

MIHIR SEN
CURRICULUM VITAE

Notre Dame, Indiana
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Educational Background

Undergraduate

1963–1968
Bachelor of Technology in Mechanical Engineering (First Class)
Indian Institute of Technology, Madras, India
Thesis project: Design of a four-stage radial compressor
Advisor: Dr.-Ing. W. Scheer

Graduate

1968–1970
Department of Mechanics
The Johns Hopkins University
Baltimore, Maryland
Thesis: Design, construction and experiments with a hot-wire anemometer vorticity meter
Advisor: Professor L.S.G. Kovásznyai

1970–1974
Doctor of Science with specialization in Fluid Mechanics
Department of Aeronautics and Astronautics, Massachusetts Institute of Technology, Cambridge, Massachusetts
Thesis: Interaction between scales in the problem of wave generation by wind
Advisor: Professor E. Mollo-Christensen (Department of Meteorology)
Doctoral Committee: Professor D.J. Benney (Department of Mathematics), Professor M.T. Landahl (Department of Aeronautics and Astronautics), Professor S. Widnall (Department of Aeronautics and Astronautics)

Continuing Education Courses

1. Finite Element Analysis in Fluid Dynamics, one-week course organized by the Center for Continuing Education in Engineering, University of Texas, Austin, Texas, July 1979. Professors: J.T. Oden, Univ. of Texas, Austin; T.J. Chung, Univ. of Alabama, Huntsville; A.J. Baker, Univ. of Tennessee, Knoxville.
2. Non-Linear Partial Differential Equations, one-week course organized by the Faculty of Engineering, U.N.A.M., March 1980. Professor: W.F. Ames, Georgia Institute of Technology, Atlanta.
3. Fundamentals of Compressed Air Systems, June 1999, one-day course organized by the Department of Energy.

Scholarships and Fellowships

1. Merit Scholarship, Indian Institute of Technology, Madras, India, 1963–1968.
2. Whitehead Fellowship, The Johns Hopkins University, Baltimore, MD, academic year 1968–1969.
3. Du Pont Memorial Fellowship, Massachusetts Institute of Technology, Cambridge, MA, academic year 1970–1971.

Professional Experience

Predoctoral

1. Practical Training, Larsen & Toubro, Ltd., Bombay, India, two months 1967.
2. Research Assistant to Professor L.S.G. Kovásznyai, The Johns Hopkins University, Baltimore, MD, 1969–1970.
3. Teaching Assistant to Professor W.S. Lewellen, Massachusetts Institute of Technology, Cambridge, MA, one semester 1971.
4. Research Assistant to Professor E. Mollo-Christensen, Massachusetts Institute of Technology, Cambridge, MA, 1971–1974.

Postdoctoral

1. Post-doctoral Fellow, Department of Meteorology, Massachusetts Institute of Technology, Cambridge, MA, Oct. 1974–Feb. 1975.
2. Professor Titular A¹, Faculty of Engineering, National University of Mexico (U.N.A.M.), Mexico City, 1975–1976.
3. Visiting Professor, Faculty of Engineering, National University of Mexico (U.N.A.M.), Mexico City, 1976–1978.
4. Professor Titular B², Faculty of Engineering, National University of Mexico (U.N.A.M.), Mexico City, 1978–1981.
5. Professor Titular C Definitivo³, Faculty of Engineering, National University of Mexico (U.N.A.M.), Mexico City, 1981–1986.
6. Visiting Professor, Sibley School of Mechanical and Aerospace Engineering, Cornell University, Ithaca, NY, 1985–1986 (while on sabbatical from U.N.A.M.).
7. Associate Professor, Department of Aerospace and Mechanical Engineering, University of Notre Dame, Notre Dame, IN, Aug. 1986– (tenured 1989).
8. Full Professor, Department of Aerospace and Mechanical Engineering, University of Notre Dame, Notre Dame, IN, Aug. 1994–.

Consulting and Other Activities

1. Research Consultant to the Department of Solar Energy, Institute of Materials Research, National University of Mexico (U.N.A.M.), Mexico City, 1981–1983.
2. Research Consultant to the Institute of Engineering, National University of Mexico (U.N.A.M.), Mexico City, 1984–1985.
3. Consultant to Sundstrand Heat Transfer, Inc., Dowagiac, Michigan, summer 1989.
4. Consultant to the Industrial Assessment Center, University of Notre Dame, 1996–2000.
5. University of Notre Dame London Program, Aug.–Dec. 2000, 2004.
6. Sabbatical at the Department of Thermo and Fluid Dynamics, Chalmers University of Technology, Göteborg, Sweden, Jan.–Aug. 2001.
7. Summer research, Department of Thermo and Fluid Dynamics, Chalmers University of Technology, Göteborg, Sweden, May–July 2002.

¹Roughly corresponds to Assistant Professor.

²Roughly corresponds to Associate Professor.

³Roughly corresponds to Full Professor with tenure.

Professional Recognition and Honors

1. Appointed National Researcher (Level II) by the National Research System (SNI) of the Government of Mexico, July 1984.
2. National Academy of Engineering (Mexico), Elected Coordinator for Mechanical Engineering (1980–1983).
3. Appointed Associate Ed for America, International Journal of Heat and Technology, published by CNR, Italy, 1986.
4. Listed in
 - (a) Who's Who in Technology, 6th Edition, (Ed.) A.L. Unterburger, Gale Research, Detroit, 1988–1989.
 - (b) Who's Who among Asian Americans, Gale Research, Detroit, MI, 1994.
 - (c) American Men and Women of Science, R.R. Bowker, New Providence, N.J., 1995–1996.
 - (d) The International Directory of Distinguished Leadership, American Biographical Institute, Raleigh, NC, 1994.
 - (e) Who's Who in Science and Engineering, Third Edition, 1996–1997, Marquis Who's Who, New Providence, NJ, 1996.
 - (f) Who's Who in the World, Seventeenth Edition, 2000, Marquis Who's Who, New Providence, NJ, 1996.
 - (g) Lexington Who's Who Registry, 1999/2000 Edition, Garden City, NJ.
5. Elected Fellow of the ASME, 1999.
6. “Master Mentor,” University of Notre Dame, 1999.
7. Fulbright Visiting Lecturer, Department of Mechanical Engineering, Indian Institute of Technology, Kanpur, India, April–May, 2000.
8. Kaneb Teaching Award, College of Engineering, University of Notre Dame, 2001.
9. Rev. Edmund P. Joyce, C.S.C., Award for Excellence in Undergraduate Teaching, 2009.

Professional Membership and Service

Membership

1. American Society for Mechanical Engineers (ASME), Student Member (1968–1970), Associate Member (1977–1979), Member (1979–1999), Fellow (1999–).
2. American Society for Engineering Education (ASEE), Member (1977–).
3. M.I.T. Chapter of the Society of the Sigma Xi (1973).
4. Institution of Engineers (India), Member (1978–).
5. National Academy of Engineering (Mexico), Life Member (1978–).
6. American Physical Society (APS), Member (1982–).
7. Combustion Institute (Mexican Section), Member (1982–1985).
8. Mexican Society of Heat Transfer (affiliated to the International Society) Founder Member (1983–), Vice-President (1983–1985).
9. New York Academy of Science, Member (1985–1986).
10. American Association for the Advancement of Science (AAAS), Member (1986–).
11. Society for Industrial and Applied Mathematics (SIAM), Member (1986–).

Professional Activities

1. National Academy of Engineering (Mexico): Organizer of Mechanical Engineering sessions in Annual Congresses (1980–1983), President of Organizing Committee for VIII Annual Congress in Torreón, Mexico, 1982.
2. Second Mexican National Symposium on Thermal Sciences (1985): Member of Organizing Committee.
3. Mexican Society of Heat Transfer (affiliated to the International Society): Vice-President (1983–1985).
4. Selected by ASME to check ABET requirements in Mexican engineering schools.
5. Member of Steering Committee, Mid-West Fluid Mechanics Retreat, 1989–1990.

6. Chairman of session on Thermofluids, XVII Congress of the National Academy of Engineering (Mexico), Monterrey, Mexico, Sept. 1991.
7. Member of International Organizing Committee, First International Thermal Energy Congress, Marrakesh, Morocco, June 1993.
8. Chairman of sessions on (a) Hydraulic and Other Equipment, and (b) Heat and Mass Transfer, in II Latinamerican Conference on Turbomachinery, Cuernavaca, Mexico, Feb. 1993.
9. Member of International Committee, and Chairman of (a) Plenary and (b) Natural and Mixed Convection Sessions, in First International Thermal Energy Congress, Marrakesh, Morocco, June 1993.
10. Member of Latin American Committee on Heat and Mass Transfer (1996-).
11. Member of Scientific Committee, Seventh Latin American Congress on Heat and Mass Transfer, Salta, Argentina, Oct., 1998.
12. Member of Organizing Committee, 52nd Annual Meeting, American Physical Society Division of Fluid Dynamics, New Orleans, LA, 1999.
13. Co-organizer, Minisymposium on Turbulence as a Dynamical System, 2nd Annual Meeting, American Physical Society Division of Fluid Dynamics, New Orleans, LA, 1999.
14. Coordinating Scientist for USA, 5th ISHMT-ASME Heat and Mass Transfer Conference and 16th National Heat and Mass Transfer Conference, Calcutta, Jan. 2002.
15. Member of Scientific Committee, Eighth Latin American Congress on Heat and Mass Transfer, Veracruz, Mexico, 2001.
16. Member of Organizing Committee, Ninth Latin American Congress on Heat and Mass Transfer, San Juan, Puerto Rico, Oct. 2002.
17. Co-Organizer, Symposium on Flow Manipulation for Heat Transfer Enhancement, ASME 2nd Joint U.S.-European Fluids Engineering Summer Meeting, July 17-20, 2006, Miami, FL.
18. Co-Organizer, Symposium on Flow Manipulation and Active Control in the 5th Joint ASME/JSME Fluids Engineering Summer Conference, Jul. 30-Aug. 02, 2007, San Diego, CA.
19. Co-Organizer, Third Symposium on Flow Manipulation and Active Control in the ASME Fluids Engineering Division Summer Conference, Aug. 10-14, 2008, Jacksonville, FL.

Service at National University of Mexico

1. Appointed by the Council and Director of the Faculty of Engineering, National University of Mexico (U.N.A.M.), Mexico City, as Member of the Committee on Appointments and Promotions of the Division of Graduate Studies (1981-1984).
2. Appointed by the Head of the Division of Mechanical and Electrical Engineering, National University of Mexico (U.N.A.M.), Mexico City, as Coordinator of all Fluid Mechanics courses (1981-1985).
3. Commissioned by the Mexican Council of Science and Technology (CONACYT) to visit India and write a report on the state of Indian science and technology (1981).
4. Member of Examining Board for the students of the Faculty of Engineering, U.N.A.M., External Member for Anahuac University and Iberoamericana University, Mexico.
5. Member of Examining Board for promotion of professors of the Metropolitan University and the National School for Professional Studies, Mexico.

Service at Notre Dame

1. Mechanical Engineering Undergraduate Curriculum Committee (1988-97).
2. Faculty advisor for Departmental Graduate Student Conference (1987-1989).
3. College of Engineering Computational Methods Advisory Committee (1988).
4. College of Engineering Fluid Mechanics and Transport Phenomena Advisory Committee (1988).
5. Elected to Department of Aerospace and Mechanical Engineering Committee on Appointments and Promotions (1989-1992, 1992-1995, 1995-1998, 1998-2001, 2007-2010).
6. Department of Aerospace and Mechanical Engineering Graduate Studies Committee (1989-1992, Director 1990-1992).
7. Graduate School Liaison for minority students (1993-1994).
8. Member of Search Committee for Associate Provost (1995).

9. Member of Search Committee for Chairman of Department of Aerospace and Mechanical Engineering (1996).
10. College of Engineering Undergraduate Studies Committee (1993–1996, 1999–2002).
11. Elected College of Engineering representative to University Committee on International Studies (1993–1998).
12. Elected member of the College of Engineering Council (1998–2001).
13. Elected member of the University Graduate Council (1998–2001).
14. Member of the Department Honesty Committee (2001–2002).
15. Elected member of the University Academic Council (2002–2005).
16. Member of University Committee on Libraries (2003–2004).
17. Member of University Council for Academic Technologies (2006–2007).

Short Courses Taught

Faculty of Engineering, National University of Mexico

1. Partial differential equations, intersemestral course for staff and students, 1976.
2. Introduction to measurement systems, intersemestral course for staff and students, 1979.
3. Dynamic measurement, part of a course on Stress Measurements in Continuum Mechanics organized by the Center for Continuing Education of the Faculty of Engineering, 1978.
4. Finite elements in thermofluids, part of a course on Finite Elements in Mechanical Engineering organized by the Center for Continuing Education of the Faculty of Engineering, April 1982, March 1983, March 1984 and Feb. 1985.
5. Numerical methods applied to thermofluids problems, intersemestral course for staff and students, Nov. 1983.
6. Thermal control, two-day course for graduate students, Oct. 2003.

Other Institutions

1. Mechanics of fluids, in the Technical Week of Electromechanical Engineering, Regional Technological Institute, Juchitán, Oaxaca, Mexico, March 1978.
2. Fluid mechanics, part of the course Fundamentals of Mechanical Engineering for the staff of the University of Zacatecas, Zacatecas, Mexico, April 1978.
3. Experimental methods, part of a course on Continuum Mechanics, Ninth Engineering Week, University of Querétaro, Querétaro, Mexico, Dec. 1980.
4. Heat transfer, course given to the staff of the Regional Technological Institute, Querétaro, Mexico, Dec. 1980.
5. Applied mathematics, part of a course on Nuclear Technology organized by the National Institute of Nuclear Research, Mexico City, Mexico, July 1980.
6. Hot-wire and hot-film anemometry, course organized by the University of Michoacán, Morelia, Mexico, Sept. 1981.
7. Boundary layer theory, course organized by the Faculty of Higher Studies, Cuautitlán (U.N.A.M.), Mexico, April 1982.
8. Hot-wire and laser Doppler anemometry, course organized by the Metropolitan University, Mexico City, Mexico, June 1982.
9. Experimental methods in fluid mechanics, course given to the staff of the Regional Technological Institute, Hermosillo, Sonora, Mexico, Aug. 1982.
10. Heat transfer, course organized by the Faculty of Higher Studies, Cuautitlán, U.N.A.M., Mexico, April 1983.
11. Numerical methods in fluid mechanics, part of a course in Fluid Mechanics given to the graduate students of the University of Guanajuato, Salamanca, Mexico, Aug. 1984.
12. Lectures on stability, Bifurcations and Chaos in Thermal Systems, Oct. 19–23, 1992, Universidad Simón Bolívar, Caracas, Venezuela.
13. Modeling by intelligent systems, June 7–11, 2007, 10 hours, Universidad Politécnica de Valencia in Alcoy, Spain.

Journal and Proposal Review

1. National Academy of Engineering (Mexico) Annual Congress: Occasional reviewer in Thermofluids area (1977–).
2. Applied Mechanics Review, published by the ASME: Reviewer (1983).
3. International Journal of Heat and Technology, published by Pitagora Editrice, Bologna, Italy, under the auspices of the National Research Council of Italy (CNR): Member of the Editorial Advisory Board (1983–), Associate Editor for America (1986–).
4. Revista de la Sociedad Mexicana de Ingeniería Mecánica, Member of Editorial Committee (2003–).
5. Occasional reviewer for the following journals: Geotermia, Mexican Federal Electricity Commission; Journal of the National Academy of Engineering (Mexico); Ingeniería Mecánica: Tecnología y Desarrollo, SOMIM; International Journal of Heat and Mass Transfer, Pergamon Press; Numerical Heat Transfer, Hemisphere Publishing Corporation; Experimental Thermal and Fluid Science, Elsevier; Advances in Water Resources, CML Publications; American Institute of Aeronautics and Astronautics Journal, AIAA; Journal of Thermophysics and Heat Transfer, AIAA; Journal of Fluid Mechanics, Cambridge University Press; Mechanics Research Communications, Pergamon Press; Journal of Fluids Engineering, ASME; Physics of Fluids, American Institute of Physics; Chemical Engineering Science, Elsevier; Chemical Engineering Communications, Gordon and Breach; Journal of Heat Transfer, ASME; American Institute of Chemical Engineers Journal, AIChE; Chaos, American Institute of Physics; Numerical Methods for Partial Differential Equations, Wiley; International Journal of Modelling and Simulation, IASTED; Aerosol Science and Technology, Taylor & Francis; International Journal for Numerical Methods in Engineering, Wiley; Experiments in Fluids, Springer; Heat Transfer Engineering, Taylor & Francis; Revista de la Sociedad Mexicana de Física, SMF; Journal of Enhanced Heat Transfer, Gordon and Breach; International Journal of Control and Intelligent Systems, ACTA Press; Acta Mechanica, Springer; Microscale Thermophysical Engineering, Taylor & Francis; Journal of Petroleum Science & Engineering, Elsevier; Applied Thermal Engineering, Elsevier; Experimental Heat Transfer, Taylor & Francis; Transactions on Components and Packaging Technologies, IEEE; International Journal of Vehicle System Modelling and Testing, Interscience Publishers; Lasers in Surgery and Medicine, Wiley.
6. Proposals reviewed for: National Science Foundation; Dutch Stichting voor Fundamenteel Onderzoek der Materie; Mexican National Council for Science and Technology (CONACYT); Idaho Board of Education Specific Research Grant Program; Department of Defense Experimental Program to Stimulate Competitive Research; University of Notre Dame Faculty Research Program; Petroleum Research Fund; Center for Indoor Air Research; Mexican Petroleum Institute (IMP); Council for International Exchanger of Scholars (Fulbright Scholars), National Sciences and Engineering Research Council of Canada, Los Alamos National Laboratory.

Publications

CHAPTERS IN BOOKS (REFEREED)

1. The influence of developments in dynamical systems theory on experimental fluid mechanics, Sen, M., in *Frontiers in Experimental Fluid Mechanics*, (Ed.) M. Gad-el-Hak, Lecture Notes in Engineering, Springer-Verlag, Berlin, Germany, Vol. 46, pp. 1–23, 1989.
2. Chaotic mixing for heat transfer enhancement, H.-C. Chang and M. Sen, in *Applied Chaos*, (Eds.) J.H. Kim, J. Stringer, John Wiley & Sons, New York, Chap. 6, pp. 175–188, 1992.
3. One-dimensional modeling of thermosyphons with known heat flux, M. Sen, C. Treviño and E. Ramos, in *Trends in Heat, Mass and Momentum Transfer*, (Eds.) J. Menon, Council of Scientific Research Integration, Trivandrum, India, Vol. 2, pp. 161–172, 1992.
4. Capillary tube boiling, M. Sen, in *Experiments in Heat Transfer and Thermodynamics*, (Ed.) R.A. Granger, Cambridge University Press, Cambridge, U.K., pp. 127–134, 1994.
5. Chaotic particle paths and heat transfer in internal flows, M. Sen and H.-C. Chang, in *Towards the Harnessing of Chaos*, (Ed.) M. Yamaguti, Elsevier, Amsterdam, Holland, pp. 397–400, 1994.

6. Applications of artificial neural networks and genetic algorithms in thermal engineering, M. Sen and K.T. Yang, Section 4.24, pp. 620–661, in *The CRC Handbook of Thermal Engineering*, (Ed.) F. Kreith, CRC Press, Boca Raton, FL, 2000.
7. Soft computing in control, M. Sen and J.W. Goodwine, Chapter 14, pp. 1–37, in *The MEMS Handbook*, (Ed.) M. Gad-el-Hak, CRC Press, Boca Raton, FL, 2nd ed., 2006.
8. Dynamics of large rings of coupled Van der Pol oscillators, M.A. Barrón, M. Sen and E. Corona, in *Innovations and Advanced Techniques in Systems, Computing Sciences and Software Engineering*, (Ed.) K. Elleithy, Springer, pp. 346–349, 2008.

JOURNAL PUBLICATIONS (REFEREED)

9. Cooling of a thin flat plate of high conductivity exposed to a laminar convective flow (in Spanish), C. Treviño and M. Sen, *Journal of the Mexican Petroleum Institute*, Vol. XII, No. 2, pp. 73–79, 1980.
10. Effects of chemical recombination on the flow of a reactive mixture (in Spanish), C. Treviño and M. Sen, *Electromecánica*, Vol. 5, No. 2, pp. 4–7, 1980.
11. Effect of plate thermal resistance on boundary layer ignition, C. Treviño and M. Sen, *Combustion and Flame*, Vol. 43, pp. 121–129, 1981.
12. Dynamic analysis of a one-dimensional thermosyphon model, M. Sen and C. Treviño, *Journal of Thermal Engineering*, Vol. 3, No. 1, pp. 15–20, 1982.
13. Effect of Prandtl number on boundary layer ignition, C. Treviño and M. Sen, *Combustion and Flame*, Vol. 46, pp. 211–212, 1982.
14. Ignition criteria in boundary layer flows, C. Treviño and M. Sen, *Latin American Journal of Heat and Mass Transfer*, Vol. 6, No. 4, pp. 235–250, 1982.
15. Numerical solution of the stability equation of a one-dimensional conductive system with phase change, R. Avila, M. Sen and J. Cervantes, *American Journal of Heat and Mass Transfer*, Vol. 7, No. 2, pp. 173–185, 1983.
16. One-dimensional thermosyphon analysis, M. Sen and C. Treviño, *Latin American Journal of Heat and Mass Transfer*, Vol. 7, No. 2, pp. 135–150, 1983.
17. The toroidal thermosyphon with known heat flux, M. Sen, E. Ramos and C. Treviño, *International Journal of Heat and Mass Transfer*, Vol. 28, No. 1, pp. 219–233, 1985.
18. Catalytic combustion in stagnation-point flow, C. Treviño and M. Sen, *Wärme-und Stoffübertragung*, Vol. 19, pp. 159–166, 1985.
19. One-dimensional modeling of multiple loop thermosyphons, M. Sen and J. L. Fernández, *International Journal of Heat and Mass Transfer*, Vol. 28, No. 9, pp. 1788–1790, 1985.
20. A steady-state analysis for variable area one-and two-phase thermosyphons, E. Ramos, M. Sen and C. Treviño, *International Journal of Heat and Mass Transfer*, Vol. 28, No. 9, pp. 1711–1719, 1985.
21. On the steady-state velocity of the inclined toroidal thermosyphon, M. Sen, E. Ramos and C. Treviño, *ASME Journal of Heat Transfer*, Vol. 107, No. 4, pp. 974–977, 1985.
22. Catalytic combustion in monolith reactors, C. Treviño and M. Sen, *Chemical Engineering Science*, Vol. 41, No. 9, pp. 2253–2260, 1986.
23. Two-phase natural circulation in a toroidal loop, E. Manero, M. Sen and E. Ramos, *Wärme und Stoffübertragung*, Vol. 21, pp. 41–49, 1987.
24. Natural convection in a thin horizontal porous annulus, M. Sen and K.E. Torrance, *International Journal of Heat and Mass Transfer*, Vol. 30, No. 4, pp. 729–739, 1987.
25. Numerical study of natural convection in a tilted rectangular porous material, S.L. Moya, E. Ramos and M. Sen, *International Journal of Heat and Mass Transfer*, Vol. 30, No. 4, pp. 741–756, 1987.
26. Natural convection in a semi-elliptical cavity, E. Martin del Campo, M. Sen and E. Ramos, *Numerical Heat Transfer*, Vol. 12, No. 1, pp. 101–119, 1987.
27. Linear stability of a cylindrical falling film, F.J. Solorio and M. Sen, *Journal of Fluid Mechanics*, Vol. 183, pp. 365–377, Oct. 1987.
28. Single-phase natural circulation in a tilted square loop, R. Acosta, M. Sen and E. Ramos, *Wärme-und Stoffübertragung*, Vol. 21, No. 5, pp. 269–275, 1987.
29. A one-dimensional model of a thermosyphon with known wall temperature, M. Gordon, E. Ramos and M. Sen, *International Journal of Heat and Fluid Flow*, Vol. 8, No. 3, pp. 177–181, Sept. 1987.

30. Multiple steady-states for unicellular natural convection in an inclined porous layer, M. Sen, P. Vasseur and L. Robillard, *International Journal of Heat and Mass Transfer*, Vol. 30, No. 10, pp. 2097–2113, 1987.
31. Thermal degasification of ammonia in a porous generator, M. Sen, R. Best and I. Pilatowsky, *Applied Scientific Research*, Vol. 44, No. 3, pp. 341–359, 1987.
32. Turbulent convection in helicoidal tubes, M. Chávez, W. Zhixue and M. Sen, *Wärme-und Stoffübertragung*, Vol. 22, No. 1–2, pp. 55–60, 1988.
33. Simple modeling procedure for estimation of cyclonic wind speeds, J. Sánchez-Sesma, J. Aguirre and M. Sen, *ASCE Journal of Structural Engineering*, Vol. 114, No. 2, pp. 352–370, 1988.
34. Initial behavior of solutions to the Lorenz equations, W. Fiszdon and M. Sen, *International Journal of Non-Linear Mechanics*, Vol. 23, No. 1, pp. 53–66, 1988.
35. Analytical and experimental study of steady-state convection in a double loop thermosyphon, M. Sen, D. Pruzan and K.E. Torrance, *International Journal of Heat and Mass Transfer*, Vol. 31, No. 4, 709–722, 1988.
36. Analysis of laminar natural convection in a triangular enclosure, E. Martín del Campo, M. Sen and E. Ramos, *Numerical Heat Transfer*, Vol. 13, No. 3, pp. 353–372, 1988.
37. Flow in conjugate natural circulation loops, O. Salazar, M. Sen and E. Ramos, *AIAA Journal of Thermophysics and Heat Transfer*, Vol. 2, No. 2, pp. 180–183, 1988.
38. Parallel flow convection in a tilted two-dimensional porous layer heated from all sides, M. Sen, P. Vasseur and L. Robillard, *Physics of Fluids*, Vol. 31, No. 12, pp. 3480–3487, 1988.
39. An inflow-outflow characterization of inhomogeneous permeable beds, M. Sen and K.T. Yang, *Transport in Porous Media*, Vol. 4, pp. 97–104, 1989.
40. The effect of axial conduction on a thermosyphon with prescribed heat flux, M. Sen, E. Ramos, C. Treviño and O. Salazar, *European Journal of Mechanics, B/Fluids*, Vol. 8, No. 1, pp. 57–72, 1989.
41. The Brinkman model for natural convection in a shallow porous cavity with uniform heat flux, P. Vasseur, C.H. Wang and M. Sen, *Numerical Heat Transfer, Part A: Applications*, Vol. 15, No. 2, pp. 221–242, 1989.
42. Longitudinal and transverse dimensions of an incipient jet driven by a constant head, M. Sen, J. Hernández and J. Cervantes, *Experiments in Fluids*, Vol. 8, pp. 107–109, 1989.
43. Thermal instability and natural convection in a fluid layer over a porous substrate, P. Vasseur, C.H. Wang and M. Sen, *Wärme-und Stoffübertragung*, Vol. 24, pp. 337–347, 1989.
44. Natural convection in an inclined rectangular porous slot: the Brinkman extended Darcy model, P. Vasseur, C.H. Wang and M. Sen, *ASME Journal of Heat Transfer*, Vol. 112, No. 2, pp. 507–511, 1990.
45. Low-Reynolds number flow over a rotatable cylinder-splitter plate body, J.C. Xu, M. Sen and M. Gad-el-Hak, *Physics of Fluids A*, Vol. 2, No. 11, pp. 1925–1927, 1990.
46. Analytical investigation of Benard-Marangoni convection heat transfer in a shallow cavity filled with two immiscible fluids, C.H. Wang, M. Sen and P. Vasseur, *Applied Scientific Research*, Vol. 48, pp. 35–53, 1991.
47. Heat transfer enhancement due to slender recirculation and chaotic transport between counter-rotating eccentric cylinders, S. Ghosh, H.-C. Chang and M. Sen, *Journal of Fluid Mechanics*, Vol. 238, pp. 119–154, 1992.
48. The periodicity of droplets emanating from interconnected orifices, D.M. Weis, P.F. Dunn and M. Sen, *Experiments in Fluids*, Vol. 13, pp. 257–266, 1992.
49. Heat transfer enhancement in coiled tubes by chaotic mixing, N. Acharya, M. Sen and H.-C. Chang, *International Journal of Heat and Mass Transfer*, Vol. 35, No. 10, pp. 2475–2489, 1992.
50. Dynamic Analysis of a Hemispherical Dome Levitated by an Air Jet, M. Sen, *Applied Mathematical Modelling*, Vol. 17, No. 5, pp. 226–235, 1993.
51. Dynamics of a rotatable cylinder with splitter plate in uniform flow, J.C. Xu, M. Sen and M. Gad-el-Hak, *Journal of Fluids and Structures*, Vol. 7, No. 4, pp. 401–416, 1993.
52. Thermal entrance length and Nusselt numbers in coiled tubes, N. Acharya, M. Sen and H.-C. Chang, *International Journal of Heat and Mass Transfer*, Vol. 37, No. 2, pp. 336–340, 1994.
53. Analysis of natural convection in a rotating open loop, M.A. Stremmer, D.R. Sawyers and M. Sen, *AIAA Journal of Thermophysics and Heat Transfer*, Vol. 8, No. 1, pp. 100–106, 1994.
54. Numerical and experimental investigation of flow past a freely rotatable square cylinder, T. Zaki, M. Sen and M. Gad-el-Hak, *Journal of Fluids and Structures*, Vol. 8, No. 6, pp. 555–582, 1994.

55. Application of chaotic advection to heat transfer, H.-C. Chang and M. Sen, *Chaos, Solitons and Fractals*, Vol. 4, No. 6, pp. 955–975, 1994 (also in *Chaos Applied to Fluid Mixing*, Eds. H. Aref, M.S. El Naschie, pp. 211–231, Pergamon Press, 1995).
56. Analysis of a square natural convective loop, C. Treviño and M. Sen, *European Journal of Mechanics, B/Fluids*, Vol. 13, No. 5, pp. 591–611, 1994.
57. A multilevel wavelet collocation method for solving partial differential equations in a finite domain, O.V. Vasilyev, S. Paolucci and M. Sen, *Journal of Computational Physics*, Vol. 120, pp. 33–47, 1995.
58. Statistics of boiling in a capillary U-tube, D.R. Kabele, M. Sen and P.F. Dunn, *International Communications in Heat and Mass Transfer*, Vol. 23, No. 1, pp. 34–44, 1996.
59. A novel pump for MEMS applications, M. Sen, D. Wajerski and M. Gad-el-Hak, *ASME Journal of Fluids Engineering*, Vol. 118, No. 3, pp. 624–627, 1996.
60. Effect of chaotic interfacial stretching on bimolecular chemical reaction in helical-coil reactors, D.R. Sawyers, M. Sen and H.-C. Chang, *The Chemical Engineering Journal*, Vol. 64, No. 1, pp. 129–139, 1996.
61. Flow and load characteristics of microbearings with slip, J. Maureau, M.C. Sharatchandra, M. Sen and M. Gad-el-Hak, *Journal of Micromechanics and Microengineering*, Vol. 7, pp. 55–64, 1997.
62. Effect of tube-to-tube conduction on plate-fin and tube heat exchanger performance, R. Romero-Méndez, M. Sen, K.T. Yang and R.L. McClain, *International Journal of Heat and Mass Transfer*, Vol. 40, No. 16, pp. 3909–3916, 1997.
63. Navier-Stokes simulations of a novel viscous pump, M.C. Sharatchandra, M. Sen and M. Gad-el-Hak, *ASME Journal of Fluids Engineering*, Vol. 119, No. 2, pp. 372–382, 1997.
64. New approach to constrained shape optimization using genetic algorithms, M.C. Sharatchandra, M. Sen and M. Gad-el-Hak, *AIAA Journal*, Vol. 38, No. 1, pp. 51–61, 1998.
65. Dynamics of boiling from a short capillary tube, E. Ramos, P. Parmananda, G. Hernández-Cruz and M. Sen, *Experimental Heat Transfer*, Vol. 10, pp. 273–290, 1997.
66. Thermal aspects of a novel viscous pump, M.C. Sharatchandra, M. Sen and M. Gad-el-Hak, *ASME Journal of Heat Transfer*, Vol. 120, No. 1, pp. 99–107, 1998.
67. Analysis of viscous micropumps and microturbines, D. DeCourtye, M. Sen and M. Gad-el-Hak, *International Journal of Computational Fluid Dynamics*, Vol. 10, pp. 13–25, 1998.
68. Heat transfer enhancement in three-dimensional corrugated channel flow, D.R. Sawyers, M. Sen and H.-C. Chang, *International Journal of Heat and Mass Transfer*, Vol. 41, No. 22, pp. 3559–3573, 1998.
69. Enhancement of heat transfer in an inviscid-flow thermal boundary layer due to a Rankine vortex, R. Romero-Méndez, M. Sen, K.T. Yang and R.L. McClain, *International Journal of Heat and Mass Transfer*, Vol. 41, No. 23, pp. 3829–3840, 1998.
70. Simulation of heat exchanger performance by artificial neural networks, G. Díaz, M. Sen, K.T. Yang and R.L. McClain, *International Journal of HVAC&R Research*, Vol. 5, No. 3, pp. 195–208, 1999.
71. Effect of fin spacing on convection in a fin and tube heat exchanger, R. Romero-Méndez, M. Sen, K.T. Yang and R.L. McClain, *International Journal of Heat and Mass Transfer*, Vol. 43, No. 1, pp. 39–51, 2000.
72. Laplace’s equation for convective scalar transport in potential flow, M. Sen and K.T. Yang, *Proceedings of the Royal Society A: Mathematical, Physical and Engineering Sciences*, Vol. 456, No. 2004, pp. 3041–3045, 2000.
73. Neural network analysis of fin-tube refrigerating heat exchanger with limited experimental data, A. Pacheco-Vega, M. Sen, K.T. Yang and R.L. McClain, *International Journal of Heat and Mass Transfer*, Vol. 44, pp. 763–770, 2001.
74. Dynamic prediction and control of heat exchangers using artificial neural networks, G. Díaz, M. Sen, K.T. Yang and R.L. McClain, *International Journal of Heat and Mass Transfer*, Vol. 44, No. 9, pp. 1671–1679, 2001.
75. Heat rate predictions in humid air-water heat exchangers using correlations and neural networks, A. Pacheco-Vega, G. Díaz, M. Sen, K.T. Yang and R.L. McClain, *ASME Journal of Heat Transfer*, Vol. 123, No. 2, pp. 348–354, 2001.
76. Analysis of heat transfer enhancement in coiled tubes by chaotic mixing, N. Acharya, M. Sen and H.-C. Chang, *International Journal of Heat and Mass Transfer*, Vol. 44, No. 17, pp. 3189–3199, 2001.
77. Adaptive neurocontrol of heat exchangers, G. Díaz, M. Sen, K.T. Yang and R.L. McClain, *ASME Journal of Heat Transfer*, Vol. 123, No. 3, pp. 556–562, 2001.

78. Study of the parameters affecting conjugated heat transfer in plate-fin and tube heat exchanger (in Spanish), R. Romero-Méndez, R. Adame and M. Sen, *Interciencia*, Vol. 26, No. 8, pp. 321–326, 2001.
79. Effect on hydrodynamics and heat transfer of wall position in a wavy-walled heat exchanger (in Spanish), R. Romero-Méndez, M. Sen, W. Franco, A. Hernández-Guerrero, *Interciencia*, Vol. 26, No. 9, pp. 383–389, 2001.
80. Nonlinear analysis of tilted toroidal thermosyphon models, A. Pacheco-Vega, W. Franco, H.-C. Chang and M. Sen, *International Journal of Heat and Mass Transfer*, Vol. 45, No. 7, pp. 1379–1391, 2002.
81. Numerical simulation of the thermal control of heat exchangers, S. Alotaibi, M. Sen, J.W. Goodwine and K.T. Yang, *Numerical Heat Transfer, Part A*, Vol. 41, pp. 229–244, 2002.
82. An analytical asymptotic solution to a conjugate heat transfer problem, C.F. Stein, P. Johansson, J. Bergh, L. Löfdahl, M. Sen and M. Gad-el-Hak, *International Journal of Heat and Mass Transfer*, Vol. 45, pp. 2485–2500, 2002.
83. Agent networks for intelligent dynamic control of complex hydronic HVAC building systems—Part 1: Framework for agent network development, K.T. Yang and M. Sen, *International Journal on Architectural Science*, Vol. 3, No. 1, pp. 43–50, 2002.
84. Simultaneous determination of in-and over-tube heat transfer correlations in heat exchangers by global regression, A. Pacheco-Vega, M. Sen and K.T. Yang, *International Journal of Heat and Mass Transfer*, Vol. 46, No. 6, pp. 1029–1040, 2003.
85. Comparison of thermal-hydraulic network control strategies, W. Franco, M. Sen, K.T. Yang and R.L. McClain, *Proceedings of the Institution of Mechanical Engineers, Part I: Journal of Systems and Control Engineering*, Vol. 217, pp. 35–47, 2003.
86. Periodicity and bifurcations in capillary tube boiling with a concentric heating wire, N. Acharya, M. Sen and E. Ramos, *International Journal of Heat and Mass Transfer*, Vol. 46, No. 8, pp. 1425–1442, 2003.
87. Prediction of turbulence statistics behind a square cylinder using soft computing techniques, P.K. Panigrahi, M. Dwivedi, V. Khandelwal and M. Sen, *ASME Journal of Fluids Engineering*, Vol. 125, pp. 385–387, 2003.
88. Unsteady flow and heat transfer in plane channels with spatially periodic vortex generators, A. Valencia and M. Sen, *International Journal of Heat and Mass Transfer*, Vol. 46, No. 17, pp. 3189–3199, 2003.
89. Solidification of a finite slab with convective cooling and shrinkage, Z. Yang, M. Sen and S. Paolucci, *Applied Mathematical Modelling*, Vol. 27, pp. 733–762, 2003.
90. Characteristics of a hot-wire microsensor for time-dependent wall shear stress measurements, L. Löfdahl, V. Chernoray, S. Haasl, G. Stemme and M. Sen, *Experiments in Fluids*, Vol. 35, No. 3, pp. 240–251, 2003.
91. Controllability of cross-flow heat exchangers, S. Alotaibi, M. Sen, W.J. Goodwine and K.T. Yang, *International Journal of Heat and Mass Transfer*, Vol. 47, pp. 913–924, 2004.
92. Effect of delay in thermal systems with long ducts, G. Díaz, M. Sen and K.T. Yang, *International Journal of Thermal Sciences*, Vol. 43, No. 3, pp. 249–254, 2004.
93. Stabilization of thermal neurocontrollers, G. Díaz, M. Sen, K.T. Yang and R.L. McClain, *Applied Artificial Intelligence*, Vol. 18, No. 5, pp. 447–466, 2004.
94. Steady streaming due to vibrating walls, F. Carlsson, M. Sen and L. Löfdahl, *Physics of Fluids*, Vol. 16, No. 5, pp. 1822–1825, 2004.
95. Dynamics of thermal-hydraulic network control strategies, W. Franco, M. Sen, K.T. Yang and R.L. McClain, *Experimental Heat Transfer*, Vol. 17, No. 3, pp. 161–179, 2004.
96. Flow-based control of temperature in long ducts, S. Alotaibi, M. Sen, B. Goodwine and K.T. Yang, *International Journal of Heat and Mass Transfer*, Vol. 47, pp. 4995–5009, 2004.
97. Fluid mixing induced by vibrating walls, F. Carlsson, M. Sen and L. Löfdahl, *European Journal of Mechanics B/Fluids*, Vol. 24, No. 3, pp. 366–378, 2005.
98. Heat transfer correlations by symbolic regression, W. Cai, A. Pacheco-Vega, M. Sen and K.T. Yang, *International Journal of Heat and Mass Transfer*, Vol. 49, pp. 4352–4359, 2006.
99. Synchronization of self-sustained thermostatic oscillations in a thermal-hydraulic network, W. Cai, M. Sen, K.T. Yang and R.L. McClain, *International Journal of Heat and Mass Transfer*, Vol. 49, pp. 4444–4453, 2006.
100. Particle-tracking random-walk computation of high Peclet-number convection, V. Özceyhan and M. Sen, *Numerical Heat Transfer, Part A*, Vol. 50, No. 7, pp. 607–622, 2006.

101. Flows in large, self-similar networks and their control, W. Franco, M. Sen and K.T. Yang, *Proceedings of the Royal Society A-Mathematical Physical and Engineering Sciences*, Vol. 462, No. 2074, pp. 2907–2926, 2006.
102. Topology optimization using a hybrid cellular automaton method with local control rules, A. Tovar, N.M. Patel, G.L. Niebur, M. Sen and J.E. Renaud, *ASME Journal of Mechanical Design*, Vol. 128, pp. 1205–1216, 2006.
103. Interaction between secondaries in a thermal-hydraulic network, W. Cai, W. Franco, G. Arimany, M. Sen, K.T. Yang and R.L. McClain, *ASME Journal of Dynamic Systems, Measurement and Control*, Vol. 128, pp. 820–828, 2006.
104. Hydrodynamic instability of one-dimensional electron flow in semiconductors, W.R. Calderón-Muñoz, M. Sen and D. Jena, *Journal of Applied Physics*, Vol. 102, Article No. 023703, 2007.
105. Optimization of control hardware placement in a thermal-hydraulic network, W. Franco, M. Sen and K.T. Yang, *HVAC&R Research*, Vol. 14, No. 1, pp. 73–84, 2008.
106. Approximation of transient temperatures in complex geometries using fractional derivatives, Y. Aoki, M. Sen and S. Paolucci, *Heat and Mass Transfer*, Vol. 44, No. 7, pp. 771–777, 2008.
107. Synchronization of thermostatically controlled first-order systems, W. Cai and M. Sen, *International Journal of Heat and Mass Transfer*, Volume 51, Nos. 11–12, pp. 3032–3043, 2008.
108. Analysis of 3-omega method for thermal conductivity measurement, H. Wang and M. Sen, *International Journal of Heat and Mass Transfer*, Vol. 52, Nos. 7-8, Pages, pp. 2102–2109, 2009.
109. Particle motion in unsteady two-dimensional peristaltic flow with application to the ureter, J.N. Jiménez-Lozano, M. Sen and P.F. Dunn, *Physical Review E*, Vol. 79, Article No. 041901, 2009.
110. Synchronization of four coupled van der Pol oscillators, M.A. Barrón and M. Sen, *Nonlinear Dynamics*, Vol. 56, No. 4, pp. 357–367, 2009.
111. Synchronization of coupled self-excited elastic beams, M.A. Barrón and M. Sen, to be published in *Journal of Sound and Vibration*.
112. Analytical solution of the Pennes equation for burn-depth determination from infrared thermographs, R. Romero-Méndez, J.N. Jiménez-Lozano, M. Sen and F.J. González, to be published in *Mathematical Medicine & Biology*.
113. Analysis of ureteral peristalsis with solid particles, J.N. Jimenez-Lozano, M. Sen and E. Corona, submitted for review.
114. Streamline topologies of two-dimensional peristaltic flow and their bifurcations, J.N. Jimenez-Lozano and M. Sen, submitted for review.
115. Hydrodynamic instability of two-dimensional electron flow in semiconductors, W. Calderon-Munoz, D. Jena and M. Sen, submitted for review.

In preparation

116. Combined Taylor-Aris and thermoacoustic effects in a channel, D. Omari, H.-C. Chang and M. Sen.
117. Multiple solutions in plane Poiseuille flow with viscous heating and temperature dependent viscosity, J. Bergh, M. Sen and L. Löfdahl.
118. Heat transfer effects due to vibrating walls, F. Carlsson, M. Sen and L. Löfdahl.
119. Hydrodynamic effects in channel flow due to vibrating walls, F. Carlsson, M. Sen and L. Löfdahl.
120. Nonlinear analysis of transient pipe flow due to control-valve actuation, W. Cai, M. Sen and K.T. Yang.
121. Relation between the fluid energy equation and the response of a hot-wire anemometer in time-dependent flows, M. Sen, L. Löfdahl and C.F. Stein.

Editorials

122. Guest Editorial: Fluid mechanics in the next century, M. Gad-el-Hak and M. Sen, in *Applied Mechanics Review*, Vol. 49, No. 3, 1996.
123. Heat transfer in the new millennium—Views by members of the ASME Heat Transfer Division, contribution by K.T. Yang and M. Sen, *ASME Journal of Heat Transfer*, Vol. 122, No. 1, p. 6, 2000.

Invited Paper

124. A review of the principles and applications of thermal control, M. Sen, *Ingeniería Mecánica, Tecnología y Desarrollo*, (Journal of the Mexican Society of Mechanical Engineering), Vol. 1, No. 4, pp. 115–131, 2004.

Conference and Symposium Papers

Based on Review of Abstract

125. Non-linear interaction in shallow water waves (in Spanish), J.L. Samaniego and M. Sen, *Proceedings of the Fifth National Congress on Hydraulics*, Vol. 4, Guadalajara, Mexico, 1978.
126. Analog simulator of problems in thermofluids (in Spanish), A. Salas, A. Sánchez and M. Sen, *Proceedings of Mexicón 78*, Institution of Electrical and Electronics Engineers, Mexico City, Mexico 1978.
127. Numerical methods in fluid mechanics, M. Sen and C. Treviño, *Proceedings of the Third Symposium on Mechanical Engineering*, Regional Technological Institute, Mérida, Mexico, 1979.
128. Considerations on the use of methane from anaerobic digestors in combustion processes (in Spanish), C. Treviño and M. Sen, *Proceedings of the Second International Meeting on Alternative Sources of Energy*, University of Michoacán, Morelia, Mexico, 1979.
129. Construction of a capacitive level transducer (in Spanish), G. Olayo, R. Barrios, A. Sánchez and M. Sen, *Proceedings of Mexicón 79*, Institution for Electrical and Electronics Engineers, Mexico City, Mexico, 1979.
130. Transient one-dimensional model of a thermosyphon solar heater (in Spanish), J. Rojas, M. Sen and C. Treviño, *Proceedings of the Fourth National Meeting on Solar Energy*, San Luis Potosí, Mexico, 1980.
131. The two-phase thermosyphon: A one-dimensional model (in Spanish), M. Sen, C. Treviño, E. Ramos and B.C. Raychaudhuri, *Proceedings of the Sixth National Meeting on Solar Energy*, La Paz, Mexico, pp. 115–117, 1982.
132. Effect of longitudinal conduction on a solar thermosyphon (in Spanish), M. Sen and C. Treviño, *Proceedings of the Sixth National Meeting on Solar Energy*, La Paz, Mexico, pp. 87–90, 1982.
133. Theoretical model of convection in a wind tower (in Spanish), S.L. Moya, E. Ramos and M. Sen, *Proceedings of the Sixth National Meeting on Solar Energy*, La Paz, Mexico, pp. 96–100, 1982.
134. Desorption of ammonia in a porous solid (in Spanish), M. Sen, R. Best and I. Pilatowsky, *Proceedings of the First Latin American Congress on Heat and Mass Transfer*, La Plata, Argentina, Vol. 2 pp. 950–966, 1982.
135. Natural convection in a two-dimensional cavity: Finite difference calculations (in Spanish), S.L. Moya, M. Sen and E. Ramos, *Proceedings of the Seventh National Meeting on Solar Energy*, Saltillo, Mexico pp. 29–33, 1983.
136. Natural convection in a two-dimensional cavity: Finite element calculation (in Spanish), E. Martín del Campo and M. Sen, *Proceedings of the Seventh National Meeting on Solar Energy*, Saltillo, Mexico, pp. 20–23, 1983.
137. Natural convection in square cavities (in Spanish), S.L. Moya, E. Ramos and M. Sen, *Proceedings of the Eighth National Meeting on Solar Energy*, pp. 103–106, 1984.
138. Experimental studies of heat transfer in viscoelastic flow through pipes: Application to Solar Energy Collectors, B. Mena, F. Avila and M. Sen, Eighth International Congress on Rheology, Naples, Italy, 1980, published in *Rheology, Vol. 2: Fluids*, (Eds.) G. Astarita, G. Marrucci, L. Nicolais, Plenum Publishing Corporation, pp. 93–96, 1980.
139. Medium and large Deborah number squeezing flows, D. Binding, F. Avila, M. Sen and A. Maldonado, Eighth International Congress on Rheology, Naples, Italy, 1980, published in *Rheology, Vol. 2: Fluids*, (Eds.) G. Astarita, G. Marrucci, L. Nicolais, Plenum Publishing Corporation, pp. 111–116, 1980.
140. Visual observations of an incipient round jet, E. Rincón, M. Sen and J. Cervantes, Sixteenth South-eastern Seminar on Thermal Sciences, Miami, Florida, 1982, published in *Thermal Sciences 16*, Vol. 1, (Ed.) T.N. Veziroglu. Hemisphere Publishing Corporation, pp. 135–140, 1983.
141. Natural circulation driven two phase loops, M. Sen, C. Treviño, E. Ramos and B.C. Raychaudhuri, Fifth Miami International Conference on Alternative Energy Sources, Miami, Florida, 1982, published

- in *Alternative Energy Sources V, Part A*, (Ed.) T.N. Veziroglu, Elsevier Science Publishers, pp. 435–441, 1983.
142. Transient response of steam flow to water injection, V. López, R. Escalera, J. Cervantes and M. Sen, *Proceedings of Condensed Papers–3rd Multi-Phase Flow and Heat Transfer Symposium-Workshop*, Clean Energy Research Inst, University of Miami, Florida, p. 304, 1983.
 143. Effect of power law friction factor on a toroidal thermosyphon, M. Sen, E. Ramos and C. Treviño, Ninth Congress on Rheology, Acapulco, Mexico, published in *Advances in Rheology*, (Eds.) B. Mena, A. Garcia-Rejón, C. Rangel-Nafaile, Vol. 2: Fluids, Elsevier Science Publishers, pp. 59–71, 1984.
 144. Natural convection in a trapezoidal porous medium, S.J. Pien and M. Sen, *Proceedings of the Symposium in Heat and Mass Transfer in Honor of B.T. Chao*, pp. 481–492, University of Illinois-Urbana, 1987.
 145. The parallel flow approximation for natural convection in Rectangular Geometries, M. Sen, P. Vasseur and L. Robillard, *Proceedings of the Third Latin American Congress on Heat and Mass Transfer*, Guanajuato, Mexico, pp. 1–10, 1988.
 146. Stability and Natural Convection in a Fluid Overlaying a Porous Medium, C.H. Wang, P. Vasseur and M. Sen, *Proceedings of the 12th Canadian Congress of Applied Mechanics*, pp. 108–109, Ottawa, 1989.
 147. Stability of flow in a rotating open loop thermosyphon, M. Sen, M.A. Stremmer, D.R. Sawyers, *Proceedings of II Latin American Conference on Turbomachinery*, Cuernavaca, Mexico, pp. 421–426, 1993.
 148. Thermoacoustic machines, M. Sen, H.-C. Chang and D. Omari, *Proceedings of the 5th Latin American Congress of Heat and Mass Transfer*, Caracas, Venezuela, pp. CP2.1–CP2.8, 1994.
 149. An artificial neural network model of a heat exchanger, X. Zhao, R.L. McClain, M. Sen and K.T. Yang, *Symposium on Thermal Science and Engineering in Honor of Chancellor Chang-Lin Tien*, November 1995, pp. 83–88.
 150. Modeling of heat transfer in free convection nucleate boiling with artificial neural networks, Part I: Literature Survey (in German), G. Díaz, J. Schmadl, T. Schutz and M. Sen, *Wissenschaftliche Beiträge*, Technische Fachhochschule Wildau, Heft 2, 2000, pp. 30–35.
 151. Modeling of heat transfer in free convection nucleate boiling with artificial neural networks, Part II: Single Component (in German), G. Díaz, J. Schmadl, T. Schutz and M. Sen, *Wissenschaftliche Beiträge*, Technische Fachhochschule Wildau, Heft 2, 2000, pp. 36–42.
 152. Evolutionary model for bone adaptation using cellular automata, A. Tovar, N. Patel, G.A. Letona, G.L. Niebur, M. Sen and J.E. Renaud, Poster at *14th Conference of the European Society of Biomechanics*, Hertogenbosch, The Netherlands, 2004.

Based on Review of Complete Manuscript(Refereed)

153. Non-linear interactions in surface wave generation, *Proceedings of the First Congress of the National Academy of Engineering*, Guanajuato, Mexico, pp. 103–109, 1975.
154. Flow between plates with heat transfer (in Spanish), A. Sámano and M. Sen, *Proceedings of the Third Congress of the National Academy of Engineering*, Oaxtepec, Mexico, pp. 379–381, 1977.
155. Approximations to the velocity of sound in a reactive mixture (in Spanish), C.Treviño and M. Sen, *Proceedings of the Fourth Congress of the National Academy of Engineering*, Mérida, Mexico, pp. 25–28, 1978.
156. Resonant interaction between surface waves (in Spanish), J.L. Samaniego and M. Sen, *Proceedings of the Fourth Congress of the National Academy of Engineering*, Mérida, Mexico, pp. 5–8, 1978.
157. Thermal boundary layer calculation using the method of Crank-Nicolson (in Spanish), C. Treviño and M. Sen, *Proceedings of the Fifth Congress of the National Academy of Engineering*, Morelia, Mexico, pp. 29–31, 1979.
158. Hydrodynamics of a falling film (in Spanish), A. Sámano, M. Sen and G.Best, *Proceedings of the Sixth Congress of the National Academy of Engineering*, Querétaro, Mexico, pp. 119–121, 1980.
159. Calculation of compressible flow with a Galerkin finite element method (in Spanish), E. Martín del Campo and M. Sen, *Proceedings of the Sixth Congress of the National Academy of Engineering*, Querétaro, Mexico, pp. 109–113, 1980.
160. Flow of gases in a rectangular chimney (in Spanish), D.A. Sámano, E. Sámano and M. Sen, *Proceedings of the Sixth Congress of the National Academy of Engineering*, Querétaro, Mexico, pp. 122–125, 1980.

161. Transient ignition in a flat plate boundary layer, C. Treviño and M. Sen, *Proceedings of the Twenty-Seventh Heat Transfer and Fluid Mechanics Institute*, Los Angeles, California, Stanford University Press, pp. 92–107, 1980.
162. Transient phenomena in boundary layer ignition with finite plate thermal resistance, C. Treviño and M. Sen, *Proceedings of the Eighteenth International Symposium on Combustion*, Waterloo, Canada, The Combustion Institute, pp. 1781–1789, 1980.
163. Stability of conductive systems with phase change: Basic equations (in Spanish), F.J. Solorio, M. Sen and J. Cervantes, *Proceedings of the Seventh Congress of the National Academy of Engineering*, Oaxaca, Mexico, pp. 216–218, 1981.
164. Numerical study of transient laminar combustion in boundary layer flow, C. Treviño and M. Sen, Second International Conference on Numerical Methods in Heat Transfer, Venice, Italy 1981, published in *Numerical Methods in Thermal Problems*, Vol. II, pp. 1227–1234, (Eds.) R.W. Lewis, K. Morgan, B.A. Schrefler, Pineridge Press, Swansea, U.K., 1981.
165. Critical conditions in steady state thermal boundary layer ignition, C. Treviño and M. Sen, in *Fluid Mechanics of Combustion Systems*, (Eds.) T. Morel, R.P. Lohmann, J.M. Rackley, ASME, pp. 131–135, 1981.
166. An approximate solution of the cylindrical falling film instability problem (in Spanish), J. Solorio and M. Sen, *Proceedings of the Eighth Congress of the National Academy of Engineering*, Torreón, Mexico, pp. 168–171, 1982.
167. Experimental study of interaction between columns subjected to waves forces (in Spanish), C. Cruz and M. Sen, *Proceedings of the Eighth Congress of the National Academy of Engineering*, Torreón, Mexico, pp. 233–236, 1982.
168. Stability analysis of one-dimensional freezing-melting models, M. Sen and J. Cervantes, *Proceedings of the Seventh International Heat Transfer Conference*, Munich, F.R.G., Vol. 6, pp. 153–157, 1982.
169. Transient effects in the laminar thermal boundary layer (in Spanish), C. Treviño and M. Sen, *Proceedings of the Eighth Congress of the National Academy of Engineering*, Torreón, Mexico, pp. 135–138, 1982.
170. Numerical solution of the stability equation of a one-dimensional conductive-convective system with phase change (in Spanish), R. Avila, M. Sen and J. Cervantes, *Proceedings of the Ninth Congress of the National Academy of Engineering*, León, Mexico, pp. 68–72, 1983.
171. Chaotic behavior in convective flows, E. Ramos, M. Sen and C. Treviño, *Proceedings of the Second School of Statistical Physics*, Oaxtepec, Mexico, (Eds.) R. Peralta-Fabi, F. Ramos-Gómez, 1983.
172. The toroidal thermosyphon with known heat flux (in Spanish), M. Sen, E. Ramos and C. Treviño, *Proceedings of the Ninth Congress of the National Academy of Engineering*, León, Mexico, pp. 34–38, 1983.
173. Finite element calculation of forced convection (in Spanish), E. Martín del Campo and M. Sen, *Proceedings of the Ninth Congress of the National Academy of Engineering*, León, Mexico, pp. 48–52, 1983.
174. Numerical solution to the nonlinear multi-dimensional Stefan problem (in Spanish), R. Avila, J. Cervantes and M. Sen, *Proceedings of the Tenth Congress of the National Academy of Engineering*, Ciudad Obregón, Mexico, pp. 248–252, 1984.
175. Flame propagation in combustible liquids immiscible in water (in Spanish), C. Flores, C. Treviño, M. Sen and J. Cervantes, *Proceedings of the Tenth Congress of the National Academy of Engineering*, Ciudad Obregón, Mexico, pp. 253–257, 1984.
176. Characterization of permeable beds in steady flow, M. Sen and K.T. Yang, 24th National Heat Transfer Conference, Pittsburgh, PA, in *Heat Transfer in Geophysical and Geothermal Systems*, (Ed.) K. Vafai, V. Prasad, I. Catton, pp. 21–26, HTD-Vol. 76, ASME, 1987.
177. Initial behavior of solutions of the Lorenz equations, W. Fiszdon and M. Sen, *Proceedings of International Conference on Modern Mathematical Problems of Mechanics and Applications* (in Russian), Moscow, U.S.S.R., 1987.
178. Unicellular convective motion in an inclined fluid layer with uniform heat flux, P. Vasseur, L. Robillard and M. Sen, in *Bifurcation Phenomena in Thermal Processes and Convection*, (Eds.) H.H. Bau, L.A. Bertram, S.A. Korpela, pp. 23–29, HTD-Vol. 94, AMD-Vol. 89, ASME, 1987.
179. Unicellular convective motion in an inclined fluid layer with uniform heat flux, P. Vasseur, L. Robillard and M. Sen, *Proceedings of the Ninth Brazilian Congress of Mechanical Engineering, Brazil*, Vol. 1, pp. 65–69, 1987.

180. The Brinkman model for natural convection in a shallow porous cavity with uniform heat flux, P. Vasseur, C.H. Wang and M. Sen, *Proceedings of the 1988 National Heat Transfer Conference*, (Ed.) H.R. Jacobs, pp. 581–586, 1988.
181. Natural convection in an inclined porous layer: The Brinkman-extended Darcy model, P. Vasseur, C.H. Wang and M. Sen, *Proceedings of the Fourth Asian Congress of Fluid Mechanics*, pp. H53–H56, Hong Kong, 1989.
182. Analysis of multiple solutions in plane Poiseuille flow with viscous heating and temperature dependent viscosity, M. Sen and P. Vasseur, *Proceedings of the 1989 National Heat Transfer Conference, Heat Transfer in Convective Flows*, (Ed.) R.K. Shah, pp. 267–272, 1989.
183. Hysteresis effects in three-dimensional natural convection in a tilted porous medium, S.J. Pien and M. Sen, *Proceedings of the 1989 National Heat Transfer Conference, Heat Transfer in Convective Flows*, (Ed.) R.K. Shah, pp. 343–348, 1989.
184. Frequency measurements in capillary tube boiling, N. Acharya and M. Sen, *Second International Multiphase Fluid Transient Symposium*, FED-Vol. 87, (Ed.) M.J. Braun, pp. 13–19, 1989.
185. Analysis of a square natural convective loop, C. Treviño and M. Sen, *Proceedings of the Ninth International Heat Transfer Conference*, Jerusalem, Israel, Vol. 2, pp. 181–186, 1990.
186. Observations of boiling in a capillary U-tube, L. Adams, M. Sen and N. Acharya, *Proceedings of the ASME-JSME Thermal Engineering Joint Conference*, Vol. 2, pp. 289–293, 1991.
187. Bifurcation analysis of flow over a rotatable cylinder with splitter plate, J.C. Xu, M. Sen and M. Gad-el-Hak, *AIAA 22nd Fluid Dynamics, Plasma Dynamics and Laser Conference*, Honolulu, Hawaii, AIAA Paper No. 91-1738.
188. Thermocapillary convective heat transfer in a cavity filled with two immiscible fluids, C.H. Wang, M. Sen and P. Vasseur, *Proceedings of the 22nd International Symposium on Manufacturing and Materials Processing*, International Centre for Heat and Mass Transfer, Dubrovnik, Yugoslavia, 1990.
189. Statistics of boiling in a capillary U-tube, D.R. Kabele, M. Sen and P.F. Dunn, *Proceedings of the Seventeenth Congress of the National Academy of Engineering*, Monterrey, Mexico, 1991, pp. 360–364.
190. Experiments on the enhancement of heat transfer in coiled tubes by chaotic mixing, N. Acharya, M. Sen and H.-C. Chang, in *Fundamentals of Forced Convection Heat Transfer*, HTD-Vol. 181, (Eds.) M.A. Ebadian, D.A. Kaminski, ASME, pp. 79–84, 1991.
191. The minimization of the solidification time of a thin cylindrical shell, S. Das, S. Paolucci and M. Sen, in *Fundamentals of Phase Change: Freezing, Melting, and Sublimation*, HTD-Vol. 215, (Eds.) P.G. Kroeger, Y. Bayazitoglu, ASME, pp. 79–87, 1992.
192. Applications of chaotic heat and mass transfer enhancement, N. Acharya, M. Sen and H.-C. Chang, in (Eds.) G.B. Tatterson, R.V. Calabreses, *Process Mixing: Chemical and Biochemical Applications*, AIChE Symposium Series, No. 286, Vol. 88, pp. 44–49, 1992.
193. Enhancement of chemical reaction through chaotic advection, D.R. Sawyers, M. Sen, H.-C. Chang, in (Eds.) H.H. Bau, L.A. Bertram, S.A. Korpela, *Bifurcation Phenomena and Chaos in Thermal Convection*, HTD-Vol. 214, AMD-Vol. 138, ASME, pp. 33–37, 1992.
194. Chaotic advection with heat transfer, M. Sen and H.-C. Chang, in (Eds.) A. Mir, E. Bilgen, Z. Zrikem, P. Vasseur, *Proceedings of First International Thermal Energy Congress*, Marrakesh, Morocco, Vol. 1, pp. 254–261, 1993.
195. Acoustic noise frequency spectra from direct condensation, V.G. López, J.G. Cervantes, F. Méndez and M. Sen, *Proceedings of the International Symposium on Heat and Mass Transfer in Energy Systems and Environmental Effects*, Cancun, Mexico, Aug. 22–25, pp. 351–355, 1993.
196. Solidification by convective cooling with void formation, Z. Yang, M. Sen and S. Paolucci, in (Eds.) C. Beckermann, H.P. Wang, L.A. Bertram, M.S. Sohal, S.I. Guceri, *Transport Phenomena in Solidification*, HTD-Vol. 284, AMD-Vol. 182, ASME, pp. 119–126, 1994.
197. Temperature measurements on an aluminum alloy permanent mold casting process under production conditions, W.M. Judson, S. Paolucci and M. Sen, in (Eds.) P.H. Oosthuizen, P.G. Kroeger, *Fundamentals of Phase Change: Sublimation and Solidification*, HTD-Vol. 286, ASME, pp. 53–60, 1994.
198. Effect of asymmetries on heat transfer in a bifurcating channel, X. Zhao, S. Paolucci, K.T. Yang and M. Sen, in (Eds.) F.W. Schmidt, R.J. Moffet, *Fundamentals of Heat Transfer in Forced Convection*, HTD-Vol. 285, ASME, pp. 69–74, 1994.

199. Chaotic advection and heat transfer, M. Sen and H.-C. Chang, in (Eds.) V.S. Arpaci, N.A. Hussain, S. Paolucci, R.G. Watts, *Chaos in Heat Transfer and Fluid Dynamics*, HTD-Vol. 298, ASME, pp. 27–33, 1994.
200. Vortex-induced enhancement of heat transfer in a thermal boundary layer, R. Romero-Méndez, M. Sen, K.T. Yang and R.L. McClain, Paper No. 96-WA/HT-33, *International Mechanical Engineers Congress and Exhibition*, Atlanta, GA, American Society of Mechanical Engineers, New York, NY, 8 pp. , 1996.
201. Analysis of data from single-row Heat exchanger experiments using an artificial neural network, G. Díaz, J.A. Yanes, M. Sen, K.T. Yang and R.L. McClain, in (Eds.) O.K. Rediniotis, D.P. Telionis, *Proceedings of the ASME Fluids Engineering Division*, International Mechanical Engineering Congress and Exhibition, Atlanta, GA, FED-Vol. 242, American Society of Mechanical Engineering, New York, NY, pp. 45–52, 1996.
202. Navier-Stokes simulations of a novel micropump, M.C. Sharatchandra, M. Sen and M. Gad-el-Hak, in (Eds.) K.S. Breuer, P.R. Bandopadhyay and M. Gad-el-Hak, *Application of Microfabrication to Fluid Mechanics*, pp. 225–238, ASME, New York, 1996.
203. Effect of tube-to-tube conduction on heat exchanger performance, R. Romero-Méndez, M. Sen, K.T. Yang and R.L. McClain, *Proceedings of the Sixth Latin American Congress on Heat and Mass Transfer*, Vol. 2, pp. 841–846, 1996.
204. Thermal effects of a novel micropumping device, M.C. Sharatchandra, M. Sen and M. Gad-el-Hak, ASME Paper No. 96-DETC/CIE-1356, in *Proceedings of the 16th Computers in Engineering Conference*, (Ed.) J.M. McCarthy, pp. 1–11, ASME.
205. Minimization of the solidification time of long thin-wall ingots, S. Shepel, S. Paolucci, S. Das and M. Sen, in (Eds.) T.L. Bergman, T.H. Hwang, P.J. Prescott, J. Seyed-Yagoobi, D.A. Zambrunnen, R. Pitchumani, M. Kulkarni, M.K. Chyu, S.J. Pien, R.L. Mahajan, *Proceedings of the 32nd National Heat Transfer Conference*, Vol. 9 (Manufacturing and Materials Processing), HTD-Vol. 347, American Society of Mechanical Engineering, New York, NY, pp. 41–46, 1997.
206. Effect of delay in heating and cooling systems, G. Díaz, S. Basu, M. Sen, K.T. Yang and R.L. McClain, *Proceedings of EURO THERM 53–Advanced Concepts and Techniques in Thermal Modelling*, Oct. 1997.
207. Genetic-algorithm based prediction of a fin-tube heat exchanger performance, A. Pacheco-Vega, M. Sen, K.T. Yang, and R.L. McClain, *Proceedings of the 11th International Heat Transfer Conference*, Korea, Vol. 6, pp. 137–142, 1998.
208. External convection in a plate fin and tube heat exchanger, R. Romero-Méndez, M. Sen, K.T. Yang and R.L. McClain, *Proceedings of the Fourth International Congress of The Mexican Society of Mechanical Engineering (SOMIM)*, Ciudad Juárez, Chih., Mexico, October 21–23, 1998, pp. 32–38.
209. Flow and load characteristics of microbearings with slip, M. Gad-el-Hak, J. Maureau and M. Sen, *Proceedings of the ASME Fluids Engineering Division Summer Meeting*, 21–25 June 1998, Washington, D.C., Paper No. FEDSM98-4911, 9 pp., CD-ROM Publication, ASME, New York, 1998.
210. A new approach to constrained shape optimization using genetic algorithms, M. Gad-el-Hak, M.C. Sharatchandra and M. Sen, *Proceedings of the ASME Fluids Engineering Division Summer Meeting*, 21–25 June 1998, Washington, D.C., Paper No. FEDSM98-4912, 10 pp., CD-ROM Publication, ASME, New York, 1998.
211. Three-dimensional analysis of viscous micropumps and microturbines, M. Gad-el-Hak, D. DeCourtye and M. Sen, *Proceedings of the ASME Fluids Engineering Division Summer Meeting*, 21–25 June 1998, Washington, D.C., Paper No. FEDSM98-4990, 9 pp., CD-ROM Publication, ASME, New York, 1998.
212. Artificial neural network simulation of the dynamic behavior of heat exchangers, G. Díaz, M. Sen, K.T. Yang and R.L. McClain, *Proceedings of the Seventh Latin American Heat and Mass Transfer Conference*, Vol. 1, pp. 23–28, 1998.
213. Neurocontrol of heat exchangers (in Spanish), G. Díaz, M. Sen, K.T. Yang and R.L. McClain, *Proceedings of the Fourth International Meeting of Mechanical Engineering*, San Luis Potosí, Mexico, pp. 123–128, 1998.
214. Effect of distance between fins on the hydrodynamics in a fin-tube heat exchanger, R. Romero-Méndez, M. Sen, K.T. Yang and R.L. McClain, *Proceedings of the ASME Fluids Engineering Division*, FED-Vol. 247, pp. 3–10, 1998.
215. Use of artificial neural networks for temperature control in heat exchangers, G. Díaz, M. Sen, K.T. Yang and R.L. McClain, *Proceedings of the Fourth ISHMT-ASME Heat and Mass Transfer Conference*

- and *Fifteenth National Heat and Mass Transfer Conference*, (Eds.) M.S. Loknath, S.P. Venkateshan, B.V.S.S.S. Prasad, B. Basu, V. Prasad, Jan. 12-14, 2000, Pune, India, pp. 963-968.
216. Prediction of humid air heat exchanger performance using artificial neural networks, A. Pacheco-Vega, M. Sen, K.T. Yang and R. McClain, *Proceedings of the ASME Heat Transfer Division*, 1999 ASME International Mechanical Engineering Congress and Exposition, HTD Vol. 364-3, 1999, pp. 307-314.
 217. Artificial neural network control of an experimental heat exchanger facility, G. Díaz, M. Sen, K.T. Yang, R.L. McClain, *Proceedings of the ASME Heat Transfer Division*, 1999 ASME International Mechanical Engineering Congress and Exposition, HTD Vol. 364-4, 1999, pp. 325-330.
 218. Coefficient of heat transfer in fin-tube heat exchanger analysis and the artificial neural networks, K.T. Yang, M. Sen, G. Díaz, A. Pacheco-Vega, and R.L. McClain, *Proceedings of the Symposium on Energy Engineering in the 21st Century (SEE2000)*, ed. Ping Cheng, Vol. 3, pp. 940-948, Begell House Publishers, NY, USA.
 219. On the use of thermal MEMS-sensors for wall-shear measurements, P. Johansson, L. Löfdahl, A. Bakchinov, M. Sen and M. Gad-el-Hak, *Proceedings of the 8th European Turbulence Conference*, Barcelona (Spain), June 27-30, 2000.
 220. Adaptive neurocontrol and minimization of energy consumption of a heat exchanger test facility, G. Díaz, M. Sen and R.L. McClain, *ASME International Mechanical Engineering Congress and Exposition*, 2000.
 221. Artificial neural network-based dynamic modeling of thermal systems and their control, K.T. Yang and M. Sen, in *Heat Transfer Science and Technology 2000*, (Ed.) B.-X. Wang, Aug. 2000, Higher Education Press, Beijing, China.
 222. Analysis of fin-tube evaporator performance with limited experimental data Using artificial neural networks, A. Pacheco-Vega, M. Sen and R.L. McClain, *Proceedings of the ASME*, HTD-Vol. 366-3, Heat Transfer Division-2000, pp. 95-101, Nov. 5-10, 2000.
 223. Adaptive neurocontrol and minimization of energy consumption of a heat exchanger test facility, G. Díaz, M. Sen and R.L. McClain, *Proceedings of the ASME*, HTD-Vol. 366-3, Heat Transfer Division-2000, pp. 111-116, November 5-10, 2000.
 224. Effect of fluid flow and heat transfer of dephasing between plates in wavy plate passages, R. Romero-Méndez, M. Sen, W. Franco-Consuegra, A. Hernández-Guerrero, *Eighth Latin American Congress on Heat and Mass Transfer*, Veracruz, Mexico, pp. 328-334, 2001.
 225. Effect of fluid flow and heat transfer of dephasing between plates in wavy plate passages, R. Romero-Méndez, M. Soto-Cabrero, M. Sen, W. Franco-Consuegra, A. Hernández-Guerrero, *Proceedings of the Fourth UNAM Supercomputing Conference*, Mexico, June 27-30, 2000, (Eds.) E. Ramos, G. Cisneros, R. Fernández-Flores, A. Santillán-González, World Scientific Publishing Co., Singapore, pp. 221-230, 2001.
 226. On-line training of artificial neural networks for control of a heat exchanger test facility, G. Díaz, M. Sen, K.T. Yang, and R.L. McClain, *Proceedings of National Heat Transfer Conference*, Anaheim, California, June 10-12, 2001, Paper No. NHTC2001-20054.
 227. Temperature control in a two-dimensional air-filled cavity, U. Lacoa, M. Sen and K.-T. Yang, *Proceedings of National Heat Transfer Conference*, Anaheim, California, June 10-12, 2001, Paper No. NHTC2001-20155.
 228. Modeling and control of a thermal-hydraulic network, W. Franco, M. Sen, K.T. Yang and R.L. McClain, *Proceedings of National Heat Transfer Conference*, Anaheim, California, June 10-12, 2001, Paper No. NHTC2001-20156.
 229. Thermal control of heat exchangers, S. Alotaibi, M. Sen, J.W Goodwine and K.T. Yang, *Proceedings of the National Heat Transfer Conference*, June 10-12, 2001, Anaheim, California, Paper No. NHTC01-20157.
 230. Correlations of fin-tube heat exchanger performance data using genetic algorithms, Simulated Annealing and Interval Methods, A. Pacheco-Vega, M. Sen, K.T. Yang and R.L. McClain, *ASME International Mechanical Engineering Congress and Exposition*, Paper No. HTD-24296, 2001.
 231. Parametric study of conjugate heat transfer in a plate-fin and tube heat exchanger, R. Romero-Méndez, R. Adame and M. Sen, *ASME International Mechanical Engineering Congress and Exposition*, Paper No. HTD-24113, 2001.

232. Using artificial neural networks to develop a predictive method from complex experimental heat transfer data, M.D. Kelleher, T.J. Cronley, K.T. Yang and M. Sen, *ASME International Mechanical Engineering Congress and Exposition*, Paper No. HTD-24282, 2001.
233. Prediction of turbulent statistics behind a rib using artificial neural networks, P.K. Panigrahi, V. Khandelwal and M. Sen, *Proceedings of the Fifth ISHMT/ASME Heat and Mass Transfer Conference and Sixteenth National Heat and Mass Transfer Conference*, Calcutta, India, pp. 676–681 ISHMT-ASME Meeting, 2002.
234. Stabilization of a neural network-based temperature controller for heat exchangers, G. Díaz, M. Sen, K.T. Yang and R.L. McClain, *Proceedings of the 12th International Heat Transfer Conference*, Grenoble, France, Volume 4, pp. 225–230, 2002.
235. Use of artificial neural networks in heat exchanger performance prediction and control, K. T. Yang and M. Sen, *Compact Heat Exchangers—A Festschrift on the 60th Birthday of Ramesh K. Shah*, (Eds.) G.P. Celata, B. Thonon, A. Bontemps, S. Kandlikar, pp. 445–450, Edizioni ETS, 2002.
236. Controllability of single and networked heat exchangers, M. Sen, W. Franco and S. Alotaibi, *Proceedings of the Ninth Latin American Heat and Mass Transfer Congress*, San Juan, Puerto Rico, pp. 541–546, 2002.
237. Optimization of control hardware placement in a thermal-hydraulic network, W. Franco, M. Sen and K.T. Yang, *Proceedings of the 6th ASME-JSME Thermal Engineering Joint Conference*, Hawaii, Paper No. TED-AJ03-239, pp. 1–8, 2003.
238. Controllability of conductive-convective systems, S. Alotaibi, J.W. Goodwine, M. Sen and K.T. Yang, *Proceedings of the 6th ASME-JSME Thermal Engineering Joint Conference*, Hawaii, Paper No. TED-AJ03-247, pp. 1–6, 2003.
239. A review of multiphase flow and heat transfer With artificial neural networks, M. Sen and K.T. Yang, Paper No. 41761, *Proceedings of the ASME International Mechanical Engineering Congress and Exposition*, 2003.
240. Heat Transfer Correlations in an Air-Water Fin-Tube Compact Heat Exchanger by Symbolic Regression, A. Pacheco-Vega, W. Cai, M. Sen and K.T. Yang, Paper No. 41977, *Proceedings of the ASME International Mechanical Engineering Congress and Exposition*, 2003.
241. Experimental comparison of thermal control strategies in piping networks, W. Franco, M. Sen, K.T. Yang and R.L. McClain, Paper No. 41913, *Proceedings of the ASME International Mechanical Engineering Congress and Exposition*, 2003.
242. Effect of residence time on the flow-based control of temperature in long ducts, S. Alotaibi, M. Sen, B. Goodwine and K.T. Yang, *Fourth European Thermal Sciences Conference*, 15 pp., March 29–31, 2004, Birmingham, U.K.
243. Heat transfer effects due to vibrating walls, F. Carlsson, M. Sen and L. Löfdahl, *Fourth European Thermal Sciences Conference*, 13 pages, March 29–31, 2004, Birmingham, U.K.
244. Bone structure adaptation as a cellular automaton optimization process, A. Tovar, G.L. Niebur, M. Sen, J.E. Renaud and B. Sanders, in *Proceedings of the 45th AIAA/ASME/ASCE/AHS/ASC Structures, Structural Dynamics & Materials Conference*, AIAA Paper No. 20041914, April 19–22, 2004.
245. Steady state hydrodynamic and thermal interactions between secondary user-loops in a hydraulic network, W. Franco, W. Cai, M. Sen and K.T. Yang, *ASME Summer Heat Transfer Conference*, San Francisco, CA, July 17–22, 2005, Paper No. HT2005-72583.
246. Genetic-programming-based symbolic regression for heat transfer correlations for a compact heat exchanger, W. Cai, M. Sen, K.T. Yang and A. Pacheco-Vega, *ASME Summer Heat Transfer Conference*, San Francisco, CA, July 17–22, 2005, Paper No. HT2005-72293.
247. Using carbon dioxide and ionic liquids for absorption refrigeration, M. Sen and S. Paolucci, *7th IIR Gustav Lorentzen Conference on Natural Working Fluids*, May 28–31, 2006, Trondheim, Norway.
248. Using carbon dioxide and ionic liquids for absorption refrigeration, S. Paolucci and M. Sen, *Energy: Production, Distribution and Conservation, ASME ATI Conference*, Milan, May 1417, 2006.
249. Property effects in ionic liquid-CO₂ absorption refrigeration, M. Sen and S. Paolucci, *International Refrigeration and Air Conditioning Conference*, Purdue University, July 17–20, 2006.
250. The use of ionic liquids in refrigeration, M. Sen and S. Paolucci, *ASME International Mechanical Engineering Congress and Exposition*, Paper No. IMECE2006-14712, Chicago, IL, Nov. 5–10, 2006.

251. Dynamics of temperatures in thermally-coupled, heated rooms with PI control, F. Thwaites and M. Sen, *ASME International Mechanical Engineering Congress and Exposition*, Poster No. IMECE2007-41274, Seattle, WA, Nov. 11–15, 2007.
252. Analysis of the Performance of Ionic Liquids in Cooling Loops, Wenjun (Katherine) Liu, M. Sen and S. Paolucci *ASME International Mechanical Engineering Congress and Exposition*, Paper No. IMECE2007-42225, Seattle, WA, Nov. 11–15, 2007.
253. Dynamic modeling of an absorption refrigeration system using ionic liquids, W. Cai, M. Sen and S. Paolucci *ASME International Mechanical Engineering Congress and Exposition*, Paper No. IMECE2007-41335, Seattle, WA, Nov. 11–15, 2007.
254. Analysis of cooling loops with ionic liquids (in Spanish), M. Sen, Wenjun (Katherine) Liu, S. Paolucci, Eighth Iberoamerican Congress of Mechanical Engineering, Cuzco, Peru, Oct. 23–25, 2007.
255. Bioheat transfer in skin for thermographic diagnosis of burns (in Spanish), J.N. Jiménez Lozano, M. Sen, F.J. González Contreras, R. Romero Méndez, XXXI National Congress of Biomedical Engineering CNIB2008, Guadalajara, Mexico, Nov. 5–8, 2008.
256. Bifurcation and symmetries of optimal solutions for distributed robotic systems, Baoyang Deng, Mihir Sen, Bill Goodwine, American Control Conference, St. Louis, Missouri, Paper FrA06.2, June 10–12, 2009.

Reports

1. Computation of natural convection in rotating systems, M. Sen, Report to the Jesse H. Jones Faculty Research Fund, 1988.
2. Deterministic chaos in nucleate boiling, M. Sen, Report to the National Science Foundation, Washington, DC, 1989.
3. A spectral method computation of convection in a porous annulus, M. Sen, Report to the National Center for Supercomputer Applications, University of Illinois, Urbana-Champaign, 1990.
4. Research in nucleate boiling, Scientific Visit to Mexico, M. Sen, Report to the National Science Foundation, 1989.
5. Continuously-focusable microscope system for droplet characterization in various flows, P.F. Dunn and M. Sen, Report to the Jesse H. Jones Faculty Research Equipment Fund, 1991.
6. Heat transfer enhancement by chaotic mixing, M. Sen and H.-C. Chang, Annual Reports to the Gas Research Institute, 1991, 1992.
7. Solidification of metals in die casting, S. Das, S. Paolucci and M. Sen, Report to AE Piston Products, Inc., 1991.
8. Low flow coil test program, Report to Brdg-Tndr, K.T. Yang, M. Sen, R.L. McClain, T.M. Pieters, 1992; K.T. Yang, M. Sen, R.L. McClain, X. Zhao, 1993.

Presentations without Proceedings, or Short Papers and Abstracts

1. Strong interaction between surface waves, M. Sen and E. Mollo-Christensen, American Physical Society Fluid Dynamics Division Meeting, 1974.
2. Finite amplitude gravity waves, E. Medina and M. Sen, Mexican Society of Physics, 1977.
3. Dynamic analysis of a one-dimensional thermosyphon, M. Sen and C. Treviño, Solar World Forum, International Solar Energy Society, Brighton, England 1981.
4. Solution to the problem of gas absorption in small concentrations in a falling film (in Spanish), A. Sámano and M. Sen, First Latin American Congress on Heat and Mass Transfer, La Plata, Argentina, 1982.
5. Transient round jets: Some visual observations, J. Cervantes, M. Sen and J. Hernández, American Physical Society Fluid Dynamics Meeting, 1983.
6. Time-dependent behavior of a toroidal thermosyphon, M. Sen, E. Ramos and C. Treviño, American Physical Society Fluid Dynamics Meeting, 1983.
7. Review of M. Strada and J.C. Heinrich, Numerical Heat Transfer 5, 81–93, 1982, *Applied Mechanics Review*, Vol. 36, No. 7, p. 1015, July 1983.
8. Review of V.K. Polevikov, USSR Computational Mathematics and Mathematical Physics 21, 126–137, 1982, *Applied Mechanics Review*, Vol. 36, No. 7, p. 1016, July 1983

9. Review of P. Vasseur and L. Robillard, Wärme-und Stoffübertragung 16, 199–207, 1982, *Applied Mechanics Review*, Vol. 36, No. 9, p. 1275, Sept. 1983
10. Review of V.A. Akinsete and T.A. Coleman, International Journal of Heat and Mass Transfer 25, 991–998, 1982, *Applied Mechanics Review*, Vol. 36, No. 10, p. 1424, Oct. 1983
11. Review of M.A. Azouni and C. Normand, Geophysical and Astrophysical Fluid Dynamics 23, 209–245, 1983, *Applied Mechanics Review*, Vol. 36, No. 12, p. 1709, Dec. 1983
12. Convective loop with axial conduction, M. Sen, E. Ramos, C. Treviño and O. Salazar, American Physical Society Fluid Dynamics Meeting, 1984.
13. Heat transfer in an inclined porous square material, E. Ramos, S.L. Moya and M. Sen, American Physical Society Fluid Dynamics Meeting, 1984.
14. Asymptotic analysis of a monolith catalytic combustor, C.Treviño and M. Sen, Joint Western and Eastern Sections Meeting of the Combustion Institute, 1985.
15. Natural convective modes in a tilted toroidal thermosyphon, E. Ramos and M. Sen, American Physical Society Fluid Dynamics Meeting, 1985.
16. Stability of a cylindrical falling film (in Spanish), Second National Symposium on Thermal Sciences, F.J. Solorio and M. Sen, Mexico City, 1985.
17. The Galerkin method applied to the analysis of flow around a droplet in a current of air (in Spanish), E. Rincón and M. Sen, Second National Symposium on Thermal Sciences, Mexico City, 1985.
18. Nonunique solutions of a second order boundary value problem, H.M. Atassi and M. Sen, Society for Industrial and Applied Mathematics Meeting, Chicago, IL, 1990.
19. Estimation of diffusion in chaotically mixed systems, S. Ghosh, N. Acharya, M. Sen and H.-C. Chang, AIChE Annual Meeting, Chicago, 1990.
20. On the nonlinear dynamics of a rotatable cylinder-splitter plate body, M. Gad-el-Hak, M. Sen and J.C.Xu, American Physical Society Fluid Dynamics Meeting, Bulletin of the American Physical Society 35, pp. 22571/22258, 1990.
21. Heat transfer enhancement by chaotic advection in an eccentric annulus, S. Ghosh, H.-C. Chang, N. Acharya and M. Sen, Second International Conference on Industrial and Applied Mathematics, Washington, D.C., 1991.
22. Numerical study of heat transfer enhancement by chaotic mixing, N. Acharya, S. Ghosh, H.-C.Chang, M. Sen, Mixing XIII, Engineering Foundation Conferences, Banff, Canada, 1991.
23. Enhancement of heat transfer by chaotic mixing, S. Ghosh, H.-C. Chang, N. Acharya and M. Sen, AIChE Annual Meeting, Los Angeles, 1991.
24. Enhancement of in-tube heat transfer in coiled tubes by chaotic mixing, H.C. Chang, N. Acharya, S. Ghosh and M. Sen, AIChE Annual Meeting, Los Angeles, 1991.
25. Chaotic mixing with chemical reaction, D.R. Sawyers, M. Sen, H.-C. Chang, XVIII International Congress of Theoretical and Applied Mechanics, Haifa, Israel, Aug. 22–28, 1992.
26. Numerical and experimental investigation of flow past a freely rotatable square cylinder, T. Zaki, M. Sen and M. Gad-el-Hak, American Physical Society Fluid Dynamics Meeting, Bulletin of the American Physical Society 38, pp. 2263–2264, 1993.
27. Effect of regular and chaotic mixing on bimolecular chemical reaction in helical coil reactors, D.R. Sawyers, M. Sen and H.-C. Chang, AIChE Annual Meeting, St. Louis, 1993.
28. Temperature measurements on an aluminum alloy permanent mold casting process under production conditions, Z. Yang, S. Paolucci and M. Sen, ASME Winter Annual Meeting, New Orleans, Nov. 28–Dec. 3, 1993.
29. Effect of shear flow on Benard natural convection in a cavity, L. Del Castillo, E. Ramos, K.T. Yang and M. Sen, CAM94 Physics Meeting, XXXVII Congreso Nacional de Física, Cancún, Mexico, September 26–30, 1994.
30. Natural convection in a rotating cavity, L.M. De la Cruz, E. Ramos, M. Sen and K.T. Yang, CAM94 Physics Meeting, XXXVII Congreso Nacional de Física, Cancún, Mexico, September 26–30, 1994.
31. A novel pump for low-Reynolds number flows, D. Wajerski, A. Texier, M. Sen, and M. Gad-el-Hak, American Physical Society Fluid Dynamics Meeting, Bulletin of the American Physical Society, Vol. 40, p. 2041, 1995.
32. Navier-Stokes simulations of a novel viscous pump, M. Sen, M.C. Sharatchandra and M. Gad-el-Hak, American Physical Society Fluid Dynamics Meeting, Bulletin of the American Physical Society, Vol. 41, No. 9, pp. 1790–1791, 1996.

33. Thermal Aspects of a Micropumping Device, M.C. Sharatchandra, M. Sen and M. Gad-el-Hak, American Physical Society Fluid Dynamics Meeting, Bulletin of the American Physical Society, Vol. 41, No. 9, pp. 1791, 1996.
34. Exact solution of slip-flow in microbearings, M. Gad-el-Hak, J. Maureau and M. Sen, American Physical Society Fluid Dynamics Meeting, 1997.
35. Analysis of viscous micropumps and microturbines, D. DeCourtye, M. Sen and M. Gad-el-Hak, American Physical Society Fluid Dynamics Meeting, 1997.
36. Constrained shape optimization using genetic algorithms, M.C. Sharatchandra, M. Sen and M. Gad-el-Hak, American Physical Society Fluid Dynamics Meeting, 1997.
37. Effect of delay in heating and cooling systems, G. Díaz, S. Basu, M. Sen, K.T. Yang and R.L. McClain, Proceedings of the Eurotherm No. 53, Advanced Concepts and Techniques in Thermal Modelling, pp. 41–42, 1997.
38. The use of MEMS-based sensors for measuring wall-shear stress, P. Johansson, L. Löfdahl, M. Sen and M. Gad-el-Hak, American Physical Society Fluid Dynamics Meeting, 1998.
39. The use of MEMS-based sensors for measuring wall-shear stress, P. Johansson, L. Löfdahl, M. Sen and M. Gad-el-Hak, Proceedings of the Annual Swedish Days of Mechanics (Svenska Mekanikdaggar) 1999 (SMD-99), eds. H. Alfredsson, Paper No. 4.5.b, Swedish National Committee for Mechanics, 7–9 June, KTH Högskoletryckeriet, Stockholm, Sweden, 1999.
40. Artificial intelligence in heat transfer, K.T. Yang and M. Sen, Journal of Heat Transfer, Millennium Edition, 2000.
41. Modeling of thermal sensors for wall-shear stress, P. Johansson, A. Bakchinov, L. Löfdahl, M. Sen and M. Gad-el-Hak, American Physical Society Fluid Dynamics Meeting, Vol. 44, No. 8, p. 181, 1999.
42. Thermal sensors for wall-shear stress: Reality and Myth, L. Löfdahl, P. Johansson, A. Bakchinov, M. Sen and M. Gad-el-Hak, American Physical Society Fluid Dynamics Meeting, Bulletin of the APS, Vol. 44, No. 8, p. 181, 1999.
43. Simulation of heat exchanger performance by artificial neural networks, G. Díaz, M. Sen, K.T. Yang and R.L. McClain, ASHRAE Winter Meeting, Dallas, TX, Feb. 2000.
44. An analytical solution to the conjugate heat transfer problem of a thermal wall-shear-stress sensor, C.-F. Stein, Peter Johansson, J. Bergh, L. Löfdahl, M. Sen, M. Gad-el-Hak, American Physical Society Fluid Dynamics Meeting, 2000.
45. Reducibility, emergence and the mathematical modeling of complex systems, M. Sen, PanIIT Research Symposium, Chennai, India, !Dec. 19–20, 2008.

Non-Technical Publications

1. Graduate programs in the thermosciences at the School of Engineering of the National University of Mexico, M. Sen and J. Cervantes, *Proceedings of the Frontiers in Education Conference*, American Society of Engineering Education–Institution for Electrical and Electronics Engineers, Buena Vista, Florida, pp. 100–104, 1978.
2. Postgraduate education as a necessary base for the creation of technology in developing countries (in Spanish), J. Cervantes and M. Sen, *Proceedings of the Second Symposium on Engineering*, University of Central America, El Salvador, 1979.
3. Postgraduate education in mechanical engineering and the creation of technology (in Spanish), J. Cervantes and M. Sen, *Proceedings of the Ninth National Biennial Congress of the College of Mechanical and Electrical Engineers*, Mexico City, Mexico, pp. 110–120, 1980.
4. Science and technology in India (in Spanish), M. Sen, *Ciencia y Desarrollo*, CONACYT, (Mexico), Vol. II, No. 41, pp. 6–53, 1981.
5. Development of a curriculum for mechanical engineering based upon intelligent systems and automation, S. Batill, S. Skaar, R. Nelson, B. Goodwine, J. Mason, and M. Sen, Session 1526, *Proceedings of the 2002 American Society for Engineering Education Annual Conference and Exposition*.
6. J.-D. Yoder and M. Sen, Development of an undergraduate intelligent systems laboratory and class with a collaborative, remote experiment, Paper No. AC 2007-1600, *Proceedings of the ASEE Annual Conference and Exposition*, Honolulu, Hawaii, June 24–27, 2007.

Invited Lectures and Seminars

1. Numerical methods in fluid mechanics, Regional Technological Institute, Merida, Mexico, 1979.
2. Chaotic behavior in convective flows, Second School of Statistical Physics, Oaxtepec, Mexico, 1983.
3. One-dimensional analysis of thermosyphons, Mechanical Engineering Department, Indian Institute of Technology, New Delhi, India, July 1985.
4. One-dimensional modeling of natural convection loops, Seminar in Mechanics Series, Department of Civil Engineering, McGill University, Montreal, Canada, April 9, 1986.
5. Natural convection in a thin horizontal porous snulus, Hydrodynamics Laboratory, Ecole Polytechnique, Montreal, Canada, April 10, 1986.
6. One-dimensional modeling of natural convection loops, Department of Mechanical Engineering, State University of New York, Stony Brook, NY, March 1986.
7. Some characteristics of unicellular convection, Department of Mechanical Engineering and Applied Mechanics, University of Pennsylvania, Philadelphia, PA, Dec. 2, 1987.
8. Periodicity and bifurcation in boiling, Aug. 16, 1989, Solar Energy Laboratory, Temixco, Mexico.
9. Natural convection in rectangular cavities with the parallel flow approximation, Aug. 23, 1989, Solar Energy Laboratory, Temixco, Mexico.
10. Chaotic mixing for heat transfer enhancement and other applications, H.-C. Chang and M. Sen, Workshop on Applications of Chaos, EPRI Office of Exploratory Research, San Francisco, Dec. 1990.
11. Relation between theory and experimentation in Research, Oct. 23, 1992, Universidad Simon Bolivar, Caracas, Venezuela.
12. Chaotic advection and heat transfer, Dec. 3, 1992, Solar Energy Laboratory, Temixco, Mexico.
13. Stability of flow in a rotating open loop thermosyphon, Feb. 18, 1993, II Latin American Conference on Turbomachinery, Cuernavaca, Mexico.
14. Chaotic advection with heat transfer, invited keynote presentation, June 9, 1993, First International Thermal Energy Congress, Marrakesh, Morocco.
15. Chaotic particle paths and heat transfer in coiled tubes, June 11, 1993, Ecole Nationale d'Industrie Minerale, Rabat, Morocco.
16. Chaotic particle paths and heat transfer in internal flows, Seventh Toyota Conference 1/2 Towards the Harnessing of Chaos, Lake Hamana, Shizuoka, Japan, Toyota Motor Corporation, Nov. 3, 1993.
17. Thermoacoustic machines, invited keynote presentation, 5th Latin American Congress of Heat and Mass Transfer, Caracas, Venezuela, Oct. 24–27, 1994.
18. Chaos and heat transfer, participation by invitation, American Society of Mechanical Engineers, Winter Annual Meeting, Chicago, Nov. 6–11, 1994.
19. Effect of chaotic advection on heat transfer, Faculty of Mechanical, Electrical and Electronic Engineering, University of Guanajuato, Salamanca, Mexico, Aug. 22, 1994.
20. Application of chaos theory in heat transfer, as part of New Frontiers in Mechanical Engineering, Division of Graduate Studies, Faculty of Engineering, National University of Engineering, Mexico City, Mexico, Aug. 22–26, 1994.
21. Chaotic advection and heat transfer, invited panelist in Panel on Chaotic Heat Transfer, ASME International ME Congress and Exposition, Chicago, Nov. 7, 1994.
22. Application of artificial intelligence to thermal engineering, Institute Lecture, Indian Institute of Technology, Kanpur, May 10, 2000.
23. Transport processes in heat exchangers, Department of Mechanical Engineering, Indian Institute of Technology, Kanpur, May 24, 2000.
24. Chaos and complexity in convective heat transfer, Department of Thermo and Fluid Dynamics, Chalmers University of Technology, Göteborg, Sweden, 2001.
25. Thermal control, Department of Mechanical Engineering, Purdue University, Nov. 7, 2002.
26. The fractional derivative and some thermofluid applications, Center for Energy Research, Temixco, Mexico, Oct. 22, 2003.
27. The fractional derivative and some thermofluid applications, Universidad Autónoma de San Luis Potosí, San Luis Potosí, Mexico, Oct. 24, 2003.
28. Control of HVAC systems, March 13, 2007, Kuwait University, Kuwait.
29. Analysis and control of complex thermo-mechanical systems, March 18, 2007, Kuwait University, Kuwait.

30. Analysis of simple and complex systems, Universidad Autónoma de San Luis Potosí, San Luis Potosí, March 30, Mexico, 2007.
31. From the simple to the complex: An engineer's perspective, Distinguished Lecture Series, Virginia Commonwealth University, Richmond, VA, April 23, 2007.
32. (a) Mathematical modeling of simple and complex systems, (b) Intelligent systems in engineering, March 5, 2008, Universidad Autónoma de Querétaro, Querétaro, Mexico.

Patent

1. Process and apparatus for enhancing in-tube heat transfer by chaotic mixing, M. Sen and H.-C. Chang, U.S. Patent No. 5,311,932, May 17, 1994.

Courses Taught at the University of Notre Dame

Undergraduate

1. Differential Equations and Applied Mathematics
2. Thermal Systems
3. Fluid Mechanics
4. ME Senior Design Project
5. Compressible Flow
6. Heat Transfer
7. Food Processing Engineering
8. Fluid Mechanics Laboratory
9. Measurements Laboratory
10. Introduction to Engineering Systems I and II
11. Engineering Analysis
12. Energy Systems

Graduate

1. Mathematical Methods I
2. Introduction to Chaotic Dynamics
3. Intermediate Fluid Mechanics
4. Intermediate Heat Transfer
5. Intelligent Systems
6. Thermal Convection

Courses Taught at Other Universities

Faculty of Engineering, National University of Mexico

Undergraduate:

1. Mechanics of Fluids I
2. Mechanics of Fluids II
3. Mechanics of Fluids III
4. Elements of Fluid Mechanics
5. Dynamics of Fluids
6. Heat Transfer
7. Thermodynamics
8. Applied Thermodynamics

Graduate:

1. Mechanics of Ideal Fluids

2. Mechanics of Viscous Fluids
3. Experimental Methods
4. Random Phenomena in Fluid Mechanics
5. Hydrodynamic Instability and Turbulence
6. Fundamentals of Fluid Mechanics
7. Advanced Topics in Fluid Mechanics
8. Geophysical Flows
9. Experimental Methods in Fluid Mechanics
10. Numerical and Approximate Methods in Fluid Mechanics
11. Advanced Topics in Heat Transfer
12. Two-Phase Heat Transfer

Cornell University

Undergraduate

1. Senior Mechanical Engineering Laboratory

Master's Theses Supervised

1. Non-Linear Interaction between Shallow Water Waves, J.L. Samaniego, 1978.
2. Analysis of the Transient Behavior of a Thermosyphon, J.A. Rojas, 1980.
3. Characteristics of Circular Jets, E. Rincón, 1981.
4. Approximate Stability Analysis for a Cylindrical Falling Film, F.J. Solorio, 1982.
5. Numerical Solution of Natural Convection in Cavities, S.L. Moya, 1983.
6. Natural Convection in Semi-Elliptical Cavity, E. Martín del Campo, 1984.
7. Flow in Conjugate Thermosyphon Loops, O. Salazar, 1984.
8. Maximum Cyclonic Wind Speeds, J. Sánchez-Sesma, 1985.
9. Starting Characteristics of Round Jets, J. Hernández, 1987.
10. Natural Convection in a Tilted Trapezoidal Enclosure, V. Kumar, 1987.
11. Deterministic Chaos in Nucleate Boiling, N. Acharya, 1989.
12. Analysis of Flow over Fixed and Rotatable Cylinder-Splitter Plate Body (Co-Director), J.C. Xu, 1990.
13. Experimental and Numerical Investigation of Flow Past a Freely Rotatable Square Cylinder (Co-Director), T.G. Zaki, 1991.
14. A Two-Dimensional Model for an Evaporative Falling Film with Deposition (Co-Director), M. Núñez, 1994.
15. Analytical and Numerical Study of Solidification by Convective Cooling with Void Formation, Z. Yang, 1994.
16. Performance of a Single-Row Heat Exchanger at Low In-Tube Flow Rates (Co-Director), X. Zhao, 1995.
17. Development of Computational Algorithms for Forced and Mixed Convection in Coiled Tubes in a Fin-Tube Heat Exchanger (Co-Director), Q. Shi, 1997.
18. Dynamic Modeling and Thermal Control of Multi-Room Cooling, Z. Xiao, 1999.

Doctoral Dissertations Supervised

1. Ignition Processes of Premixed Gases in Boundary Layer Flows, César Treviño, 1980.
2. Linear Stability of a Cylindrical Falling Film of Liquid: Theoretical and Experimental Study, Francisco J. Solorio, 1989.
3. Experimental and Numerical Investigation of Heat Transfer Enhancement by Chaotic Mixing, Narasimha Acharya, 1992.
4. Mathematical Modeling of Thermocompressive and Thermoacoustic Machines (Co-Director), Driss Omari, 1996.
5. Heat Transfer Enhancement by Regular and Chaotic Mixing in Laminar Channel Flow, David R. Sawyers, 1997.

6. Study of External Heat Transfer Mechanisms in Single-Row Fin and Tube Heat Exchangers, Ricardo Romero-Méndez, 1998.
7. Simulation and Control of Heat Exchangers using Artificial Neural Networks, Gerardo Díaz, 2000.
8. Simulation of Compact Heat Exchangers using Global Regression and Soft Computing, Arturo Pacheco-Vega, 2002.
9. Temperature Controllability in Cross-Flow Heat Exchangers and Long Ducts, Sorour Alotaibi, 2003.
10. Hydrodynamics and Control in Thermal-Fluid Networks, Walfre Franco, 2003.
11. Nonlinear Dynamics of Thermal-Hydraulic Networks, Weihua Cai, 2006.
12. Linear Stability of Electron-Flow Hydrodynamics in Ungated Semiconductors, Williams Calderón Muñoz, 2009.
13. Peristaltic Flow with Application to Ureteral Biomechanics, Joel Jiménez Lozano, 2009.