

Curriculum Vitae

Pasquale Cinnella, PhD, PE
*Professor of Mechanical Engineering &
Undergraduate Program Director
The University of Alabama at Birmingham*

Education

July 1987 Bachelor of Science, Summa Cum Laude (Mechanical Engineering), University of Bari, Italy
Dec. 1989 Doctor of Philosophy in Aerospace Engineering, Virginia Polytechnic Institute and State University
Research Advisor: Prof. Bernard Grossman

Employment

Jan. 2017 – Current Professor, Mechanical Engineering Department, University of Alabama at Birmingham, Birmingham, AL.
Aug. 2003 – Jan. 2017 Professor, Aerospace Engineering Department, Mississippi State University, Mississippi State, MS.
July 2011 – Dec. 2013 Dept. Head, Bill and Carolyn Cobb Chair, Aerospace Engineering Department, Mississippi State University, Mississippi State, MS.
July 2009 – June 2011 Interim Dept. Head, Aerospace Engineering Department, Mississippi State University, Mississippi State, MS
Aug. 1996 – Aug. 2003 Associate Professor, Aerospace Engineering Department, Mississippi State University, Mississippi State, MS.
July 1990 – Aug. 1996 Assistant Professor, Aerospace Engineering Department, Mississippi State University, Mississippi State, MS.
January – July 1990 Research Associate, Aerospace and Ocean Engineering, Virginia Polytechnic Institute and State University, Blacksburg, VA.
Sept. 1987 – Dec. 1989 Graduate Project Assistant, Aerospace and Ocean Engineering, Virginia Polytechnic Institute and State University, Blacksburg, VA.
August – Sept. 1986 Researcher, von Karman Institute of Fluid Dynamics Rhône-St.-Genève, Belgium

Professional Activities

Professional Societies:

AIAA (American Institute of Aeronautics and Astronautics, Associate Fellow)

Professional Registration: P.E., License No. 22706, State of Alabama

Refereed Journals:

AIAA Journal (Referee)

AIAA Journal of Aircraft (Referee)

AIAA Journal of Propulsion and Power (Referee)

AIAA Journal of Thermophysics and Heat Transfer (Referee)

Communications in Numerical Methods in Engineering (Referee)

Computers and Fluids (Referee)

International Journal for Numerical Methods in Fluids (Referee)

Journal of Applied Mathematics and Computations (Referee)

Journal of Computational Physics (Referee)

Meccanica – International Journal of the Italian Association of Theoretical
and Applied Mechanics (Referee)

Awards and Honors

Firestone Italia Fellowship – 1988

Graduate Student Research Award 1989-90 (Ph.D. Division) – 2nd Place

Sponsored by College of Engineering of Virginia Tech

Outstanding Research Paper in the College of Engineering – Mississippi State
University, 1993

Outstanding Research Paper in the College of Engineering – Mississippi State
University, 1995

Research Unit Award for Outstanding Contribution in Research – 1996

Medallion Certificate – Southeastern Section ASEE

Hearin Distinguished Professor – Mississippi State University, 1999/2000

Areas of Teaching and Research Specialization

Computational Fluid Dynamics

Non-Equilibrium Gas Dynamics

Thermodynamics

Compressible Aerodynamics

Engineering Mechanics

Service

American Institute of Aeronautics and Astronautics (AIAA)

Fluid Dynamics Committee
Associate Member, Spring 1994 – Winter 1997
Library Advisory Council
Member, July 2012 – present

SECTAM-XX (SouthEastern Conference on Theoretical and Applied Mechanics)

Member, Editorial Committee, Fall 1999 – Spring 2000

ICNPAA-2000 (3rd International Conference on Nonlinear Problems in Aviation and Aerospace)

Member, International Organizing Committee, Fall 1999 – Spring 2000

American Society for Engineering Education (ASEE)

NDSEG (National Defense Science and Engineering Graduate) Fellowship
Annual Review Panelist, 2/07, 2/08, 2/11. Panel Chair 2/09.
NASA Aeronautics Scholarships
Annual Review Panelist, 2/09.

ABET (in conjunction with AIAA)

Program Evaluator (PeV)
Aerospace Engineering Programs, 2012 – present

National Science Foundation (NSF)

GRFP (Graduate Research Fellowship Program)
Annual Review Panelist, 2/13

University of Alabama at Birmingham (UAB)

School of Engineering at UAB

Undergraduate Committee
Member, January 2017 – present
Chair, June 2017 – present

Department of Mechanical Engineering at UAB

Undergraduate Program Director
January 2017 – present
Advisor for Mechanical Engineering Undergraduates
January 2017 – present

Mississippi State University (MSU)

University Library Committee
Member, July 1993 – June 2000, July 2002 – June 2008

Chair, July 1996 – June 1997, July 2003 – June 2004
University Committee on Courses and Curricula
Member, July 1995 – June 1998
Search Committee for the position of Dean of Libraries
Member, October 1996 – June 1997
Robert Holland Faculty Senate
Member, April 1998 – March 2004, April 2014 – June 2016
University Research Council
Faculty Senate Representative, Feb. 2000 – March 2004
International Studies and Programs Committee
Member, January 2009 – January 2017
Graduate Council
Member, July 2012 – June 2015
Search Committee for the position of Dean of the Bagley College of Engineering
Member, January – May 2013

College of Engineering at MSU

Engineering College Committee on Women and Minorities
Member, Spring 1991
Engineering College Committee on Scholarships
Member, Spring 1991 – Spring 1998
Engineering College Faculty Council
Member, January 1992 – December 1994
Coordinating Committee for Computational Engineering
Member, July 1999 – January 2017
ABET Committee on Internal Service Courses
Member, January 2005 – January 2017
Distance Education Task Force
Member, August 2008 – January 2017
Promotion and Tenure Committee
Chair, Fall 2014 – June 2015
Member, Fall 2015 – January 2017

Department of Aerospace Engineering at MSU

Library Representative
January 1991 – January 2017
Engineering Mechanics Committee
Member, January 1997 – July 2002, January 2003 – June 2009
Chair, July 2002 – Dec. 2002
Aerodynamics Committee
Member, January 1997 – July 2002
Advisor for Aerospace Engineering Seniors
January 2002 – June 2010
Scholarship Committee
Chair, January 2002 – December 2003
Graduate Committee

Chair, January 2003 – June 2009
Member, January 2015 – January 2017
Graduate Coordinator
January 2003 – June 2010
ABET Coordinator
January 2004 – June 2010
July 2012 – December 2013
Examination Committee, PhD Qualifying Examinations
Chair, Spring 2006 – Spring 2009
Promotion and Tenure Committee
Member, Fall 2006 – June 2009
Advisor for Aerospace Engineering Juniors
January 2010 – January 2017

Department of Civil and Environmental Engineering at MSU
Promotion and Tenure Committee
Member, Fall 2006, Fall 2008

Department of Computer Science and Engineering at MSU
Promotion and Tenure Committee
Member, Fall 2009

Grants and Contracts

Center-level Efforts (at MSU)

1. Served as Lead for “Reactive Flow Simulations,” a component of the efforts of the NSF-funded Engineering Research Center for Computational Field Simulations, Mississippi State University, April 1990 – April 2001 (Base funding for the entire Center from NSF: approximately \$22,000,000).
2. Served as Lead for “Multi-Phase, Reactive Flow Simulations,” a component of the efforts of the Computational Simulation and Design Center (SimCenter), Mississippi State University, 2001 to 2008.
3. Served as member of the Computational Fluid Dynamics (CFD) group, part of the Center for Advanced Vehicular Research (CAVS), Mississippi State University, 2008 to present.
4. Served as PI for the “Ultra-Light Sensor Platform (ULSP)” Program, Rspet Flight Research Laboratory, from October to December 2009. The program ran from January 2005 until December 2009. Total funding was approximately \$8,800,000. The sponsor was the US Army Space and Missile Command in Huntsville, AL.

Individual and Collaborative Efforts (at MSU)

1. “Three-Dimensional Simulations of Radiative Heat Transfer in High-Speed Fluid Flows,” Office of Research, Mississippi State, \$6,000, January–December 1991.

2. "Academic Fellowship for One Year of Graduate Study for: Gerald Pitalo," NASA Stennis Space Center, \$10,000, July 1992 – June 1993.
3. "Student Fellowship for Lorenzo Dambrosio," Polytechnic of Bari, Italy, \$10,088, January 1993 – May 1994.
4. "A Numerical Study of Hydrodynamic Dispersion in Porous Media", Waterways Experiment Station, \$53,986, May 1994 – September 1995.
5. "Multi-Block Simulations of Flows in Local Chemical Equilibrium on Parallel Architectures," NASA EPSCoR, \$41,000, January 1995 – June 1997.
6. "Enhancement of Computational Fluid Dynamics Capabilities at Lockheed Martin," (with T. Swafford and D. Whitfield), Lockheed Martin, \$175,000, March 1996 – February 1997.
7. "Connectivity: ERC at MSU and CCL at Georgia Tech," (with J.D. Trotter), NSF, \$375,466, October 1999 – September 2001.
8. "Bench Marking Support to the NASA Propulsion System Testing", NASA-Stennis, \$40,000, April – September 2000.
9. "Numerical Contaminant Transport Model Applicable to an Urban Regime Simulation," (with B. Soni and R. Koomullil), Miss. Space Commerce Initiative, \$97,280, July – November 2000.
10. "Dynamic Grid Extension to Loci-CHEM in Support of Liftoff and Debris Field Analysis," (with E.A. Luke), NASA-Marshall, \$534,450, May 2006 – February 2007.
11. "Non-Equilibrium Real Fluids Models Implemented in Loci-CHEM," (with E.A. Luke), NASA-Marshall, \$416,772, January 2007 – January 2010.
12. "Development of a Multi-Physics Coupled Analysis Framework for Hypersonic Vehicles," (with E.A. Luke and E. Blades), US Air Force, \$25,000, sub-contract for a Phase I SBIR awarded to ATA Engineering, Inc., December 2008 – December 2009.

Books

1. Cinnella, P., and Grossman, B., "Flux-Split Algorithms for Hypersonic Flows," in *Computational Methods in Hypersonic Aerodynamics*, Ed. T.K.S. Murthy, pp. 153-202, Computational Mechanics Publications, Southampton, UK, 1991.
2. Cinnella, P., and Grossman, B., "Computational Methods for Chemically Reacting Flows," in *Handbook of Fluid Dynamics and Fluid Machinery*, Eds. J.A. Schetz and A.E. Fuhs, Vol. 2, pp. 1541-1590, John Wiley & Sons, Inc., New York, NY, 1996.
3. Cinnella, P., and Cox, C.F., "Modern Computational Techniques for 3D Hypersonic Flows," in *Molecular Physics and Hypersonic Flows*, Ed. M. Capitelli, pp. 543-560, Kluwer Academic Publishers, The Netherlands, 1996.
4. Cinnella, P., and Cox, C.F., "Computational Reacting Flow," in *The Computer Science and Engineering Handbook*, Ed. A.B. Tucker, Jr., pp. 892-911, CRC Press, Boca Raton, FL, 1996.

5. Cariño, R.L., Cox, C.F., Zhu, J., and Cinnella, P., "On Building a Parallel Version of a "Real Gas" Flow Solver," in *Nonlinear Problems in Aviation and Aerospace*, Ed. S. Sivasundaram, Vol. 11, pp. 195-208, Gordon and Breach, The Netherlands, 2000.

Refereed Publications

1. Grossman, B., and Cinnella, P., "The Computation of Non-Equilibrium, Chemically-Reacting Flows," *Computers and Structures*, Vol. 30, No. 1/2, pp. 79-83, 1988.
2. Napolitano, M., and Cinnella, P., "A Numerical Study of Planar and Axially-Symmetric Sudden Expansion Flows," *Computers and Fluids*, Vol. 17, No. 1, pp. 185-193, 1989.
3. Grossman, B., and Cinnella, P., "Upwind Methods for Flows with Non-Equilibrium Chemistry and Thermodynamics", *Numerical Combustion*, Eds. A. Dervieux and B. Larrouturou, Lecture Notes in Physics, Springer Verlag, pp. 323-337, 1990.
4. Grossman, B., and Cinnella, P., "Flux-Split Algorithms for Flows with Non-Equilibrium Chemistry and Vibrational Relaxation," *Journal of Computational Physics*, Vol. 88, No. 1, pp. 131-168, 1990.
5. Walters, R.W., Cinnella, P., Slack, D.C., and Halt, D., "Characteristic Based Algorithms for Flows in Thermo-Chemical Non-Equilibrium," *AIAA Journal*, Vol. 30, No. 5, pp. 1304-1313, 1992.
6. Cinnella, P., and Cox, C.F., "Robust Algorithms for the Thermo-Chemical Properties of Real Gases," *CFD Journal*, Vol. 1, No. 2, pp. 143-154, 1992.
7. Grossman, B., Cinnella, P., and Eppard, W.M., "New Developments Pertaining to Algorithms for Non-Equilibrium Hypersonic Flows," *CFD Journal*, Vol. 1, No. 2, pp. 175-186, 1992.
8. Elbert, G.J., and Cinnella, P., "Truly Two-Dimensional Algorithms for Radiative Non-Equilibrium Flows," *Thirteenth International Conference on Numerical Methods in Fluid Mechanics*, Eds. M. Napolitano and F. Sabetta, Lecture Notes in Physics, Springer-Verlag, Berlin, 1993.
9. Szego, S., Cinnella, P., and Cunningham, A.B., "Numerical Simulation of Biofilm Processes in Closed Conduits," *Journal of Computational Physics*, Vol. 108, No. 2, pp. 246-263, 1993.
10. Cox, C.F., and Cinnella, P., "General Solution Procedure for Flows in Local Chemical Equilibrium," *AIAA Journal*, Vol. 32, No. 3, pp. 519-527, 1994.
11. Bergamini, L., and Cinnella, P., "Using the Liou-Steffen Algorithm for the Euler and Navier-Stokes Equations," *AIAA Journal*, Vol. 32, No. 3, pp. 657-659, 1994.
12. Elbert, G.J., and Cinnella, P., "Two-Dimensional Radiative Heat-Transfer Calculations for Nonequilibrium Flows," *Journal of Spacecraft and Rockets*, Vol. 32, No. 2, pp. 231-240, 1995.
13. Elbert, G.J., and Cinnella, P., "Truly Two-Dimensional Algorithms for Radiative Heat-Transfer Calculations in Reactive Flows," *Computers and Fluids*, Vol. 24, No. 5, pp. 523-552, 1995.

14. Cinnella, P., "Numerical Simulations of Reactive Flows," *ACM Computing Surveys*, Vol. 28, No. 1, pp. 93-96, 1996.
15. Yevi, G., Cinnella, P., and Zhuang, X., "On Parallelizing a Groundwater Pollution Simulator," *Applied Mathematics and Computation*, Vol. 89, pp. 313-325, 1998.
16. Westmoreland, W.S., and Cinnella, P., "Limitations of a Reduced Model for the Simulation of Hydrogen/Air Combustion," *AIAA Journal*, Vol. 36, No. 9, pp. 1752-1754, 1998.
17. Busby, M.A., and Cinnella, P., "Nonsingular Eigenvectors of the Flux Jacobian Matrix for Reactive Flow Problems," *AIAA Journal*, Vol. 37, No. 3, pp. 398-401, 1999.
18. Cao, L., Zhu, J., and Cinnella, P., "An Efficient Computational Method for Simulations of Reaction-Diffusion Processes," *Computer Physics Communications*, Vol. 126, pp. 41-46, 2000.
19. Wu, J., Tang, L., Luke, E.A., Tong, X.-L., and Cinnella, P., "Comprehensive Numerical Study of Jet-Flow Impingement over Flat Plates," *Journal of Spacecraft and Rockets*, Vol. 39, No. 3, pp. 357-366, 2002.
20. Liu, Q.Y., Luke, E.A., and Cinnella, P., "Coupling Heat Transfer and Fluid Flow Solvers for Multidisciplinary Simulations," *Journal of Thermophysics and Heat Transfer*, Vol. 19, No. 4, pp. 417-427, 2005.
21. Luke, E.A., and Cinnella, P., "Numerical simulations of mixtures of fluids using upwind algorithms," *Computers and Fluids*, Vol. 36, pp. 1547-1566, 2007.

Partially Refereed Publications

1. Grossman, B. and Cinnella, P., "The Development of Flux-Split Algorithms for Flows with Non-Equilibrium Thermodynamics and Chemical Reactions," Paper No. 88-3595-CP, AIAA/ASME/SIAM/APS 1st National Fluid Dynamics Congress, July 1988.
2. Grossman, B., Cinnella, P., and Garrett, J., "A Survey of Upwind Methods for Flows with Equilibrium and Non-Equilibrium Chemistry and Thermodynamics," Paper No. 89-1653, AIAA 24th Thermophysics Conference, June 1989.
3. Walters, R.W., Cinnella, P., Slack, D.C., and Halt, D., "Characteristic Based Algorithms for Flows in Thermo-Chemical Non-Equilibrium," Paper No. 90-0393, AIAA 28th Aerospace Sciences Meeting, January 1990.
4. Cinnella, P., and Grossman, B., "Upwind Techniques for Flows with Multiple Translational Temperatures," Paper No. 90-1660, AIAA 21st Fluid Dynamics, Plasma Dynamics and Lasers Conference, Seattle, June 1990.
5. Grossman, B., Cinnella, P., and Eppard, W.M., "Algorithms for Non-Equilibrium Hypersonic Flows," in *4th International Symposium on Computational Fluid Dynamics, A Collection of Technical Papers*, Vol. 1, pp. 443-448, University of California, Davis, 1991.
6. Cinnella, P., and Cox, C.F., "Robust Algorithms for the Thermo-Chemical Properties of Real Gases," in *4th International Symposium on Computational*

- Fluid Dynamics, A Collection of Technical Papers*, Vol. 1, pp. 216-221, University of California, Davis, 1991.
7. Cinnella, P., and Cox, C.F., "An Efficient "Black Sox" Solver for the Equilibrium Composition of Real Gases," Paper No. 91-3322-CP, in *AIAA 9th Applied Aerodynamics Conference, A Collection of Technical Papers*, Vol. 2, pp. 919-933, September 1991.
 8. Cinnella, P., and Elbert, G.J., "Two-Dimensional Radiative Heat Transfer Calculations for Flows in Thermo-Chemical Non-Equilibrium," Paper No. 92-0121, AIAA 30th Aerospace Sciences Meeting, January 1992.
 9. Elbert, G.J., and Cinnella, P., "An Axisymmetric Radiative Heat Transfer Calculations for Flows in Chemical Non-Equilibrium," Paper No. 93-0139, AIAA 31st Aerospace Sciences Meeting, January 1993.
 10. Bergamini, L., and Cinnella, P., "A Comparison of "New" and "Old" Flux-Splitting Schemes for Non-Equilibrium Flows," Paper No. 93-0876, AIAA 31st Aerospace Sciences Meeting, January 1993.
 11. Cox, C.F., and Cinnella, P., "An Approximate Riemann Solver for Arbitrary Real Gas Mixtures," Paper No. 93-0892, AIAA 31st Aerospace Sciences Meeting, January 1993.
 12. Cox, C.F., Cinnella, P., and Arabshahi, A., "Multi-Block Calculations for Flows in Local Chemical Equilibrium," Paper No. 93-2999, AIAA 24th Fluid Dynamics Conference, July 1993.
 13. Szego, S., Cinnella, P., and Cunningham, A.B., "On the Finite Volume Technique for Unsteady, Multi-Phase, Reactive Flows: Biofilms in Closed Conduits," Paper No. 93-3326-CP, in *A Collection of Technical Papers, 11th AIAA Computational Fluid Dynamics Conference*, Vol. 1, pp. 315-327, July 1993, reprinted in *Field Points*, Vol. 3, No. 2, Fall 1993.
 14. Wei, S., Zhu, J., Cox, C.F., and Cinnella, P., "On the Parallelization of a Three-Dimensional "Real Gas" Flow Solver," Paper No. 95-0571, AIAA 33rd Aerospace Sciences Meeting, January 1995.
 15. Yevi, G., and Cinnella, P., "Simulation of Pollutant Dispersion in Porous Media Via a Network Model," in *Sixth International Symposium on Computational Fluid Dynamics, A Collection of Technical Papers*, Vol. 3, pp. 1455-1460, Lake Tahoe, Nevada, September 1995.
 16. Cariño, R.L., Zhu, J., Cox, C.F., and Cinnella, P., "Parallel Performance of a Three-Dimensional Viscous Multi-Block "Real Gas" Flow Solver," in *Proceedings of the First International Conference on Nonlinear Problems in Aviation and Aerospace*, Ed. S. Sivasundaram, pp. 103-108, Embry-Riddle Aeronautical University Press, Daytona Beach, FL, 1996.
 17. Busby, M.A., and Cinnella, P., "Steps Toward more Accurate and Efficient Simulations of Reactive Flows," Paper No. 98-2425, AIAA 29th Fluid Dynamics Conference, July 1998.
 18. Zaccanti, M.R., and Cinnella, P., "Analysis of Preconditioning Methods for the Euler Equations," Paper No. 99-3264, in *A Collection of the 14th AIAA Computational Fluid Dynamics Conference Technical Papers*, Vol. 1, pp. 128-162, June/July 1999.

19. Cao, L., Zhu, J., and Cinnella, P., "A Multiscale Algorithm for Solving Reaction-Diffusion Equations," in *Second International Conference on Nonlinear Problems in Aviation and Aerospace*, Ed. S. Sivasundaram, Vol. 1, pp. 131-138, European Conference Publications, Cambridge, UK, 1999.
20. Tong, X.-L., Luke, E.A., and Cinnella, P., "Numerical Computation of Chemically Reactive Turbulent Flows Implemented Within the Loci System," Paper No. FM-19, in *Developments in Theoretical and Applied Mechanics*, Eds. H.V. Tippur and P.K. Raju, Vol. 20, pp. 166-173, College of Engineering, Auburn University, 2000.
21. Wu, J., Tang, L., Tong, X.-L., Luke, E.A., and Cinnella, P., "Numerical Simulation of Under-Expanded Jet Impingement," Paper No. FM-20, in *Developments in Theoretical and Applied Mechanics*, Eds. H.V. Tippur and P.K. Raju, Vol. 20, pp. 174-181, College of Engineering, Auburn University, 2000.
22. Zaccanti, M.R., and Cinnella, P., "An Evaluation of the Numerical Performance of Preconditioning Methods for the Two-Dimensional Euler Equations," Paper No. FM-22, in *Developments in Theoretical and Applied Mechanics*, Eds. H.V. Tippur and P.K. Raju, Vol. 20, pp. 190-197, College of Engineering, Auburn University, 2000.
23. Zaccanti, M.R., and Cinnella, P., "Effective Preconditioning Methods for the Euler Equations," Paper No. 2000-2253, AIAA Fluids 2000 Conference, June 2000.
24. Wu, J., Tang, L., Luke, E.A., Tong, X.-L., and Cinnella, P., "A Comprehensive Numerical Study of Jet Flow Impingement over Flat Plates at Varied Angles," Paper No. 2001-0745, AIAA 39th Aerospace Sciences Meeting, January 2001.
25. Luke, E.A., Tong, X.-L., Wu, J., Tang, L., and Cinnella, P., "A Step Towards 'Shape-Shifting' Algorithms: Reactive Flow Simulations Using Generalized Grids," Paper No. 2001-0897, AIAA 39th Aerospace Sciences Meeting, January 2001.
26. Adhikara, K.V., Zhu, J., Luke, E.A., and Cinnella, P., "An Implicit Local Time Stepping Algorithm for Calculating Accurate Unsteady Solutions," in *Proceedings of the 2000 International Conference on Nonlinear Problems in Aviation and Aerospace*, Ed. S. Sivasundaram, Vol. 1, pp. 1-10, European Conference Publications, Cambridge, UK, 2001.
27. Wu, J., Tang, L., Luke, E.A., and Cinnella, P., "A Low Mach Number Preconditioning Scheme of the Reactive Roe Flux," Paper No. 2003-0307, 41st AIAA Aerospace Sciences Meeting, January 2003.
28. Yildirim, B., and Cinnella, P., "On the Validation of a Global Preconditioner for the Euler Equations," Paper No. 2004-0740, 42nd AIAA Aerospace Sciences Meeting, January 2004.
29. Liu, Q., Luke, E.A., Cinnella, P., and Tang, L., "Coupling Heat Transfer and Fluid Flow Solvers for Multi-Disciplinary Simulations," Paper No. 2004-0996, 42nd AIAA Aerospace Sciences Meeting, January 2004.
30. Cinnella, P., Luke, E. A., and Tong, X.-L., "A Thermodynamic Model for Chemically Reacting, Two-Phase Fluids," Paper No. 2006-1291, 44th AIAA Aerospace Sciences Meeting, 2006.

31. Luke, E. A., Tong, X.-L., and Cinnella, P., "Numerical Simulations of Fluids with a General Equation of State, Paper No. 2006-1295, 44th AIAA Aerospace Sciences Meeting, 2006.
32. Cinnella, P., Bridges, D.H., and Vizzini, A.J., "Designing a Self-Assessment Process for ABET Accreditation," Paper No. 2007-0300, 45th AIAA Aerospace Sciences Meeting, 2007.
33. Cinnella, P. and Gaiaschi, P., "Enhanced Models for Mixtures of Fluids in Chemical Equilibrium at High Pressures," Paper No. 2007-4160, 37th AIAA Fluid Dynamics Conference, 2007.
34. Cinnella, P., and Gaiaschi, P., "Simulations of Mixtures of Fluids in Chemical Equilibrium at High Pressures" Paper No. 2009-4037, 39th AIAA Fluid Dynamics Conference, 2009.
35. Ballard, J.R., Cinnella, P., and Howington, S.E., "A Heat and Fluid Transport Simulation of a Soil-Root-Stem System," Paper No. 2009-4042, 39th AIAA Fluid Dynamics Conference, 2009.
36. Ballard, J. R., Howington, S.E., Cinnella, P., and Smith, J. A., "Simulated Seasonal Spatio-Temporal Patterns of Soil Moisture, Temperature, and Net Radiation in a Deciduous Forest," IGARSS 2011 Conference, Vancouver CA, 2011.

Invited Presentations

1. Grossman, B., Cinnella, P., and Eppard, W. M., "Flux-Split Methods in Non-Equilibrium Flows," International Conference on Mathematical Models and Continuum Mechanics, Novosibirsk, USSR, May 1991.
2. Cinnella, P., and Cox, C.F., "Advances in Flux-Split Algorithms for Chemically Reacting Flows," in *First Industry/Academy Symposium on Research for Future Supersonic and Hypersonic Vehicles*, Eds. A. Homaifar and J.C. Kelly, Jr., pp. 598-604, TSI Press Series, Albuquerque, NM, 1994.
3. Cao, L., Zhu, J., and Cinnella, P., "An Efficient Computational Method for the Simulations of Reaction-Diffusion Process," First International Conference on Modern Trends in Computational Physics, Dubna, Russia, 1998.
4. Cinnella, P., "On the Quest for Accurate Simulations of Non-Equilibrium Flows," in *Second International Conference on Nonlinear Problems in Aviation and Aerospace*, Ed. S. Sivasundaram, Vol. 1, pp. 157-164, European Conference Publications, Cambridge, UK, 1999.

Reports and Presentations

1. Cinnella, P., "Grid Generation Using Poisson's Equations," Report No. 1986-34, von Karman Institute for Fluid Dynamics, Belgium, 1986.
2. Grossman, B., and Cinnella, P., "Flux-Split Algorithms for Flows with Non-Equilibrium Chemistry and Vibrations Relaxation," ICAM Report No. 88-08-03, Virginia Polytechnic Institute and State University, 1988.

3. Grossman, B., and Cinnella, P., "An Approximate Riemann Solver for Flows with Non-Equilibrium Chemistry and Vibrational Relaxation," Paper No. DA-4, Division of Fluid Mechanics Annual Meeting, American Physical Society, 1988.
4. Walters, R.W., Cinnella, P., and Slack, D.C., "A Status Report on GASP - A General Aerodynamic Simulation Program," Paper No. 9, Seventh National Aero-Space Plane Symposium, 1989.
5. Grossman, B., and Cinnella, P., "Gas-Dynamics of Non-Equilibrium Flows with Multiple Temperature Models," Paper No. BE-3, Division of Fluid Mechanics Annual Meeting, American Physical Society, 1989.
6. Cinnella, P., and Grossman, B., "A Study of Non-Equilibrium Flows with Multiple Translational Temperatures", Open Forum, AIAA 28th Aerospace Sciences Meeting, 1990.
7. Walters, R.W., Cinnella, P., and Slack, D.C., "Code Enhancements and Validation of GASP," Paper No. 44, 8th National Aero-Space Plane Symposium, 1990.
8. Cinnella, P., and Grossman, B., "Flux-Split Algorithms for Flows with Multiple Translational Temperatures," ICAM Report No. 90-06-01, Virginia Polytechnic Institute and State University, 1990.
9. Walters, R.W., Slack, D.C., Cinnella, P., Applebaum, M., and Frost, C., "A User's Guide to GASP," NASA Langley Research Center, 1990.
10. Janus, J.M., Cox, C.F., Arabshahi, A., Cinnella, P., and Whitfield, D.L., "Numerical Solution and Algorithm Analysis for the Unsteady Navier-Stokes Equations on Dynamic Multiblock Grids Including Chemical Equilibrium," Vol. 2, Report No. WL-TR-92-7044, Wright Laboratory, 1992.
11. Cox, C.F., and Cinnella, P., "Multi-Block Simulations of Real Gas Flows," Mississippi State Annual Conference on Differential Equations and Computational Simulations, Miss. State, MS, 1993.
12. Elbert, G.J., and Cinnella, P., "Truly Two-Dimensional Algorithms for Radiative Heat Transfer Calculations in Reactive Flows," Report No. MSSU-EIRS-ASE-94-3, Mississippi State University, 1994.
13. Yevi, G., and Cinnella, P., "A Network Model for the Dispersion of Reactants in Porous Media," Third SIAM Conference on Mathematical and Computational Issues in the Geosciences, 1995.
14. Yevi, G., Cinnella, P., and Zhuang, X., "Performance Notes for Parallel Simulation of Groundwater Contaminants Transport," Second Mississippi State Conference on Differential Equations and Computational Simulations, Miss. State, MS, 1995.
15. Cox, C.F., Cinnella, P., and Westmoreland, S., "Progress Towards an Efficient and General CFD Tool for Propulsion Design/Analysis," in *Thirteenth Workshop for Computational Fluid Dynamics Applications in Rocket Propulsion and Launch Vehicle Technology*, NASA Conference Publication No. 3332, Vol. 1, pp. 593-611, 1995.
16. Westmoreland, S., and Cinnella, P., "Numerical Solution of the Euler Equations with Nonequilibrium Chemistry," Third Mississippi State

- Conference on Differential Equations and Computational Simulations, Miss. State, MS, 1997.
17. Zaccanti, M.R., and Cinnella, P., "Exploration of 1-D Preconditioning Methods for the Euler Equations," Fourth Mississippi State Conference on Differential Equations and Computational Simulations, Miss. State, MS, 1999.
 18. Tong, X.-L., Luke, E.A., and Cinnella, P., "Numerical Computation of Non-Equilibrium Chemically Reactive Flows Implemented Within the LOCI System," Fourth Mississippi State Conference on Differential Equations and Computational Simulations, Miss. State, MS, 1999.
 19. Cinnella, P., "Challenges in the Simulation of Complex Non-Equilibrium Flows," Paper No. FM-21, Twentieth Southeastern Conference on Theoretical and Applied Mechanics, Callaway Gardens, GA, 2000.
 20. Wu, J., Tang, L., Tong, X.-L., Luke, E.A., and Cinnella, P., "Numerical Simulations of Jet Impingement and Jet Separation," Report No. MSSU-ASE-00-2, Mississippi State University, 2000.
 21. Wang, L., Wu, J., and Cinnella, P., "Simulations of Pollutant Release and Transport in an Urban Environment," Fifth Mississippi State Conference on Differential Equations and Computational Simulations, Miss. State, MS, 2001.
 22. Luke, E.A., Tong, X.-L., Wu, J., and Cinnella, P., "CHEM 2: A Finite-Rate Viscous Chemistry Solver – The User Guide," Report No. MSSU-COE-ERC-04-07, Mississippi State University, 2004.
 23. Nasir, S. A., Brewer, W. H., and Cinnella, P., "An accurate unstructured simulation of a wingtip vortex," *Poster session*, Harvey Mudd College Mathematics Conference on Scientific Computing, 2005.
 24. Cinnella, P., *Book Review*, "Computational Fluid Dynamics for Engineers," by T. Cebeci, J. P. Shao, F. Kafyeke, and E. Laurendeau, *AIAA Journal*, Vol. 44, No. 11, pp. 2812-2814, 2006.

Students Advised

Theses at MSU (*ASE = Aerospace Eng., CME = Computational Eng.*)

1. Bergamini, L., "Towards more Robust and Efficient Upwind Solvers for all Mach Numbers: A Preliminary Study," Mississippi State University, May 1993 (ASE).
2. Westmoreland, W.S., "Numerical Solution of the Euler Equations with Nonequilibrium Chemistry," Mississippi State University, May 1997 (ASE).
3. Darapuram, R.V., "An Investigation of Flux-Splitting Algorithms for Chemically Reacting Flows," Mississippi State University, May 2001 (CME).
4. Wang, L., "Simulation of Pollutant Transport in an Urban Area," Mississippi State University, May 2002 (CME).
5. Yildirim, B. "A Global Preconditioning Method for the Euler Equations," Mississippi State University, Dec. 2003 (ASE).

- Gaiaschi, P. "Enhanced Models for Mixtures of Fluids in Chemical Equilibrium at High Pressures," Mississippi State University, Dec. 2008 (ASE).

Dissertations at MSU (*ASE = Aerospace Eng., CME = Computational Eng., ME = Mechanical Eng.*)

- Cox, C.F., "An Efficient Solver for Flows in Local Chemical Equilibrium," Mississippi State University, December 1992 (ME).
- Elbert, G.J., "Two Dimensional and Axisymmetric Radiative Heat Transfer for Hypersonic Flows in Chemical Nonequilibrium," Mississippi State University, December 1992 (ASE).
- Yevi, G.Y., "Numerical Simulation of Nonlocal Transport of Reacting Solutes in Porous Media," Mississippi State University, August 1996 (CME).
- Busby, M.A., "Steps Toward More Accurate and Efficient Simulations of Reactive Flows," Mississippi State University, August 1997 (ASE).
- Zaccanti, M.R., "Analysis and Design of Preconditioning Methods for the Euler Equations," Mississippi State University, December 1999 (ASE).
- Pitalo, G.A., "Numerical Modeling of Boundary-Layer Cooling of Rocket Engine Combustion Chambers," Mississippi State University, December 2000 (ASE).
- Liu, Q., "Coupling Heat Transfer and Fluid Flow Solvers for Multi-Disciplinary Simulations," Mississippi State University, December 2003 (CME).
- Ballard, J.R. "A Three-Dimensional Heat and Mass Transport Model for a Tree within a Forest", Mississippi State University, May 2011 (CME).
- Liang, L., "Simulation of multispecies gas flows using the Discontinuous Galerkin method," Mississippi State University, December 2012 (ASE).

Courses Taught

Graduate Courses and Seminars

- AOE 5114, High-Speed Aerodynamics, Virginia Polytechnic Institute and State University, Spring 1990.
- Workshop on the Use of GASP, NASA Langley Research Center, Short Course (with R.W. Walters and D.C. Slack), November 1990.
- ASE 8333, Physical Gas Dynamics, Mississippi State University, Spring 1991 (offered for the first time), Spring 1995, Spring 1997, Spring 1999.
- Numerical Simulation of Reactive Flows, Polytechnic of Bari, Italy, Short Course, May 1993.
- ASE 7993, Computational Fluid Dynamics III, Mississippi State University, Fall 1993 (offered for the first time).
- Physical Gas Dynamics, Polytechnic of Bari, Italy, Short Course, December 1995.

7. Modeling of Turbulence, Polytechnic of Bari, Italy, Short Course, December 1997.
8. ASE 8423, Computational Fluid Dynamics II, Mississippi State University, Spring 1999.
9. Flux-Split Algorithms for the Euler and Navier-Stokes Equations, Polytechnic of Bari, Italy, Short Course, May 2000.
10. Fundamentals of Aeroacoustics, Polytechnic of Bari, Italy, Short Course, May 2002.
11. ASE/ME 8363, Computational Heat Transfer, Mississippi State University, Fall 2003, Fall 2008.
12. Computational Heat Transfer, Polytechnic of Bari, Italy, Short Course, May 2004.
13. ASE 8353, Advanced Compressible Aerodynamics II, Mississippi State University, Spring 2006, Spring 2007, Spring 2008, Spring 2015.
14. Topics in Applied Aerodynamics, Polytechnic of Bari, Italy, Short Course, June 2006.
15. ASE 8990, Advanced Space Propulsion, Mississippi State University, Spring 2008 (offered for the first time), Spring 2009.

Undergraduate Courses

1. EM 3313 (Fluid Mechanics), Mississippi State University, Fall 1990, Fall 1992, Spring 1994, Fall 1996, Fall 2002, Spring 2003, Spring 2014, Spring 2015, Spring 2016.
2. EM 2433 (Engineering Mechanics II), Mississippi State University, Spring 1992, Spring 1993 (2 sections), Fall 1995, Fall 1997, Fall 1998 (2 sections), Fall 1999 (2 sections), Fall 2000 (2 sections), Fall 2001 (2 sections), Spring 2002 (2 sections), Summer 2002.
3. EM 2413 (Engineering Mechanics I), Mississippi State University, Fall 1993, Spring 1994, Fall 1994, Spring 1996, Spring 1998, Spring 2000 (2 sections), Spring 2001, Fall 2002.
4. ASE 4343 (Compressible Aerodynamics), Mississippi State University, Fall 1994, Fall 1995, Fall 1996, Fall 1997, Fall 2003, Fall 2004, Fall 2005.
5. ASE 4413 (Aerospace Propulsion), Mississippi State University, Spring 1995, Spring 1996, Spring 1997, Spring 1998.
6. ASE 3333 (Aerothermodynamics), Mississippi State University, Fall 2005, Fall 2006, Fall 2007, Fall 2008, Fall 2010, Fall 2011, Fall 2012, Fall 2013, Fall 2014, Fall 2015, Fall 2016.
7. ME 215 (Dynamics), University of Alabama at Birmingham, Spring 2017.