Date:

R E S U M E

Full name: Steven H. Frankel

Identity No.

Date and place of birth:

Marital status: Married

Web site: https://cfdlab.net.technion.ac.il/ (under construction)

ACADEMIC DEGREES

State University of New York at Buffalo, Buffalo, New York
Department of Mechanical and Aerospace Engineering
Doctor of Science, awarded June 1993

North Carolina State University, Raleigh, NC
Department of Mechanical and Aerospace Engineering
Master of Science, awarded August 1990

State University of New York at Buffalo, Buffalo, New York
Department of Mechanical and Aerospace Engineering
Bachelor of Science, awarded June 1988

ACADEMIC APPOINTMENTS

- 1993-1999, Assistant Professor, School of Mechanical Engineering, Purdue University, West Lafayette, IN, USA
- 1999-2004, Associate Professor, School of Mechanical Engineering, Purdue University, West Lafayette, IN, USA
- 2004-2013, Professor, School of Mechanical Engineering, Purdue University, West Lafayette, IN, USA – on leave of absence from Fall 2013
- 2013- Present, Professor, Faculty of Mechanical Engineering, Technion – Israel Institute of Technology, Haifa, Israel

PROFESSIONAL EXPERIENCE

None

RESEARCH INTERESTS

Prof. Frankel's research interests are all in the field of computational fluid dynamics focusing on modeling and simulation of turbulent flows, with applications in combustion, aeroacoustics,

biological and multiphase flows. High performance parallel computing is an important aspect of his research. He has worked on both fundamental numerical methods, modeling, and flow physics issues as well as applied flow devices.

TEACHING EXPERIENCE

- Thermodynmics I, undergraduate/sophomore level
- Thermodynamics II, undergraduate/junior level
- Intermediate Fluid Mechanics, graduate level
- Combustion, graduate level
- Turbulence, graduate level
- Numerical Methods, graduate level
- Computational Fluid Dynamics, graduate level
- Galerkin Methods for Fluid Dynamics, graduate level

TECHNION ACTIVITIES

None

DEPARTMENTAL ACTIVITIES

None

PUBLIC PROFESSIONAL ACTIVITIES

- 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)
- Most recently served on:
    - School of Mechanical Engineering Computer Committee (1996-present).
    - School of Mechanical Engineering Combustion, Energy Utilization and Thermodynamics Committee (1993-present).
    - School of Mechanical Engineering Graduate Committee (August 2010 – December 2011)
    - Chair, Combustion, Energy Utilization, and Thermodynamics Committee (January 2011-2013)

MEMBERSHIP IN PROFESSIONAL SOCIETIES

- 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)

HONORS
- Scholarship for summer training at von Karman Institute of Fluid Dynamics (1988).
- AFOSR Summer Faculty Research Program (1994).
- Office of Naval Research Young Investigator Award (1995-1998).
- Letter of Outstanding Performance for Distance Learning Education from General Motors Technical Education Program (1997).
- B.F.S. Schaefer Outstanding Young Faculty Scholar Award (2000).
- Discovery in Mechanical Engineering Award (2008).
- Cor Vitae Award, American Heart Association, Lafayette Heart Ball (2011).

GRADUATE STUDENTS

Completed Theses

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 Combustor 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 Khandelwahl,** *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 Chunekar,** *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.

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 Turbluent 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.

Theses in Progress

Ph.D. student:
Qian Li, High-Order Simulations of Electrokinetic Instabilities in Microfluidic Devices, Aug. 2011 – Present.

RESEARCH GRANTS

Grant #1:

Agency/Title of Grant: American Chemical Society-Petroleum Research Fund (Type G)/ *A Computational Investigation of Turbulent Nonpremixed Flame Dynamics*
Duration of Funding (Dates): September 1, 1994 – August 31, 1996
Total amount of award: $20,000
Your role: PI responsible for 100% of funding
If Co-PI, for how much of the total funding are you directly responsible: N/A

Grant #2:

Agency/Title of Grant: Office of Naval Research /*NO_X Reduction in Lean Direct Injection Engines*
Duration of Funding (Dates): June 1, 1994 – May 31, 1997
Total amount of award: $270,000
Your role: co-PI responsible for computational modeling aspects of project
If Co-PI, for how much of the total funding are you directly responsible: 10%

Grant #3

Agency/Title of Grant: Purdue Research Foundation / *Coupled Turbulence, Radiation and Soot Kinetics Computations in Acetylene-Air Diffusion Flames*
Duration of Funding (Dates): August 15, 1994 – August 14, 1996
Total amount of award: $20,400
Your role: PI
If Co-PI, for how much of the total funding are you directly responsible: N/A

Grant #4

Agency/Title of Grant: Office of Naval Research Young Investigator Program / *Coupled Turbulence, Soot Chemistry and Radiation Effects in Strongly Radiating Diffusion Flames*
Duration of Funding (Dates): June 1, 1995 – May 31, 1998
Total amount of award: $225,000
Your role: PI
If Co-PI, for how much of the total funding are you directly responsible: N/A

Grant #5

Agency/Title of Grant: AFOSR through Arnold Engineering Development Center / *A Computational Model of Poststall Gas Turbine Combustor Dynamics for Inclusion in a Dynamic Engine Code*
Duration of Funding (Dates): August 1, 1995 – December 31, 1998
Total amount of award: $104,966
Your role: co-PI with P.B. Lawless
If Co-PI, for how much of the total funding are you directly responsible: 50%

Grant #6

Agency/Title of Grant: Caterpillar Inc., Lafayette, IN / *Numerical Simulations of Natural Gas Engines*
Duration of Funding (Dates): January 1995 – June 1996
Total amount of award: $79,073
Your role: PI
If Co-PI, for how much of the total funding are you directly responsible: N/A

Grant #7

Agency/Title of Grant: Caterpillar Inc., Lafayette, IN / *Turbulence Optimization for Natural Gas Engine Combustion Chambers*
Duration of Funding (Dates): January 1995 – June 1996
Total amount of award: $45,000 (awarded as voluntary support)
Your role: PI
If Co-PI, for how much of the total funding are you directly responsible: N/A

Grant #8

Agency/Title of Grant: Purdue Research Foundation / *Large Eddy Simulations of Premixed Turbulent Jet Flames*
Duration of Funding (Dates): September 1, 1997 – August 31, 1999
Total amount of award: $23,400
Your role: co-PI with J. P. Gore
If Co-PI, for how much of the total funding are you directly responsible: 50%

Grant #9

Agency/Title of Grant: AFOSR through Arnold Engineering Development Center/ *Development and Application of a Multidimensional Engineering Model for Gas Turbine Combustor Dynamics*
Duration of Funding (Dates): January 1, 1998 – December 31, 1998
Total amount of award: $50,000
Your role: co-PI with P. B. Lawless
If Co-PI, for how much of the total funding are you directly responsible: 50%

Grant #10

Agency/Title of Grant: National Institutes of Health (subcontract from Bowling Green State University with PI: R. Scherer/ *Phonatory Aerodynamics*
Duration of Funding (Dates): July 1, 1998 – June 30, 2002
Total amount of award: $490,964
Your role: co-PI with L. Mongeau
If Co-PI, for how much of the total funding are you directly responsible: 50%

Grant #11

Agency/Title of Grant: Caterpillar Inc., Peoria, Illinois/ *Advanced Simulation of Hydraulic Valve Phenomena*
Duration of Funding (Dates): August 1, 1998 –May 31, 2001
Total amount of award: $246,751
Your role: PI
If Co-PI, for how much of the total funding are you directly responsible: N/A

Grant #12

Agency/Title of Grant: Sandia/DOE / *Radiation Effects on Combustion and NOx Emissions in Direct Injection Engines*
Duration of Funding (Dates): April 1, 1999 – March 31, 2002
Total amount of award: $165,659
Your role: co-PI with J. P. Gore
If Co-PI, for how much of the total funding are you directly responsible: 50%

Grant #13

Agency/Title of Grant: American Chemical Society / *Modeling Effects of Radiation-Chemistry Interactions on Combustion and Pollutant Emissions in Direct Injection Engines*
Duration of Funding (Dates): September 1, 1999 – August 31, 2001
Total amount of award: $60,000
Your role: co-PI with J. P. Gore
If Co-PI, for how much of the total funding are you directly responsible: 50%

Grant #14

Agency/Title of Grant: Aeroquip Corporation (now part of Eaton) / *Analysis of Refrigerant Flow Control Devices*
Duration of Funding (Dates): August 1, 1999 - July 31, 2001
Total amount of award: $144,977
Your role: co-PI with J. Braun and E. Groll
If Co-PI, for how much of the total funding are you directly responsible: 33%

Grant #15

Agency/Title of Grant: Indiana 21st Century Fund through Rolls Royce Allison / *Design of Low Emission Regional Aircraft Engine Combustors for the 21st century*
Duration of Funding (Dates): February 1, 2000 – January 31, 2002
Total amount of award: $252,723
Your role: co-PI with J. P. Gore
If Co-PI, for how much of the total funding are you directly responsible: 50%

Grant #16

Agency/Title of Grant: B.F.S. Schaefer Outstanding Young Faculty Scholar Award (Purdue ME)/ *A Proposal to Develop a Research Program in Computational Biofluid Dynamics*

Duration of Funding (Dates): October 2000 – September 2002
Total amount of award: $70,000
Your role: PI
If Co-PI, for how much of the total funding are you directly responsible: N/A

Grant #17

Agency/Title of Grant: Indiana 21st Century Fund and Innovative Controls / *Design of a Jet-Axial Control Valve System for the Oil, Gas, Chemical, Synfuel and Petrochemical Industry*
Duration of Funding (Dates): January 1, 2001 – December 31, 2002
Total amount of award: $428,080
Your role: co-PI with M. Plesniak
If Co-PI, for how much of the total funding are you directly responsible: 50%

Grant #18

Agency/Title of Grant: Showalter Trust Fund / *Towards Prevention and Control of Atherosclerosis: Endothelial and Smooth Muscle Cell Response to Pulsatile Flow in Stenotic Blood Vessels*
Duration of Funding (Dates): July 1, 2001 – June 30, 2002
Total amount of award: $83,000
Your role: co-PI with M. Plesniak, S. Wereley, L. Xu, K. Haberstroh, T. Webster
If Co-PI, for how much of the total funding are you directly responsible: 17%

Grant #19

Agency/Title of Grant: NASA Glen Research Center / *Scramjet Scaling and Interactions*
Duration of Funding (Dates): October 1, 2001 – September 31, 2004
Total amount of award: $271,935
Your role: co-PI with B. G. Murthy for 1 semester
If Co-PI, for how much of the total funding are you directly responsible: 50%

Grant #20

Agency/Title of Grant: Environmental Protection Agency / *Flow Control and Design of Environmentally Benign Spray Systems*
Duration of Funding (Dates): March 1, 2002 – December 31, 2004
Total amount of award: $350,000
Your role: co-PI with P. Sojka and M. Plesniak
If Co-PI, for how much of the total funding are you directly responsible: 33%

Grant #21

Agency/Title of Grant: National Institutes of Health (subcontract from Bowling Green State University with PI: R. Scherer) / *Aerodynamic and Acoustic Models of Phonation*
Duration of Funding (Dates): June 1, 2002 – May 31, 2006
Total amount of award: $1,161,646

Your role: co-PI with L. Mongeau and M. Plesniak
If Co-PI, for how much of the total funding are you directly responsible: 33%

Grant #22

Agency/Title of Grant: ONR / *Aeroacoustics and Emissions of Swirling Combustor Flows*
Duration of Funding (Dates): June 1, 2002 – May 31, 2005
Total amount of award: $495,000
Your role: co-PI with L. Mongeau and J. P. Gore
If Co-PI, for how much of the total funding are you directly responsible: 40%

Grant #23

Agency/Title of Grant: Maha Funds (Purdue University) / *Computational Fluid Dynamics and Experimental Test Bench Development*
Duration of Funding (Dates): July 1, 2002 – June 30, 2004
Total amount of award: $125,000
Your role: co-PI with M. Plesniak
If Co-PI, for how much of the total funding are you directly responsible: 50%

Grant #24

Agency/Title of Grant: National Institutes of Health with subcontracts to Bowling Green State University and others)/ *Fluid-Structure Interactions within the Human Larynx*
Duration of Funding (Dates): July 1, 2003 – May 31, 2007
Total amount of award: $2,306,311
Your role: co-PI with L. Mongeau, T. Seigmund
If Co-PI, for how much of the total funding are you directly responsible: 33%

Grant #25

Agency/Title of Grant: Purdue Research Foundation/ *Direct Numerical Simulation of Pulsatile Flow through Stenotic Blood Vessels*
Duration of Funding (Dates): April 1, 2003 – March 31, 2005
Total amount of award: $29,430
Your role: PI
If Co-PI, for how much of the total funding are you directly responsible: N/A

Grant #26

Agency/Title of Grant: Sandia National Laboratories/ *Dynamics of Flame Extinction and Reigintion*
Duration of Funding (Dates): January 1, 2004 – September 30, 2005
Total amount of award: $79,040
Your role: PI
If Co-PI, for how much of the total funding are you directly responsible: N/A

Grant #27

Agency/Title of Grant: Percardia Inc./*Numerical Modeling and Simulation of VSTENT Hemodynamics*
Duration of Funding (Dates): March 1, 2004 – May 30, 2004
Total amount of award: $19,244
Your role: PI
If Co-PI, for how much of the total funding are you directly responsible: N/A

Grant #28

Agency/Title of Grant: CIC Enterprises, *Computational Finance Research*
Duration of Funding (Dates): January 01, 2005 – August 31, 2005
Total amount of award: $34,467
Your role: PI
If Co-PI, for how much of the total funding are you directly responsible: N/A

Grant #29

Agency/Title of Grant: NSF/ERC/Compact and Efficient Fluid Power
Duration of Funding (Dates): June 1, 2006 – May 31, 2011
Total amount of award: $500,000 (sub from Univ. Minnesota)
Your role: co-PI
If Co-PI, for how much of the total funding are you directly responsible:

Grant #30

Agency/Title of Grant: Indiana University-Purdue University in Indianapolis/Expandable Axial Flow Pump for Cavopulmonary Assist in a Univentricular Fontan Circulation
Duration of Funding (Dates): January 1, 2007 – December 31, 2007
Total amount of award: $29,035
Your role: co-PI
If Co-PI, for how much of the total funding are you directly responsible: 30%

Grant #31

Agency/Title of Grant: Peat International, Inc./Modeling Thermal Plasmas
Duration of Funding (Dates): October 1, 2006 – December 31, 2008
Total amount of award: $236,274
Your role: PI

Grant #32

Agency/Title of Grant: ISSI/Modeling Augmentor Dynamics
Duration of Funding (Dates): January 1, 2007 – September 31, 2008
Total amount of award: $79,000
Your role: PI

Grant #33

Agency/Title of Grant: NSF/Collaborative Research: Subgrid-Scale Mixing Models for Large Eddy Simulation of Turbulent Flames
Duration of Funding (Dates): September 1, 2007 – August 31, 2010
Total amount of award: $245,000
Your role: PI

Grant #34

Agency/Title of Grant: Creare Inc./Modeling Augmentor Dynamics
Duration of Funding (Dates): January 2008 – October 31, 2009
Total amount of award: $93,000
Your role: PI

Grant #35

Agency/Title of Grant: Innovative Energy Sciences Inc./Inclusion of Detailed Chemistry in LES/FMDF Comptuations
Duration of Funding (Dates): October 2008 – May 31, 2009
Total amount of award: $25,000
Your role: PI

Grant #36

Agency/Title of Grant: NIH/RO1 – Cavopulmonary Assist Circulatory Support for the Univentricular Fontan Circulation
Duration of Funding (Dates): July 2010 – June 2014
Total amount of award: $2.1 million
Your role: PI on subcontract to Purdue from IU School of Medicine (Dr. Mark Rodefeld, PI)

Grant #37

Agency/Title of Grant: Beckman-Coulter - Modeling Sample Quality
Duration of Funding (Dates): January 1, 2011 – August 31, 2011
Total amount of award: $83,879
Your role: PI

Grant #38

Agency/Title of Grant: Caterpillar Inc., Modeling Journal Bearing Cavitation
Duration of Funding (Dates): May 1, 2011 – January 31, 2012
Total amount of award: $31,000
Your role: PI

Grant #39

Agency/Title of Grant: Air Force High Performance Computing, Implementation of Multi-Block Version of ESWENO LES Combustion Code
Duration of Funding (Dates): June 15, 2011 – July 31, 2012

Total amount of award: $150,000
Your role: PI

Grant #40

Agency/Title of Grant: Regal Beloit Manufacturing Corp, Computational Fluid
Dynamics of Unsteady Blower Dynamics and Noise
Duration of Funding: 05/15/12 – 12/15/12

Total amount of award: $55,775

Your role: PI

Grant #41

Agency/Title of Grant: CD Adapco, Support for Fluid Dynamics/Hemodynamics

Duration of Funding: 07/03/12 – 12/31/75

Total amount of award: $3,000

Your role: PI

Grant #42

Agency/Title of Grant: Purdue University Technical Assistance Program (TAP)

Duration of Funding: 06/01/12 – 06/30/12

Total amount of award: $22,034.86 ($8,755 grad student salary and travel support
and $13,279.86 for one month summer salary for Steve Frankel)

SIGNIFICANT PROFESSIONAL PROJECTS

PUBLICATIONS

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
   Butterwroth-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.

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