

Iván Bermejo-Moreno

Assistant Professor, University of Southern California
Department of Aerospace and Mechanical Engineering
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EDUCATION

California Institute of Technology

Ph.D. in Aeronautics

Academic advisor: Professor D. I. Pullin

Dissertation title: *“On the non-local geometry of turbulence.”*

Pasadena, California, USA

September 2004 - April 2008

California Institute of Technology

M.Sc. in Aeronautics

Pasadena, California, USA

September 2003 - June 2004

School of Aeronautics, Polytechnic University of Madrid

Aeronautical Engineer (five-year program)

End-of-studies special project: *“Experimental installation for the measurement of surface tension in liquids by the method of capillary waves”* (with highest honors).

Madrid, Spain

September 1996 - July 2001

HONORS AND AWARDS

National Science Foundation CAREER Award.

2021/12/08

Postdoctoral Fellowship, Center for Turbulence Research, NASA/Stanford University.

2009-2014

Fulbright Fellowship.

2003-2008

The Hans G. Hornung Prize, GALCIT, Caltech.

2008

(awarded for the best oral Ph.D. defense presentation by a student advised by Aeronautics faculty)

The William F. Ballhaus Prize, GALCIT, Caltech.

2008

(awarded for an outstanding doctoral dissertation in Aeronautics)

The Rolf D. Buhler Memorial Award in Aeronautics, GALCIT, Caltech.

2004

(awarded for outstanding academic achievement in the Master’s program in Aeronautics)

End-of-studies National Awards, Special Mention, Official State Bulletin, Spain.

2001

PROFESSIONAL AND RESEARCH EXPERIENCE

University of Southern California, Los Angeles, California, USA
Assistant Professor October 2015 - present
Department of Aerospace and Mechanical Engineering

Center for Turbulence Research, NASA/Stanford University Stanford, California, USA
Postdoctoral fellow July 2009 - June 2014
Research advisors: Professor Parviz Moin, Professor Sanjiva K. Lele.

California Institute of Technology Pasadena, California, USA
Doctoral research September 2004 - April 2008
Research advisor: Professor D. I. Pullin.

GMV Aerospace and Defense - Space Flight Dynamics Division Madrid, Spain
Aeronautical Engineer 2001 - 2003
Summer internship 2000

Ignacio Da Riva Institute (IDR/UPM) Madrid, Spain
Facility Support Centre for the Fluid Science Laboratory in the network of User Support and Operation Centres (USOCs) of the Manned Space Flight and Microgravity Division of the European Space Agency (ESA).
Undergraduate research, academic year internship 2000 - 2001
Research advisors: Professor J. Meseguer Ruiz, Professor J. M. Perales Perales.

TEACHING EXPERIENCE

University of Southern California Los Angeles, California, USA
AME 309 - Dynamics of fluids (ungraduate level course, 4 units) Fall 2016-2020
AME 511 - Compressible gas dynamics (graduate level course, 4 units) Spring 2017-2021
AME 651 - Statistical Theories of Turbulence (graduate level course, 3 units) Spring 2016

California Institute of Technology Pasadena, California, USA
Teaching Assistant, occasional lecturer 2005 - 2007
Ae 101 - Fluid Mechanics (graduate level course).
Professor T. Colonius (2005 - 2006); Professor D. I. Pullin (2006 - 2007).

Educational Courses Taken
CET New Faculty Institute 2018 - 2019

Journal publications:

Buchmeier, J., Bußmann, A., Gao, X, **Bermejo-Moreno, I.** (2021) “Geometry and dynamics of passive scalar structures in compressible turbulent mixing” *Physics of Fluids*, 33, 105126.

Koh, D. Anderson, R. L. & **Bermejo-Moreno, I** (2021) “Cell-mapping orbit search for mission design at ocean worlds using parallel computing” *The Journal of the Astronautical Sciences*, [dx.doi.org/10.1007/s40295-021-00251-6](https://doi.org/10.1007/s40295-021-00251-6)

Gao, X., **Bermejo-Moreno, I.**, & Larsson, J. (2020). “Parametric numerical study of passive scalar mixing in shock turbulence interaction.” *J. Fluid Mech.*, 895, A21. doi:10.1017/jfm.2020.292

Choi, D., Park, E., Jung, E., Cha, B., Lee, S., Yu, J., Kim, P. M., Lee, S., Hong, Y. J., Koh, C., Cho, C., W. Wu, Y., Jeon, N. L., Wong, A., Shin, L., Kumar, R., **Bermejo-Moreno, I.**, Srinivasan, S., Cho, I.-T., and Hong Y.-K., (2019) “Piezo1 Incorporates Mechanical Force Signals to the Genetic Program that Governs Lymphatic Valve Development and Maintenance” *JCI Insight* 4(5):e125068

Larsson, J., Kawai, S., Bodart, J. & **Bermejo-Moreno, I.** (2016) “Large eddy simulation with modeled wall-stress: recent progress and future directions.” *Mechanical Engineering Reviews*, JSME, volume 3, number 1, pages 15-00418

Larsson, J. , Laurence, S. J., **Bermejo-Moreno, I.**, Bodart, J., Karl, S. and Vicquelin, R., (2015) “Incipient thermal choking and stable shock-train formation in the heat-release region of a scramjet combustor. Part II: Large eddy simulations,” *Comb. Flame*, volume 162, pages 907-920.

Bermejo-Moreno, I., L. Campo, J. Larsson, J. Bodart, D. Helmer & J. K. Eaton (2014) “Confinement effects in shock wave/turbulent boundary layer interactions through wall-modelled large-eddy simulations.” *J. of Fluid Mech.*, volume 758, pages 5-62.

Larsson, J., **Bermejo-Moreno, I.** & Lele, S. K. (2013) “Reynolds- and Mach-number effects in canonical shock-turbulence interaction.” *J. of Fluid Mech.*, volume 717, pages 293-321.

Atkinson, C., Chumakov, S., **Bermejo-Moreno, I.** & Soria, J. (2012) “Lagrangian evolution of the invariants of the velocity gradient tensor in a turbulent boundary layer” *Phys. Fluids*, volume 24, 105104.

Yang, Y., Pullin, D. I. & **Bermejo-Moreno, I.** (2010) “Multi-scale geometric analysis of Lagrangian structures in isotropic turbulence.” *J. of Fluid Mech.*, volume 654, pages 233-270.

Bermejo-Moreno, I., Pullin, D. I. & Horiuti, K. (2009) “Geometry of enstrophy and dissipation, grid resolution effects and proximity issues in turbulence.” *J. of Fluid Mech.*, volume 620, pages 121-166.

Bermejo-Moreno, I. & Pullin, D. I. (2008) “On the non-local geometry of turbulence.” *J. of Fluid Mech.*, volume 603, pages 101-135.

Peer-reviewed conference proceedings:

Hoy, J. & **Bermejo-Moreno, I.** (2021) “Numerical study of STBLI on flexible panels with wall-modeled LES, AIAA SciTech 2021 Forum. doi:10.2514/6.2021-0250

Bermejo-Moreno, I., Bodart, J., Larsson, J., Barney, B., Nichols, J. & Jones, S. (2013) “Solving the compressible Navier-Stokes equations on up to 1.97 million cores and 4.1 trillion grid points” *Proceedings of SC13: International Conference for High Performance Computing, Networking, Storage and Analysis, SC’13*, pages 62:1–62:10. New York, NY, USA: ACM.

Non-archival publications:

Di Battista, R., Bermejo-Moreno, I., Ménard, T., de Chaisemartin, S. & Massot, M. (2019) “Post-processing of two-phase DNS simulations exploiting geometrical features and topological invariants to extract flow statistics: application to canonical objects and the collision of two droplets” *Proceedings of the 10th International Conference on Multiphase Flow, ICMF 2019, Rio de Janeiro, Brazil, May 19–24, 2019* <https://hal.archives-ouvertes.fr/hal-02345825/document>

Gao, X., Buchmeier, J., **Bermejo-Moreno, I.**, Larsson, J., Fu, L. & Lele, S. K. (2018) “Scalar mixing under shock/turbulence interaction: DNS, statistical and geometric analyses.” *Proc. of the Summer Program 2018*, Center for Turbulence Research, Stanford University, pages 165-174. <https://stanford.box.com/s/wxj8im5ctzfxcn0fxpg09ao1xa1k97tk>

Koh, D., Anderson, R. L. and **Bermejo-Moreno, I.** (2018) “Exploration of three-dimensional orbit bifurcations in the CRTBP using cell mapping,” AAS/AIAA Astrodynamics Specialist Conference, AAS 18-264.

Koh, D., Anderson, R. L. and **Bermejo-Moreno, I.** (2017) “Cell Mapping Orbit Search for Mission Design at Ocean Worlds Using Parallel Computing,” AAS/AIAA Astrodynamics Specialist Conference, AAS 17-756.

Kim, J., **Bermejo-Moreno, I.**, Schreyer, A.-M. & Urzay, J. (2016) “LES of hypersonic compression-corner flows with upstream sub-boundary-layer microramp vortex generators” *Ann. Res. Briefs*, Center for Turbulence Research, Stanford University, pages 51-63.

Adami, S., Kaiser, J., Adams, N. A. and **Bermejo-Moreno, I.** (2016) “Numerical modeling of shock waves in biomedicine.” *Proc. of the Summer Program 2016*, Center for Turbulence Research, Stanford University, pages 15-24.

Schreyer, A.-M., **Bermejo-Moreno, I.**, Kim, J. & Urzay, J. (2016) “Separation control in a hypersonic compression ramp interaction” *Proc. of the Summer Program 2016*, Center for Turbulence Research, Stanford University, pages 223-232.

Philip, J., **Bermejo-Moreno, I.**, Chung, D. and Marusic, I. (2015) “Characteristics of the entrainment velocity in a developing wake” Proceedings of the International Symposium on Turbulence and Shear Flow Phenomena, TSFP-9. Melbourne, Australia.

Bermejo-Moreno, I., Bodart, J. & Larsson, J. (2014) “Wall modeled large-eddy simulation of shock wave/turbulent boundary layer interaction with separation” *Ann. Res. Briefs*, Center for Turbulence Research, Stanford University, pages 155-167.

Vane, Z., **Bermejo-Moreno, I.**, Lele, S. K. (2014) “Wall-Modeled Large-Eddy Simulations of a Supersonic Turbulent Flow in a Square Duct” Proceedings of the 44th Fluid Dynamics Conference, American Institute of Aeronautics and Astronautics (AIAA). AIAA 2014-2209

Bermejo-Moreno, I., Larsson, J., Bodart, J., & Vicquelin, R. (2013) “Wall-modeled large-eddy simulations of the HIFiRE-2 scramjet” *Ann. Res. Briefs*, Center for Turbulence Research, Stanford University, pages 3-19.

Bodart, J., Coletti, F., **Bermejo-Moreno, I.**, & Eaton, J. K. (2013) “High-fidelity simulation of a turbulent inclined jet in a crossflow” *Ann. Res. Briefs*, Center for Turbulence Research, Stanford University, pages 263-275.

Bermejo-Moreno, I., Bodart, J. & Larsson, J. (2013) “Scaling compressible flow solvers on the IBM Blue Gene/Q platform on up to 1.97 million cores” *Ann. Res. Briefs*, Center for Turbulence Research, Stanford University, pages 343-358.

Bermejo-Moreno, I., Campo, L., Larsson, J., Bodart, J., Helmer, D. and Eaton, J. K. (2013) “Wall-modeled large-eddy simulations of shock/turbulent-boundary-layer interactions in a low aspect-ratio duct” Proceedings of the International Symposium on Turbulence and Shear Flow Phenomena, TSFP-8. Poitiers, France.

Vane, Z., **Bermejo-Moreno, I.**, Lele, S. K. (2013) “Simulations of a normal shock train in a constant area duct using wall-modeled LES” Proceedings of the 43rd Fluid Dynamics Conference, American Institute of Aeronautics and Astronautics (AIAA). AIAA. 2013-3204

Bermejo-Moreno, I., Larsson, J., Campo, L. Bodart, J., Emory, M., Palacios, F., Helmer, D., Iaccarino, G. & Eaton, J. K. (2012) “Multi-fidelity numerical simulations of shock/turbulent-boundary-layer interaction in a duct with uncertainty quantification” *Ann. Res. Briefs*, Center for Turbulence Research, Stanford University, pages 67-79.

Larsson, J., **Bermejo-Moreno, I.**, Bodart J. & Vicquelin, R. (2012) “Predicting the operability limit of the HyShot II scramjet using LES” *Ann. Res. Briefs*, Center for Turbulence Research, Stanford University, pages 241-251.

Bermejo-Moreno, I., Larsson, J., Campo, L., Bodart, J., Vicquelin, R., Helmer, D. & Eaton, J. K., (2011) “Wall-modeled large eddy simulation of shock/turbulent boundary-layer interaction in a duct.” *Ann. Res. Briefs*, Center for Turbulence Research, Stanford University, pages 49-62.

Larsson, J., Vicquelin, R. & **Bermejo-Moreno, I.** (2011) “Large eddy simulations of the HyShot II scramjet.” *Ann. Res. Briefs*, Center for Turbulence Research, Stanford University, pages 63-74.

Bermejo-Moreno, I., Larsson, J. & Lele, S. (2010) “LES of canonical shock-turbulence interaction.” *Ann. Res. Briefs*, Center for Turbulence Research, Stanford University, pages 209-222.

Bermejo-Moreno, I., Atkinson, C., Chumakov, S., Soria, J. & Wu, X. (2010) “Flow topology and non-local geometry of structures in a flat-plate turbulent boundary layer.” *Proc. of the Summer Program 2010*, Center for Turbulence Research, pages 65-76.

Pai, M. G., **Bermejo-Moreno, I.**, Desjardins, O. & Pitsch, H. (2010) “Parametric study of primary breakup of turbulent liquid jets in crossflow: Role of Weber number.” *Proc. of the 48th American Institute of Aeronautics and Astronautics (AIAA) Aerospace Sciences Meeting*, 2010-212.

Pai, M. G., **Bermejo-Moreno, I.**, Desjardins, O. & Pitsch, H. (2009) “Role of Weber number in primary breakup of turbulent liquid jets in cross flow.” *Ann. Res. Briefs*, Center for Turbulence Research, Stanford University, pages 145-158.

Bermejo-Moreno, I. (2009) “Subgrid-scale modeling of shock-turbulence interaction for large-eddy simulations.” *Ann. Res. Briefs*, Center for Turbulence Research, Stanford University, pages 247-259.

CONFERENCE PRESENTATIONS, WORKSHOPS AND SEMINARS

Hoy, J. & **Bermejo-Moreno, I.** “Numerical study of STBLI on flexible panels with wall-modeled LES,” AIAA SciTech 2021 Forum, January 2021

Larsson, J., Baurle, R., Brehm, C., Garmann, D., **Bermejo-Moreno, I.**, Galbraith, M., Gonzalez, D., Komives, J., Rizzeta, D., Subbareddy, P., Toosi, S. “Description and preliminary results of the LES smooth-body separation test case for the 2022 High-Fidelity CFD workshop,” AIAA SciTech 2021 Forum, January 2021

Hoy, J. & **Bermejo-Moreno, I.** “Numerical investigation of shock-turbulent boundary layer interaction on flexible panels using wall modelled large eddy simulations” 73rd Annual Meeting of the APS Division of Fluid Dynamics, Chicago, Illinois, November 2020.

Buchmeier, J., Bussmann, A., Gao, X. & **Bermejo-Moreno, I.** “Temporal evolution of flow features in isotropic turbulence and shock-turbulence interaction” 73rd Annual Meeting of the APS Division of Fluid Dynamics, Chicago, Illinois, November 2020.

Gao, X., **Bermejo-Moreno, I.** & Larsson, J. “Shock-induced Ignition in 2D Shock Turbulence Interaction” 73rd Annual Meeting of the APS Division of Fluid Dynamics, Chicago, Illinois, November 2020.

Buchmeier, J., Bussmann, A., Gao, X. & **Bermejo-Moreno, I.** “Tracking of flow structures in shock-turbulence interaction” 72nd Annual Meeting of the APS Division of Fluid Dynamics, Seattle, Washington, November 2019.

Toosi, S., Larsson, J. & **Bermejo-Moreno, I.** “Algorithmic grid selection in LES” 72nd Annual Meeting of the APS Division of Fluid Dynamics, Seattle, Washington, November 2019.

Hoy, J. & **Bermejo-Moreno, I.** “Analysis of the effect of elasticity on Shock Turbulent Boundary Layer Interaction” 72nd Annual Meeting of the APS Division of Fluid Dynamics, Seattle, Washington, November 2019.

Bussmann, A., Buchmeier, J., Dodd, M. & **Bermejo-Moreno, I.** “Tracking droplet breakup in homogenous isotropic turbulence” 72nd Annual Meeting of the APS Division of Fluid Dynamics, Seattle, Washington, November 2019.

Gao, X., **Bermejo-Moreno, I.**, & Larsson, J. “Alignment Analysis of Passive Scalar Mixing in Shock Turbulence Interaction” 72nd Annual Meeting of the APS Division of Fluid Dynamics, Seattle, Washington, November 2019.

Di Battista, R., **Bermejo-Moreno, I.**, Ménard T., de Chaisemartin, S. & Massot, M. “Post-processing of two-phase DNS simulations exploiting geometrical features and topological invariants to extract flow statistics: application to canonical objects and the collision of two droplets” 10th International Conference on Multiphase FlowAt, Rio de Janeiro, Brazil, May 2019.

Buchmeier, J. & **Bermejo-Moreno, I.** “Geometry of passive scalar mixing structures in shock-turbulence interaction” 13th Southern California Flow Physics Symposium (SoCal Fluids XIII), Santa Barbara, California, April 2019.

Hoy, J. & **Bermejo-Moreno, I.** “Numerical simulation of shock-boundary layer interactions on flexible panels” 13th Southern California Flow Physics Symposium (SoCal Fluids XIII), Santa Barbara, California, April 2019.

Gao, X., **Bermejo-Moreno, I.**, & Larsson, J. “Direct Numerical Simulation of Passive Scalar Mixing in Shock Turbulence Interaction: Effects of Taylor Microscale Reynolds Number” 13th Southern California Flow Physics Symposium (SoCal Fluids XIII), Santa Barbara, California, April 2019.

Gao, X., **Bermejo-Moreno, I.**, Larsson, J., Fu, L. & Lele, S. K. “Flow Topology and Alignment Analysis of Passive Scalar Mixing in Shock Turbulence Interaction” 71th Annual Meeting of the APS Division of Fluid Dynamics, Atlanta, Georgia, November 2018.

Buchmeier, J., Gao, X. **Bermejo-Moreno, I.**, Larsson, J., Fu, L. & Lele, S. K. “Time-evolution of passive scalar structures in shock-turbulence interaction” 71th Annual Meeting of the APS Division of Fluid Dynamics, Atlanta, Georgia, November 2018.

Koh, D., Anderson, R. L. & **Bermejo-Moreno, I.** “Exploration of three-dimensional orbit bifurcations in the CRTBP using cell mapping,” AAS/AIAA Astrodynamics Specialist Conference, AAS 18-264, Snowbird, UT, August 19-23, 2018

Buchmeier, J., Gao, X. & **Bermejo-Moreno, I.** “A Methodology to Track Structures in Turbulent Flow” 12th Southern California Flow Physics Symposium (SoCal Fluids XII), Los Angeles, California, April 2018.

Gao, X., **Bermejo-Moreno, I.** & Larsson, J. “Direct Numerical Simulation of Passive Scalar Mixing in Shock Turbulence Interaction” 12th Southern California Flow Physics Symposium (SoCal Fluids XII), Los Angeles, California, April 2018.

Gao, X., **Bermejo-Moreno, I.** & Larsson, J. “Direct Numerical Simulation of Passive Scalar Mixing in Shock Turbulence Interaction” 70th Annual Meeting of the APS Division of Fluid Dynamics, Denver, Colorado, November 2017.

Koh, D., Anderson, R. L. & **Bermejo-Moreno, I.** Cell Mapping Orbit Search for Mission Design at Ocean Worlds Using Parallel Computing, AAS/AIAA Astrodynamics Specialist Conference, AAS 17-756, Stevenson, Washington, August 20-24, 2017.

De, S., Brewick, P. T., Johnson, E. A., Wojtkiewicz, S. F., **Bermejo-Moreno, I.** “Error and Likelihood Bounds for Falsification of Dynamical Models” IMAC-XXXV Conference, Society for Experimental Mechanics, Garden Grove, California, January-February 2017.

Bermejo-Moreno, I., Campo, L., Larsson, J., Bodart, J., Helmer, D. & Eaton, J. “Confinement effects in shock/turbulent-boundary-layer interaction through wall-modeled LES” 69th Annual Meeting of the APS Division of Fluid Dynamics, Portland, Oregon, November 2016.

Adami, S., Kaiser, J., **Bermejo-Moreno, I.** & Adams, N. “Simulating shock-bubble interactions at water-gelatin interfaces” 69th Annual Meeting of the APS Division of Fluid Dynamics, Portland, Oregon, November 2016.

Schreyer, A.-M., **Bermejo-Moreno, I.**, Kim, J & Urzay, J. “Separation control in a hypersonic shock wave / turbulent boundary-layer interaction” 69th Annual Meeting of the APS Division of Fluid Dynamics, Portland, Oregon, November 2016.

Philip, J., **Bermejo-Moreno, I.**, Chung, D. and Marusic, I. “Characteristics of the entrainment velocity in a developing wake” International Symposium on Turbulence and Shear Flow Phenomena, TSFP-9, Melbourne, Australia, July 2015.

Vane, Z., **Bermejo-Moreno, I.** & Lele, S. K. “Wall-Modeled Large-Eddy Simulations of a Supersonic Turbulent Flow in a Square Duct” AIAA Fluid Dynamics Conference, Atlanta, Georgia, June 2014.

Bermejo-Moreno, I., Campo, L., Larsson, J., Bodart, J., Helmer, D. B. & Eaton, J. K. “Confinement effects in shock/turbulent-boundary-layer interaction through wall-modeled large-eddy simulations” Thermal and Fluid Sciences Affiliates and Sponsors Conference, Stanford, California, February 2014.

Vane, Z., **Bermejo-Moreno, I.**, & Lele, S. K. “Wall-modeled LES of a three-dimensional shock train in a constant area duct” Thermal and Fluid Sciences Affiliates and Sponsors Conference, Stanford, California, February 2014.

Bermejo-Moreno, I., Bodart, J., Larsson, J., & Iaccarino, G. “Compressible flow solvers and uncertainty analysis on million-core architectures.” Thermal and Fluid Sciences Affiliates and Sponsors Conference, Stanford, California, February 2014.

Larsson, J., Vicquelin, R., Bodart, J., **Bermejo-Moreno, I.** & Laurence, S. “Quasi-dual-mode behavior in the combustor of the HyShot scramjet” 66th Annual Meeting of the APS Division of Fluid Dynamics, Pittsburgh, Pennsylvania, November 2013.

Vane, Z., **Bermejo-Moreno, I.** & Lele, S. K. “Simulations of a normal shock train in a constant area duct using wall-modeled LES” 66th Annual Meeting of the APS Division of Fluid Dynamics, Pittsburgh, Pennsylvania, November 2013.

Bermejo-Moreno, I., Campo, L., Larsson, J., Emory, M., Bodart, J., Palacios, F., Iaccarino, G. & Eaton, J. K. “Multi-fidelity numerical simulations of shock/turbulent-boundary layer interaction with uncertainty quantification” 66th Annual Meeting of the APS Division of Fluid Dynamics, Pittsburgh, Pennsylvania, November 2013.

Bermejo-Moreno, I., Bodart, J., Larsson, J., Barney, B., Nichols, J. & Jones, S. “Solving the compressible Navier-Stokes equations on up to 1.97 million cores and 4.1 trillion grid points” SC’13, 2013 International Conference for High Performance Computing, Networking, Storage and Analysis, November 17-21 2013, Denver, CO, USA.

Bermejo-Moreno, I., Campo, L., Larsson, J., Bodart, J., Helmer, D. & Eaton, J. K. “Wall-modeled Large-Eddy Simulations of shock/turbulent-boundary-layer interactions in a low aspect-ratio duct” International International Symposium on Turbulence and Shear Flow Phenomena, TSFP-8, Poitiers, France, August 2013.

Bermejo-Moreno, I., Moin, P. & Iaccarino, G. “Predictive Simulations of Multi-Physics Flow Phenomena with Application to Integrated Hypersonic Systems” 12th U.S. National Congress on Computational Mechanics (USNCCM12), Raleigh, North Carolina, July 2013.

Bermejo-Moreno, I. & Moin, P. “Center for Predictive Simulations of Multi-Physics Flow Phenomena with Application to Integrated Hypersonic Systems” Stewardship Science Academic Program (SSAP) Annual Review Symposium, Albuquerque, New Mexico, June 2013.

Vane, Z., **Bermejo-Moreno, I.** & Lele, S. K. “Simulations of a normal shock train in a constant area duct using wall-modeled LES” AIAA Fluid Dynamics Conference, San Diego, California, June 2013.

Bermejo-Moreno, I., Campo, L., Larsson, J., Iaccarino, G. & Eaton, J. K. “Multi-fidelity numerical simulations of shock/turbulent-boundary-layer interaction in a duct with uncertainty quantification” Thermal and Fluid Sciences Affiliates and Sponsors Conference, Stanford, California, February 2013.

Vane, Z., **Bermejo-Moreno, I.** & Lele, S. K. “Simulations of a normal shock-train in a constant-area duct using wall-modeled LES” Thermal and Fluid Sciences Affiliates and Sponsors Conference, Stanford, California, February 2013.

Bermejo-Moreno, I. “Towards air-breathing hypersonic vehicles” HPC Advisory Council Stanford Conference 2013, Stanford, California, February 2013.

Bermejo-Moreno, I. “Continuous Integration in software development through open-source tools” HPC Advisory Council Stanford Conference 2013, Stanford, California, February 2013.

Bermejo-Moreno, I., Bodart, J, Nichols, J. W. & Palacios, F. “Scaling CFD and UQ codes on Sequoia (BG/Q)” HPC Advisory Council Stanford Conference 2013, Stanford, California, February 2013.

Bermejo-Moreno, I., Larsson, J., Campo, L., Bodart, J., Helmer, D. Ham, F. & Eaton, J. K. “Wall-modeled large-eddy simulations of shock/turbulent-boundary layer interaction in a duct” 65th Annual Meeting of the APS Division of Fluid Dynamics, San Diego, California, November 2012.

Urzay, J & **Bermejo-Moreno, I.** “Kinetic models and geometrical sensitivities: combined experimental and computational investigations” Verification and Validation Meeting, Ann Arbor, Michigan, August 2012.

Bermejo-Moreno, I., Drosbeke, H., Larsson, J. & Iaccarino, G. “Shock-Boundary Layer Interaction In A Low-Aspect-Ratio Duct” Thermal and Fluid Sciences Affiliates and Sponsors Conference, Stanford, California, February 2012.

Hickel, S., Egerer, C.P., Larsson, J, & **Bermejo-Moreno, I.** “Implicit Large-Eddy Simulation of Shock-Turbulence Interaction.” 11th U.S. National Congress on Computational Mechanics; St. Paul, Minnesota, July 2011.

Atkinson, C., Chumakov, S., **Bermejo-Moreno, I.**, & Soria, J. “Mean Topological Evolution in a Turbulent Boundary Layer” Seventh International Symposium on Turbulence and Shear Flow Phenomena (TSFP-7), Ottawa, Canada, July 2011.

Bermejo-Moreno, I., Larsson, J. & Lele, S. “LES of shock turbulence interaction” Thermal and Fluid Sciences Affiliates and Sponsors Conference, Stanford, California, February 2011.

Chumakov, S., Atkinson, C., **Bermejo-Moreno, I.**, Wu, X. & Soria, J. “Geometrical structure and topology of pressure Hessian in the turbulent boundary layer” 63rd Annual Meeting of the APS Division of Fluid Dynamics, Long Beach, California, November 2010.

Atkinson, C., Chumakov, S., **Bermejo-Moreno, I.**, Wu, X. & Soria, J. “Time-evolution and time-scales of topological structures in a turbulent boundary layer through conditional mean trajectory analysis” 63rd Annual Meeting of the APS Division of Fluid Dynamics, Long Beach, California, November 2010.

Bermejo-Moreno, I., Atkinson, C., Chumakov, S., Wu, X. & Soria, J. “Multi-scale geometry of flow structures in a flat-plate turbulent boundary layer” 63rd Annual Meeting of the APS Division of Fluid Dynamics, Long Beach, California, November 2010.

Bermejo-Moreno, I., Larsson, J. & Lele, S. “Large-eddy simulations of the shock-turbulence interaction canonical problem” 63rd Annual Meeting of the APS Division of Fluid Dynamics, Long Beach, California, November 2010.

Pai, M. G., **Bermejo-Moreno, I.**, Desjardins, O. & Pitsch, H. “Role of Weber number in the primary breakup of liquid jets in cross ow” 62nd Annual Meeting of the APS Division of Fluid Dynamics, Minneapolis, Minnesota, November 2009.

Yang, Y., Pullin, D. I. & **Bermejo-Moreno, I.** “Multi-scale geometric analysis of Lagrangian structures in isotropic turbulence” 62nd Annual Meeting of the APS Division of Fluid Dynamics, Minneapolis, Minnesota, November 2009.

Bermejo-Moreno, I., Pullin, D. I. & Horiuti, K. “On the non-local geometry of turbulence” 60th Annual Meeting of the APS Division of Fluid Dynamics, Salt Lake City, Utah, November 2007.

Bermejo-Moreno, I. & Pullin, D. I. “Geometrical and multi-scale analysis of scalar structures in forced homogeneous turbulence” 59th Annual Meeting of the APS Division of Fluid Dynamics, Tampa, Florida, November 2006.

INVITED PRESENTATIONS

“Flow-structure interactions of STBLIs on flexible panels with WMLES.” NATO AVT-352 Task Force: Measurement, Modelling and Prediction of Hypersonic Turbulence (virtual), April 2021.

“Numerical study of shock waves interacting with turbulent boundary layers developed over flexible panels.” (virtual) Sandia National Laboratory, March 2021

“Interactions of shock waves, turbulent boundary layers, and flexible panels.” (virtual) Mechanics Seminar, The UW-Madison Mechanics Group, University of Wisconsin, Madison, March 2021

“Shock-induced turbulent mixing and interactions with flexible panels through simulations.” (virtual) Penn Institute for Computational Science, October 2020

“Numerical Investigation of Shock-Induced Phenomena in Turbulent Flows.” (virtual) Australasian Fluid Mechanics Seminar Series, October 2020

“Shock-induced phenomena in turbulent flows through numerical simulation and diagnostics.” (virtual) CTR Tea Seminar, Center for Turbulence Research, Stanford University, September 2020

“Numerical simulation of shock-induced turbulent mixing and interactions with flexible panels” Mechanical Engineering Department Seminar, University of California, Santa Barbara, March 2020

“Numerical simulations of the interactions between shock waves and turbulence” Mechanical Engineering Department Colloquium, University of California, Riverside, December 2017

“Numerical simulations of the interactions between shock waves and turbulent boundary layers in a nearly-square duct” Fluid Mechanics Seminar Stanford University, Stanford, November 2016

“Numerical simulations of the interactions between shock waves and turbulent boundary layers in a nearly-square duct” Fluid Mechanics and Combustion Series Seminar University of California, San Diego, October 2016

“Compressible turbulence, shock-turbulence interaction and hypersonics” Tutorial for the 2016 Summer Program, Center for Turbulence Research, Stanford University, Stanford, California, July 2016.

“Numerical simulations of shock/turbulent-boundary layer interaction in a nearly-square duct” GALCIT Colloquium, California Institute of Technology, Pasadena, California, October 2015.

“Integrated simulation and diagnostics of multi-physics turbulent fluid flows: from the geometry of turbulence to hypersonic flight propulsion” Department of Aerospace and Mechanical Engineering Seminar, University of Southern California, Los Angeles, California, February 2014.

“Compressible Flow Solvers and Uncertainty Analysis on Million-Core Architectures” Applied Modeling & Simulation (AMS) Seminar Series, NASA Ames Research Center, Moffett Field, California, February 2014.

“Transforming computational science software research for extreme-scale computing: Patterns and best practices - Testing and V&V”, DOE ASCR Workshop on Software Productivity for eXtreme-scale Science (SWP4XS) Washington D.C/Rockville, January 13-14, 2014.

“Continuous integration through open-source tools” High Performance Computing Seminar Series, Stanford University, April 2012.

“On the non-local geometry of turbulence” CTR Tea Seminar, Center for Turbulence Research, NASA / Stanford University, California, July 2009.

“On the non-local geometry of turbulence” Eidgenössische Technische Hochschule Zurich (ETHZ), Zurich, Switzerland, May 2008.

“On the non-local geometry of turbulence” GALCIT Colloquium, California Institute of Technology, Pasadena, CA, April 2008.

PROFESSIONAL SOCIETY MEMBERSHIPS

American Institute of Aeronautics and Astronautics (AIAA), Senior Member.

Association for Computing Machinery (ACM), Senior Member.

American Physical Society (APS).

JOURNAL REVIEWER EXPERIENCE

Journal of Fluid Mechanics, Physics of Fluids, American Institute of Aeronautics and Astronautics (AIAA) Journal, Applied Mathematics and Computation, Combustion and Flame, Computers and Fluids, European Journal of Mechanics / B Fluids, Europhysics Letters, International Journal of Heat and Fluid Flow, International Journal of High Performance Computing, Journal of Aerospace Engineering, Journal of Computational Physics, Journal of Fluids and Structures, Journal of Fluids Engineering, Journal of Propulsion and Power, Ocean Engineering, Physical Review Fluids, Proceedings of the Combustion Institute.

OUTREACH

Partnership with Washington STEM Magnet Elementary School, Pasadena, CA, 2018

“Linux, Python, and Supercomputing Tutorial Series”

Eight-week tutorial series for 15 students in 3rd-5th grades.

STEM Spotlight AME at USC, Presentation “Flying Faster,” to student groups from participating high-schools (Diamond Bar High School, STEM Academy of Boyle Heights, STEM Academy of Hollywood, Manual Arts High School), October 12, 2017

STEM Academy of Hollywood Project Showcase, Los Angeles Unified School District (LAUSD)

Project Based Learning Judge

10th-grade “Driving to the Future Engineering Gallery,”

May 15, 2017

Health Fair

December 7, 2016

“A career in aerospace engineering” AIAA USC Chapter, Signature Speaker Series University of Southern California, November 2016

PROFESSIONAL SERVICE

Professional Committees:

- Member of the Fluid Dynamics Technical Committee (FDTC) of the American Institute of Aeronautics and Astronautics (AIAA). 2020-present
- Reviewer for the National Science Foundation (NSF) 2021
- Reviewer for the Innovative and Novel Computational Impact on Theory and Experiment (INCITE, 2017, 2018) programs from the Department of Energy. 2017, 2018
- Reviewer for the European Research Council (ERC) 2017 Starting, Consolidator and Advanced Grant Calls 2017
- Reviewer for the Advanced Scientific Computing Research (ASCR) Leadership Computing Challenge (ALCC) 2016
- User representative of the National User Facility Organization (NUFO) 2014-present
- Chair of the User Advisory Council (UAC) at Argonne Leadership Computing Facility (ALCF), Argonne National Laboratory (ANL) 2014 & 2015
- Operational Assessment Reviewer of the Argonne Leadership Computing Facilities (ALCF) at Argonne National Laboratory 2014

Conferences/Workshops:

- Co-organizer of the AIAA Aviation Forum and Exposition 2021
- Co-organizer of the 12th Southern California Flow Physics Symposium (SoCal Fluids XII) (87 presentations, three-parallel sessions, one-day conference) 2018
- Co-organizer of the Large Eddy Simulation Workshop on Smooth-Body Separation at AIAA SciTech 2021 2019-2021

Editorial activities:

- Co-editor of the Annual Research Briefs, Center for Turbulence Research, NASA/Stanford University 2013

OTHER ACTIVITIES AND SKILLS

Private Pilot.