric cardiology," *Physics of Fluids* (invited paper), Vol. 25, 101303 (2013).

41. **Long, C.C., Esmaily Moghadam, M.,** Marsden, A.L., Bazilevs, Y., "Computation of Residence Time in the Simulation of Pulsatile Ventricular Assist Devices," *Computational Mechanics*, Vol. 54(4), pp. 911-919, (2013).

42. **Esmaily Moghadam, M.**, Bazilevs, Y., Marsden, A.L., "A new preconditioning technique for implicitly coupled multidomain simulations with applications to hemodynamics," *Computational Mechanics,* Vol. 52(5), pp. 1141-1152, (2013).

43. **Long**, C. C., Marsden, A. L., Bazilevs, Y., "Fluid-Structure Interaction Simulation of Pulsatile Ventricular Assist Devices," *Computational Mechanics*, Vol. 52(5), pp. 971-981, (2013).

44. **Oakes, J.M.**, Marsden, A.L., Grandmont, C., Shadden, S.C., Darquenne, C., Vignon-Clementel, I.E., "Airflow and Particle Deposition Simulations in Health and Emphysema: From In Vivo to In Silico Animal Experiments," *Annals of Biomedical Engineering,* Vol. 42(4), pp. 899-914, (2013).

45. Corsini, C., Baker, C., **Kung, E.O.**, Schievano, S., Arbia, G., Baretta, A., Biglino, G., Migliavacca, F., Dubini, G., Pennati, G., Marsden, A., Vignon-Clementel, I., Taylor, A, Hsia, T.-Y., and Dorfman, A., "An Integrated Approach to Patient-specific Predictive Modeling for Single Ventricle Heart Palliation," *Computer Methods in Biomechanics and Biomedical Engineering,* Vol. 17(14), pp. 1572-1589, (2013).

46. Arbia, G., Corsini, C., **Esmaily Moghadam, M.**, Marsden, A.L., Migliavacca, F., Pennati, G., Hsia, T-Y, Vignon-Clementel, I.E., "Numerical blood flow simulation in surgical corrections: what do we need for an accurate analysis?" *Journal of Surgical Research*, Vol. 186(1), pp. 44-55, (2014).

47. **Sengupta, D.**, Kahn, A.M., Shirinsky, O., Lyskina, G., Burns, J.C., Marsden, A.L., "Thrombotic risk stratification using computational modeling in patients with coronary artery aneurysms following Kawasaki disease," *Biomechanics and Modeling in Mechanobiology,* Vol. 13(6), pp. 1261-1276, (2014).

48. Marsden, A.L., "Optimization in cardiovascular modeling," *Annual Review of Fluid Mechanics* (invited paper), Vol. 46, 519-546 (2014).

49. Marsden, A.L., Bazilevs, Y., **Long, C.C.**, Behr, M., "Recent advances in computational methodology for simulation of mechanical circulatory assist devices," to appear in *WIREs Systems Biology & Medicine* (invited paper), Vol. 6(2), pp. 169-188, (2014).

50. **Kung E.O.**, Pennati G., Migliavacca F., Hsia T.Y., Marsden, A.L., Giardini A., MOCHA Investigators. "A simulation protocol for exercise physiology in Fontan patients using a closed-loop lumped-parameter model," *Journal of Biomechanical Engineering,* Vol. 136(8), pp. 081007, (2014).

51. **Kung E.O.**, Kahn A.M., Burns J.C., Marsden, A.L., "In-vitro Validation of Patient-Specific Hemodynamic Simulations in Coronary Aneurysms Caused by Kawasaki Disease." *Cardiovascular Engineering and Technology,* Vol. 5(2), pp. 189-201, (2014).

52. **Long, C.C.**, Bazilevs, Y., Marsden, A.L., "Shape Optimization of Pulsatile Ventricular Assist Devices Using FSI to Minimize Thrombotic Risk," *Computational Mechanics,* Vol. 54(4), pp. 921-932, (2014).

53. Bao, G., Bazilevs, Y., Chung, J.H., Decuzzi, P. Espinosa, H.D., Ferrari, M., Gao, H., Hossain, S., Hughes, T.J.R., Kamm, R., Liu, W.K., Marsden, A.L., "USNCTAM Perspectives on Mechanics in medicine," *Journal of the Royal Society Interface,* Vol. 11(97), pp. 20140301, (2014).

54. Takizawa, K., Tezduyar, T.E., **Long, C. C.**, Marsden, A. L., Schjodt, K., "ST and ALE-VMS methods for patient-specific cardiovascular fluid mechanics modeling," *Mathematical Models and Methods in Applied Sciences*, Vol 24(12), pp. 2437-2486, (2014).

55. **Esmaily Moghadam**, Bazilevs, Y., Marsden, A.L., "Impact of data distribution on the parallel performance of iterative linear solvers with emphasis on CFD of incompressible flows," *Computational Mechanics*, Vol. 55(1), pp. 93-103, (2015).

56. **Esmaily-Moghadam, M.**, Murtuza, B., Hsia, T.Y., Marsden, A.L., "Simulations reveal adverse hemodynamics in single ventricle patients with multiple systemic to pulmonary shunts," *Journal of Biomechanical Engineering,* Vol. 137(3), 031001, (2015).

57. **Ramachandra, A. B.**, Sankaran, S., Humphrey, J.D., Marsden, A.L., "Computational simulation of the adaptive capacity of vein grafts in response to increased pressure," *Journal of Biomechanical Egnineering*, Vol. 137, pp. 031009-1, (2015). PMCID: PMC4321118

58. **Kung, E.O.**, Perry, J.C., Davis, C.K., Migliavacca, F., Pennati, G., Hsia, T-Y, Giardini, A., Marsden, A.L., "Computational Modeling of Pathophysiologic Responses to Exercise in Fontan Patients," *Annals of Biomedical Engineering*, Vol. 43(6), pp. 1335-1347, (2015).

59. **Esmaily-Moghadam, M.**, Bazilevs, Y., Marsden, A.L.,, "A bi-partitioned iterative algorithm for solving linear systems obtained from incompressible flow problems," *Computer Methods in Applied Mechanics and Engineering*, Vol. 286, pp. 40-62, (2015).

60. **Schiavazzi, D.**, **Kung, E.O.**, Marsden, A.L., Baker, C., Pennati, G., Hsia, T.-Y., Dorfman, A., "Hemodynamic effects of left pulmonary artery stenosis following superior cavopulmonary connection: a patient-specifc multiscale modeling study," *Journal of Thoracic and Cardiovascular Surgery*, Vol. 149(3), pp. 689-696, (2015).

61. **Esmaily-Moghadam, M.**, Hsia, T-Y, Marsden, A.L., "The Assisted Bidirectional Glenn: a novel surgical approach for first stage single ventricle heart palliation," *Journal of Thoracic and Cardiovascular Surgery*, Vol. 149(3), pp. 699-705, (2015).

62. **Oakes, J.M.**, Marsden, A.L., Grandmont, C., Darquenne, C., Vignon-Clementel, I.E., "Distribution of Aerosolized Particles in Healthy and Emphysematous Rat Lungs: Comparison Between Experimental and Numerical Studies," *Journal of Biomechanics*, Vol. 48(6), pp. 1147-1157, (2015).

63. Martin, M.H., Feinstein, J.A., Chan, F.P., Marsden, A.L., **Yang, W.**, Reddy, V.M., "Technical Feasibility and Intermediate Outcomes of a Hand-Crafted, Area-Preserving, Bifurcated "Y-Graft" Fontan," *Journal of Thoracic and Cardiovascular Surgery*, Vol. 149(1), pp. 247-255, (2015).

64. **Yang, W.**, Chan, F.P., Reddy, V.M., Marsden, A.L., Feinstein, J.A., "Flow Simulations and Validation for the First Cohort of Y-graft Fontan Patients," *Journal of Thoracic and Cardiovascular Surgery*, Vol. 149(1), pp. 247-255, (2015).

65. Corsini, C., Baker, C.E., Baretta, A., Biglino, G., Hlavacek, A.M., Hsia, T.Y., **Kung, E.O.**, Marsden, A.L., Migliavacca, F., Vignon-Clementel, I.E., Pennati, G., "Integration of clinical data collected at different times for virtual surgery in single ventricle patients: a case study," *Annals of Biomedical Engineering,* 43(6), pp. 1310-20, (2015).

66. Marsden, A.L., and **Esmaily Moghadam, M.**, "Multiscale Modeling of Cardiovascular Flows for Clinical Decision Support," (invited), *Applied Mechanics Reviews*, Vol. 67, pp. 030804-1-11 (2015).

67. Zhou, J., **Esmaily-Moghadam, M.**, Conover, T., Hsia, T.-Y., Marsden, A.L., Figliola, R., "In vitro experimental assessment of the assisted bidirectional Glenn procedure for stage one single ventricle repair" *Cardiovascular Engineering and Technology,* Vol. 6(3), pp. 256-267, (2015).

68. Marsden, A.L., Feinstein, J.A., "Computational modeling and engineering in pediatric and congenital heart disease," (invited), *Current Opinion in Pediatrics*, Vol. 27(5), pp. 587–596, (2015).

69. Van De Bruaene, A., Claessen, G, La Gerche, A., **Kung E.**, Marsden, A., De Meester, P., Devroe, S., Bogaert, J., Claus, P., Heidbuchel, H., Budts, W., Gewillig, M., "Effect of respiration on cardiac filling at rest and during exercise in Fontan patients: A clinical and computational modeling study," *IJC Heart & Vasculature,* Vol. 9, pp. 100-108, (2015).

70. Farrar, G., Suinesiaputra, A., Gilbert, K., Perry, J., Hegde, S., Marsden, A., Young, A., Omens, J., McCulloch, A., "Atlas-Based Patient-Specific Ventricular Shape Analysis in Congenital Heart Disease," *Progress in Pediatric Cardiology,* Vol. 43, pp. 61-69 (2016).

71. **Schiavazzi, D. E.**, Arbia, G., Baker, C., Hlavacek, A.M., Hsia, T.Y., Marsden, A.L., Vignon-Clementel, I.E., "Uncertainty quantification in virtual surgery hemodynamics predictions for single ventricle palliation," *International Journal of Numerical Methods in Biomedical Engineering,* Vol. 32(3), (2016).

72. **Schiavazzi, D. E.**, Hsia, T. Y., Marsden, A.L., "On a sparse pressure-flow rate condensation of rigid circulation models," *Journal of Biomechanics,* Vol. 49(11) (Special Issue) pp. 2174-2186, (2016).

73. **Ramachandra, A.B.**, Kahn, A. M., Marsden, A.L., "Patient specific simulations reveal significant differences in mechanical stimuli in venous and arterial coronary grafts," *Journal of Cardiovascular Translational Research*, Vol. 9 (4), pp. 270-290, (2016). PMCID: PMC5533611

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75. **Schiavazzi, D.E.**, Baretta, A., Pennati, G., Hsia, T.-Y., Marsden, A.L., "Patient-specific parameter estimation in single-ventricle lumped circulation models under uncertainty," *International Journal of Numerical Methods in Biomedical Engineering*, Vol. 33 (3), e02799, (2017).

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77. Ward, E.P., Schiavazzi, D., Sood, D., Marsden, A., Lane, J., Owens, E., Barleben, A., "Computed Tomography Fractional Flow Reserve Can Identify Culprit Lesions in Aortoiliac Occlusive Disease Using Minimally Invasive Techniques," *Annals of Vascular Surgery*, Vol. 38, pp. 151-157 (2017).

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79. **Schiavazzi, D. E.**, Doostan, A., Iaccarino, G., Marsden, A. L., "A Generalized Multi-resolution Expansion for Uncertainty Propagation with Application to Cardiovascular Modeling," *Computer Methods in Applied Mechanics and Engineering,* Vol. 314, Special Issue (SI), pp. 196-221, (2017).

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81. Wu, M. C.H., Kamensky, D., Wang, C., Herrema, A.J., Xu, F., Pigazzini, M.S., Marsden, A.L., Bazilevs, Y., Hsu, M.C., "Optimizing fluid-structure interaction systems with immersogeometric analysis and surrogate modeling: Application to a hydraulic arresting gear," *Computer Methods in Applied Mechanics and Engineering,* Vol. 316 (Special Issue), pp. 668-693 (2017).

82. **Ramachandra, A. B.**, Humphrey, J. D., Marsden, A. L., "Gradual loading ameliorates maladaptation in computational simulations of vein graft growth and remodeling," *Journal of the Royal Society Interface,* Vol. 14(130), (2017). PMCID: PMC5454282

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84. **Grande-Gutierrez, N.**, Kahn, A., Burns, J.C., Marsden, A. L., "Computational blood flow simulations in Kawasaki disease patients: Insight into coronary artery aneurysm hemodynamics," *Global Cardiology Science and Practice*, Vol. 2017(3), (2017). PMCID: PMC5856960

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184. **Salvador, M., Kong, F.**, Peirlinck, M., Parker, D.W., Chubb, H., Dubin, A.M., Marsden, A.L., "Digital twinning of cardiac electrophysiology for congenital heart disease," *Journal of the Royal Society Interface*, Vol. 21(215), (2024).

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Journal Articles - In Press

1. **Kaiser, A.D.**, Haidar, M.A., Choi, P.S., Sharir, A., Marsden, A.L., Ma, M.R., "Simulation-Based Design of Bicuspidization of the Aortic Valve," *Journal of Thoracic and Cardiovascular Surgery*, in press.

2. **Menon, K., Hu, Z.**, Marsden, A.L., "Cardiovascular fluid dynamics: A journey through our circulation," *Flow*, in press.

3. **Menon, K.**, Khan, M.O., **Sexton, Z.A.**, Richter, J., Nieman, K., Marsden, A.L., "Personalized coronary and myocardial blood flow models incorporating synthetic vascular trees and CT perfusion imaging," *npj Imaging*, in press.

4. Lee, J.D., Richter, J., **Pfaller, M.R., Szafron, J.M., Menon, K., Zanoni, A.**, Ma, M.R., Feinstein, J.A., Kreutzer, J., Marsden, A.L., Schiavazzi, D.E., "A probabilistic neural twin for treatment planning in peripheral pulmonary artery stenosis," *International Journal for Numerical Methods in Biomedical Engineering,* to appear.

5. **Zanoni, A.**, Geraci, G., **Salvador, M., Menon, K.**, Marsden, A.L., Schiavazzi, D.E., "Improved multifidelity Monte Carlo estimators based on normalizing flows and dimensionality reduction techniques," *Computer Methods in Applied Mechanics and Engineering*, to appear.

6. **Pfaller, M.R.**, Latorre, M, Schwarz, E.L., Gerosa, F.M., **Szafron, J.M.**, Humphrey, J. D., Marsden, A.L., "FSGe: A fast and strongly-coupled 3D fluid-solid-growth interaction method," *Computer Methods in Applied Mechanics and Engineering*, to appear.

7. **Kong, F.**, Stocker, S., Choi, P.S., Ma, M., Ennis, D.B., Marsden, A., "SDF4CHD: Generative modeling of cardiac anatomies with congenital heart defects," *Medical Image Analysis*, to appear.

8. Richter, J., Nitzler, J., **Pegolotti, L., Menon, K.**, Biehler, J., Wall, W.A., Schiavazzi, D.E., Marsden, A.L., Pfaller, M.R., "Bayesian Windkessel calibration using optimized 0D surrogate models," *Philisophical Transactions A*, to appear.

Journal Articles - Submitted

1. **Sexton, Z.A.**, Hudson, A.R., Herrmann, J.E., Shiwarski, D.J., **Pham, J., Szafron, J.M.**, Wu, S.M., Skylar-Scott, M., Feinberg, A.M., Marsden, A.L., "Rapid model-guided design of organ-scale synthetic vasculature for biomanufacturing," submitted for review.

2. Tsutomu Shinohara, T., Moonen, J.-R., Chun, Y.H., Lee-Yow, Y.C., Okamura, K., **Szafron, J.M.**, Kaplan, J., Cao, A., Wang, L., Taylor, S., Isobe1, S., **Dong, M.**, Yang, W., Guo, K., Franco, B.D., Pacharinsak, C., Pisani, L.J., Saitoh, S., Mitani, Y., Marsden, A.L., Engreitz, J.M., Körbelin, J., Rabinovitch, M., "High Shear Stress Reduces ERG Causing Endothelial-Mesenchymal Transition and Pulmonary Arterial Hypertension," submitted for review.

3. **Rubio, N. L., Pegolotti, L., Pfaller, M.R.**, Darve, E.F., Marsden, A.L., "Hybrid Physics-Based and Data-Driven Modeling of Vascular Bifurcation Pressure Differences," submitted for review.

4. Seresti Abbasnejad, A., Marsden, A.L., Kahn, A.M., Reeves, R.R., Mahmud, E., Al Khiami, B., Ang, L., "Validation of CTA-based Closed-Loop Coronary Artery Flow Simulations Against Intravascular Doppler Velocity and Pressure Measurements," submitted for review.

5. Hermansson, F.N., Celestin, B.E., Bagherzadeh, S.P., Santana, E.J., Mantri, N., Zamanian, R.T., Marsden, A.L., Salerno, M., Dual, S.A., Haddad, F., "Improving Right Ventricular Analysis in Echocardiography Using an Automated Centerline Method," submitted for review.

6. Choi, P.S., Sharir, A., Ono, Y., Shibata, M., Kaiser, A.D., Palagani, Y., Marsden, A.L., Ma, M.R., "Combined Simulation and Ex-vivo Assessment of Free-edge Length in Bicuspidization Repair for Congenital Aortic Valve Disease," submitted for review

Book Chapters

1. Marsden, A. and Kung, E.O., "Multiscale Modeling of Cardiovascular Flows," *Computational Bioengineering*, CRC Press Taylor & Francis Group, edited by Guigen Zhang, April 2015.

2. C. Alberto Figueroa, Charles A. Taylor, Alison L. Marsden, "Blood Flow," *Encyclopedia of Computational Mechanics*, 2nd Edition, Wiley, (2018).

3. Yang, W., Feinstein, J.A., Marsden, A.L., "Computational Modeling and Personalized Surgery," *3-Dimensional Modeling in Cardiovascular Disease*, Elsevier, edited by Evan M. Zahn, (2020).

4. Pfaller, M.R., Pegolotti, L., Pham, J., Rubio, N.L., Marsden, A.L., "Reduced Order Modeling," *Biomechanics of the Aorta: Modeling for Patient Care*, Elsevier, edited by Christian Gasser, (2023).

Refereed Conference Papers

1. Bazilevs, Y., Marsden, A.L., Lanza di Scalea, F., Majumdar, A., Tatineni, M., "Toward a Computational Steering Framework for Large-Scale Composite Structures Based on Continually and Dynamically Injected Sensor Data," *Procedia Computer Science* **9**, pp. 1149-1158, (2012).

2. Xie, J., Frazier, P.I., Sankaran, S., Marsden, A.L., Elmohamed, S. "Optimization of Computationally Expensive Simulations with Gaussian Processes and Parameter Uncertainty: Application to Cardiovascular Surgery," Acccepted as an invited paper at the 50th Annual Allerton Conference on Communication, Control, and Computing, (2012).

3. Esmaily-Moghadam, M., Bazilevs, Y., Marsden, A.L., "Low entropy data mapping for sparse iterative linear solvers", *Proceedings of the Conference on Extreme Science and Engineering Discovery Environment: Gateway to Discovery*, ACM, p. 2., (2013).

4. Gilbert, K., Farrar, G., Cowan, B., Suinesiaputra, A., Occleshaw, C., Perry, J., Hegde, S., Marsden A., Omens, J., McCulloch, A., Young, A., "Creating Shape Templates for Patient Specific Biventricular Modeling in Congenital Heart Disease," Conf Proc IEEE Eng Med Biol Soc. pp. 679-82, (2015).

5. Merkow, J., Tu, Z., Kriegman, D., Marsden, A., "Structural edge detection for cardiovascular modeling," International Conference on Medical Image Computing and Computer-Assisted Intervention, pp. 735-742, (2015).

6. Korobenko, A., Pigazzini, M., Singh, V., Kim, H., Allaire, D., Willcox, K., Marsden, A.L., Bazilevs, Y., "Dynamic-Data-Driven Damage Prediction in Aerospace Composite Structures," 17th AIAA/ISSMO Multidisciplinary Analysis and Optimization Conference, Washington, D.C., June 2016.

7. Merkow, J., Marsden, A.L., Kriegman, D., Tu, Z., "Dense volume-to-volume vascular boundary detection," International Conference on Medical Image Computing and Computer-Assisted Intervention, pp. 371-379, (2016).

8. Goergen, C., Shadden, S.C., Marsden, A.L., "SimVascualr as an instructional tool in the classroom," Frontiers in Education, Indiannapolis, Indiana, (2017).

9. Wilson, N.M., Marru, S., Abeysinghe, E., Christie, M.A., Maher, G.D., Updegrove, A.R., Pierce, M., Marsden, A.L., "Using a Science Gateway to Deliver SimVascular Software as a Service for Classroom Instruction" Proceedings of the Practice and Experience on Advanced Research Computing, 102, (2018).

Patents

1. U.S. patent 10709400: Hemodynamic and Morphological predictors of Vascular Graft Failure, issued July 14, 2020.
2. U.S. patent pending PCT/US2021/026443: Graft assemblies and methods for manufacture and implementation, filed April 8, 2020.
3. U.S. provisional patent US-20230080204-A1: SYSTEMS, DEVICES, AND METHODS TO PREVENT AUTO AND XENO GRAFT FAILURE.
4. U.S. provisional patent US-20230225696-A1: Methods and Systems for Assessment of Pulmonary Hypertension, filed Jan 2022.
5. U.S. patent pending US-20230414361-A1: DEVICES AND METHODS FOR MECHANICALLY INDUCED VENTRICULAR GROWTH IN SINGLE VENTRICLE PATIENTS.

Independent Consulting and Industry Experience

Medical Device Consulting: Provided independent consulting services for medical device start up companies including Inquis, Renata, Innovein, NXT Biomedical. Worked on devices including catheters, artificial valves, surgical grafts, and pediatrics. Performed computational fluid dynamics and finite element simulations for cardiovascular medical device evaluation and design optimization using SimVascular.

Medical device development: co-founder and chief science advisor of medical device start up company BioGraft, Inc, currently in preclinical phase, NIH STTR funded (Phase I).

Industrial research contracts and collaborations: Research collaborations involving industrial contracts and grants with Starlight Cardiovscular, Google ATAP and Medtronic.

Editorials

1. Marsden, A.L. and Feinstein, J.A., "Will computational simulation in congenital heart disease ever make it out of the lab and into the clinic?" (editorial) *Therapy*, **6**(4) pp. 541-543, (2009).

2. Marsden, A.L. "Cardiovascular blood flow simulation: from computation to clinic," SIAM News (invited article), (2015).

3. Marsden, A.L. "Clinically Useful Computational Models for Personalized Treatment Planning in Cardiovascular Disease," SIAM News (invited article), (2018).

4. Chubb, H., Salvador, M., Marsden, A.L., "Computational Modelling of CRT in Congenital Heart Disease: Fantasy or the Future?," Europace, (2024).

Current Extramural Funding

NIH NHLBI R01HL159954 (Marsden, PI), "Computational model-driven design to mitigate vein graft failure after coronary artery bypass," 08/15/2022 - 06/30/2026, $2.75M.

NIH NIBIB R01EB029362 (Marsden, PI) "SCH: INT: A Virtual Surgery Simulator to Accelerate Medical Training in Cardiovascular Disease," 9/19-6/24 (NCX), $1.37M.

NIH NHLBI R01HL141712 (Nieman, PI, Marsden co-I) "Comprehensive CT Guided Coronary Artery Bypass Graft Surgery," 02/15/2019 - 01/31/2025, $3.4M ($674,000 Marsden lab portion).

NIH NHLBI R01HL12850305 (Red Horse PI, Marsden co-I), "Mechanotransduction and transcriptional regulation during artery development," 09/2020 – 06/2025, $2.7M ($100,343 Marsden lab portion)

Additional Ventures Foundation (Marsden PI) "Additional Ventures Cures Collaborative (AVCC)," 09/2020 – 09/2025, $242,602 per 6 month interval.

Additional Ventures Foundation (Marsden PI) "An Electrohydraulic Pulsatile Conduit as a Power Source for the Fontan Circulation," 07/2023 – 06/2024, $50,000.

NSF 2105345 (Marsden PI), "Multifidelity Uncertainty Quantification Through Model Ensembles and Repositories," 09/2021 – 08/2024, $513,515.

NIH NHLBI R01HL129727 (Hsiai PI, Marsden co-PI), "Shear stress and light-field to elucidate the initiation of cardiac outflow tract," 01/2021 – 12/2024, ($322,400 Marsden lab portion).

NIH NHLBI R01HL159970 (Hsiai PI, Marsden co-PI), "Integrating Volumetric Light-Field with Computational Fluid Dynamics to Study Myocardial Trabeculation and Function," 08/2021 – 5/2025, ($707,090 Marsden lab portion).

NIH NHLBI R01HL139796 (Breuer, PI, Marsden co-PI), "Improving Tissue Engineered Vascular Graft Performance via Computational Modeling," 01/01/2022 - 03/31/2026, $1.2M ($636,924 Marsden lab portion).

NIH NHLBI R41HL162397 (Wilson, PI, Marsden co-PI), "Preclinical testing of a 3D printed external scaffold device to prevent vein graft failure after coronary bypass graft surgery," 9/2022-9/2023, $345,000, ($104,995 Marsden lab portion).

NIH NHLBI R01HL167516 (Marsden, PI, Feinstein co-PI), "Uncertainty aware virtual treatment planning for peripheral pulmonary artery stenosis," 07/2023 - 06/2028, $3.42M.

NSF 2310909 (Marsden, PI), "Collaborative Research: Frameworks: A multi-fidelity computational framework for vascular mechanobiology in SimVascular," 09/2023 - 08/2027, $1.6M.

ARPA-H AY1AX000002 (Skylar Scott, PI), "Heart Enabling Advancements through Regenerative Tissue (HEART) Program," 09/2023-8/2026, $15M, ($63,073 Marsden lab portion)

Computational Resource Awards

XSEDE High performance computing hours (6M SUs) on National supercomputing resource centers. (current)

XSEDE Educational allocation for the SimVascular GATEWAY (150,000 SUs) (current)

Rescale University 1st place in simulation research grant competition, 2013. Awarded compute hours for simulations in new cloud computing environment, Rescale Corp., San Francisco. $2,000.

Completed Extramural Funding

NIH NLM R01LM013120 (Marsden, PI) "Automated data curation to ensure model credibility in the Vascular Model Repository," 9/19-5/22 (NCX), $1.15M.

NIH NHLBI 5R01HL12850305 (Rodefeld PI, Marsden co-I), "Cavopulmonary Assist to Reverse the Fontan," 09/2020 – 08/2025, $387,221.

NSF (Schiavazzi PI, Marsden co-I) "Robust Diagnosis in Electronic Health Records Integrating Physics-based Missing Data Multiple Imputation, Fast Inference for Hemodynamic Models, and Differential Privacy," 09/2019-08/2022, $62,682.

NSF SSI (Marsden PI) "SI2-SSI Collaborative Research: The SimCardio open source multi-physics cardiac modeling package," 9/1/2017-8/31/2021 (NCX), $1.4M

AHA Transformational Project Award (Marsden, PI) "Hemodynamic determinants of premature pulmonary valve dysfunction in children with Tetralogy of Fallot," 07/01/2019-06/30/2022, $300,000.

NIH NHLBI (Breuer PI, Marsden co-PI) R01HL139976 "Improving Tissue Engineered Vascular Graft Performance via Computational Modeling," 01/01/2018 - 11/30/2022, $133,941 per year

NIH NIBIB R01EB018302 (Marsden PI) "Enabling reliable cardiovascular simulations via uncertainty quantification," 2016-2020 (NCX), $1.55M.

DoD (Breuer PI, Marsden co-I) "Development and preclinical validation of an improved tissue engineered vascular graft for use in congenial heart surgery," 09/30/2018 - 09/29/2021, $488,245

NIH NHLBI R01HL123689 (Marsden PI), "Multiscale modeling for vein graft failure risk stratification in CABG patients" 7/1/14-6/30/20, $1.8M.

NSF CDS&E (Marsden PI) "CDS&E: Uncertainty Quantification and Bayesian Updating in Data-Driven Cardiovascular Modeling," 2015-2019, $375,000.

NIH NHLBI R01HL129727 (Hsiai, PI, Marsden, Co-PI) "Shear Stress and Light-Sheets to Study Cardiac Trabeculation, 07/09/2015 - 06/30/2019

American Heart Association *Beginning Grant in Aid*, (PI) "Optimization and implementation of a newly developed Fontan Ygraft: from computational models to clinical application." $140,000, 2008-2010.

UCSD Collaboratories Grant (co-PI) "A Pipeline for Patient-Specific Cardiovascular Modeling: Imaging, Simulation and Visualization", 2009-2010. $60,000.

National Science Foundation - CBET *Conference Grant* (PI) "1st International Conference on Computational Simulation in Congenital Heart Disease", Feb 26-27, 2010, La Jolla, CA. $10,000.

SDSC TRO "Computational framework for Cardiovascular surgical procedures" 2010-2011. $22,004.

Burroughs Wellcome Fund *Career Award at the Scientific Interface*, (PI) "Engineering new treatments for cardiovascular disease using physiologic simulation and optimal design." $500,000, 2007-2012.

NIH NHLBI R21 grant RHL102596A (PI), "Patient-specific simulations for thrombotic risk assessment in Kawasaki disease", 2010-2012. $404,737.

NIH SBIR Phase II, (Co-I, PI Nathan Wilson) "Cardiovascular, Lung, and Blood Computation Model Library", 2011-2013. $109,623.

AFOSR DDDAS (Co-I, PI Yuri Bazilevs) "Computational Steering of Large-Scale Structural Systems Through Advanced Simulation, Optimization, and Structural Health Monitoring" 2012-2015, $695,905

Leducq Foundation *Transatlantic Network of Excellence for Cardiovascular Research*, (American core member, PI TY Hsia) "Multi-Scale Modeling of Single Ventricle Hearts for Clinical Decision Support," 2010-2015. $6M (UCSD portion $560,000)

Google ATAP 5/1/2015 - 3/1/2016, "Modeling Noninvasive Measurements of Cardiovascular Dynamics, 2015-2016, $220,000.

NIH NHLBI R01 grant 1R01HL121754-01 (PI Andrew McCulloch), "The Cardiac Atlas Project" 12/01/2013-11/30/2018

NSF SSI, (PI) "SI2-SSI: Collaborative Research: A sustainable open source software pipeline for patient specific blood flow simulation and analysis," 2013-2017, $1.2M.

NSF CAREER, (PI), "Optimization and parameterization for multiscale cardiovascular flow simulations using high performance computing," 2012-2017, $427,569.

Stanford Child Health Research Institute (PI) "Hemodynamic determinants of pulmonary valve dysfunction in children with Tetralogy of Fallot," $35,000.

American Heart Association (PI) 18UNPG34080431 "Cardiovascular hemodynamics simulation and deep learning software and data base for the AHA Precision Medicine Platform,'' 04/02/2018 - 04/01/2019, $136,364

Stanford Child Health Research Institute (Marsden PI) "Integrated in vitro and in silico models of pulmonary valve dysfunction in children with Tetralogy of Fallot," 2017-2019, $200,000.

Open Source and Open Data

Lead developer of **SimVascular** open source software project for patient specific cardiovascular modeling and simulation, www.simvascular.org, https://github.com/SimVascular

Lead developer of **Vascular Model Repository** (www.vascularmodel.com) open data project, containing over 250 imaging, 3D models, and simulation datasets.

In the Press

Future of Everything, SiriusXM Radio with host Russ Altman, ''Computer Models Could Transform Cardiovascular Surgery," Nov. 2018.

Biomedical Computation Review, "Doing the Heart Good: Translating Models to the Clinic," March 2014.

KPBS San Diego "UC San Diego Engineers try to redesign heart pump," Nov. 13, 2012

San Diego Union Tribune "Female scientists blazing new trails," July 8, 2012.

Congenital Cardiology Today "UC San Diego Engineer Develops Method to Combat Congenital Heart Disease in Children," April 2009.

Science News "Virtual Surgery: Doctors can simulate heart operations with the click of a mouse," July 2007.

Imagine It^2 interviewed for inspirational documentary film about science and engineering, August 2008.

San Diego Science Festival Nifty Fifty Selected to be one of San Diego's 50 most inspiring scientists, to make outreach presentations to local schools 2009-12.

KPBS San Diego Interviewed on local public radio station about simulations for congenital heart disease.

Technical Reports

1. Marsden, A. L., Wang, M. and John E. Dennis, Jr., "Constrained aeroacoustic shape optimization using the surrogate management framework." *Annual Research Briefs*, Center for Turbulence Research. 2003, 399-412.

2. Marsden, A. L., Wang, M. and Koumoutsakos P., "Optimal aeroacoustic shape design using approximation modeling." *Annual Research Briefs*, Center for Turbulence Research. 2002, 201-213.

3. Marsden, A. L., Wang, M. and Mohammadi B., "Shape optimization for aeodynamic noise control." *Annual Research Briefs*, Center for Turbulence Research. 2001, 241-247.

4. Marsden, A. L. and Vasilyev, O. V., "Construction of Commutative Filters for LES on Unstructured Meshes." *Annual Research Briefs*, Center for Turbulence Research. 2000, 179-192.

5. Marsden, A. L. and Vasilyev, O. V., "Commutative Filters for LES on Unstructured Meshes." *Annual Research Briefs*, Center for Turbulence Research. 1999, 389-402.

Invited Departmental Seminars

"Multi-physics modeling of flow and cardiac function in pediatric cardiology," Cardiovascular Institute, Stanford University, Dec. 2023.

"Multi-physics modeling of flow and cardiac function in pediatric cardiology," Department of Mechanical Engineering, University of Minnesota, Nov. 2023.

"Multi-physics modeling of flow and cardiac function in pediatric cardiology," Department of Mechanical Engineering, Iowa State, Nov. 2023.

"Multi-physics modeling of flow and cardiac function in pediatric cardiology," Department of Mechanical Engineering, Illinois Institute of Technology, Nov. 2023.

"Multi-physics modeling of flow and cardiac function in pediatric cardiology," Department of Mechanical Engineering, University of Illinois Urbana Champagne, Nov. 2023.

"Multi-physics modeling of flow and cardiac function in pediatric cardiology," Department of Mechanical Engineering, Purdue University, Nov. 2023.

"Multi-physics modeling of flow and cardiac function in pediatric cardiology," Computational Biology Institute, **Flatiron Institute**, April, 2023.

"Multi-physics modeling of flow and cardiac function in pediatric cardiology," Department of Mathematics, **North Carolina State University**, April, 2023.

"Multi-physics modeling of flow and cardiac function in pediatric cardiology," Department of Bioengineering, **University of Utah**, Feb. 2023.

"Multi-physics modeling of flow and cardiac function in pediatric cardiology," Department of Mechanical Engineering, **UC Davis**, Nov. 2022.

"Multi-physics modeling of flow and cardiac function in pediatric cardiology," Department of Bioengineering seminar, **UT Arlington**, Oct. 2022 (virtual).

"Multi-physics modeling of flow and cardiac function in pediatric cardiology," Biomath seminar, **UCLA**, Sept. 2022.

"Patient-Specific Modeling for Virtual Treatment Planning in Cardiovascular Disease," Mississippi State University Department of Mechanical Engineering, Aug. 2022 (virtual).

"Patient-specific modeling for virtual treatment planning in cardiovascular disease," Department of Mechanical Egnineering, **Tufts University,** April 2022.

"Patient-specific modeling for virtual treatment planning in cardiovascular disease," Department of Mechanical Engineering, **University of Virginia,** March 2022.

"Towards patient-specific fluid solid growth simulations of vascular adaptation and remodeling," Center for Biomolecular and Tissue Engineering, **Duke University,** Nov. 2020.

"Towards patient-specific fluid solid growth simulations of vascular adaptation and remodeling," Department of Bioengineering, **Brown University,** Nov. 2020.

"Patient-specific modeling for virtual treatment planning in pediatric cardiology," Department of Mechanical Engineering, **University of Texas Dallas,** Nov. 2020.

"Patient-specific modeling for virtual treatment planning in pediatric cardiology," Department of Mechanical Engineering, **University of California San Diego,** Oct. 2020.

"Patient-specific modeling for virtual treatment planning in pediatric cardiology," Department of Mechanical Engineering, **University of Southern California,** Dec. 2019.

"Computational modeling of coronary artery hemodynamics for personalized medicine in children and adults," Lindbergh Lecture, Department of Mechanical Engineering, **University of Wisconsin Madison,** Sep. 2019.

"Virtual Treatment Planning in Pediatric and Congenital Heart Disease: Pulmonary Stenosis and Single Ventricle," Pediatric Surgical Conference, **University of Wisconsin Madison Children's Hospital,** Sep. 2019.

"Computational modeling of coronary artery hemodynamics for personalized medicine in children and adults," Department of Mechanical Engineering, **Iowa State University,** Sep. 2019.

"Computational modeling of coronary artery hemodynamics for personalized medicine in children and adults," School of Engineering, **Harvard University**, Dec. 2018.

"Blood flow simulations in pediatric cardiology: virtual surgical planning and models of disease progression," Department of Mechanical Engineering, **University of Washington**, Oct. 2018.

"Blood flow simulation in cardiovascular disease and development," Institute for Computational Discovery and Engineering, **University of Michigan**, March 2018.

"Personalized treatment planning in Pediatric Cardiology: Methodology Development and Clinical Application," Department of Biomedical Engineering, **University of Minnesota**, February, 2018.

"Simulating coronary artery hemodynamics in children and adults: from computation to clinic," Department of Biomedical Engineering, **University of Virginia**, October, 2017.

"Computational Methods for Personalized Medicine in Cardiovascular Disease," Department of Biomedical Engineering, **Purdue University**, August 2017.

"Computational Methods for Personalized Medicine in Cardiovascular Disease," Department of Mechanical Engineering, **University of Pennsylvania**, March 2017.

"Computational Methods for Personalized Medicine in Cardiovascular Disease," Department of Mechanical Engineering, **Vanderbilt University**, March 2017.

"Computational Methods for Personalized Medicine in Cardiovascular Disease," Joint Mechanical and Bioengineering Seminar, **Columbia University**, March 2017.

"Computational investigations of coronary hemodynamics and vein graft failure," Department of Bioengineering, **Tulane University**, November 2016.

"Patient-specific modeling in pediatric cardiology: from computation to clinic," Department of Bioengineering, **UCLA**, Sept 12, 2016.

"Cardiovascular modeling and surgical planning in pediatric cardiology: from computation to clinic," Department of Computational and Applied Mathematics, **Rice University**, March 21, 2016.

"Cardiovascular modeling and surgical planning in pediatric cardiology: from computation to clinic," Division of Pediatric Cardiology, **Texas Children's Hospital**, March 21, 2016.

"Cardiovascular disease modeling and surgical planning in pediatric cardiology: from computation to clinic," Department of Mechanical Engineering, **Santa Clara University,** Feb 24, 2016.

"Coronary artery disease modeling in children and adults: from computation to clinic," Institute for Computational Engineering Science, **UT Austin,** Jan 7, 2016.

"Patient specific modeling in cardiovascular disease: from computation to clinic," Bioengineering Department, **Georgia Institute of Technology,** Jan, 2015.

"Patient Specific Cardiovascular modeling: from computation to clinic," Bioengineering Department seminar, **Georgia Institute of Technology,** Nov 12, 2014.

"Multiscale modeling and optimal treatment planning in Pediatric Cardiology," Bioengineering Department seminar, **Colorado State University**, March 3, 2014.

"Multiscale modeling and optimal treatment planning in cardiovascular health and disease," Bioengineering Colloquium, **Stanford University**, Nov. 2013.

"Simulation Based Treatment Planning in Pediatric Cardiology," Bioengineering department seminar, **Arizona State University**, April 20, 2013.

"Simulation Based Treatment Planning in Pediatric Cardiology," Scientific Computing Institute seminar, **University of Utah**, Feb. 7, 2013.

"Multiscale Simulations of Coronary Artery Hemodynamics," Mechanical Engineering department Seminar, **University of California Santa Barbara**, Nov. 2012.

"Multiscale Simulations of Coronary Artery Hemodynamics," Mechanical Engineering department Seminar, **Princeton University**, Oct. 2012.

"Current methods in multiscale simulation and surgery optimization for congenital heart disease patients," Mechanical Engineering Department Seminar, **The Johns Hopkins University**, April 12, 2012.

"Current methods in multiscale simulation and surgery optimization for congenital heart disease patients," Applied Mechanics Colloquium, **Harvard University**, March 21, 2012.

"Optimization and multiscale modeling for surgical planning in cardiovascular disease," Center for Applied Mathematics Seminar, **Cornell University**, March 9, 2012.

"Optimization and Multiscale Modeling for Single Ventricle Heart Patients," Mechanical Engineering Dept. Seminar, **University of Michigan**, Dec. 13, 2011.

"Optimization and Multiscale Modeling for Single Ventricle Heart Patients," Pediatric Cardiology, **University of Michigan Children's Hospital**, Dec. 14, 2011.

"Multiscale finite element simulations and optimization for surgical repair in single ventricle heart patients," Department of Applied and Computational Mathematics and Statistics, **Notre Dame**, Sept. 12, 2011.

"Current methods in multiscale simulation and optimization for single ventricle heart patients," **Medical College of Wisconsin**, Sept. 13, 2011.

"Multiscale finite element simulations and optimization for surgical repair in single ventricle heart patients," Mechanical Engineering Department Seminar, **Illinois Institute of Technology**, Sept 14, 2011.

"Optimal Design and Multiscale Modeling in Blood Flow Simulations for Pediatric Heart Disease," Department of Structural Engineering Seminar, **UCSD**, Jan 19, 2011.

"Optimal design and uncertainty quantification in blood flow simulations for congenital heart disease," Mechanical Engineering Dept. Seminar, **UC Riverside**, May 14th, 2010.

"Optimal design and uncertainty quantification in blood flow simulations for congenital heart disease," Mathematics Dept. Seminar, **Texas A&M**, April 19th, 2010.

"Optimal design and uncertainty quantification in blood flow simulations for congenital heart disease," Biomedical Engineering Dept. Seminar, **USC**, April 5th, 2010.

"Optimal design and uncertainty quantification in blood flow simulations for congenital heart disease," Fluid Mechanics Seminar, MAE dept., **Stanford University**, March 30, 2010.

"Optimal design and uncertainty quantification in blood flow simulations for congenital heart disease," Bioengineering Department Seminar, **UCSD**, March 5, 2010.

"Optimization and Uncertainty Quantification for Cardiovascular Surgery Design," Thermo/Fluids Research Seminar, MAE Dept. **UCLA**, Feb 4, 2010.

"Optimization and Simulation for Cardiovascular Surgery Design in Children with Heart Disease," Congenital Heart Surgery Seminar, **Rady Children's Hospital**, Oct 16, 2009.

"Optimization and Simulation for Cardiovascular Surgery Design in Children with Heart Disease," Division of Physiology Seminar, **UCSD**, Oct 2, 2009.

"Patient specific modeling in pediatric cardiology" Mechanical engineering department seminar, **Clemson University**, Clemson, SC, August 2009.

"Virtual interventions and optimization improve hemodynamics in single ventricle heart patients" Mechanical Engineering Department Seminar, **San Diego State University**, Dec 2008.

"Engineering new treatments for cardiovascular disease via optimal design and physiologic simulation," Graduate Aeronautical Laboratories seminar, **Caltech**, Feb. 9, 2007.

"Optimization in complex fluid mechanics problems using the surrogate management framework," Mechanical and Aerospace Engineering Department, **University of Southern California**, Jan. 31, 2007.

"Engineering new treatments for cardiovascular disease via optimal design and physiologic simulation," Mechanical and Aerospace Engineering Department seminar, **University of Southern California**, Nov. 17, 2006.

"Engineering new treatments for cardiovascular disease via optimal design and physiologic simulation," Mechanical and Aerospace Engineering Department seminar, **Princeton University**, Oct. 20, 2006.

"Derivative-free optimization in fluid mechanics: from aeroacoustics to the cardiovascular system," Fluid mechanics seminar, **University of California Berkeley**, Feb. 13, 2006.

"Aerodynamic Noise Control by Optimal Shape Design," Mechanical Engineering Department seminar, **University of California Santa Barbara**, Nov 8. 2004.

"Suppression of vortex-shedding noise via derivative-free shape optimization." Invited seminar speaker. Mechanical Engineering Department, **University of California San Diego**, April 2, 2004.

"Suppression of vortex-shedding noise via derivative-free shape optimization." Invited technical talk. **Sandia National Laboratories**, Livermore, CA, March 9, 2004.

"Optimal aeroacoustic shape design using the surrogate management framework," Scientific Computing Group seminar, **Lawrence Berkeley National Lab**, Oct 10, 2003.

Named Lectureships

"Towards patient-specific fluid solid growth simulations of vascular adaptation and remodeling," Bremer Lecture, Nationwide Children's Hospital, March 2021.

Invited Plenary and Semi-Plenary Conference Lectures

"Multi-physics modeling of flow and cardiac function in single ventricle physiology," Plenary Speaker, *Modeling the Cardiac Function*, Cetraro, Italy, Sept. 2022.

"Patient-specific modeling for virtual treatment planning in cardiovascular disease" Plenary speaker, *13th International ERCOFTAC symposium on engineering, turbulence, modelling and measurements,* Rhodes, Greece, September 2021 (virtual).

"Patient-specific modeling for virtual treatment planning in cardiovascular disease" Plenary speaker, *3rd Pan American Congress on Computational Mechanics,* Rio de Janeiro, Brazil, November 2021 (virtual).

"Personalized Simulations for Cardiovascular Disease Progression and Treatment," Plenary speaker, *International Conference on Scientific Computation and Differential Equations,* Innsbruck, Austria, July 2019.

"Personalized Simulations for Cardiovascular Disease Progression and Treatment," Semi-plenary speaker, *Finite Elements in Flow*, Chicago, IL, April 2019.

"Patient-specific modeling of coronary hemodynamics in the presence of uncertainty," Plenary speaker, *BMES/FDA Frontiers in Medical Devices*, Washington, DC, March 2019.

"Predicting Cardiovascular Disease Progression in Adults and Children with Personalized Simulations," Plenary speaker, *SIAM Life Science Meeting,* Minneapolis, MN, August, 2018.

"Computational Methods for Personalized Medicine in Cardiovascular Disease," Semi-plenary speaker, *SIAM Annual Meeting,* Pittsburgh, PA, July 2017.

"Computational investigations of the biomechanical underpinnings of vein graft failure," Keynote speaker, *5th International Conference on Computational and Mathematical Biomedical Engineering,* Pittsburgh, PA, April 2017.

"Patient specific modeling in cardiovascular disease: from computation to clinic," Semi-plenary speaker, *U.S. National Congress on Computational Mechanics*, San Diego, California, July 2015.

"Simulation-based planning of surgical interventions in pediatric cardiology," Semi-plenary speaker, *65th Annual Meeting of the APS Division of Fluid Dynamics*, San Diego California, November 18-20, 2012.

Invited Conference and Workshop Talks (selected)

"Patient specific simulations of Hemodynamics and Mechanobiology," UC Davis Cardiovascular Symposium, Davis, CA, March 2022.

"Computer models that direct new surgical approaches and predict pediatric vascular disease outcomes," North American Vascular Biology Organization (NAVBO), Monterrey, CA, Oct 2019.

"Computer Modeling and Novel Solutions to Congenital Heart Disease," *Pediatric Cardiac Intensive Care Society, 14th Annual International Meeting,* Miami, FL, Dec, 2018.

"Patient Specific Hemodynamics and Growth and Remodeling in Congenital Heart Disease Surgery," *The Third International Symposium on Vascular Tissue Engineering*, Columbus, OH, June 2017.

"The Assisted Bidirectional Glenn Surgery for Single Ventricle Palliation: in silico, in vitro, and in vivo performance," *EF2016: 5th International Conference on Engineering Frontiers in Pediatric and Congenital Heart Disease*, University of Central Florida, College of Medicine, Orlando, Florida, June 9-10 2016.

"Coronary artery disease modeling in children and adults: From computation to clinic," *16th Annual Maui Cardiovascular Symposium*, Wailea, HI, Oct 2016.

"Physiologic modelling and surgical optimization in single ventricle congenital heart defects," *14th International Symposium on Computer Methods in Biomechanics and Biomedical Engineering,* Tel Aviv, Israel, Sept. 2016.

"Assisted Bidirectional Glenn: A novel concept for initial palliation of single ventricle physiology," *4th International Conference on Engineering Frontiers in Pediatric and Congenital Heart Disease*, Paris, France, May 2014.

"Multiscale modeling and optimal treatment planning in pediatric cardiology," *ICERM Workshop: From partial differential equations to the clinic and back*, Brown University, Jan. 2014.

"Patient specific multiscale modeling in pediatric cardiology," *Mathematical Biosciences Institute Workshop: Mathematics guiding bioartificial heart valve design*, Ohio State University, Oct. 2013.

"Towards fluid solid growth simulations of vein graft biomechanics in coronary artery bypass surgery," *ASME / FDA: Frontiers in Medical Devices*, Sept. 2013.

"Multiscale Modeling of Single Ventricle Physiology," *Western Society of Pediatric Cardiology*, June, 2013.

"Simulations for improved risk stratification in patients with Kawasaki Disease," *Tech Connect*, Washington, D.C., May 2013.

"Computational Simulation for Accelerated Design of Surgeries and Devices," *MD&M West*, Anaheim, CA, Feb 2013.

"Multiscale modeling and optimization in pediatric heart disease," *Finite elements in flow, 70th Birthday Celebration of Thomas Hughes*, Feb. 2013.

"Simulations for improved risk stratification in patients with Kawasaki Disease," *Cardiac Physiome Meeting*, San Diego, CA, Nov. 2012.

"Computational fluid dynamics in Fontan Patients," *North American Society of Cardiovascular Imaging*, Pasadena, CA, Oct. 2012.

"Simulations for improved risk stratification in patients with Kawasaki Disease," *Directions in Computational Physics: Symposium in honor of Parviz Moin's 60th birthday*, San Diego, CA, Oct 12., October 12, 2012.

"Blood Flow Simulations in Coronary Artery Aneurysms in Children with Kawasaki Disease," invited mini-symposium speaker, *SIAM Conference on the Life Sciences*, Aug 7-10, 2012.

"Simulation of Coronary Abnormalities in Kawasaki Disease," *The 3rd International Conference on Engineering Frontiers in Pediatric and Congenital Heart Disease*, May 1-2, 2012.

"Future Imaging: Modeling Flows in the Fontan Circuit," *Congenital Cardiovascular Surgery Symposium: San Diego 2012*, Evolving Concepts in the Management of Complex Congenital Heart Disease III, Jan 19, 2012.

"Multiscale modeling and surgical planning for single ventricle heart patients," invited minisymposium speaker, *Meeting of the American Physical Society Division of Fluid Dynamics.* November, 2011.

"Optimization and Simulation of a Novel Y-graft for the Fontan Surgery," invited minisymposium speaker, *7th International Congress on Industrial and Applied Mathematics*, Vancouver, B.C., July 2011.

"Optimization and multiscale modeling of the BT shunt for single ventricle heart patients", invited speaker, minisymposium on Fluid-structure interaction, *Finite Elements in Flow*, Munich, Germany, Mar. 2011.

"Optimization and uncertainty quantification for cardiovascular surgery design," *Sumer School on Mathematical Modeling and Numerical Simulation of the Cardiovascular System*, La Coruna, Spain, July 7-9, 2010.

"Optimal design and uncertainty quantification in blood flow simulation in congenital heart disease," *FDA / NHLBI / NSF Workshop on Computer Methods for Cardiovascular Devices*, Rockville, MD, June 10-11, 2010.

"From trial and error to optimal design: simulation-based surgical planning in the presence of uncertainty," *1st International Conference on Computational Simulation in Congenital Heart Disease*, La Jolla, CA, Feb 26-27, 2010.

"Optimal design and uncertainty quantification in blood flow simulations for congenital heart disease," invited speaker, Mini-Symposium on Uncertainty Quantification in Simulations of Fluid Flow, *Meeting of the American Physical Society Division of Fluid Dynamics.* November, 2009.

"Optimization, simulation and uncertainties in blood flow simulations for pediatric cardiology" *Experimental Biology, invited minisymposium speaker*, New Orleans, LA, March, 2009.

"The Application of Surrogate Optimization Methods to an Expensive Fluid Mechanics Shape-Design Problem," *Workshop on "Surrogate Modeling and Management for Simulation-Based Analysis and Optimization."* Invited participant, Rice University, Houston TX. May 24-25, 2004.

"Optimal Aeroacoustic Shape Design Using the Surrogate Management Framework." Invited speaker in minisymposium *"Derivative-free Optimization", SIAM Annual Meeting*, Montreal, QC, Canada, June 2003.

"Shape Optimization for Trailing Edge Noise Reduction." Invited technical speaker. *Workshop on Geometry, Dynamics and Mechanics in Honour of the 60th Birthday of J.E. Marsden*, The Fields Institute, University of Toronto, Toronto Ontario, Canada, Aug 2002.

Conference Proceedings and Abstracts (selected)

(students and postdocs in bold)

Jeffrey J Hsu, **Vijay Vedula**, Kyung In Baek, Cynthia Chen, Yichen Ding, Yin Tintut, Alison L Marsden, Tzung K Hsiai "Contractile and Hemodynamic Forces Promote Cardiac Valve Development via Notch1b-Mediated Endothelial-to-Mesenchymal Transition", Circulation Vol. 138, Suppl. A14393-A14393, (2018).

Veronica Toro Arana, Frandics Chan, **Nicole Shiavone**, Doff McElhinney, Sushma Reddy, Alison Marsden, "Pre-Operative Right Ventricular Outflow Tract and Pulmonary Artery Geometry Predicts Pulmonary Valve Replacement Outcomes in Patients With Tetralogy of Fallot," Circulation Vol. 138, Suppl. A17390-A17390, (2018).

M Owais Khan, Justin S Tran, Han Zhu, Rene S Packard, Ronald P Karlsberg, Andrew Kahn, Alison L Marsden, "Computational Fluid Dynamics (BypassCFD) Trumps Anatomic Predictors of Saphenous Vein Graft Failure in CABG Patients," Circulation Vol. 138, Suppl. A14906-A14906, (2018).

J Seo, D Schiavazzi, A Marsden, "Uncertainty quantification for patient-specific cardiovascular simulations in high-performance computing," Bulletin of the American Physical Society, (2018).

P Eslami, A Marsden, J Tran, J Lo, A Coskun, P Stone, U Hoffmann, M Lu, "Effect of Wall Elasticity on Endothelial Shear Stress Calculations in Coronary Arteries" Bulletin of the American Physical Society, (2018).

N Schiavone, C Elkins, D McElhinney, J Eaton, A Marsden, "In vitro assessment of bioprosthetic valve performance in healthy and diseased right ventricular outflow tracts using magnetic resonance velocimetry" Bulletin of the American Physical Society, (2018).

Wilson, N. M., Marru, S., Abeysinghe, E., Christie, M. A., **Maher, G. D.**, Updegrove, A. R., Pierce, M., Marsden, A. L.,, "Using a Science Gateway to Deliver SimVascular Software as a Service for Classroom Instruction," PEARC18, Pittsburgh, PA, July 2018.

Jeffrey J Hsu, Junjie Chen, Vijay Vedula, Juhyun Lee, Yichen Ding, Alison L Marsden, Tzung K Hsiai, "4-D Light-Sheet Imaging and Moving-Domain Computation Reveal That Oscillatory Shear Index Mediates Endocardial Notch1b Signaling and Valve Development," Circulation Vol. 136 Suppl. A19498-A19498, (2017).

Lan, H., Updegrove, A., Wilson, N., Shadden, S., Marsden, A., "SimVascular: an Open Source Pipeline for Image-Based Cardiovascular Simulation," BMES Annual Meeting, Minneapolis, MN, Oct. 2016.

Ramachandra, A.B., Jensen, C., Goldstone, A., Woo, J.Y., Boyd, J.H., Kahn, A.M., Marsden, A.L., "Virtual evaluation of surgical revasularization techniques in coronary artery bypass graft surgery," SB3C National Harbor, MD, June, 2016.

Schmidt, T. M., Rosenthal, D.N., Reinhartz, O., Marsden, A.L., Kung, E.O., "Evaluation of pulsatile and continuous flow ventricular assist device implementation in the single ventricle circulation: a lumped parameter modeling study," SB3C National Harbor, MD, June, 2016.

Shang, J. K., Esmaily-Moghadam, M., Khalapyan, T., Figliola, R., Reinhartz, O., Hsia, T.Y., Marsden, A.L., "Implementation of the Assisted Bidirectional Glenn in an Idealized Single Ventricle Model," SB3C National Harbor, MD, June, 2016.

Verma, A., Marsden, A.L., "Automated optimization framework for cardiovascular flow simulations," SB3C National Harbor, MD, June, 2016.

Grande Gutierrez, N., Shirinsky, O., Gagarina, N.V., Lyskina, G.A., Fukazawa, R., Ogawa, S., Burns, J.C., Kahn, A.M., Marsden, A.L., "Thrombotic Risk Assessment Of Coronary Artery Aneurysms Caused By Kawasaki Disease Using Transluminal Attenuation Gradient And Computational Modeling," 5th International Conference on Engineering Frontiers in Pediatric and Congenital Heart Disease, Orlando, Florida, 9-10 June, 2016.

Vedula, V., Lee, J., Hsiai, T., Marsden, A., "Effect of Trabeculae on the Hemodynamics of an Embryonic Left Ventricle" 68th Annual Meeting of the APS Division of Fluid Dynamics, Boston, MA, Nov. 2015.

Marsden, A., Shang, J., Esmaily-Moghadam, M., Figliola, R., Reinhartz, O., Hsia, T.Y., "Optimization of the assisted bidirectional Glenn for single ventricle palliation," 68th Annual Meeting of the APS Division of Fluid Dynamics, Boston, MA, Nov. 2015.

Schiavazzi, D., Marsden, A.L., "Data Assimilation and Propagation of Uncertainty in Multiscale Cardiovascular Simulation," 68th Annual Meeting of the APS Division of Fluid Dynamics, Boston, MA, Nov. 2015.

Tran, J., Schiavazzi, D., Ramachandra, A., Kahn, A., Marsden, A.L., "Automated Tuning for Parameter Identification in Multi-Scale Coronary Simulations," 68th Annual Meeting of the APS Division of Fluid Dynamics, Boston, MA, Nov. 2015.

Verma, A., Marsden, A.L., "Strategies for Pile-up and Over-refinement to improve performance of the Surrogate Management Framework in cardiovascular flow optimization," 68th Annual Meeting of the APS Division of Fluid Dynamics, Boston, MA, Nov. 2015.

Lan, H., Merkow, J., Updegrove, A., **Schiavazzi, D.**, Wilson, N., Shadden, S., Marsden, A.L., "SimVascular 2.0: an Integrated Open Source Pipeline for Image-Based Cardiovascular Modeling and Simulation," 68th Annual Meeting of the APS Division of Fluid Dynamics, Boston, MA, Nov. 2015.

Grande Gutierrez, N., Kahn, A., Shirinsky, O., Gagarina, N., Lyskina, G., Fukazawa, R., Ogawa, S., Burns, J.C., Marsden, A.L., "Assessment Of Coronary Artery Aneurysms Using Transluminal Attenuation Gradient And Computational Modeling In Kawasaki Disease Patients," 68th Annual Meeting of the APS Division of Fluid Dynamics, Boston, MA, Nov. 2015.

Ramachandra, A.B., Sankaran, S., Humphrey, J.D., Marsden, A.L., "Computational Simulation of the Adaptive Capacity of Vein Grafts in Response to Increased Pressure JOURNAL OF BIOMECHANICAL ENGINEERING-TRANSACTIONS OF THE ASME Volume: 137 Issue: 3 Article Number: 031009 Published: MAR 2015

Grande Gutierrez, N. Kahn, A. M., Shirinsky, O., Burns, J.C., Marsden, A.L., "Thrombotic Risk Assessment in Kawasaki Disease Patients with Coronary Artery Aneurysms using Transluminal Attenuation Gradient Analysis" Conference: 11th International Kawasaki Disease Symposium (IKDS) Location: Honolulu, HI Date: FEB 03-06, CIRCULATION Vol (131), Supplement: 2, Abstract: 164, (2015).

Grande Gutiérrez, N., Shirinsky, O., Gagarina, N.V., Lyskina, G.A., Fukazawa, R., Ogawa, S., Burns, J.C., Marsden, A.L., Kahn, A.M., "Assessment of Coronary Artery Aneurysms Caused By Kawasaki Disease Using Transluminal Attenuation Gradient Analysis of Coronary CT Angiograms," AHA scientific Sessions 2015, Orlando, FL. November 7-11, 2015.

Ramachandra, A.B., Sankaran, S., Humphrey, J.D., Marsden, A.L., "A computational model for vein graft growth and remodeling: Response to altered hemodynamics," 7th World Congress of Biomechanics, Boston, MA, July 2014.

Esmaily-Moghadam, M., Hsia, T.-Y., Marsden, A.L., "Assisted Bidirectional Glenn: an Alternative for the Systemic-to-Pulmonary Shunt Physiology," 7th World Congress of Biomechanics, Boston, MA, July 2014.

Yang, W., Feinstein, J.A., Reddy, V.M., Chan, F.P., Marsden, A.L., "Comparison of clinical and simulation results for the Stanford Y-graft Fontan Pilot Trial," *ASME Summer Bioengineering Conference*, Fajardo, Puerto Rico, Jun. 2012.

Sengupta, D., Kahn, A.M., Gordon, J.B., Burns, J.C., Marsden, A.L. "Image-Based Modeling and Simulation of Hemodynamics in Coronary Aneurysms in Patients with Kawasaki Disease" *10th international Kawasaki Disease Symposium*, Kyoto, Japan, Feb 7-10, 2012.

Esmaily Moghadam, M., Migliavacca, F. Vignon-Clementel, I.E., Marsden, A.L., "BT shunt optimization for the Norwood procedure using a multiscale method," *2nd International Conference on Engineering Frontiers in Congenital Heart Disease*, London, March 17-18, 2011.

Sankaran, S., Marsden, A.L., " A Computational Framework for Robust Shape Optimization of Cardiovascular Bypass Graft Surgeries," **1st International Conference on Computational Simulation in Congenital Heart Disease**, La Jolla, CA, Feb 26-27, 2010.

Marsden, A. L., Bernstein, A. J., Spilker, R. L., Chan, F. P., Taylor, C. A. and Feinstein, J. A., "Large differences in efficiency among Fontan patients demonstrated in patient specific models of blood flow simulations," *Circulation* Supplement II, Vol 116, No. 16, pp. II-480, 2007.

Teaching

MAE 107 - Computational Methods for Engineering (undergraduate) UCSD, MAE Dept.

MAE 101A - Introduction to Fluid Mechanics (undergraduate) UCSD, MAE Dept.

MAE 261 - Cardiovascular fluid mechanics (graduate, developed new course), UCSD, MAE Dept.

MAE 290A/B - Numerical Methods for Science and Engineering (graduate) UCSD, MAE Dept.

MAE 210A - Fluid Mechanics (graduate), UCSD, MAE Dept.

CME/BioE 285 - Computational Modeling in the Cardiovascular System, Stanford, Bioengineering / ICME.

BioE 393 - Bioengineering Department Seminar, Stanford.

Eng 298 - Fluid Mechanics Seminar, Stanford.

CME 206/ME 300C - Introduction to Numerical Methods for Engineering, Stanford ICME / Mechanical Engineering.

CME 108/ MA 144 - Introduction to Scientific Computing, Stanford ICME / Math.

CME 209 - Mathematical Modeling of Biological Systems, Stanford ICME / Bioengineering.

Academic Service

Advisory Boards:

Burroughs Wellcome Fund, Advisory Board, Career Award at the Scientific Interface, 2017 -

University of British Columbia, School of Biomedical Engineering, Advisory Board, 2018 -

Additional Ventures, Scientific Advisory Board, 2020 -

Professional Societies:

USACM Executive Council Member-at-Large, 2016 - 2019 (elected).

APS DFD executive committee member-at-large, 2019 - present (elected).

ASME Bioengineering Division Executive Committee Chair, 2021-2022 (elected).

ASME Bioengineering Division Executive Committee Secretary, 2020-2021 (elected).

ASME Bioengineering Division Executive Committee Secretary-elect, 2019-2020 (elected).

ASME Bioengineering Division Vice Chair of Fluids Technical Committee, 2015 - 2018 (elected).

ASME Bioengineering Division Chair of Fluids Technical Committee, 2018 - 2019 (elected).

ASME Bioengineering Division Diversity Chair, 2016 - 2018. (organized mentor-mentee mixer, diversity travel awards)

Editorial:

Associate Editor, *Journal of Biomechanical Engineering*, 2013 - 2019.

Associate Editor, *PLOS Computational Biology*, 2016- present.

Associate Editor, *Cardiovascular Engineering and Technology*, 2017 - present.

Section Editor, *Current Opinion in Biomedical Engineering*, 2016- present.

Associate Editor, *International Journal for Numerical Methods in Biomedical Engineering*, 2018-present.

Associate Editor, *Scientific Reports*. 2022 - present.

Conference and Workshop Organization

Founder and lead organizer, Engineering Frontiers in Congenital Heart Disease, La Jolla, 2010, London, UK, 2011, Stanford, CA, 2012, Paris, 2014, Orlando, 2016)

Workshop Organization: SimVascular Workshop and New User Training, Summer Bioengineering Conference, Snowbird, Utah, 2015 and Tucson, Arizona, 2017, Dublin, Ireland, 2018.

Workshop organization: Verification, Validation and Uncertainty Quantification in Cardiovascular Modeling and Diagnostics, Summer Bioengineering Conference, National Harbor, MD, June 2016.

Organizing committee: SIAM Conference on Computational Science and Engineering, 2019.

Review Panels:

Chair, NIH Modeling and Analysis of Biological Systems study section, 2020 - 2022.

American Heart Association Region III reviewer consortium, 2009 - 2012

HHMI international fellowship review panel, 2011-12.

NSF BMMB, Fluids CAREER review panels, 2011 - 2016.

NIH MABS review panel, study section permanent member, 2018 - 2022.

NIH special emphasis panel, 2016-2018.

XSEDE XRAC National High Performance Computing Resource, permanent review panel member, 2015-2018

University Service:

Stanford Radiology Department chair search committee, 2021.

Stanford Biodesign program director search committee member, 2019-2020.

Bioengineering department search committe member, 2019-2020.

Pediatrics UTL search committee chair, 2018-2019.

Mechanical Engineering search committee member, 2018-2019.

Pediatrics Advancements and Promotions committee member 2018-present.

ICME director's advisory panel, 2018 - present.

ICME Diversity chair, 2021-present.

ICME admissions committee, 2016 - 2019.

Provost's committee on faculty housing, 2018-2019.

Stanford Hospital Betty Irene Moore Pediatric Heart Center, Steering Committee, 2018 - 2022.

Stanford Bio-X Leadership Council, 2017-present.

Stanford Bioengineering Department Seminar organizer, 2016-2017.

Stanford Bioengineering search committee member, 2015-2016.

Stanford ICME search committee, 2015-2016.

UCSD MAE department search committee chair, 2013-2014.

UCSD MAE department computer committee, 2008-2009.

UCSD MAE department Undergraduate Affairs Committee, 2009-2012.

UCSD MAE department Graduate Affairs Committee, 2014.

UCSD Faculty advisor for ASME student organization, 2010-2011.

UCSD MAE industrial advisory council meeting, 2012.

UCSD JSOE SWIFT Committee, 2012.

UCSD Senate Joint Task Force on Family Accommodation Policy, 2014.

UCSD Academic Senate Committee on Undergraduate Scholarships and Honors, 2014.

Diversity and Outreach

Stanford ICME, Diversity chair, 2020-present.

Society of Women Engineers. UCSD Envision lab tours, 2012-2015.

San Diego Science Festival. Nifty Fifty Program, outreach talks at local schools (2009-2012).

Underrepresented minority lab tours. UCSD, 2012.

Founder MAE Graduate Women's group, UCSD Faculty founder and sponsor for graduate women's group, assisting to organize events, speakers, and mentoring. 2012.

Mechanical Engineering Women's Group, Stanford University. Organized seminar and special events related to increasing the role of women in engineering fields, group financial officer, 2000-2005

Johns Hopkins Center for Talented Youth, Organized all day academic enrichment workshop for high acheiving middle and high school students on "Engineering in Cardiovascular Medicine," Sep. 2013.

Founder WiMSCE - Women in Math, Statistics and Computational Engineering, Stanford, Faculty founder and sponsor for graduate women's group, assisting to organize events, speakers, mentoring, 2016- present.

Faculty sponsor, Women in Fluid Dynamics, Faculty sponsor for graduate women's group, assisting to organize events, speakers, mentoring, 2016- present.

Current and Past Trainees

Past Trainees and their current positions:

Weiguang Yang, PhD - Research Scientist, Pediatrics Dept, Stanford University.

Dibyendu Sengupta, PhD - Principal Engineer, Oracle, Corp.

Jessica Oakes, PhD - Assistant Professor, Northeastern University.

Sethuraman Sankaran, PhD - Facebook AI, New York, NY.

Chris Long, PhD - Research Scientist, Los Alamos National Laboratory.

Mahdi Esmaily Moghadam, Assistant Professor, Mechanical Engineering, Cornell University

Ethan Kung, PhD, Associate Professor, Mechanical Engineering, Clemson University

Daniele Schiavazzi, PhD - Associate Professor, Applied Mathematics, Computation and Statistics, Notre Dame University

Jessica Shang, PhD - Assistant Professor, Mechanical Engineering, University of Rochester

Abhay Bangalore Ramachandra - Postdoctoral Fellow, Bioengineering, Yale University

Hongzhi Lan, PhD - Medical Software Start up, Schenzen, China

Justin Tran - Assistant Professor, Mechanical Engineering, California State University Fullerton

Noelia Grande Gutierrez, PhD - Assistant Professor, Mechanical Engineering, Carnegie Mellon University

Vijay Vedula, PhD - Assistant Professor, Mechanical Engineering, Columbia University

Aekaansh Verma, PhD - R&D engineer, Apple

Gabriel Maher, PhD - Vice President, Quantitative Research, Stanford, CA

Ju Liu, PhD - Assistant Professor, Southern University of Science and Technology, Shenzhen, China.

Muhammad Owais Khan, PhD - Assistant Professor, Electrical Computer and Biomedical Engineering, Ryerson University, Toronto, Canada.

Stephanie Lindsey, PhD - Assistant Professor, Mechanical Engineering, UCSD.

Melody Dong, PhD - Clinical Scientist, Abbott.

Nicole Schiavone, PhD - Biomedical Engineer / Lead Reviewer, FDA.

Ingrid Lan, PhD - Software Engineer, SpaceX.

Jongmin Seo, PhD - Assistant Professor, Mechanical Engineering, Kyung Hee University, Korea.

Casey Fleeter (ICME) - Postdoctoral Researcher, Calico Life Sciences.

Current Trainees:

Oguz Ziya Tikenogullari (ME)

Erica Schwartz (BioE, NSF graduate fellowship, AHA predoctoral fellowship)

Zachary Sexton (BioE, NSF graduate fellowship)

Jonathan Pham (ME)

Zinan Hu (ME)

Aaron Brown (ME)

Priya Nair (BioE, NSF fellowship)

Natalia Rubio (ME, SGF fellowship, NSF fellowship)

Suhaas Anbazhakan (BioE, BioX graduate fellowship)

Alex Kaiser, PhD (research scientist, NIH T32 Training grant)

Martin Pfaller, PhD (instructort)

Karthik Menon, PhD (postdoc)

Jason Szafron, PhD (postdoc, T32 Training grant, Parker B. Francis fellowship)

Luca Pegolotti, PhD (postdoc)

Fannie Gerosa, PhD (postdoc)