

CURRICULUM VITAE – October 2020
STEVEN H. FRANKEL
Professor

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EDUCATION

State University of New York at Buffalo, Buffalo, New York
Department of Mechanical and Aerospace Engineering
Doctor of Science, awarded June 1993
GPA: 3.8/4.0; Advisor: Dr. Peyman Givi

North Carolina State University, Raleigh, NC
Department of Mechanical and Aerospace Engineering
Master of Science, awarded August 1990
GPA: 3.7/4.0; Advisor: Dr. Hassan Hassan

State University of New York at Buffalo, Buffalo, New York
Department of Mechanical and Aerospace Engineering
Bachelor of Science, awarded June 1988
GPA: 3.65/4.0; Magna Cum Laude

EXPERIENCE

October 18, 2020 **Quantum Machines**, Tel Aviv, Israel
- September 30, 2021 *Quantum Algorithms Engineer*, Sabbatical from Technion

August 2013 **Technion – Israel Institute of Technology**, Haifa 32000, Israel
- Present *Professor, Rosenblatt Chair*, Faculty of Mechanical Engineering

October 2014 **Purdue University**, West Lafayette, IN
- Present *Adjunct Full Professor*, School of Mechanical Engineering

August 2004 **Purdue University**, West Lafayette, IN
- August 2013 *Professor*, School of Mechanical Engineering,
Maurice J. Zucrow Laboratory

August 1999 **Purdue University**, West Lafayette, IN
- August 2004 *Associate Professor with tenure*, School of Mechanical Engineering,
Maurice J. Zucrow Laboratory

- August 1993 **Purdue University**, West Lafayette, IN
 -August 1999 *Assistant Professor*, School of Mechanical Engineering,
 Maurice J. Zucrow Laboratory
- Summer 1994 **Arnold Engineering Development Center**, Tullahoma, TN
Research Associate, Air Force Office of Scientific Research,
 Summer Faculty Research Program; Computational modeling of
 gas turbine combustor dynamics.
- August 1990 **State University of New York at Buffalo**, Buffalo, NY
 -August 1993 *Research Lecturer*
 Instructor for various courses; responsible for all aspects.
Research Assistant
 Dissertation involved advanced modeling and simulation of
 turbulent reacting flows.
- Summer 1989 **NASA Langley Research Center**, Hampton, VA
 and 1990 *Research Contractor*, during MS work at North Carolina.
 Worked in Theoretical Flow Physics Branch on developing
 models for supersonic turbulent combustion.
- Summer 1988 **von Karman Institute for Fluid Dynamics**, Belgium
Stagiaire on scholarship for short training program.
 Worked on implementation of high-order turbulence models
 in compressible boundary layer code.

TEACHING

Over 20 years as Professor at Purdue University, Prof. Frankel taught classes in undergraduate thermodynamics (introduction and advanced), and graduate classes in numerical methods, computational fluid dynamics, fluid dynamics, turbulence, and combustion. Since arriving at Technion in 2013 he has taught the following courses:

- Fall 2014: Computational Fluid Dynamics, graduate
- Spring 2015: Turbulent Combustion Modeling, graduate
- Fall 2015: Analytical Fluid Dynamics, graduate
- Spring 2016: Applied Computational Fluid Dynamics, undergraduate
- Spring 2016: Turbulence Modeling, graduate
- Fall 2016: Computational Fluid Dynamics, graduate
- Spring 2017: Applied Computational Fluid Dynamics, undergraduate
- Fall 2017: Numerical Methods for PDEs, graduate and Turbulence Modeling, graduate
- Spring 2018: Introduction to Combustion, undergraduate and graduate
- Fall 2018: Introduction to Fluid Mechanics (undergraduate, International program), Computational Fluid Dynamics, graduate
- Spring 2019: Applied Computational Fluid Dynamics, undergraduate
- Fall 2020: Introduction to Fluid Mechanics (undergraduate, International program), Compressible Flow, undergraduate

- Spring 2020: Introduction to Fluid Mechanics (undergraduate, GTIIT program), Applied Computational Fluid Dynamics (undergraduate), and Introduction to High-Performance Computing (graduate, new course)
- Fall 2020 - Spring 2021 - No teaching due to sabbatical

BOOK CHAPTERS

1. DesJardin, P. E., Zimberg, M. J., and Frankel, S. H., “Towards Large Eddy Simulation of Strongly Radiating Turbulent Diffusion Flames”, in Advanced Computation and Analysis of Combustion, Editors: G. D. Roy, S. M. Frolov, and P. Givi, ENAS Publishers, Moscow, Russia, 503-519, 1997.
2. DesJardin, P. E. and Frankel, S. H., “Coupled Turbulence, Radiation and Soot Kinetics Effects in Strongly Radiating Nonpremixed Flames”, in Advances in Chemical Propulsion: Science to Technology, CRC Press, 2002.
3. Frankel, S. H., Gore, J. P., and Mongeau, L., “Aeroacoustics and Emissions Studies of Swirling Combustors”, in Combustion Processes in Propulsion: Control, Noise, and Pulse Detonation, Edited by Gabriel D. Roy, Elsevier Butterworth-Heinemann, 211-221, 2006.

REFEREED ARCHIVAL PUBLICATIONS

1. Frankel, S. H., and Madnia, C. K., and Givi, P., “Modeling of the Unmixedness in Homogeneous Reacting Turbulence”, *Chemical Engineering Communications*, **104**, pp. 117-125, 1991.
2. Madnia, C. K., Frankel, S. H., and Givi, P., “Direct Numerical Simulations of the Unmixedness in a Homogeneous Reacting Turbulent Flow”, *Chemical Engineering Communications*, **109**, pp. 19-29, 1991.
3. Frankel, S. H., Jiang, T. J., and Givi, P., “Modeling of Isotropic Reacting Turbulence by a Hybrid Mapping-EDQNM Closure”, *American Institute for Chemical Engineering Journal*, **38**, (4), pp. 535-543, 1992.
4. Frankel, S. H., Madnia, C. K., and Givi, P., “Modeling of the Reactant Conversion Rate in a Turbulent Shear Flow”, *Chemical Engineering Communications*, **113**, pp. 192-209, 1992.
5. Madnia, C. K., Frankel*, S. H., and Givi, P., “Reactant Conversion in Homogeneous Turbulence: Mathematical Modeling, Computational Validations, and Practical Applications”, *Theoretical and Computational Fluid Dynamics*, **4**, pp. 79-93, 1992.
6. Miller, R. S., Frankel, S. H., Madnia, C. K., and Givi, P., “Johnson-Edgeworth Translation for Probability Modeling of Binary Scalar Mixing in Isotropic Turbulence”, *Combustion, Science and Technology*, **91**, pp. 21-52, 1993.
7. Frankel, S. H., Madnia, C. K., and Givi, P., “Comparative Assessment of Closures for Turbulent Reacting Flows”, *American Institute for Chemical Engineering Journal*, **39**, (5), pp. 899-903, 1993.
8. Frankel, S. H., McMurtry, P. A., and Givi, P., “Binary Scalar Mixing in Homogeneous Turbulence: Some Linear Eddy Model Results”, *Energy and Fuels*, **7**, (6), pp. 827-834, 1993.

9. Frankel, S. H., McMurtry, P. A., and Givi, P., "Linear Eddy Modeling of Reactant Conversion and Selectivity in Homogeneous Turbulence", *American Institute for Chemical Engineering Journal*, **41**, (2), pp. 258-266, 1995.
10. DesJardin, P. E. and Frankel, S. H., "Assessment of Turbulent Combustion Submodels Using the Linear Eddy Model", *Combustion and Flame*, **104**, (3), pp. 343-357, 1996.
11. DesJardin, P. E. and Frankel, S. H., "Linear Eddy Modeling of Nonequilibrium Turbulent Reacting Flows with Nonpremixed Reactants", *Combustion and Flame*, **109**, (3), pp. 471-487, 1997.
12. Zimberg, M. J., Frankel, S. H., Gore, J. P., and Sivathanu, Y. R., "A Study of Coupled Turbulent Mixing, Soot Chemistry, and Radiation Effects Using the Linear Eddy Model", *Combustion and Flame*, **113**,(3), pp. 454-469, 1998.
13. Zhang, D. and Frankel, S. H., "A Numerical Study of Natural Gas Combustion in a Lean Burn Engine", *Fuel*, **77**, (12), pp. 1339-1347, 1998.
14. DesJardin, P. E. and Frankel, S. H., "Large Eddy Simulation of a Nonpremixed Reacting Jet: Application and Assessment of Subgrid-Scale Combustion Models", *Physics of Fluids*, **10**, (9), pp. 2298-2314, 1998.
15. Costura, D. M., Lawless, P. B., and Frankel, S. H., "A Computational Model for the Study of Gas Turbine Combustor Dynamics", *Journal of Engineering Gas Turbines and Power*, **121**, pp. 243-248, April 1999.
16. DesJardin, P. E. and Frankel, S. H., "Two-Dimensional Large Eddy Simulation of Soot Formation in the Near-Field of a Strongly Radiating Nonpremixed Acetylene-Air Turbulent Jet Flame", *Combustion and Flame*, **119**, (1/2), pp. 121-132, 1999.
17. Zhao, W., Frankel, S. H., and Mongeau, L., "Effect of Trailing Jet Instability on Vortex Ring Formation", *Physics of Fluids*, **12**, (3), pp. 589-596, March 2000.
18. Glaze, D. J. and Frankel, S. H., "Effect of Dispersion Characteristics on Particle Temperature in a Nonpremixed Reacting Jet", *International Journal of Multiphase Flow*, **26**, pp. 609-633, 2000.
19. Zhao, W., Frankel, S. H., and Mongeau, L., "Effect of Spatial Filtering on Sound Radiation from a Subsonic Axisymmetric Jet", *AIAA (American Institute of Aeronautics and Astronautics) Journal*, **38**, (11), pp. 2032-2039, 2000.
20. Zhao, W., Frankel, S. H., and Mongeau, L., "Large Eddy Simulations of Sound Radiation from Subsonic Turbulent Jets", *AIAA Journal*, **39**, (8), pp. 1469-1477, 2001.
21. Zhao, W. and Frankel, S. H., "Numerical Simulations of Sound Radiation from Axisymmetric Premixed Flames", *Physics of Fluids*, **13**, (9), pp. 2671-2681, 2001.
22. Zhao, W., Frankel, S. H., and Mongeau, L., "Numerical Simulations of Sound from Confined Pulsating Axisymmetric Jets", *AIAA Journal*, **39**, (10), pp. 1868-1874, 2001.
23. Xing, T., and Frankel, S. H., "Effect of Cavitation on Vortex Dynamics in a Submerged Laminar Jet", *AIAA Journal*, **40**, (11), pp. 2266-2276, 2002.
24. Zhao, W., Zhang, C., Frankel, S. H., and Mongeau, L., "Computational Aeroacoustics of Phonation, Part I: Numerical Methods, Acoustic Analogy Validation, and Effects of Glottal Geometry", *Journal of Acoustical Society of America*, **112**, (5), pp. 2134-2146, 2002.
25. Zhang, C., Zhao, W., Frankel, S. H., and Mongeau, L., "Computational Aeroacoustics of Phonation, Part II: Effects of Subglottal Pressure, Glottal Oscillation Frequency, and Ventricular Folds", *Journal of Acoustical Society of America*, **112**, (5), pp. 2147-2154, 2002.

26. Zhang, Z., Mongeau, L., and Frankel, S. H., "Experimental Verification of the Quasi-Steady Assumption for Aerodynamic Sound Generation by Pulsating Jets in Tubes", *Journal of Acoustical Society of America*, **112**, (4), pp. 1652-1663, 2002
27. Zhang, Z., Mongeau, L., and Frankel, S. H., "Broadband Sound Generation by Confined Turbulent Jets", *Journal of Acoustical Society of America*, **112**, (2), pp. 677-689, 2002.
28. Singh, K., Frankel, S. H., and Gore, J. P., "Effects of Combustion on the Sound Pressure Generated by Circular Jet Flows," *AIAA Journal*, **41**, (2), pp. 319-321, 2003.
29. Glaze, D. and Frankel, S. H., "Stochastic Inlet Conditions for Large Eddy Simulation of a Fully Turbulent Jet", *AIAA Journal*, **41**, (6), pp. 1064-1073, 2003.
30. Varghese, S. S. and Frankel, S. H., "Numerical Modeling of Pulsatile Turbulent Flow in Stenotic Vessels", *Journal of Biomechanical Eng.*, **125**, (4), pp. 445-460, 2003.
31. Singh, K. K., Frankel, S. H., and Gore, J. P., "Study of Spectral Noise Emissions from Standard Turbulent Nonpremixed Flames," *AIAA Journal*, **42**, (5), pp. 931-936, 2004.
32. Zhang, Z., Mongeau, L., Frankel, S. H., Thomson, S., Park, J., "Sound Generation by Steady Flow through Glottis-Shaped Orifices", *Journal of Acoustical Society of America*, **116**, (3), pp. 1720-1728, 2004.
33. Li, G., Frankel, S. H., Braun, J. E., and Groll, E. A., "Application of CFD Models to Two-Phase Flow in Refrigerant Distributors", *International Journal of Heating, Ventilating, Air-Conditioning and Refrigeration Research*, **11**, (1), pp. 45-62, 2005.
34. Xing, T., Li, Z., and Frankel, S. H., "Numerical Simulation of Vortex Cavitation in a Three Dimensional Submerged Transitional Jet", *Journal of Fluids Engineering*, **127**, (4), pp. 714-725, 2005.
35. Thomson, S. L., Mongeau, L., and Frankel, S. H., "Aerodynamic Transfer of Energy to the Vocal Folds," *Journal of Acoustical Society of America*, **118**, (3), pp. 1689-1700, 2005.
36. Suh, J., Frankel, S. H., Mongeau, L., and Plesniak, M. W., "Compressible Large Eddy Simulation of Wall-Bounded Turbulent Flows Using a Semi-Implicit Numerical Scheme for Low Mach Number Aeroacoustics", *Journal of Computational Physics*, **215**, pp. 526-551, 2006.
37. Singh, K. P., Mongeau, L., Frankel, S. H., and Gore, J., "Effect of Co- and Counter-Swirl on Noise Emission from Swirling Non-reacting Flows and Flames", *AIAA Journal*, **45**(3), pp. 651-661, 2007.
38. Thomson, S. L., Mongeau, L., and Frankel, S. H., "Flow over a Membrane-Covered, Fluid-Filled Cavity", *Computers and Structures*, **85**, pp. 1012-1019, 2007.
39. Varghese, S. S., Frankel, S. H., and Fischer, P. F., "Direct Numerical Simulation of Stenotic Flows, Part I: Steady Flow", *Journal of Fluid Mechanics*, **582**, 253-280, 2007.
40. Varghese, S. S., Frankel, S. H., and Fischer, P. F., "Direct Numerical Simulation of Stenotic Flows, Part II: Pulsatile Flow", *Journal of Fluid Mechanics*, **582**, 281-318, 2007.
41. Chandy, A., Glaze, D. J., and Frankel, S. H., "Parallelizing the Discrete Ordinates Method (DOM) for Three-Dimensional Radiative Heat Transfer Calculations Using a Priority Queuing Technique", *Numerical Heat Transfer, Part B: Fundamentals*, **52**, 33-49, 2007.

42. Suh, J. and Frankel, S. H., "Numerical Simulation of Turbulence Transition and Sound Radiation of Flow through a Rigid Glottal Model", *Journal of Acoustical Society of America*, **121**(6), 3728-3739, 2007.
43. Throckmorton, A. L., Myers, C. D., Ballman, K. K., Frankel, S. H., Litwak, K., Rodefeld, M. D., "Mechanical Cavopulmonary Assist for the Univentricular Fontan Circulation using a Novel Folding Propeller Blood Pump", *ASAIO J.*, **53**, 734-741, 2007.
44. Varghese, S., Frankel, S. H., and Fischer, P., "Modeling Transition to Turbulence in Eccentric Stenotic Flows", *Journal of Biomechanical Engineering*, **130**(1), 7 pages, 2008.
45. Suh, J. and Frankel, S. H., "Comparing Turbulence Models for Flow through Rigid Glottal Model", *Journal of Acoustical Society of America*, **123**(3), 1237-1240, 2008.
46. Throckmorton A, Ballman K, Myers CD, Frankel SH, Brown JW, Rodefeld MD. Performance of a 3-bladed Propeller Pump to Provide Cavopulmonary Assist in the Failing Fontan Circulation, *Ann. Thorac. Surg.*, **86**, 1343-1347, 2008.
47. Chandy, A., Glaze, D. J., Frankel, S. H., "A Hybrid LES/Filtered Mass Density Function Approach for the Calculation of Strongly Radiating Turbulent Flames", *J. of Heat Transfer*, **131**(5), 9 pages, 2009.
48. Chandy, A. and Frankel, S. H., "Regularization-based Subgrid-Scale (SGS) Models for Large Eddy Simulation (LES) of High-Re Decaying Isotropic Turbulence", *J. of Turbulence*, **10**(25), 1-22, 2009.
49. Chandy, A. and Frankel, S. H., "The t-model as a Large Eddy Simulation Model for the Navier-Stokes Equations", *Multiscale Modeling and Simulation*, **8**(2), pp. 445-462, 2009.
50. Shetty, D., Chandy, A., and Frankel, S. H., "A new fractal IEM mixing model for LES/FMDF applied to a multi-scalar three-stream turbulent jet", *Phys. Fluids*, **22**, 025102, 2010.
51. Shetty, D., Shen, J., Chandy, A. J., Frankel, S. H., "A Pressure Correction Scheme for Rotational Navier-Stokes Equations and its Application to Rotating Turbulent Flows", *Comm. Comp. Phys.*, Special Issue for David Gottlieb, 9, pp. 740-755, 2010.
52. Dittakavi, N., Chunekar, A., and Frankel, S. H., "Large Eddy Simulation of Turbulent-Cavitation Interactions in a Venturi Nozzle", *J. Fluids Eng.*, **132**(12), 2010.
53. Rodefeld, M. D., Coats, B., Fisher, T., Giridharan, G. A., Chen, J., Brown, J. W., and Frankel, S. H., "Cavopulmonary Assist for Univentricular Fontan Circulation: von Karman Viscous Impeller Pump (VIP)", *J. Thoracic and Cardiovascular Surgery*, **140**(3), pp. 529-536, 2010.
54. Shetty, D., Fisher, T., Chunekar, A., and Frankel, S. H., "High-Order Incompressible Large Eddy Simulation of Fully Inhomogeneous Turbulent Flows", *Journal of Computational Physics*, **229**(23), pp. 8802-8822, 2010.
55. Chandy, A. and Frankel, S. H., "Leray-alpha LES of Magnetohydrodynamic Turbulence at Low Magnetic Reynolds Number", *Journal of Turbulence*, **12**(17), 2011.
56. Fisher, T. C., Carpenter, M. H., Yamaleev, N., and Frankel, S. H., "Boundary Closures for Fourth-Order Energy Stable Weighted Essentially Non-Oscillatory Finite Difference Schemes", *Journal of Computational Physics*, **230**, pp. 3727-3752, 2011.
57. Kennington, J. R., Frankel, S. H., Chen, Jun, Koenig, S. C., Sobeiski, M. A., Giridharan, G. A., Rodefeld, M. D., "Design Optimization and Performance Studies of an

- Adult Scale Viscous Impeller Pump for Powered Fontan in an Idealized Total Cavopulmonary Connection”, *Cardiovascular Engineering and Technology*, **2**(4), pp. 237-243, 2011.
58. Cao, Y., Daskin, A., Frankel, S. H., and Kais, S., “Quantum Circuit Design for Solving Linear Systems of Equations”, *Molecular Physics*, **110** (15-16), pp. 1675-1680, 2012.
 59. Chandra, R., Jacobson, T., Moussa, J. E., Frankel, S. H., and Kais, S., “Quadratic constrained mixed discrete optimization with an adiabatic quantum optimizer”, *Physical Review A*, **90**, 012308 (2014).
 60. Giridharan G. A., Koenig, S. C., Kennington, J., Sobieski, M. A., Chen, J., Frankel, S. H., and Rodefeld, M. D., “Performance Evaluation of a Pediatric Viscous Impeller Pump for Fontan Cavopulmonary Assist”, *J. Thoracic and Cardiovascular Surgery*, **145**(1), pp. 249-254, 2013.
 61. Ghaisas, N., Shetty, D., and Frankel, S. H., “Large Eddy Simulation of Thermal Driven Cavity: Evaluation of Sub-grid Scale Models and Flow Physics”, *International Journal of Heat and Mass Transfer*, **56** (1-2), pp. 606-624, 2013.
 62. Delorme, Y., Anupindi, K., Kerlo, A. E., Shetty, D., Rodefeld, M., Chen, J., and Frankel, S. H., “Large Eddy Simulation of Powered Fontan Hemodynamics”, *J. Biomechanics*, **46**(2), pp. 408-422, 2013.
 63. Shetty, D. A. and Frankel, S. H., “Assessment of Stretched Vortex Subgrid-Scale Models for LES of Incompressible Inhomogeneous Turbulent Flow”, *Int. J. Numer. Meth. Fluids*, **73**(2), pp. 152-171, 2013.
 64. Kerlo, A. M., Delorme, Y. T., Xu, D., Frankel, S. H., Giridharan, G. A., Rodefeld, M. D., and Chen, J., “Experimental Characterization of Powered Fontan Hemodynamics in an Idealized Total Cavopulmonary Connection Model”, *Exps. Fluids*, **54**:1581, 2013.
 65. Delorme, Y. T., Anupindi, K., and Frankel, S. H., “Large Eddy Simulation of FDA’s Idealized Medical Device”, *Cardiovascular Engineering and Technology*, **4**(4), pp. 392-407, 2013.
 66. Giridharan, G. A., Ising, M., Sobieski, M. A., Koenig, S. C., Chen, J., Frankel, S. H., and Rodefeld, M. D., “Cavopulmonary assist for the failing Fontan circulation: Impact of ventricular function on mechanical support strategy”, accepted for publication, *American Society for Artificial Internal Organs*, 2014.
 67. Anupindi, K., Delorme, Y., Shetty, D., and Frankel, S. H., “A Novel Multiblock Immersed Boundary Method for Complex Arterial Hydrodynamics”, *J. Comput. Phys.*, **254**, pp. 200-218, 2013.
 68. Anupindi, K., Lai, W., and Frankel, S. H., “Characterization of oscillatory instability in lid driven cavity flows using lattice Boltzmann method”, **92**, pp. 7-21, *Computers and Fluids*, 2014.
 69. Ghaisas, N. and Frankel, S. H., “A priori evaluation of large eddy simulation subgrid-scale scalar flux models in isotropic passive-scalar and anisotropic buoyancy-driven homogeneous turbulence”, **15**(2), *J. of Turbulence*, 2014.
 70. Pal, A., Anupindi, K., Delorme, Y., Ghaisas, N., Shetty, D. A., and Frankel, S. H., “Large eddy simulation of transitional flow in a stenotic blood vessel: Evaluation of subgrid-scale models”, *J. Biomechanical Engineering*, **136**, 2014.

71. Delorme, Y., Kerlo, A., Anupindi, K., Rodefled, M. D., and Frankel, S. H., “Dynamic Mode Decomposition of Fontan Hemodynamics in an Idealized Total Cavopulmonary Connection”, *Fluid Dyn. Res.*, **46** (04125), 2014.
72. Chandra, R., Jacobson, N. T., Moussa, J. E., Frankel, S. H., and Kais, S., “Quadratic constrained mixed discrete optimization with an adiabatic quantum optimizer”, *Physical Review A.*, **90** (012308), 2014.
73. Carpenter, M. H., Fisher, T. C., Nielsen, E., and Frankel, S. H., “Entropy Stable Spectral Collocation Schemes for the Navier-Stokes Equations: Discontinuous Interfaces”, *SIAM J. Sci. Comput.*, **36**(5), B835–B867, 2014.
74. Ghaisas, N., Shetty, D., and Frankel, S. H. “Large Eddy Simulation of Turbulent Horizontal Buoyant Jets”, *J. of Turbulence*, **16**:8, 772-808, 2015.
75. Ghaisas, N. and Frankel, S. H. “Dynamic Gradient models for the sub-grid scale stress tensor and scalar flux vector in large eddy simulation”, *J. of Turbulence*, **17**:1, 30-50, 2016.
76. Li, Q., Delorme, Y., and Frankel, S. H., “Parametric Numerical Study of Electrokinetic Instability in Cross-shaped Microchannels”, *Microfluidics and Nanofluidics*, **20**(2):29, 2016.
77. Delorme, Y., Frankel, S. H., and Rodefled, M., “Multiblock High Order Large Eddy Simulation of Powered Fontan Hemodynamics: Towards Computational Surgery”, *Computers and Fluids*, **143**, 16-31, 2017.
78. Haimovich, O. and Frankel, S. H., “Numerical Simulations of Compressible Multi-component and Multiphase Flow Using a High-Order Targeted ENO (TEN0) Finite-Volume Method”, *Computers and Fluids*, **145**, 105-116, 2017.
79. Delorme, Y., Puri, K., Nördstrom, J., Linders, V., Dong, S., and Frankel, S. H., “A Simple and Efficient Incompressible Navier-Stokes Solver for Unsteady Complex Geometry Flows on Truncated Domains”, **150**(3), pp. 84-94, *Computers and Fluids*, 2017.
80. Frankel, S. H., "Coarse Grained Simulation and Turbulent Mixing", *AIAA Journal*, Vol. **55**, No. 5, pp. 1767-1768, 2017.
81. Faingold, G., Tartokovsky, L., and Frankel, S. H., ”Numerical Study of a Direct Injection Internal Combustion Engine Burning a Blend of Hydrogen and Dimethyl Ether”, *Drones* 2018, 2, 23; doi:10.3390.
82. Singh, V. and Frankel, S. H., “On the use of split forms and wall modeling to enable accurate high-Reynolds number discontinuous Galerkin simulations on body-fitted unstructured grids”, *Computers and Fluids*, **208**, 104616, 2020.
83. Pant, C. S., Delorme, Y., and Frankel, S. H., “Accuracy Assessment of RANS Predictions of Active Flow Control for Hydrofoil Cavitation”, *Processes*, **8**(677), 2020.
84. Linders, V., Nördstrom, J., and Frankel, S. H., “Properties of Runge-Kutta-Summation-By-Parts Methods”, *Journal of Computational Physics*, **419**, 2020.
85. Delorme, Y., Stanly, R., Frankel, S. H., and Greenblatt, D., “Application of Actuator Line Model for Large Eddy Simulation of Rotor Noise Control”, accepted for publication, *Aerospace Science and Technology*, 2020.
86. Chamarthi, A. S., and Frankel, S. H., “High-Order Central-Upwind shock capturing scheme using a Boundary Variation Diminishing (BVD) Algorithm”, accepted for publication, *Journal of Computational Physics*, 2020.

87. Delorme, Y. and Frankel, S. H., "High-Order Large Eddy Simulation of External Flows: Assessment of Curvilinear Body-Fitted Grids and Immersed Boundary Methods", submitted to AIAA J., under review, 2020.
88. Delorme, Y., Jain, R., and Frankel, S. H., "High-Order Large Eddy Simulation and Immersed Boundary Method on Dynamic Meshes: Application to Rotorcraft Aerodynamics", AIAA J., under revision, 2020.

CONFERENCE PAPERS/PRESENTATIONS OR SYMPOSIUM PROCEEDINGS

1. Frankel, S. H., Hassan, H. A., and Drummond, J. P., "A Hybrid Reynolds Averaged/PDF Closure Model for Supersonic Turbulent Combustion", AIAA 90-1573, AIAA 21st Fluids, Laser and Plasmadynamics Conference, Seattle, WA, 1990.
2. Frankel, S. H., "Mixing in Homogeneous Reacting Turbulence", AIAA Student Conference Paper, Worcester, MA, 1991
3. Frankel, S. H., Jiang, T. J., and Givi, P., "Mathematical Modeling of Isotropic Reacting Turbulence by a Hybrid EDQNM-Mapping Closure", Eastern States Section Meeting of the Combustion Institute, Ithaca, NY, 1991.
4. Madnia, C. K., Frankel, S. H., and Givi, P., "Mathematical Modeling of the Reactant Conversion Rate by Single-Point PDF Methods", Eastern States Section Meeting of the Combustion Institute, Ithaca, NY, 1991.
5. Frankel, S. H., "Probabilistic and Deterministic Description of Reacting Turbulence: PDF, EDQNM, DNS, LES, and more . . .", AIAA Student Conference Paper (received 2nd prize), Buffalo, NY, 1992.
6. Miller, R. S. and Frankel, S. H., "On Mathematical Modeling of Isotropic Reacting Turbulence: Stochastic Distributions and Conditional Dissipation", AIAA Student Conference Paper, Buffalo, NY, 1992.
7. Frankel, S. H., Adumitroaie, V., Madnia, C. K., and Givi, P., "Large Eddy Simulation of Turbulent Reacting Flow by Assumed PDF Methods", ASME Fluids Engineering Division Conference on Engineering Applications of Large Eddy Simulations, FED Vol. 162, pp. 81-101, 1993.
8. Frankel, S. H., Madnia, C. K., and Givi, P., "Probabilistic and Deterministic Description of Reacting Turbulent Flows", Bulletin of the American Physical Society, **37**(8), p. 1755, 1992.
9. Madnia, C. K., Miller, R. S., Frankel, S. H., and Givi, P., "Method of Translation for Stochastic Modeling of Binary Scalar Mixing in Isotropic Turbulence", Bulletin of the American Physical Society, **37**(8), p. 1756, 1992.
10. Frankel, S. H., McMurtry, P. A., and Givi, P., "Linear Eddy Modeling of Selectivity", Western States Section Meeting of the Combustion Institute, Salt Lake City, Utah, 1993.
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120. Anupindi, K., Delorme, Y., Shetty, D., and Frankel, S. H., Large Eddy Simulation of Pathological and Medical Device Hemodynamics: A novel multiblock immersed boundary method, SIAM Conference on Computational Science and Engineering, Boston, MA, February 25-March 1, 2013.

121. Delorme, Y., T., Kerlo, A-E. M., Anupindi, K., Chen, J., Frankel, S. H., Rodfeld, M. D., “Dynamic Mode Decomposition of Fontan Hemodynamics in an Idealized Total Cavopulmonary Connection”, Bifurcations and Instabilities in Fluid Dynamics Conference, Technion, Haifa, Israel, July 8-11, 2013.
122. Frankel, S. H., “Hybrid LES/PDF Methods for Turbulent Reacting Flows: Jet Mixing and Idealized Jet Flames”, Keynote Lecture, 27th Annual Symposium of the Israeli Section of the Combustion Institute, November 28, 2013, Tel Aviv, Israel.
123. Frankel, S. H., Qian, Li, Anunpindi, K., and Delorme, Y., “High-Order Numerical Simulations of Electrokinetic Instability in a Cross-Shaped Microchannel”, Israel Society of Theoretical and Applied Mathematics (ISTAM), Dec. 1, 2013, Tel-Aviv University.
124. Ghaisas, N. S. and Frankel, S. H., "Large eddy simulation of buoyancy induced asymmetry in horizontal jets", 66th Annual Meeting of the APS Division of Fluid Dynamics, November 24-26, 2013, Pittsburgh Pennsylvania.
125. Qian, Li, Anunpindi, K., Delorme, Y., and Frankel, S. H., “High-Order Numerical Simulations of Electrokinetic Instability in a Cross-Shaped Microchannel”, 66th Annual Meeting of the APS Division of Fluid Dynamics, November 24-26, 2013, Pittsburgh Pennsylvania.
126. Frankel, S. H., Delorme, Y., and Anupindi, K., “A Novel Multiblock Immersed Boundary Method for Large Eddy Simulation of Pathological and Medical Device Hemodynamics”, World Congress on Biomechanics, invited talk, July 6-11, 2014, Boston, MA.
127. Delorme, Y., Kerlo, A., Rodefled, M. D., and Frankel, S. H., “A Novel Multiblock Immersed Boundary Method for Large Eddy Simulation of Pathological and Medical Device Hemodynamics”, World Congress on Biomechanics, invited talk, July 6-11, 2014, Boston, MA.
128. Kerlo, A. E., Frankel, S. H., Chen, J., Vlachos, P., “Experimental Study of a Thoracic Aortic Aneurysm Prior to and After Surgical Repair Hemodynamics”, APS Division of Fluid Dynamics, November 2014.
129. Nielsen, T., Fisher, T., & Frankel, S. (2014). “High-Order Implicit-Explicit Multiblock Time-stepping Method for Hyperbolic PDEs”, 52nd Aerospace Sciences Meeting, January 2014, AIAA 2014-0770.
130. Shachar, B. L., Delorme, Y., Hofemeier, P., Frankel, S. H., Sznitman, J., “Non-spherical Aerosol Transport under Oscillatory Shear Flows at Low-Reynolds Numbers”, American Physical Society, 67th Annual Meeting of the Division of Fluid Dynamics in San Francisco, CA, November 23-25 2014.
131. Linders, V., Kupiainen, M., Frankel, S. H., Delorme, Y., and Nordstrom, J., “Summation-by-Parts Operators with Minimal Dispersion Error for Accurate and Efficient Flow Calculations“, AIAA-2016-1329, presented at the 54th AIAA Aerospace Sciences Meeting, AIAA Science and Technology Forum and Exposition, San Diego, CA, 4-8 January 2016.
132. Frankel, S. H., “High-Fidelity numerical simulations of vortical structures and cardiovascular disease”, The 14th International Symposium Computer Methods in Biomechanics and Biomedical Engineering, Tel Aviv, Israel, 20 - 22 September 2016.
133. Haimovich, O. and Frankel, S. H., “High-Order Numerical Simulations Of Compressible Multicomponent And Multiphase Flow Using A Targeted ENO (TEN0) Finite

- Volume Method”, 34th Israeli Conference on Mechanical Engineering, Technion - Israel Institute of Technology, Haifa, Israel, Nov. 22-23, 2016.
134. Laufer, M., and Frankel, S. H., and Greenblatt, D., “CFD Predictions Of Load Control Using Steady Blowing On A Thick Airfoil”, 34th Israeli Conference on Mechanical Engineering, Technion - Israel Institute of Technology, Haifa, Israel, Nov. 22-23, 2016.
 135. Delorme, Y., Golan, S., Brand, M., and Frankel, S. H., “Large Eddy Simulation Of Flow Inside An Idealized Arteriovenous Fistula”, 34th Israeli Conference on Mechanical Engineering, Technion - Israel Institute of Technology, Haifa, Israel, Nov. 22-23, 2016.
 136. Delorme, Y., Frankel, S. H., Jain, R., and Strawn, R., “Performance Assessment of High-Order Large Eddy Simulation and Immersed Boundary Method for Rotorcraft Hover”, AIAA-2017-0539, 55th Aerospace Sciences Meeting, Grapevine, TX, 2017.
 137. Puri, K. and Frankel, S. H., “Towards An Efficient, High-Order, Hybrid Unstructured and Adaptive Cartesian Mesh Approach for External Aerodynamics”, AIAA-2017-0072, 55th Aerospace Sciences Meeting, Grapevine, TX, 2017.
 138. Puri, K., Singh, V., and Frankel, S. H., “Evaluation of a Directive-Based GPU Approach for High-Order Unstructured Mesh Computational Fluid Dynamics”, The Platform for Advanced Scientific Computing (PASC), Palazzo dei Congressi, Lugano, Switzerland, June 26-28, 2017.
 139. Delorme, Y., Frankel, S. H., Jain, R., and Strawn, R., “High-Order Large Eddy Simulation and Immersed Boundary Method on Dynamic Meshes: Application to Rotorcraft Aerodynamics”, AIAA-2018-0599, 56th Aerospace Sciences Meeting, Kissimmee, FL, 2018.
 140. Puri, K., Laufer, M., Müller-Vahl, Greenblatt, D., and Frankel S. H., “Computations of Active Flow Control Via Steady Blowing Over a NACA-0018 Airfoil: Implicit LES and RANS Validated Against Experimental Data”, AIAA-2018-0792, 56th Aerospace Sciences Meeting, Kissimmee, FL, 2018.
 141. Puri, K., Delorme, Y., and Frankel, S. H., “A Novel Mapped Grid Approach for GPU Acceleration of High-Order Structured Grid CFD Solvers”, NVIDIA GPU Technology Conference (GTC) 2018, San Jose, CA, March 27, 2018.
 142. Singh, V. and Frankel, S. H., "Performance assessment of variable order flux reconstruction for implicit large eddy simulation of turbulent channel flow", ECCM-E CFD Conference, Glasgow, UK, June, 2018.
 143. Linders, V., Delorme, Y., Singh, V., and Frankel, S. H., “Computational Assessments of Finite Difference and Flux Reconstruction Schemes for Implicit Large Eddy Simulations”, International Conference on Spectral and High-Order Methods (ICOSAHOM), London, UK, July 9-13, 2018.
 144. Singh, V. and Frankel, S. H., “Using The Flexibility of p-Refinement in Flux Reconstruction for Optimal Simulation of Turbulent Flows”, International Conference on Spectral and High-Order Methods (ICOSAHOM), London, UK, July 9-13, 2018.
 145. Delorme, Y. and Frankel, S. H., “High-Fidelity LES of Scramjet Engines”, 32nd Annual Symposium of Israel Section of the Combustion Institute, Dan Panorama, Tel Aviv, Israel, December 6, 2018.

146. Delorme, Y., Amitay, M., and Frankel, S. H., “High-Fidelity LES of Reversed Flow Aerodynamics of Pitching Wing”, 57th Aerospace Sciences Meeting, San Diego, CA, 2019.
147. Singh, V. and Frankel, S. H., “Wall-Modeled Implicit LES of Transitional Flows using Variable-Order Flux Reconstruction Method”, AIAA-2019-0645, 57th Aerospace Sciences Meeting, San Diego, CA, 2019.
148. Delorme, Y. and Frankel, S. H., “Numerical Simulations of Scramjet Combustion: Geometry Representations and Turbulence-Chemistry Interactions”, 33rd Annual Symposium of Israel Section of the Combustion Institute, Dan Panorama, Tel Aviv, Israel, December 26, 2018.
149. Hoffmann, N., Delorme, Y., and Frankel, S. H., “High-Order Large Eddy Simulations of High-Speed Boundary Layer Transition”, AIAA-2020-0033, 58th Aerospace Sciences Meeting, Orlando, FL, 2020.
150. Stanly, R., Delorme, Y., and Frankel, S. H., “Computational Assessment of Actuator Line Model for Large Eddy Simulation of Rotor Noise, AIAA-2020-0035, 8th Aerospace Sciences Meeting, Orlando, FL, 2020.
151. Frankel, S. H., “Coarse-grid simulations of hypersonic boundary layer transition: Is it even possible?”, Invited Oral Presentation, Session FD-10/HSABP-02, LES and RANS/LES Methods for High Speed Flows, AIAA Scitech, 58th Aerospace Sciences Meeting, Orlando, FL, 2020.

INVITED SEMINARS, LECTURES, ETC.

Entries 1-7 are related to Prof. Frankel’s Ph.D. research and were presented as part of job interviews.

1. *Probabilistic and Deterministic Description of Reacting Turbulence*, ICOMP/NASA Lewis Research Center, Cleveland, OH, December 1992.
2. *Probabilistic and Deterministic Description of Reacting Turbulence*, Center for Turbulence Research, Stanford University, Palo Alto, CA, December 1992.
3. *Probabilistic and Deterministic Description of Reacting Turbulence*, CFD Research Corporation, Huntsville, AL, January 1993.
4. *Probabilistic and Deterministic Description of Reacting Turbulence*, ICASE/NASA Langley Research Center, Hampton, VA, March 1993.
5. *Probabilistic and Deterministic Description of Reacting Turbulence*, University of Oklahoma, Norman, OK, April 1993.
6. *Probabilistic and Deterministic Description of Reacting Turbulence*, Purdue University, West Lafayette, IN, April 1993.
7. *Probabilistic and Deterministic Description of Reacting Turbulence*, University of South Florida, Tampa, FL, May 1993.
8. *Numerical Modeling of Turbulent Combustion: What does the future hold and are we at a threshold?*, CENUT Seminar Series, School of Mechanical Engineering, Purdue University, November 1993.
9. *Computational Modeling of Poststall Gas Turbine Combustor Dynamics*, Arnold Engineering Development Center, Tullahoma, TN, July 1994.

10. *Computational Modeling of Gas Turbine Combustor Dynamics*, Advanced Gas Turbine Systems Research Combustion Workshop II, March 1995.
11. *Towards Large Eddy Simulation of Strongly Radiating Turbulent Diffusion Flames*, International Colloquium on Advanced Computation and Analysis of Combustion, Moscow, Russia, May 1997.
12. *LES of Turbulent Flows*, Department of Civil Engineering, Purdue University, West Lafayette, IN, April 2002.
13. *LES of Turbulent Flows*, Department of Mechanical Engineering, IUPUI, Indianapolis, IN, April 2002.
14. *LES of Turbulent Reacting Flows: Applications from Soot to Noise*, Mechanical Engineering Department, Washington University, St. Louis, MO, April 15, 2004.
15. *LES of Turbulent Combustion*, Wright Patterson Air Force Base, Ohio, October, 2004.
16. *Numerical Simulations of Turbulent Flows*, Purdue Booth Presentation at Supercomputing 04 (SC04) conference, Pittsburg, PA, November 6-12, 2004.
17. *LES of Nonpremixed Flame Dynamics*, Workshop on Multiphase and Reacting Flow Simulations, Purdue University, West Lafayette, IN June 27-28, 2005.
18. *Computational Aeroacoustics in a Model of the Human Vocal Tract*, Distinguished Invited Lecture, Mechanical Engineering Department, Virginia Commonwealth University, Richmond, VA, November 12, 2007.
19. *Subgrid-Scale Mixing Models for Large Eddy Simulation of Turbulent Reacting Flows*, Aerospace Engineering Department, University of Illinois at Urbana-Champaign, April 7, 2008.
20. *High-Order Large Eddy Simulation of Compressible Turbulent Reacting Flows*, Hypersonics Propulsion Branch, NASA Langley Research Center, Langley, VA, August 9, 2010.
21. *Computational Hemodynamics: Congenital and Acquired Heart Disease*, University of Illinois, Chicago, Mech. and Industrial Eng. Dept., October 26, 2010.
22. Frankel, S. H., Large Eddy Simulations of Powered Fontan Hemodynamics, invited talk, Department of Mechanical Engineering, Tel Aviv University, March 22, 2012.
23. Frankel, S. H., A Novel Cavopulmonary Assist Device for Univentricular Fontan Circulation, invited talk, UC Merced, April 30, 2012.
24. Frankel, S. H., Large Eddy Simulations of Pathological and Medical Device Hemodynamics, invited talk, Hebrew University, Jerusalem, Israel, December, 20, 2012.
25. Frankel, S. H., “WenoCFD: A High-Order CFD Code for Complex Turbulent Flows”, Israeli Ministry of Defense, CFD Conference, Kirya, Tel Aviv, Israel, June 24, 2013.
26. Frankel, S. H. “WenoHemo: A High-Fidelity Simulation Tool for Pathological and Medical Device Hemodynamics in Patient-Specific Geometries”, Israel Society of Biomedical Engineering, February 27, 2014.
27. Frankel, S. H., “WenoHemo: A High-Fidelity Simulation Tool for Pathological and Medical Device Hemodynamics”, Heartware Inc., Miami Lakes, Florida, May 6, 2014.
28. Frankel, S. H., Keynote Technology Panel Discussion – Computational Fluid Dynamics in Today’s Bulk Handling, Powders, Bulk and Solids Conference, Rosemont, IL, May 8, 2014.
29. Frankel, S. H., Moderator - International Best Practices Panel Discussion, Powders, Bulk and Solids Conference, Rosemont, IL, May 8, 2014.

30. Frankel, S. H., “WenoHemo: A High-Fidelity Simulation Tool for Pathological and Medical Device Hemodynamics”, Sheba Medical Center, Tel Aviv, Israel, August 26, 2014.
31. Frankel, S. H., “WenoHemo: A High-Fidelity Simulation Tool for Pathological and Medical Device Hemodynamics”, Enopace Inc., Caesaria, Israel, September 11, 2014.
32. Frankel, S. H., “WenoHemo: A High-Fidelity Simulation Tool for Pathological and Medical Device Hemodynamics”, Biomedical Engineering Department, Tel Aviv University, Tel Aviv, Israel, October 26, 2014.
33. Frankel, S. H., “High-Fidelity Large Eddy Simulation of Turbulent Combustion”, 1st CFDIMPACT Conference, Technion - Israel Institute of Technology, Haifa, Israel, June 30, 2015.
34. Frankel, S. H., “Immersed in Blood Pumps and Helicopters: The Role of von Karman in my Fluid Life”, Fluid Mechanics Seminar, Stanford University, Palo Alto, CA, April 12, 2016.
35. Frankel, S. H., “Can you have your airfoil and simulate turbulence too?”, Invited Seminar, Mechanical Engineering Department, Ben Gurion University, Beer Sheva, Israel, June 15, 2017.
36. Frankel, S. H., “Quantum computing algorithms for simulating turbulent flows”, Invited Lecture, Israel Symposium on Computational Mechanics, October 29, 2020.

STUDENT SUPERVISION

GRADUATE STUDENTS

M.S. students:

1. **Paul E. DesJardin**, *Linear Eddy Modeling of Reacting Homogeneous Turbulence: Numerical Simulations and Model Comparisons*, M.S.E., Purdue University, August 1995
2. **Kaimei Sun**, *A Computational Study of Premixed and Partially Premixed Flames*, M.S.E., Purdue University, December 1996 (co-advised with J. Gore)
3. **Mitchell J. Zimberg**, *Linear Eddy Modeling of an Acetylene-Air Diffusion Flame in Homogeneous Turbulence: Heat Release Effects and Soot Chemistry/Radiation Interactions*, M.S.M.E., Purdue University, May 1997
4. **Greg S. Hertle**, *Multidimensional Numerical Simulations of a Diesel Engine Using KIVA-3 Enhanced with a Turbulent Combustion Submodel*, M.S.M.E., May 1997
5. **David M. Costura**, *A Computational and Experimental Study of Gas Turbine Compressor Dynamics*, M.S.M.E., December 1997 (co-advised with P. Lawless)
6. **David J. Glaze**, *A Computational Study of the Spatial and Thermal Dynamics of Particles in a Reacting Jet*, M.S.M.E., May 1998
7. **Gang Li**, *A Numerical and Experimental Investigation of Refrigeration Flow Control Devices*, M.S.M.E., December 2001 (co-advised with J. Braun and E. Groll)

8. **Cheng Zhang**, *Computational Aeroacoustics of Phonation*, M.S.M.E., December 2001 (co-advised with L. Mongeau)
9. **Sonu Sam Varghese**, *Numerical Modeling and Simulation of Pulsatile Flow through Stenotic Vessels*, M.S.M.E., May 2002
10. **Nagendra Dittakavi**, *Numerical Simulation of Non-Reacting and Reacting Free Swirling Jets*, M.S.M.E., May 2003 (co-advised with J. Gore)
11. **Sachin Khosla**, *Modeling the Effects of Porous Inserts in Gas Turbine Combustors and Liquid Atomization for Spray Combustion Applications*, M.S.M.E, May 2004.
12. **Stephen Mattick**, *Numerical Modeling of Supersonic Combustion: Validation and Vitiation Studies Using FLUENT*, M.S.M.E., May 2004.
13. **Stephane Poussou**, *Jet Cavitation*, August 2004.
14. **Paul Smith**, *Modeling Fluid-Structure Interactions in the Human Vocal Tract* (Co-advised with Luc Mongeau; May 2006.
15. **John Roach**, *Turbulent-Chemistry Interactions in Modeling Augmentor Dynamics*, August 2007.
16. **Somesh Khandelwahi**, *Fluid-Structure Interactions in Human Vocal Tract*, co-advised with Prof. Siegmund, August 2007.
17. **Dheeraj Saxena**, *CFD Modeling of Axial Piston Pumps*, December 2008.
18. **Travis Fisher**, *Modeling Afterburner Dynamics*, August 2007-May 2009.
19. **Aditya Chuneekar**, *Numerical Modeling and Simulation of Cavitation in a Venturi Geometry*, August 2007 - August 2009.
20. **Sikandar Mashayak**, *Numerical Modeling of Thermal Plasma Reactor for Medical Waste Incineration*, August 2007 – August 2009.
21. **Jeff Kennington**, *Experimental and Numerical Studies of a Novel Cavopulmonary Assist Device for Fontan Circulation*, August 2009-May 2011.
22. **Abhro Pal**, *Numerical Simulations of Flow Through Stenotic Blood Vessel*, August 2010 – May 2012.
23. **Yudong Cao**, *Quantum Computing for Computational Fluid Dynamics*, August 2010 – May 2013.
24. **Tanner Nielsen**, *Energy-Stable Multiblock Implicit-Explicit Methods for Conservation Laws*, August 2011 – May 2013.

25. **Weichen Lai**, *Large Eddy Simulations of Lid Driven Cavity Flows using the Lattice Boltzmann Method*, August 2011 – May 2013.

26. **Bryan Reuter**, *Computational Fluid Dynamics of Industrial and Biomedical Rotating Machinery*, August 2011 – May 2013.

27. **Jonathan DeGan**, *Applications of CFD for a Novel Viscous Impeller Heart Pump*, August 2011 – August 2013.

28. **Rishabh Chandra**, *Partial Differential Equations Constrained Combinatorial Optimization on an Adiabatic Quantum Optimizer* August 2011 - May 2013.

29. **Zvi Hantsis**, *A New Hybrid RANS-LES Method Applied to Turbulent Channel Flow*, March 2014 - November 2016.

30. **Galia Faingold**, *CFD of alternative fuel blends in direct-injection IC engines*, March 2016 - August 2018.

31. **Igal Tsarfis**, *CFD and Uncertainty Quantification for Thermal Hydraulic Turbulent Flows*, October 2016 - December 2019.

32. **Anatoly Dvorsky**, *Computational Fluid Dynamics of Biomedical Devices*, August 2014 - October 2020.

Ph.D. students:

1. **Paul E. DesJardin**, *Large Eddy Simulation of Strongly Radiating Nonpremixed Turbulent Jet Flames*, Ph.D., August 1998.
2. **Ravi O. S. Prasad**, *Direct Numerical and Large Eddy Simulations of Turbulent Premixed Flames*, Ph.D., August 1998 (co-advised with J. Gore)
3. **Wei Zhao**, *A Numerical Investigation of Sound Radiation from Jets with Application to Phonation*, Ph.D., August, 2000 (co-advised with L. Mongeau)
4. **Zhaoyan Zhang**, *Experimental Study of Sound Generation by Confined Jets with Application to Human Speech Production*, August 2002, (co-advised with L. Mongeau)
5. **Xing Tao**, *Numerical Modeling and Simulation of Laminar and Transitional Cavitating Submerged Jets*, August 2002
6. **Scott Thomson**, *Fluid-Structure Interactions Within the Human Larynx*, August 2004, (co-advised with L. Mongeau)

7. **David Glaze**, *Large Eddy Simulation of a Turbulent Jet Diffusion Flame Using the Filtered Mass Density Function Model*, May 2006
8. **Sonu Varghese**, *Even a Small Stenosis Asymmetry can Trigger Post-Stenotic Transition to Turbulence: Implication for Modeling and Simulation*, May 2006
9. **Jungsoo Suh**, *Large Eddy Simulation of Confined Turbulent Flows for Aeroacoustics with Application to Phonation*, May 2006
10. **Abhilash Chandy**, *Large Eddy Simulations of Turbulence-Chemistry-Radiation Interactions in Diffusion Flames*, May 2007
11. **Cheng Zhang**, *Large Eddy Simulations of Sound Radiation from Heated and Swirling Jets*, August 2007
12. **Nagendra Dittakavi**, *Computational Acoustics of Confined Flows: Swirl Combustors and Venturi Cavitation*, December 2008
13. **Dinesh Shetty**, *Subgrid-Scale mixing Models for Large Eddy Simulation of Turbulent Reacting Flows via the Filtered Mass Density Function Approach*, August 2010
14. **Travis Fisher**, *High-Order L2 Stable Multi-Domain Finite Difference Method for Compressible Flows*, June 2009 – May 2012.
15. **Yann Delorme**, *High-Order Large Eddy Simulations of Unpowered and Powered Fontan Hemodynamics in Idealized and Patient-specific Geometries*, January 2010 – August 2013.
16. **Ana Kerlo**, *Experimental Study of Pathological and Cardiovascular Device Hemodynamics*, January 2010 – August 2013 (co-advised with Prof. Jun Chen).
17. **Niranjan Ghaisas**, *Subgrid-Scale Modeling of Buoyant Turbulent Flows*, January 2010 – August 2013.
18. **Kameswara Rao**, *A Novel Multiblock Immersed Boundary Method for Large Eddy Simulation of Pathological and Medical Device Hemodynamics*, January 2010 -December 2013.
19. **Qian Li**, *High Fidelity Simulations of Electrokinetic Phenomena in Microfluidic Devices*, January 2010 - December 2014.
20. **Ori Haimovich**, *LES of Compressible Multifluid Flows*, August 2014 - August 2017.
21. **Solal Amouyal**, *High-Fidelity Low-Mach Number Simulations of Reacting Flows Using Accelerated Chemistry*, August 2014 - July 2020.

22. **Vikram Singh**, *Large Scale High-Order Simulations of Compressible Aerodynamics using hybrid CPU-GPU Parallel Programming*, October 2015 - August 2019.

Postdoctoral students:

1. **Dr. Dehong Zhang**, *Numerical Simulations of Combustion in Natural Gas Engines*, Post-doctoral student, June 1995 – June 1997
2. **Dr. Wei Zhao**, *Numerical Simulation of Flame Sound and Combustion Instability*, Postdoctoral student, August 2000 – May 2001, co-advised with J. Gore
3. **Dr. Xuelel Zhu**, *Radiation Effects on Combustion and NO_x Emissions in Direct Injection Engines* June 1999 - October 2002, co-advised with J. Gore.
4. **Dr. Ye Taohong**, *SGS Turbulent Combustion Modeling for Large Eddy Simulation*, December 2001 - October 2002.
5. **Dr. Guillermo P. Salvador**, Polytechnic University of Valencia, Spain, Numerical Modeling of Cavitation in Hydraulic Devices, July 21 – August 31, 2003 and July 2004.
6. **Dr. Jungsoo Suh**, *Aeroacoustic Models for Phonation*, June 2006 – May 2007.
7. **Dr. Abhilash Chandy**, *Turbulent flow simulations related to mixing, combustion, and thermal plasma reactors*, June 2007 – August 2008
8. **Dr. Dechuan Sun**, visiting scholar from China, August 2010 – August 2011.
9. **Dr. Dinesh Shetty**, *High-order CFD for low-speed and high-speed flow applications*, August 2010 – May 2012.
10. **Dr. Kunal Puri**, *High-order numerical methods and complex geometries for CFD*, October 2014 - Present.
11. **Dr. Nipun Arora**, Numerical Simulations of Electro-rheological Flows, June 2017 - January 2019.
12. **Dr. Viktor Linders**, Numerical Studies based on High-Order Flux Reconstruction, March 2018 - September 2019.
13. **Dr. Yann Delorme**, *Advanced Modeling and Simulation of Turbulent Flows: Aerodynamics, Cardiovascular, Combustion, and Multiphase*, October 2013 - December 2019 (also served as Senior Researcher after his 2 year postdoc).

Visiting Scholars (to CFDLAB@Technion)

1. **Dr. Alon Manor**, Subgrid-Scale Modeling of Buoyant Turbulent Flows for Large Eddy Simulation, Israel Biological Institute, June 2016 - May 2017,

Current M.S. students advised:

At Technion

1. **Michael Laufer**, *CFD of Active Flow Control of Aerodynamics*, March 2017 - Present.

2. **Max Shkatrut**, *Machine Learning for Active Flow Control*, January 2019 - Present.
3. **Sean Boker**, *Scramjet combustion modeling and simulation*, October 2019 - Present.
4. **Ronith Stanly**, *LES of Rotor Aerodynamics and Aeroacoustics*, - January 2019 - November 2020.

Current Ph.D. students advised:

At Technion

1. **Natan Hoffmann**, *Simulations of High-Speed Boundary Layer Transition*, October 2018 - Present.

Current Postdoctoral Students advised:

1. **Dr. Chandrasekhar Pant**, *LES of tidal turbine cavitation*, July 2019 - Present.
2. **Dr. Sainadh Chamarthi**, *High-Order Simulations of High-Speed Reacting Flows*, July 2019 - Present.

Undergraduate special projects directed:

1. **Groskreutz, M.**, Parallel Computer Programming for Turbulent Combustion (Spring 1994, Fall 1994*)
2. **McGee, J.**, Numerical Simulations of a Natural Gas Engines (Spring 1996*)
3. **Mullinix, J.**, Numerical Modeling of an IC Engine (Fall 1996)
4. **Weber, J.**, Computational Modeling of Phonation, (Spring 1999)
5. **Weber, J.**, Numerical Modeling of Combustion, (Spring 2000**)
6. **Harrity, J.**, Numerical Modeling of Combustion, (Spring 2000)
7. **Feldman, A.**, Numerical Modeling of Combustion (Fall 2000)
8. **Weber, J.**, Numerical Modeling of Combustion (Spring 2001)
9. **Erikson, M.**, Numerical Modeling of Swirling Gas Turbine Combustor (Fall 2002*,**)
10. **Berger, D.**, Spectral Methods in CFD (Spring 2004)
11. **Cummins, J.**, Computational Biofluids (Fall 2006)
12. **Frazier, S.**, Parallel Computing, LSAMP (Summer 2007)
13. **Yen, M.**, SURF: Augmentor Reactor Network Modeling (Spring 2009)
14. **DeGan, Jonathan**, Patient-Specific MRI-based CFD of Powered Fontan Hemodynamics (Summer 2010, continuing Fall/Spring 2011) – in collaboration with Prof. Jun Chen.
15. **Amber Plee**, Experimental Studies of Novel Cavopulmonary Assist Device for Fontan Circulation, (Spring 2011) – in collaboration with Prof. Jun Chen.
16. **Stephanie Firehammer**, CFD studies of thoracic aortic aneurysms, (Fall 2012).
17. **Stephanie Firehammer**, CFD studies of fluid-structure interactions, (Spring 2013).

*Recipient of the Ralph T. Simon Memorial Scholarship for undergraduate research

** Recipient of the John M. Bruce Memorial Scholarship for undergraduate research

RESEARCH GRANTS (TECHNION ONLY)

1. Ministry of Defense, General support for high-fidelity computational fluid dynamics research in aerodynamics, combustion, and multiphase flows, Approximately 500,000NIS awarded since arriving two years ago.
2. Israel Science Foundation, “High-Fidelity Large Eddy Simulations of Turbulent Combustion using GPU Chemistry”, 1M NIS over 4 years; also equipment grant for 985,000NIS.
3. Israel Science Foundation with National Science Foundation of China, “Large-scale Parallel Computation on Heterogeneous Many-core Supercomputers for LES of Aerodynamics”, 323,000NIS/year for three years plus 270,000NIS for equipment; in collaboration with Prof. Mark Silberstein of Technion and Chinese investigators.
4. Ministry of Science and Technology, “Large Eddy Simulation of Swirl-Stabilized Hydrogen-Air Combustors”, 100,000NIS/year over two years, in collaboration with Indian investigators.
5. Pazy Foundation, “Large Eddy Simulation of Thermal Hydraulics”, in collaboration with Rotem, ~100,000NIS/year.
6. European Union, Horizon 2020 “Tidal turbine simulations”, ~450,000Euro, April 2019 - September 2022.

SOCIETY MEMBERSHIPS

- American Institute of Aeronautics and Astronautics, **Associate Fellow** (1985-Present).
- American Society of Mechanical Engineers, **Member** (1993-Present).
- The Combustion Institute, Member (1993-2000).
- American Physical Society, Division of Fluid Dynamics, Member (1993-2000).
- Society of Automotive Engineers, Member (1993-2003).
- Tau Beta Pi, Engineering Honor Society (1986).
- Sigma Gamma Tau, Aerospace Engineering Honor Society (1988).
- Society of Industrial and Applied Mathematics, Member (2006-present)

PROFESSIONAL ACTIVITIES

- Vice-Chair for session on Government, Industry, University Alliances and Partnerships at ASME Meeting of International Gas Turbine Institute Meeting, Houston, TX, June 1995.
- Chair for session on Turbulent Combustion at the Central States Section Meeting of the Combustion Institute, St. Louis, MO, May 1996.
- Member of NASA Microgravity Combustion Science Peer Review Panel, Washington, D.C., April 1998.
- Chair for session on Turbulent Combustion Modeling at the Central States Section Meeting of the Combustion Institute, Lexington, KY, May/June 1998.
- Served as reviewer for Combustion and Flame, Physics of Fluids, Fuel, Energy and Fuel, and AIAA journals, and the International Combustion Symposium.

- Served as reviewer of proposals for National Science Foundation and American Chemical Society.
- Co-Chair for session on Turbulent Combustion Modeling at the Joint Technical Meeting of the U.S. Sections of the Combustion Institute, Washington, D. C., March 1999.
- Served as co-organizer for local arrangements of the Central States Section Meeting of the Combustion Institute, co-hosted by Purdue and Rolls-Royce Allison, April 2000.
- Member of NSF Information Technology Research Peer Review Panel; Washington, D.C., April 2000.
- Chair for session on multiphase flow at the AIAA Fluid Dynamics and CFD meeting, Anaheim, CA, June 2001.
- Member of NASA Microgravity Combustion Science Peer Review Panel, Washington, D.C., June 2002.
- Co-instructor for Short Course on Computational Fluid Dynamics for HVAC&R held concurrently with the 9th International Refrigeration and Air Conditioning Conference at Purdue, July 14-15, 2002.
- Served as panel reviewer of proposals for NSF in combustion area, Nov. 2008.
- Served on DOE-SBIR proposal panel review for combustion, Feb. 2011.
- Chaired session on Biomechanics of Medical Devices at 32nd Israeli Conference on Mechanical Engineering, Tel-Aviv University, October 17-18, 2012.
- Chaired session at Israel Society of Theoretical and Applied Mechanics, December 1, 2013, Tel-Aviv University.
- Organised and chaired first CFDIMPACT conference at Technion, <https://www.cfdimpact.org>, June 30, 2015.
- Organised and chaired second CFDIMPACT conference at Technion, <https://www.cfdimpact.org>, June 28, 2016.
- Chair for Fluid Mechanics/CFD session at 34th Israeli Conference on Mechanical Engineering, Technion - Israel Institute of Technology, Nov. 22-23, 2016.
- Serving on ISF panel review for fluid mechanics and heat transfer Feb. 1, 2016.
- Organized CFDIMPACT conference (www.cfdimpact.org), summers 2015-2018 - national professional conference in CFD.
- Organized High-Performance Computing Workshop at Technion bringing academic and industrial practitioners together for one-day of presentations and discussions, 04/11/2016.

ACADEMIC SERVICE

- Served on Mechanical and Aerospace Engineering Computer Committee to assist Computer and Information Technology Division of Academic Services at SUNY at Buffalo in a Computing Use and Needs Assessment Study (1992-1993).
- Participated in Admitted Student Receptions (1995, 1997).
- Participated in ME Hands-On Short Course (Summer 1996, 1997).

- Participated in panel discussion on international research opportunities sponsored by Women in Engineering Graduate Mentees and Mentors Program.
- Participated in scholarship interviews for Dept. of Freshman Engineering (Spring, 1999)
- ME 290 invited lecture on computational fluid dynamics
- Served on:
 - School of Mechanical Engineering Combustion Faculty Search Committee (1995).
 - School of Mechanical Engineering Committee to develop Head evaluation process (1997).
 - School of Mechanical Engineering Graduate Committee (1997-1999).
 - School of Mechanical Engineering Advisory Committee (1997-1999).
 - School of Mechanical Engineering Head Search Committee (1997-1999).
 - School of Mechanical Engineering Fluids and Heat Transfer Search Committee (1999).
 - University Research Computing and Communications Advisory Committee (1999-2001).
 - School of Mechanical Engineering, Thermal Science Search Committee (1999-2001)
 - School of Mechanical Engineering, Computational Thermo-Fluids Search Committee, Chair, (2001)
 - School of Mechanical Engineering, Acoustics Search Committee, (2003)
 - School of Mechanical Engineering, Fluid Power Search Committee (2006-2007)
 - School of Mechanical Engineering Computer Committee (1996-2013).
 - School of Mechanical Engineering Combustion, Energy Utilization and Thermodynamics Committee (1993-2013).
 - School of Mechanical Engineering Graduate Committee (August 2010 – December 2011)
 - Chair, Combustion, Energy Utilization, and Thermodynamics Committee (January 2011- June 2012)
 - Currently serving on Faculty of Mechanical Engineering Computer Committee, and Vaada Mechina.
 - ISF Research Proposal Panel Review Meeting, December 21, 2016
 - ISF Research Proposal Panel Review Meeting, June 11, 2017
- Serving on Faculty Search Committee from October 2019 - Present.

AWARDS

1. Scholarship for summer training at von Karman Institute of Fluid Dynamics (1988).
2. AFOSR Summer Faculty Research Program (1994).

3. Office of Naval Research Young Investigator Award (1995-1998).
4. Letter of Outstanding Performance for Distance Learning Education from General Motors Technical Education Program (1997).
5. B.F.S. Schaefer Outstanding Young Faculty Scholar Award (2000).
6. Discovery in Mechanical Engineering Award (2008).
7. Cor Vitae Award, American Heart Association, Lafayette Heart Ball (2011).
8. Rosenblatt Chaired Professorship in Faculty of Mechanical Engineering, (2014).