

M. Pino Martín

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Department of Aerospace Engineering
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CURRENT STATUS

Sep-2009–present **Associate Professor**, Department of Aerospace Engineering, University of Maryland
Associate Professor, University of Maryland Institute for Advanced Computer Studies (UMIACS)
Visiting Research Scholar, Princeton University

Research Areas: Computational fluid dynamics, numerical simulation of turbulent flows, direct numerical and large eddy simulation, numerical models for large eddy simulations and Reynolds-averaged Navier Stokes calculations, numerical methods for compressible turbulence, physics of compressible turbulence, shock waves and turbulence interaction, turbulence and finite-rate chemistry interaction, surface reactions and fluid interaction.

EDUCATION

University of Minnesota: Ph.D. in Aerospace Engineering, June 1999.
Thesis: Direct Numerical Simulation and Large Eddy Simulation Closure of Reacting Turbulence in Hypersonic Flows
Advisor: Professor Graham V. Candler

University of Minnesota: M.S. in Aerospace Engineering, December 1995.

Boston University: B. Eng. In Aerospace Engineering, May 1994.
(Honors, Summa cum laude)

EXPERIENCE

Sep-2009–present **Associate Professor**, University of Maryland

Sep-2009–present **Visiting Research Scholar**, Princeton University

2001–Aug-2009 Assistant Professor, Princeton University

2000–2001 Research Associate, Stanford University

1999–2000 Postdoctoral Fellow, University of Minnesota

HONORS

NSF Career Award (January 2003)
Alfred Rheinstein'11 Faculty Award (May 2007)

PUBLICATIONS

Refereed Journal Papers (18)

1. O'Farrell, C. and Martín, M.P., "Chasing Eddies and Their Wall Signature in DNS Data of Turbulent Boundary Layers," accepted for publication in *Journal of Turbulence*, 2009.
2. Priebe, S., Wu, M., and Martín, M.P., "Direct numerical simulation of a reflected shockwave and turbulent boundary layer interaction," *AIAA Journal*, **47**, 5, 2009.
3. Duan, L. and Martín, M.P., "An effective procedure for testing the validity of DNS of wall-bounded turbulence including finite-rate reactions," *AIAA Journal*, **47**, 1, 2009.
4. Ringuette, M.J., Wu, M., and Martín, M.P., "Low Reynolds Number Effects in a Mach 3 Shock Turbulent Boundary Layer interaction," *AIAA Journal*, **46**, 7, 2008.
5. Taylor, E.M., and Martín, M.P., "Synchronization of Weighted Essentially Non-Oscillatory Methods," *Communications in Computational Physics*, **4**, 1, 2008.
6. Pejaković, D.A., Marschall, J., Duan, L., Martín, M.P., "Nitric Oxide Production from Surface Recombination of Oxygen and Nitrogen Atoms," *Journal of Thermophysics and Heat Transfer*, **22**, 2, 2008.
7. Wu, M. and Martín, M.P., "Analysis of Shock Motion in STBLI using Direct Numerical Simulation Data," *Journal of Fluid Mechanics*, **594**, 71-83, 2008.
8. Ringuette, M., Wu, M., and Martín, M.P., "Coherent Structures in DNS of Turbulent Boundary Layers at Mach 3," *Journal of Fluid Mechanics*, **594**, 59-69, 2008.
9. Wu, M., and Martín, M.P., "Direct Numerical Simulation of Shockwave and Turbulent Boundary Layer Interaction induced by a Compression Ramp," *AIAA Journal*, **45**, 4, 879-889, 2007.
10. Martín, M.P., "DNS of Hypersonic Turbulent Boundary Layers. Part I: Initialization and Comparison with Experiments," *Journal of Fluid Mechanics*, **570**, 347-364, 2007.
11. Taylor, E.M., Wu, M., and Martín, M.P., "Optimization of Nonlinear Error Sources for Weighted Non-Oscillatory Methods in Direct Numerical Simulations of Compressible Turbulence," *Journal of Computational Physics*, **223**, 384-397, 2007.
12. Taylor, E.M. and Martín, M.P., "Stencil Adaptation Properties of a WENO Scheme in Direct Numerical Simulations of Compressible Turbulence," accepted for publication in *Journal of Scientific Computing*, **30**, 533-554, 2007.
13. Martín, M.P., Taylor, E.M., Wu, M., and Weirs, V.G., "A Bandwidth-Optimized WENO Scheme for the Direct Numerical Simulation of Compressible Turbulence," *Journal of Computational Physics*, **220**, 1, 270-289, 2006.
14. Martín, M.P. and Candler, G.V., "A Parallel Implicit Method for the Direct Numerical Simulation of Compressible Flows," *Journal of Computational Physics*, **215**, 1, 153-171, 2006.
15. Xu, S. and Martín, M.P., "Assessment of inflow Boundary Conditions for Compressible Turbulent Boundary Layers," *Physics of Fluids*, **16**, 7, 2623-2639, 2004.
16. Martín, M.P., Piomelli, U., and Candler, G.V., "Subgrid-Scale Models for Compressible LES," *Theoretical and Computational Fluid Dynamics*, **13**, 5, 361-376, 2000.
17. Martín, M.P. and Candler, G.V., "Subgrid-Scale Model for the Temperature Fluctuations in Reacting Hypersonic Turbulent Flows," *Physics of Fluids*, **11**, 9, 2765-2771, 1999.
18. Martín, M.P. and Candler, G.V., "Effect of Chemical Reactions on Decaying Isotropic Turbulence," *Physics of Fluids*, **10**, 7, 1715-1724, 1998.

Conference Papers Appearing in Printed Proceedings (Reviewed, 51)

1. Martín, M.P. and Candler, G.V., "Effect of Chemical Reactions on the Decay of Homogeneous Isotropic Turbulence," *AIAA Paper No. 1996-2060*, June 1996.

2. Martín, M.P., Olejniczak, D., Weirs, V.G. and Candler, G.V., "DNS of Reacting Hypersonic Turbulent Boundary Layers," *AIAA Paper No. 98-2817*, New Orleans, June 1998.
3. Martín, M.P., and Candler, G.V., "DNS and Data Analysis of Reacting Turbulent Boundary Layers," 2nd AFOSR International Conference on Direct Numerical Simulation and Large Eddy Simulation, New Brunswick, NJ, June 1999.
4. Martín, M.P., Piomelli, U., and Candler, G.V., "A Priori Test of SGS Models in Compressible Turbulence," ASME Symposium on Transitional and Turbulent Compressible Flow, San Francisco, CA, July 1999.
5. Martín, M.P., and Candler, G.V., "DNS of a Mach 4 Boundary Layer with Chemical Reactions," *AIAA Paper No. 2000-0399*, Reno, NV, January 2000.
6. Sinha, K., Martín, M.P., and Candler, G.V., "Assessment of Temperature Fluctuation Models for RANS Simulations of Hypersonic Reacting Flows," *AIAA Paper No.~2000-0537*, Reno, NV, January 2000.
7. Martín, M.P., Weirs, G., Candler, G.V., Piomelli, U., Johnson, H., and Nompelis, I., "Toward the large-Eddy Simulation Over a Hypersonic Elliptical Cross-Section Cone," *AIAA Paper No.~2000-2311*, Denver, CO, June 2000.
8. Marusic, I., Candler, G.V., Interrante, V., Martín, M.P., Subbareddy, P.K., and Moss, A., "Detection and Tracking of Coherent Features in a Mach 4 turbulent Boundary Layer," *AIAA Paper No.~2000-2414*, Denver, CO, June 2000.
9. Martín, M.P. "Shock capturing and the LES of high-speed flows," In *Annual Research Briefs*, Center for Turbulence Research, NASA Ames/Stanford University, 2000.
10. Sinha, K., Martín, M.P., and Candler, G.V., "Assessment of the k-epsilon Turbulence Model for Compressible Flows using Direct Simulation Data," *AIAA Paper 01-0730*, Reno, NV, January 2001.
11. Martín, M.P. and Candler, G.V., "Temperature Fluctuation Scaling in Reacting Turbulent Boundary Layers," *AIAA Paper No. 01-2717*, 31st *AIAA Fluids Dynamics Conference*, Anaheim, CA, June 2001. Also in *Annual Research Briefs*, Center for Turbulence Research, NASA Ames/Stanford University, 2001.
12. Martín, M.P., Weirs, G., Wright, M., Piomelli, U., Johnson, H., and Candler, G.V., "LES over a Hypersonic Elliptical Cross-Section Cone," *Third AFOSR International Conference on DNS/LES*, Arlington, Texas, August 2001. Also in *Annual Research Briefs*, Center for Turbulence Research, NASA Ames/Stanford University, 2001.
13. Xu, S., and Martín, M.P., "Inflow Boundary Conditions for Compressible Turbulent Boundary Layers," *AIAA 2003-3963*, Orlando, FL, June 2003.
14. Martín, M.P., Xu, S., and Wu, M., "Preliminary DNS of Shock/Turbulent Boundary Layer Interaction," *AIAA Paper No. 2003-3464*, 33rd *AIAA Fluids Dynamics Conference*, Orlando, FL, June 2003.
15. Martín, M.P., "Preliminary DNS/LES Database of Hypersonic Turbulent Boundary Layers," *AIAA Paper No. 2003-3726*, 33rd *AIAA Fluid Dynamics Conference and Exhibit*, Orlando, FL, June 2003.
16. Martín, M.P., "Exploratory Studies of Turbulence/Chemistry Interaction in Hypersonic Flows," *AIAA Paper No. 2003-4055*, 36th *AIAA Thermophysics Conference*, Orlando, FL, June 2003.
17. Martín, M.P., "DNS of Hypersonic Turbulent Boundary Layers," *AIAA Paper No. 2004-2337*, 34th *AIAA Fluid Dynamics Conference*, Portland, Oregon, June 2004.
18. Wu, M and Martín, M.P., "Direct Numerical Simulation of Shockwave/Turbulent Boundary Layer Interaction," *AIAA Paper No. 2004-2145*, 34th *AIAA Fluid Dynamics Conference*, Portland, Oregon, June 2004.
19. Taylor, E., Martín, M.P., and Weirs, G.V., "Local Adaptation and Dissipation Properties of a Weighted Essentially Non-Oscillatory Scheme," *AIAA Paper No. 2004-2706*, 34th *AIAA Fluid Dynamics Conference*, Portland, Oregon, June 2004.
20. Smits, A.J., and Martín, M.P., "Turbulence in Supersonic and Hypersonic Boundary Layers," in *Proceedings of the One Hundred Years of Boundary Layer Research Symposium*, International Union of Theoretical and Applied Mechanics, DLR Göttingen Germany, August 2004.

21. Wu, M., Bookey, P., Martín, M.P., and Smits, A.J., "Analysis of Shockwave/Turbulent Boundary Layer Interaction using DNS and Experimental Data," *AIAA Paper No. 2005-2145, 43rd AIAA Aerospace Science Meeting and Exhibit*, Reno, NV, January 2005.
22. Bookey, P., Smits, A.J., and Martín, M.P., "New Experimental Data of STBLI at DNS/LES Accessible Reynolds Numbers," *AIAA Paper No. 2005-0309, 43rd AIAA Aerospace Science Meeting and Exhibit*, Reno, NV, January 2005.
23. Martín, M.P., "Preliminary Study of the SGS Time Scales for Compressible Boundary Layers using DNS Data," *AIAA Paper No. 2005-0665, 43rd AIAA Aerospace Science Meeting and Exhibit*, Reno, NV, January 2005.
24. Taylor, E.M., Martín, M.P., and Smits, A.J., "Preliminary Study of the Turbulence Structure in Supersonic Boundary Layers using DNS Data," *AIAA Paper No. 2005-5290, 35th AIAA Fluid Dynamics Conference*, Toronto, Canada, June 2005.
25. Wu, M., Taylor, E.M., and Martín, M.P., "Assessment of STBLI DNS Data and Comparison against Experiments," *AIAA Paper No. 2005-4895, 35th AIAA Fluid Dynamics Conference*, Toronto, Canada, June 2005.
26. Taylor, E.M., Wu, M., and Martín, M.P., "Optimization of Nonlinear Error Sources for Weighted Non-Oscillatory Methods in Direct Numerical Simulations of Compressible Turbulence," *AIAA Paper No. 2006-1091, 44th AIAA Aerospace Science Meeting and Exhibit*, Reno, NV, January 2006.
27. Wu, M. and Martín, M.P., "Assessment of Numerical Methods for DNS of Shockwave/Turbulent Boundary Layer Interaction," *AIAA Paper No. 2006-0717, 44th AIAA Aerospace Science Meeting and Exhibit*, Reno, NV, January 2006.
28. Martín, M.P., Smits, A.J., Wu, M. and Ringuette, M. "The Turbulence Structure of Shockwave and Boundary Layer Interaction in a Compression Corner," *AIAA Paper No. 2006-0497, 44th AIAA Aerospace Science Meeting and Exhibit*, Reno, NV, January 2006.
29. Martín, M.P., "Mach Number and Wall-Temperature Effects in Turbulent Boundary Layers," *Proceedings of the Conference on Turbulence and Interactions TI 2006, Porquerolles*, France, May 2006.
30. Wu, M. and Martín, M.P. "New DNS Data of Shockwave/Turbulent Boundary Layer Interaction," *AIAA Paper 2006-3037, 36th AIAA Fluid Dynamics Conference*, San Francisco California, June 2006.
31. Ringuette, M., Martín, M.P. and Smits, A.J. "Characterization of the Turbulence Structure in Supersonic Boundary Layers using DNS Data," *AIAA Paper 2006-3539, 36th AIAA Fluid Dynamics Conference*, San Francisco California, June 2006.
32. Taylor, E.M., and Martín, M.P., "On Synchronous Weighted Essentially Non-oscillatory Methods," *AIAA Paper 2006-3740, 36th AIAA Fluid Dynamics Conference*, San Francisco California, June 2006.
33. Wu, M., and Martín, M.P., "Analysis of Shock Motion in STBLI induced by a Compression Ramp Configuration using DNS Data," *AIAA Paper 2007-1136, 45th Aerospace Science Meeting and Exhibit*, Reno, NV, January 2007.
34. Taylor, E.M., and Martín, M.P., "Synchronization of Weighted Essentially Non-Oscillatory Methods," *AIAA Paper 2007-0913, 45th Aerospace Science Meeting and Exhibit*, Reno, NV, January 2007.
35. Ringuette, M., Wu, M., and Martín, M.P., "Coherent Structures in DNS of Turbulent Boundary Layers at Mach 3," *AIAA Paper 2007-1138, 45th Aerospace Science Meeting and Exhibit*, Reno, NV, January 2007.
36. Martín, M.P., and Wu, M., "Upstream and downstream influence on the unsteadiness of STBLI using DNS data", *Proceedings of the IUTAM Symposium on Unsteady Separated Flows and their Control*, Corfu, Greece, June 2007.
37. Wu, M., and Martín, M.P., "Analysis of shock motion in STBLI using DNS data", *AIAA Paper 2007-4114, 37th AIAA Fluid Dynamics Conference and Exhibit*, Miami, FL, June 2007.
38. Taylor, E.M., Grube, N., and Martín, M.P., "Evaluation of traditional and shock-confining LES filters using data of compressible turbulence", *AIAA Paper 2007-4197, 37th AIAA Fluid Dynamics Conference and Exhibit*, Miami, FL, June 2007.

39. Grube, N., Taylor, E.M., and Martín, M.P., “Assessment of WENO methods with shock-confining filtering for LES of compressible turbulence”, *AIAA Paper 2007-4198*, 37th *AIAA Fluid Dynamics Conference and Exhibit*, Miami, FL, June 2007.
40. Wu, M., and Martín, M.P., “Analysis of shock motion in STBLI using DNS data”, 5th International Symposium on Turbulence and Shear Flow Phenomena, Munich, August 2007.
41. Pejakovic, D., Marschall, J., Duan, L., and Martín, M.P., “Nitric oxide production from surface recombination of oxygen and nitrogen atoms,” *AIAA Paper 2008-1249*, 46th *AIAA Aerospace Science Meeting and Exhibit*, Reno, NV, January 2008.
42. Duan, L., and Martín, M.P., “Validation of a DNS code for wall-bounded turbulence including finite-rate reactions and surface catalysis”, *AIAA Paper 2008-0645*, 46th *AIAA Aerospace Science Meeting and Exhibit*, Reno, NV, January 2008.
43. Martín, M.P., Priebe, S., and Wu, M., “Upstream and downstream influence on the unsteadiness of STBLI using DNS data in two configurations”, *AIAA Paper 2008-0719*, 46th *AIAA Aerospace Science Meeting and Exhibit*, Reno, NV, January 2008.
44. Beekman, I., Priebe, S., Ringuelet, M., Martín, M.P., “Effect of Wall Temperature and Mach Number on the Turbulence Structure of Hypersonic Boundary Layers”, *AIAA Paper 2009-1328*, 47th *AIAA Aerospace Science Meeting and Exhibit*, Orlando, FL, January 2009.
45. Priebe, S., and Martín, M.P., “Direct Numerical Simulation of Shockwave and Turbulent Boundary Layer Interactions”, *AIAA Paper 2009-0589*, 47th *AIAA Aerospace Science Meeting and Exhibit*, Orlando, FL, January 2009.
46. Duan, L., and Martín, M.P., “Effect of Finite-rate Chemical Reactions on Turbulence in Hypersonic Turbulent Boundary Layers”, *AIAA Paper 2009-0588*, 47th *AIAA Aerospace Science Meeting and Exhibit*, Orlando, FL, January 2009.
47. Grube, N., and Martín, “Assessment of Subgrid-scale Models and Shock-confining Filters in Large-eddy Simulations of Highly Compressible Isotropic Turbulence”, *AIAA Paper 2009-0947*, 47th *AIAA Aerospace Science Meeting and Exhibit*, Orlando, FL, January 2009.
48. Smits, A.J., Martín, M.P., and Girimaji, S., “Current Status of Basic Research in Hypersonic Turbulence”, *AIAA Paper 2009-0151*, 47th *AIAA Aerospace Science Meeting and Exhibit*, Orlando, FL, January 2009.
49. Duan, L., and Martín, M.P., “Effect of Turbulence Fluctuations on Surface Heating Rate in Hypersonic Turbulent Boundary Layers”, *AIAA Paper 2009-4040*, 39th *AIAA Fluid Dynamics Conference*, San Antonio, TX, June 2009.
50. Priebe, S. and Martín, M.P., “Analysis of Low-Frequency Unsteadiness in the Direct Numerical Simulation of a Shockwave and Turbulent Boundary Layer Interaction”, *AIAA Paper 2009-3711*, 39th *AIAA Fluid Dynamics Conference*, San Antonio, TX, June 2009.
51. Grube, N., Taylor, E.M., and Martín, M.P., “Direct Numerical Simulation of Shock-wave/Isotropic Turbulence Interaction”, *AIAA Paper 2009-4165*, 39th *AIAA Fluid Dynamics Conference*, San Antonio, TX, June 2009.

Invited Lectures (42)

1. Martín, M.P., “Turbulent Hypersonic Flows: Physics and Simulation”, Department of Aerospace Engineering, University of Texas A&M, College Station, TX, February 26th, 2009.
2. Martín, M.P., “Numerical Simulation of Turbulent Hypersonic Flows: Validation and Interpretation of Numerical Data”, Department of Aerospace Engineering, University of Maryland, College Park, MD, December 10th, 2008.
3. Martín, M.P., “Validation and Interpretation of DNS Data on Compressible Boundary Layers with Interactions”, School of Aeronautics and Astronautics, Purdue University, West Lafayette, IN, December 8th, 2008.
4. Martín, M.P., “Hypersonic Turbulent Wall-Bounded Flows: Physics and Simulation,” Aerospace Engineering Sciences, University of Colorado at Boulder, Boulder, CO, December 4th, 2008.

5. Martín, M.P., "Turbulent Hypersonic Flows: Physics and Simulation," *Fall Semester Seminar Series*, Mechanical and Aerospace Engineering, Princeton University, Princeton, NJ, October 2008.
6. Martín, M.P., "Numerical challenges for DNS and LES of highly compressible turbulence," *Workshop on Recent Developments in Numerical Methods for Nonlinear Hyperbolic Partial Differential Equations and their Applications*. Banff International Research Station for Mathematical Innovation and Discovery, September 1-5, Banff, Alberta, Canada.
7. Martín, M.P., "Turbulent Hypersonic Flows: Physics and Simulation," Tsinghua University, School of Aerospace Engineering, Beijing, October 21st, 2008.
8. Martín, M.P., "Thoughts on Foundational Research in Turbulent Wall-Bounded Flows," International Workshop on Compressible Turbulent Flow Research for the Next Generation of Air Vehicles, IUSTI Marseille, France, March 18th, 2008.
9. Martín, M.P., "Turbulent Hypersonic Flows: Physics and Simulation," *Spring Semester Seminar Series*, New Jersey Institute of Technology, Department of Mathematical Sciences, Newark, NJ, March 10, 2008.
10. Martín, M.P., "Direct and Large Eddy Simulations of Highly Compressible Turbulent Flows," *Princeton Applied Math Conference*, Program in Applied and Computational Mathematics, Princeton University, NJ, February 22, 2008
11. Martín, M.P., "Turbulent Hypersonic Flows: Physics and Simulation," *Spring Semester Seminar Series, MIT Department of Aeronautics and Astronautics*, Boston, MA, February 15, 2008.
12. Martín, M.P., "Turbulent Hypersonic Flows: Physics and Simulation," *Keynote Lecture*, West-East High Speed Flow Field Conference, Russian Academy of Sciences, Moscow, November 2007.
13. Martín, M.P., "Direct Numerical Simulation of Supersonic and Hypersonic Turbulent Boundary Layers," *Fourth International Workshop on Wall-Bounded Turbulent Flows*, Erice, Sicily, October 1, 2006.
14. Martín, M.P., "Turbulent Hypersonic Flows: Physics and Simulation," *Fall Semester Seminar Series of the Mechanical Engineering Department*, City College of New York, New York, NY, September 21, 2006.
15. Martín, M.P., "Turbulent Hypersonic Flows: Physics and Simulation," Sandia National Laboratories, Aerosciences and Compressible Fluid Mechanics Department, Albuquerque, NM, August 28, 2006.
16. Martín, M.P., "Hypersonic Boundary Layers: Mach Number, Wall Temperature and Real Gas Effects," Department of Aeronautics and Astronautics, University of Michigan, July 27, 2006
17. Martín, M.P., "Turbulent Hypersonic Flows: Physics and Simulation," NASA Ames Research Center, Space Technology Division, Moffett Field, CA, June 1, 2006.
18. Martín, M.P., "Turbulent Hypersonic Flows: Physics and Simulation," *Spring Seminar Series, Center for Turbulence Research*, Stanford University, June 2, 2006
19. Martín, M.P., "Turbulent Hypersonic Flows: Physics and Simulation," *Spring Seminar Series*, Department of Aerospace Engineering and Mechanics, University of Minnesota, April 28, 2006.
20. Martín, M.P., "Turbulent Hypersonic Flows: Physics and Simulation", *Spring Seminar Series*, Department of Aeronautics and Astronautics, University of Illinois at Urbana Champaign, May 8, 2006.
21. Martín, M.P., "Turbulent Hypersonic Flows: Physics and Simulation", *Spring Seminar Series*, Department of Aeronautics and Astronautics, Purdue University, April 20, 2006.
22. Martín, M.P., "Turbulent Hypersonic Flows: Physics and Simulation," *Spring Seminar Series*, Department of Aerospace Engineering, University of Michigan, April 13, 2006.
23. Martín, M.P., "Characterization of the Near-Wall High-Temperature Turbulent Flow Regime," *AFOSR Workshop on Merging Aerothermodynamics and High-Temperature Materials Research*, Herndon, Virginia, February 3, 2005.
24. Martín, M.P. "Accessing the Inaccessible Flow Regime," *School of Engineering and Applied Sciences Junior Faculty Seminar Series*, Princeton University, Princeton, NJ, November 2004.
25. Martín, M.P. "Using Shock-Capturing Techniques for DNS and LES of Turbulent Boundary Layers," *ICOSAHOM04 Minisymposium on WENO Methods*, Division of Applied Mathematics, Brown University, Providence, RI, June 21, 2004.

26. Martín, M.P. "Successes of Computational Science with Application to Turbulent Flows," *Program in Integrative Information, Computer and Application Sciences Spring Seminar Series*, Department of Computer Science, Princeton University, Princeton, NJ, April 21, 2004.
27. Martín, M.P. "Effect of Finite-Rate Chemistry in Isotropic Turbulence and Turbulent Boundary Layers," *Spring Seminar Series*, Department of Aerospace Engineering, University of Maryland, College Park, MD, April 9, 2004.
28. Martín, M.P. "Numerical Methods for Direct and Large-Eddy Simulations of Compressible Turbulence," *Princeton Institute for Computational Science and Engineering Spring Seminar Series*, Princeton University, Princeton, NJ, February 2004.
29. Martín, M.P. "Status of the CROCCO Laboratory: Understanding and Predicting Turbulent Hypersonic Flows," *Workshop on LES and SGS Modeling for Turbulent Mixing and Reactive Flows*, California Institute of Technology, Pasadena, CA. December 2003.
30. Martín, M.P. "Flow Physics and Predictive Tools for Transitional and Turbulent Hypersonic Flows," *AFOSR Scientific Advisory Board Review*, Washington D.C., August 2003.
31. Martín, M.P. "Efficient Parallel Numerical Methods for DNS and LES of Turbulent Hypersonic Flows," Princeton Plasma Physics Laboratory, Princeton, NJ, December 9th, 2002.
32. Martín, M.P. "Understanding and Predicting Turbulent Hypersonic Flows," Princeton Institute for Computational Science and Engineering, Kick Off Workshop, October 2002.
33. Martín, M.P. "Studies of Turbulent Hypersonic Flows," Advisory Council Meeting for Princeton MAE Department, September 27, 2002.
34. Martín, M.P., and Smits, A.J. "Understanding, Predicting, and Controlling Shock Wave Turbulent boundary Layer Interactions," AFOSR Contractor and Grantee Meeting, *Unsteady Aerodynamics and Hypersonics Program*, September 10, 2002.
35. Martín, M.P. "Numerical Studies of Turbulent Hypersonic Flows," NASA Ames Research Center, Space Technology Division, Moffett Field, CA, August 2002.
36. Martín, M.P., and Smits, A.J. "Understanding and Predicting Shockwave/Turbulent Boundary Layer Interactions," AFOSR Workshop on *Shock Wave Turbulent Boundary Layer Interaction*, Arlington, VA, February, 2002.
37. Martín, M.P. "Exploratory Studies of Turbulence/Chemistry Interaction in Hypersonic Flows," Fluid Mechanics Seminar Series, Graduate Aeronautical Laboratories, California Institute of Technology, February 2002.
38. Martín, M.P. "Effect of Chemical Reactions on Turbulent Hypersonic Flows," Department of Mechanical and Aerospace Engineering, *2001 Spring Seminar Series*, Princeton University, Princeton, NJ, February 2001.
39. Martín, M.P. "CFD and Turbulence in Hypersonic Flows," NASA Ames Research Center, Moffett Field, CA, October 2000.
40. Martín, M.P. "DNS and the LES Closure of Reacting Turbulence in Hypersonic Flows," at Sandia National Laboratories, Livermore, CA, November 1999. Also at the Center for Simulation of Dynamic Response in Materials, California Institute of Technology, January 2000. Also at the Center for Turbulence Research, Stanford University, February 2000.
41. Martín, M.P. "Turbulence in Hypersonic Flows," Department of Aerospace Engineering and Mechanics, *1999 Fall Seminar Series*, University of Minnesota, Minneapolis, MN, October 1999.
42. Martín, M.P., and Candler, G.V. "Evaluation of a Subgrid-Scale Model for the Temperature Fluctuations in Reacting Turbulence," invited paper at the 35th AIAA Aerospace Sciences Meeting and Exhibit, Reno, NV, January 1997.

Additional Talks at National Technical Meetings (Non-Reviewed, 28)

1. Martín, M.P., and Candler, G.V., "Effect of Chemical Reactions on Decaying Isotropic Turbulence," 49th APS Division of Fluid Dynamics Meeting, Syracuse, NY, November 1996.
2. Martín, M.P., and Candler, G.V., "Subgrid-Scale Model of Temperature Fluctuations in Reacting Turbulence," 50th APS Division of Fluid Dynamics Meeting, San Francisco, CA, November 1997.

3. Martín, M.P., and Candler, G.V., "DNS of Reacting Hypersonic Turbulent Boundary Layers," 51st APS Division of Fluid Dynamics Meeting, Philadelphia, PA, November 1998.
4. Martín, M.P., and Candler, G.V., "DNS and the LES Closure of Reacting Turbulence in Hypersonic Flows," 52nd APS Division of Fluid Dynamics Meeting, New Orleans, LA, November 1999.
5. Sinha, K., Martín, M.P., and Candler, G.V., "Assessment of Turbulence Modeling of Compressible Flows using DNS Data," 53rd APS Division of Fluid Dynamics Meeting, Washington, D.C., November 2000.
6. Martín, M.P., Candler, G.V., and Piomelli, U., "LES of Supersonic Boundary Layers," 53rd APS Division of Fluid Dynamics Meeting, Washington, D.C., November 2000.
7. Martín, M.P., "Temperature Fluctuation Scaling in Reacting Turbulent Boundary Layers," 54th APS Division of Fluid Dynamics Meeting, San Diego, CA, November 2001.
8. Xu, S., and Martín, M.P., "Boundary Conditions for Turbulent Hypersonic Boundary Layers," 55th APS Division of Fluid Dynamics Meeting, Dallas, TX, November 2002.
9. Martín, M.P., "Understanding and Predicting STBLI," AIAA STBLI Study Group, 42nd AIAA Aerospace Meeting and Exhibit, Reno, January 2004.
10. Taylor, E.M. and Martín, M.P., "Local Adaptation and Dissipation Properties of a Weighted Essentially Non-oscillatory Scheme," 57th APS Division of Fluid Dynamics Meeting, Seattle, WA, November 2004.
11. Wu, M. and Martín, M.P., "DNS of Shockwave and Turbulent Boundary Layer Interactions," 57th APS Division of Fluid Dynamics Meeting, Seattle, WA, November 2004.
12. Wu, M., Bookey, P., Martín, M.P., and Smits, A.J., "Comparison of Experiment with DNS in Mach 3 Shockwave/Turbulent Boundary Layer Interactions," 57th APS Division of Fluid Dynamics Meeting, Seattle, WA, November 2004.
13. Martín, M.P., "DNS of Hypersonic Turbulent Boundary Layers," 57th APS Division of Fluid Dynamics Meeting, Seattle, WA, November 2004.
14. Wu, M., Taylor, E.M. and Martín, M.P., "An Optimized WENO Smoothness Measurement for the Direct Numerical Simulation of Compressible Turbulent Flow," 58th APS Division of Fluid Dynamics Meeting, Chicago, IL, November 2005.
15. Taylor, E.M. and Martín, M.P., "Local Stencil Adaptation Properties of a WENO Scheme in Direct Numerical Simulations of Compressible Turbulence," 58th APS Division of Fluid Dynamics Meeting, Chicago, IL, November 2005.
16. Ringuelette, M.J., Martín, M.P., and Smits, A.J., "Characterizing Coherent Structures in Supersonic Turbulent Boundary Layers," 58th APS Division of Fluid Dynamics Meeting, Chicago, IL, November 2005.
17. Richdale, G.C., M., Martín, M.P., and Silver, D., "Eddy Hunting in Compressible Boundary Layers using DNS Data," 59th APS Division of Fluid Dynamics Meeting, Tampa, FL, November 2006.
18. Ringuelette, M., Wu, M., and Martín, M.P., "Superstructures in Compressible Turbulent Boundary Layers," 59th APS Division of Fluid Dynamics Meeting, Tampa, FL, November 2006.
19. Taylor, E.M., and Martín, M.P., "Evaluation of WENO Adaptation Modifications in DNS of Compressible Isotropic Turbulence Interacting with a Shockwave," 59th APS Division of Fluid Dynamics Meeting, Tampa, FL, November 2006.
20. Wu, M., and Martín, M., "Analysis of Shock Motion induced by a Compression Ramp Configuration using DNS Data," 59th APS Division of Fluid Dynamics Meeting, Tampa, FL, November 2006.
21. O'Farrell, C., Priebe, S., and Martín, M.P., "Study of Hairpin Packets and Their Wall Signature in Turbulent Boundary Layers," 60th APS Division of Fluid Dynamics Meeting, Salt Lake City, UT, November 2007.
22. Priebe, S., Wu, M., and Martín, M.P., "Analysis of shock motion in STBLI using DNS data", 60th APS Division of Fluid Dynamics Meeting, Salt Lake City, UT, November 2007.
23. Grube, N., and Martín, M.P., "Shock-confining filters for LES of compressible turbulence", 60th APS Division of Fluid Dynamics Meeting, Salt Lake City, UT, November 2007.
24. Priebe, S., Wu, M., and Martín, M.P., "Direct numerical simulation of a reflected shockwave and turbulent boundary layer interaction," 18th International Shock Interaction Symposium, July 15-18, 2008, Rouen, France.

25. Beekman, I., Priebe, S., and Martin, M.P., "Effect of heat transfer on turbulent boundary layers," *61st APS Division of Fluid Dynamics Meeting*, San Antonio, TX, 2008.
26. Duan, L., and Martin, M.P., "Direct numerical simulations of reacting boundary layers," *61st APS Division of Fluid Dynamics Meeting*, San Antonio, TX, 2008.
27. Grube, N., and Martin, M.P., "Assessment of shock-capturing schemes and subgrid scales models for LES of highly compressible turbulence," *61st APS Division of Fluid Dynamics Meeting*, San Antonio, TX, 2008.
28. Priebe, S., Beekman, I.B., and Martin, M.P., "Chasing eddies and their wall signature in turbulent boundary layers at Mach 3 through 10," *61st APS Division of Fluid Dynamics Meeting*, San Antonio, TX, 2008.

TEACHING

Undergraduate Courses:

2001 Fall	MAE 335: Fluid Dynamics (with Prof. Martínelli), Princeton University
2002 Spring	MAE 222: Mechanics of Fluids, Princeton University
2002 Fall	MAE 335: Fluid Dynamics, Princeton University
2003 Spring	MAE 222: Mechanics of Fluids (with Profs. Smits and Rogers) , Princeton University
2003 Fall	MAE 335: Fluid Dynamics, Princeton University
2006 Fall	MAE 335: Fluid Dynamics, Princeton University
2007 Fall	MAE 335: Fluid Dynamics, Princeton University

Graduate Courses:

2003 Spring	MAE 557: Simulation and Modeling of Fluid Flows, Princeton University
2004 Spring	MAE 558: Simulation and Modeling of Turbulent Fluid Flows, Princeton University
2005 Spring	MAE 557: Simulation and Modeling of Fluid Flows, Princeton University
2006 Spring	MAE 557: Simulation and Modeling of Fluid Flows, Princeton University
2007 Spring	MAE 557: Simulation and Modeling of Fluid Flows, Princeton University

ADVISING

Graduate Research Advisees:

- Ellen M. Taylor, Ph.D., Princeton University
Fall 2002 – spring 2007. Final Public Oral examination May 2007.
Thesis title: Linearly and Nonlinearly Optimized WENO Methods for Compressible Turbulence
- Minwei Wu, Ph.D., Princeton University
Fall 2002 – spring 2007. Final Public Oral examination May 2007.
Thesis title: Direct Numerical Simulation of Shockwave and Turbulent Boundary Layer Interactions
- Nathan Grube: Fall 2004 – present, Ph.D. expected: Spring, 2011.
Topic: Development of large-eddy simulation models for compressible flows
- Lian Duan: Fall 2005 – present, Ph.D. expected: Spring 2011.
Topic: Understanding gas and surface chemistry interaction in turbulent hypersonic flows
- Stephan Priebe: Fall 2006 – present, PhD. Expected: Spring 2011
Topic: Heat transfer and real gas effects on shock wave and turbulent boundary layer interactions
- Izaak B. Beekman. Fall 2007 – Spring 2012.
Topic: DNS of turbulent boundary layers with surface transpiration

Undergraduate Research Advisees (summers funded through NSF REU):

- Keith Schreer, Electrical Engineering, Class of 2005, Princeton University
June 2002 – August 2002
Topic: Development of the tcl and tk interface and graphical access to MESCO
- Loan Le, Mechanical and Aerospace Engineering, Class of 2007, Princeton University

M. Pino Martín

June 2006 – August 2006

Topic: Statistical Data Analysis of Compressible Turbulent Boundary Layers

- G. Coleman Richdale, Mechanical and Aerospace Engineering, Class of 2007, Princeton University
June 2006 – June 2007
Senior Thesis title: Eddy Chasing in DNS Data
- Clara O'Farrell, Mechanical and Aerospace Engineering, Class of 2008, Princeton University
June 2007 – present
Senior Thesis title: Eddy Chasing using DNS Data

Post-docs

- Sheng Xu, July 2002 – June 2003, Princeton University.
Topic: Inflow boundary conditions for DNS of compressible turbulent boundary layer
- Matthew Ringuette, July 2005 – July 2008 (with A.J. Smits), Princeton University.
Topic 1: Data analysis of turbulence structure in compressible boundary layers.
Topic 2: Development of a DPIV System for Hypersonic Wind Tunnels
Topic 3: Performing detailed measurements of wall-pressure fluctuations in STBLI

DEPARTMENTAL SERVICE

- 2001 – present Seminar Committee Member
Mechanical and Aerospace Engineering Department, Princeton University.
- 2003 - present AIAA Student Chapter Faculty Advisor with Prof. Miles
Mechanical and Aerospace Engineering Department, Princeton University

UNIVERSITY SERVICE

- 2002–present **Member.** Princeton University Research Computing Advisory Group (RCAG)
- 2005–present **Steering Committee Member:** Princeton University Institute for Computational Science and Engineering (PICSciE)
- 2005, 2006 **Member:** Princeton University Ray Grimm Memorial Prize Selection Committee

EXTERNAL SERVICE ACTIVITIES

- 2002–2006 **Voting Member:** AIAA Fluid Dynamics Technical Committee, CFD Technical Sub-Committee
- 2003–2006 **Chair.** AIAA Fluid Dynamics Best Paper Award Committee
- 2005 **Faculty Advisor:** AIAA Regional Student Paper Competition (held at Princeton University)
- 2008 **Scientific Committee Member:** Workshop on Compressible Turbulent Flow Research for the Next Generation of Air Vehicles, Marseille, France, March 2008.
- 2009 **APS Fluid Dynamics Prize Committee**

REVIEW ACTIVITIES

Journals:

- 2006 Physics of Fluids
- 2006-present Journal of Computational Physics
- 2003–present AIAA Journal

M. Pino Martín

2002–present Journal of Fluid Mechanics

2002 Journal of Fluids in Engineering

Programs:

2002–2005 NSF, CBET Program

2007 Army Research Office

SOCIETIES AND AFFILIATIONS

1994–2007 Member AIAA (American Institute of Aeronautics and Astronautics)

2007–present Senior Member AIAA (American Institute of Aeronautics and Astronautics)

1995–present Member APS (American Physical Society)