Curriculum Vitae et Studiorum

Adrian Bejan

J. A. Jones Distinguished Professor of Mechanical Engineering

Current Address:

Department of Mechanical Engineering	Born on 24 September 1948, U.S. Citizen
and Materials Science	TEL (919) 308-9930
Duke University	FAX (919) 660-8963
Durham, NC 27708-0300	EMAIL <u>abejan@duke.edu</u>

Education:

1971	B.S., Mechanical Engineering (Honors Course), Massachusetts Institute of Technology.
1972	M.S., Mechanical Engineering (Honors Course), Massachusetts Institute of Technology.
1975	Ph.D., Mechanical Engineering, Massachusetts Institute of Technology.

Professional Experience:

1989 - :	J.A. Jones Professor of Mechanical Engineering, Duke University, Durham, NC.
1984 - 1989:	Full Professor with Tenure, Department of Mechanical Engineering and Materials Science, Duke University, Durham, NC.
1978 - 1984:	Assistant and Associate Professor, Department of Mechanical Engineering, University of Colorado, Boulder, CO.
1976 - 1978:	Fellow of the Miller Institute of Basic Research in Science, University of California-Berkeley.
1975 - 1976:	Lecturer and Research Associate, Department of Mechanical Engineering, Massachusetts Institute of Technology.
1971 - 1974:	Research Assistant, Department of Mechanical Engineering, Massachusetts Institute of Technology.
1972:	Staff Engineer, Scientific Energy Systems, Inc., Watertown, Massachusetts.

Adrian Bejan Page 2

Honors:

Society Awards:

Benjamin Franklin Medal 2018.

Lifetime member of the Franklin Institute.

Mexican Academy of Sciences, Corresponding Member, 2017.

Ralph Coats Roe Medal, American Society of Mechanical Engineers, 2017, "For permanent contributions to the public appreciation of the pivotal role of engineering in an advanced society through outstanding accomplishments as an engineering scientist and educator, renowned communicator and prolific writer".

Top 100 read articles 2015, *Nature Scientific Reports*, 15 April 2016, for the article "Why humans build fires shaped the same way".

Special Achievement Award, Alianța Romania - America, October 7, 2015, Washington, DC.

Editor's Choice, *Journal of Applied Physics*, 21 August 2015, Morphing tree structures for latent thermal energy storage, S. Ziaei, S. Lorente, A. Bejan, J. Appl. Phys., **117**, 224901 (2015).

Atlas Award 2013, for the book *Design in Nature*, for its role in "building a converging, unified and urgent voice in the Climate Movement."

Academia Europaea ('The Academy of Europe'), Member, 2013.

Honorary Chairman, Constructal Law Conference, Nanjing, China, 14-15 October 2013.

75th Anniversary Gold Medal of the ASME Heat Transfer Division, 15 July 2013, Minneapolis.

Cover of the *Journal of Applied Physics*, 21 April 2013, Constructal Law of Design and Evolution: Physics, biology, technology and society, by A. Bejan and S. Lorente.

Ranked since 2001 among the 100 most highly cited authors worldwide in engineering (all fields, all countries), the Institute for Scientific Information (<u>http://isihighlycited.com</u>).

Associate Fellow, World Academy of Art & Science, elected in Spring 2012.

The Library Journal named Design in Nature as one of the Best Books 2012 in Science & Technology.

Cover of the *Journal of Applied Physics*, 1 January 2012, Tree-shaped fluid flow and heat storage in a conducting solid, by L. Combelles, S. Lorente, R. Anderson and A. Bejan.

Romanian Academy, Honorary Member, 2011.

Honorary Member of the American Society of Mechanical Engineers, 2011, "for an extraordinary record of creative work, including the unification of thermodynamics and heat transfer; the conceptual development of design as a science that unites all fields; legendary contributions to engineering education; and, since 1996, the discovery and continued development of the constructal law".

Honorable Mention from the Professional and Scholarly Division of the American Association of Publishers for the book *Design with Constructal Theory*, 5 February 2009.

Traian Vuia Prize from the Romanian Academy, for the Romanian translation of the book *Shape* and *Structure, from Engineering to Nature*, 24 August 2009.

Donald Q. Kern Award from the American Institute of Chemical Engineers (AIChE), 2008, for "seminal contributions to heat exchange design based on two original methods: entropy generation minimization, and constructal theory."

Fluid Science Research Award of the Institute of Fluid Science, Tohoku University, Japan, 21 January 2008.

James P. Hartnett Memorial Award, 2007, International Center of Heat and Mass Transfer.

Luikov Medal, 2006, International Heat Transfer Conference, Sydney.

Edward F. Obert Award, 2004, American Society of Mechanical Engineers, for the paper "Thermodynamic Formulation of the Constructal Law" with S. Lorente.

Charles Russ Richards Memorial Award, 2001, American Society of Mechanical Engineers, for "outstanding achievement in mechanical engineering by an engineer twenty years or more following graduation."

Ralph Coats Roe Award, 2000, American Society of Engineering Education.

Max Jakob Memorial Award, 1999, awarded jointly by the American Institute of Chemical Engineers and the American Society of Mechanical Engineers, "for highly imaginative and inspiring ideas in the thermal science and design of engineering and nature."

Robert Henry Thurston Lecturer, 1999, American Society of Mechanical Engineers, "Shape and Structure in Engineering and Nature: Constructal Theory."

Worcester Reed Warner Medal, 1996, of the American Society of Mechanical Engineers, "for originality, challenges to orthodoxy, and impact on engineering thermodynamics and heat transfer, which were made through the first three books: *Entropy Generation Through Heat and Fluid Flow* (1982), *Convection Heat Transfer* (1984), and *Advanced Engineering Thermodynamics* (1988)."

Heat Transfer Memorial Award, 1994, American Society of Mechanical Engineers, science" category, "for significant and often unconventional contributions to heat transfer, notably in natural convection, thermodynamic aspects of heat transfer, convection in porous media, thermal tribology, solar energy conversion, cryogenics, and transition to turbulence; and for bringing modern research results and methods into heat transfer education."

James Harry Potter Gold Medal, 1990, American Society of Mechanical Engineers, for "original and unorthodox ideas, journal articles, textbooks, graphics and lectures demonstrating that *engineering thermodynamics* is an active and often controversial field of research, and for encouraging others to invest their creativity in the future of the field."

Gustus L. Larson Memorial Award, 1988, American Society of Mechanical Engineers, for "demonstrated outstanding achievement in *mechanical engineering* within ten to twenty years following graduation."

Ralph R. Teetor Award, 1980, of the Society of Automotive Engineers.

ASME Distinguished Lecturer, 2002-2005.

Meritorious Service Award, for "outstanding leadership in and contributions to the development of the fields of exergy, energy and environment", received at the International Exergy, Energy and Environment Symposium, Izmir, Turkey, 15 July 2003.

Academy of Sciences of Moldova, Honorary Member, 2001.

Academy of Technical Sciences of Romania, Honorary Member, 2004.

George E. Palade Prize of the Romanian Cultural Foundation, Bucharest, 1996.

The 50th Anniversary Jubilee Medal of the University of the Lower Danube, Galati, Romania, 1998.

The Special Prize of the Romanian Society of Thermodynamicists, 1998.

Honorary Citizen, Galati, Romania, 1996.

Fellow of the American Society of Mechanical Engineers, elected in October 1987.

International Academy of Refrigeration, Member, 1999.

Bejan number (Be), proposed as name for the dimensionless group $\Delta P x^2 / (\rho v^2)$ in forced convection (S. Bhattacharjee and W.L. Grosshandler, The formation of a wall jet near a high temperature wall under microgravity environment, ASME HTD-Vol. 96, 1988, pp. 711-716).

Bejan number (Be), proposed as name for the dimensionless ratio of fluid friction irreversibility divided by heat transfer irreversibility, in convection (S. Paoletti, F. Rispoli and E. Sciubba, Calculation of exergetic losses in compact heat exchanger passages, ASME AES-Vol. 10-2, 1989, pp. 21-29).

Bejan number (Be), proposed as name for the dimensionless group $\Delta P L^2 / (\mu \alpha)$ in forced convection, electronic cooling, contact melting, and second law analysis of heat transfer (S. Petrescu, Int. J. Heat Mass Transfer, Vol. 37, 1994, p. 1283).

Cover story of *Mechanical Engineering* magazine, ASME, "How Nature Takes Shape," October 1997.

Cover story of *Science & Vie*, "Une Théorie Explique l'Intelligence de la Nature", November 2003, No. 1034, pp. 1, 44-63.

Cover story of Ingenieria Mecanica, Tecnologia y Desarrollo, March 2005, Vol. 1, No. 6.

Cover story of *Duke Magazine*, September-October 2007.

Academic Honors:

Doctor of Engineering honoris causa, University of Pretoria, 23 April 2015.

Docteur Honoris Causa, Institut National des Sciences Appliquées, Lyon, France, 3 April 2014.

Doctor Honoris Causa, University of Rome I, La Sapienza, Rome, Italy, 13 May 2009.

Professor Catedrático Convidado, University of Évora, Portugal, 2009 - present.

Extraordinary Professor, University of Pretoria, South Africa, 2007 - present.

Consulting Professor, Shanghai Jiaotong University, 2007 - present.

Doctor Honoris Causa, Technical University of Varna, Bulgaria, 2006.

Doctor Honoris Causa, Technical University of Gabrovo, Bulgaria, 2004.

Doctor of Science Honoris Causa, Swiss Federal Institute of Technology (ETH), Zürich, Switzerland, 2003, "for outstanding originality, challenges to conventional thinking, impact on modern thermal sciences, and for his pivotal role as promoter of constructal theory, entropy generation minimization, and European scientific culture."

Docteur Honoris Causa, Université Henri Poincaré, Nancy, France, 2001: "Leader scientifique mondial des domaines Energétique-Thermique et Mécanique des fluides. Promoteur de l'Analyse Entropique et de la Théorie Constructale. Profondément attaché aux valeurs humanistes et à la culture européenne."

Doctor Honoris Causa, University of Évora, Portugal, 2003 : "For outstanding contributions to the progress of knowledge in the field of engineering, namely for the development of Constructal Theory, which provides a groundbreaking method that enlightens the generation of shape and structure in both engineering and nature."

Doctor Honoris Causa, Federal University of Parana, Curitiba, Brazil, 2001.

Doctor Honoris Causa, Technical University of Moldova, Chisinau, Moldova, 2001.

Honorary Doctor of Science, Azerbaijan Technical University, Baku, Azerbaijan, 2000.

Doctor of Philosophy in Engineering (honoris causa), University of Durban-Westville, South Africa, 1999.

Doctor Honoris Causa, Odessa State Academy of Refrigeration, Odessa, Ukraine, 1999.

Doctor Honoris Causa, Technical University of Civil Engineering, Bucharest, 1999.

Doctor Honoris Causa, Gh. Asachi Technical University, Iasi, Romania, 1998.

Doctor Honoris Causa, Ovidius University, Constanta, Romania, 1997.

Doctor Honoris Causa, University of the Lower Danube, Galati, Romania, 1995.

Doctor Honoris Causa, Polytechnic University of Bucharest, 1992.

The Legacy of Adrian Bejan: Three Generations of Brazilian Scientists, International Symposium, Pontifical Catholic University of Parana, Curitiba, Brazil, December 12, 1997.

Bejan's Constructal Theory of Shape and Structure, International Symposium, University of Evora, Portugal, 31 October, 2003.

Extraordinary Professor, University of Pretoria, South Africa, 2005. Consulting Professor, Jiao Tong University, Shanghai, 2006

Graduation Speaker, University of Durban-Westville, South Africa, 1999.

Honorary Professor, University of the Lower Danube, Galati, Romania, 1993.

TEPCO Endowed Chair, Keio University, Yokohama, Japan, 1998.

Woodruff Colloquium invited speaker, Georgia Institute of Technology, 1999.

The Gurley Lecture in Mechanics, Rensselaer Polytechnic Institute (1998).

Honorary Diploma, Romanian General Association for Refrigeration (AGFR), 11 November 2000.

The Charles E. Foster Lecture, The University of Oklahoma (1994).

J.A. Jones Chair in Mechanical Engineering, Duke University, April 1989.

F. Mosey Visiting Scholarship of the Faculty of Engineering, University of Western Australia, Nedlands, Western Australia, 1984.

Faculty Fellowship of the University of Colorado, for the academic year 1984-85.

Croft Professorship 1981-82, College of Engineering, University of Colorado.

Post-Doctoral Research Fellowship, Miller Institute for Basic Research in Science, University of California - Berkeley, March 1976.

MIT, Sloan Research Traineeship, June 1971.

MIT, Member of Honors Course, Department of Mechanical Engineering, 1970 - 1972.

MIT, De Florez Award for ingenuity in engineering design, 1969.

Company Boards

Technical Advisory Board of General Compression Co., Newton, MA.

Advisor on Studio 360's "Science and Creativity" series, NPR station New York (WNYC).

Editorial Boards:

Honorary Chief Editor, International Journal of Mechanical and Aeronautical Engineering, 2016.

Honorary Editor, International Journal of Exergy, 2004

Honorary Editor, Exergy, An International Journal, 2001.

Honorary Editor, International Journal of Applied Thermodynamics, 1998.

Honorary Editor, Termotehnica, 1993.

Honorary Editor, Journal of Applied and Computational Mechanics, 2018.

Honorary Editorial Advisory Board, International Journal of Heat and Mass Transfer, 1992.

Honorary Editorial Advisory Board, International Communications in Heat and Mass Transfer, 1992.

Honorary Editorial Board, Heat and Fluid Flow, 2014.

Honorary Editor, International Journal of Energy and Environmental Engineering, 2014.

Associate Editor, International Journal of Thermal Sciences, 2001.

Associate Editor, International Journal of Energy & Technology, 2014.

Editor, International Journal of Design & Nature and Ecodynamics, 2009-present

Editor, Medical Physics, 2004.

Editorial Board, Applied Mechanics Reviews, 2009-present.

Editorial Board, International Journal of Energy & Technology, 2009-present.

Editorial Board, Design & Nature, 2004 – 2008.

Editorial Board, Advances in Transport Phenomena (Elsevier), 2006.

Editorial Board, International Journal of Ecodynamics, 2004.

Editorial Board, International Journal of Energy & Sustainable Systems, 2008.

Editorial Board, WIT Transactions, 2008.

Associate Technical Editor, ASME Journal of Heat Transfer, 2000.

Associate Editor, Energy-The International Journal, 1997.

Editor, Heat Transfer Handbook, Wiley, 2001.

Editorial Board, Journal of Porous Media, 1996.

Editorial Board, Mechanical Engineers' Handbook, Second Edition, Wiley, 1995.

International Editorial Board, Book series *The Sustainable World*, Wessex Institute of Technology, 2002.

Editorial Advisory Board, Acta Mechanica, 2003.

Editorial Advisory Board, Journal of Green Energy, 2003.

Editorial Advisory Board, Engenharia Térmica, 2001.

Editorial Advisory Board, International Journal of Heat and Technology (formerly Calore e Tecnologia), 2000.

Editorial Advisory Board, Heat Transfer-Asian Research, 1998.

Editorial Advisory Board, International Journal of Transport Phenomena, 1997.

Editorial Advisory Board, Heat Transfer Research (formerly, Heat Transfer Soviet Research), 1997.

Editorial Advisory Board, Journal of Non-Equilibrium Thermodynamics, 1996.

Editorial Advisory Board, Numerical Heat Transfer, 1995.

International Advisory Board, Archives of Thermodynamics, 1997.

International Advisory Board, Jordan Journal of Mechanical and Industrial Engineering, 2006.

Board of Editors, International Journal for Engineering Analysis and Design, 1992.

Advisory Editor, Heat Transfer — Japanese Research, 1990.

Advisory Editor, International Journal of Heat and Fluid Flow, 1988-2001.

Member of the Max Jakob Memorial Award Committee, 2003-2006.

Member of the Nusselt-Reynolds Prize Board, 1990-1992.

Member of the Committee on Honors and Awards, ASME Heat Transfer Division, 1997-2000.

Chairman of the Committee on Honors and Awards, ASME Heat Transfer Division, 1999-2000.

International Advisory Board, Suranaree University of Technology, Thailand, 2010-2012.

Member of the Editorial Board, Frontiers in Heat and Mass Transfer, 2010.

International Advisory Board, Journal of Biourbanism, 2010.

Advisory Editor, Journal of Mechanics, 2011.

Advisory Board, *Journal of Research Applications in Mechanical Engineering*, The Thai Society of Mechanical Engineers, 2011.

Editor, Scientific Reports (Nature), 2012.

Member of the Advisory Committee, Proceedings of the Romanian Academy, 2013.

Member of the International Scientific Board, Refrigeration Engineering and Technologies, 2014.

Chronological List of Publications

Books:

- 1. A. Bejan, *Entropy Generation through Heat and Fluid Flow*, John Wiley & Sons, New York, 1982, 264 pages, 139 illustrations, 223 references.
- 2. A. Bejan, *Convection Heat Transfer*, John Wiley & Sons, New York, 1984, 492 pages, 148 illustrations, 387 references.
- 3. A. Bejan, *Advanced Engineering Thermodynamics*, John Wiley & Sons, New York, 1988, 782 pages, 277 illustrations, 635 references.

Romanian translation: A. Bejan, *Termodinamica Tehnica Avansata*, Editura Tehnica, Bucharest, Romania, 1996, 848 pages, 277 illustrations, 635 references.

- 4. D. A. Nield and A. Bejan, *Convection in Porous Media*, Springer-Verlag, New York, 1992, 425 pages, 149 illustrations, 692 references.
- 5. A. Bejan, *Heat Transfer*, John Wiley & Sons, New York, 1993, 698 pages, 459 illustrations, 383 references.

Portuguese translation: A. Bejan, *Transferencia de Calor*, Edgard Blücher, Sao Paulo, Brazil, 1996, 540 pages, 459 illustrations, 383 references.

Korean translation: A. Bejan, *Heat Transfer*, Cheong Moon Gak, Seoul, Korea, 1996, 744 pages, 459 illustrations, 383 references.

- 6. A. Bejan, *Convection Heat Transfer*, Second Edition, John Wiley & Sons, New York, 1995, 652 pages, 228 illustrations, 543 references.
- 7. A. Bejan, *Entropy Generation Minimization*, CRC Press, Boca Raton, FL, 1996, 362 pages, 230 illustrations, 438 references.
- 8. A. Bejan, G. Tsatsaronis and M. Moran, *Thermal Design and Optimization*, John Wiley & Sons, New York, 1996, 540 pages, 110 illustrations, 189 references.

Indonesian translation: A. Bejan, G. Tsatsaronis and M. Moran, *Desain & Optimalisasi Termal*, Penerbit ITB, Bandung, Indonesia, 2012.

- 9. A. Bejan, *Advanced Engineering Thermodynamics*, Second Edition, John Wiley & Sons, New York, 1997, 888 pages, 324 illustrations, 612 references.
- 10. D. A. Nield and A. Bejan, *Convection in Porous Media*, Second Edition, Springer-Verlag, New York, 1999, 546 pages, 164 illustrations, 1600 references.
- 11. A. Bejan, P.Vadasz and D. G. Kröger, Eds., *Energy and the Environment*, Kluwer Academic Publishers, Dordrecht, The Netherlands, 1999, 276 pages, 129 illustrations, 333 references.
- 12. A. Bejan and E. Mamut, Eds., *Thermodynamic Optimization of Complex Energy Systems*, Kluwer Academic Publishers, Dordrecht, The Netherlands, 1999, 480 pages, 151 illustrations, 589 references.
- 13. A. Bejan, *Shape and Structure, from Engineering to Nature*, Cambridge University Press, Cambridge, UK, 2000, 343 pages, 191 illustrations, 311 references.

Romanian translation: A. Bejan, *Forma si Structura, de la Inginerie la Natura*, Editura Academiei, Bucharest, 2005, 330 pages, 191 illustrations, 311 references.

- 14. A. Bejan and A. D. Kraus, Eds., *Heat Transfer Handbook*, Wiley, New York, 2003, 1479 pages.
- 15. D. B. Ingham, A. Bejan, E. Mamut and I. Pop, Eds., *Emerging Technologies and Techniques in Porous Media*, Kluwer Academic Publishers, Dordecht, The Netherlands, 2004, 507 pages, 173 illustrations, 2073 references.
- 16. A. Bejan, I. Dincer, S. Lorente, A. F. Miguel and A. H. Reis, *Porous and Complex Flow Structures in Modern Technologies*, Springer-Verlag, 2004, 408 pages, 336 illustrations, 577 references.
- 17. A. Bejan, *Convection Heat Transfer*, Third Edition, John Wiley & Sons, Hoboken, 2004, 694 pages, 207 illustrations, 759 references.
- 18. A. Bejan and S. Lorente, *La Loi Constructale*, L'Harmattan, Paris, 2005, 110 pages, 25 illustrations, 113 references.
- 19. D. A. Nield and A. Bejan, *Convection in Porous Media*, Third Edition, Springer-Verlag, New York, 2006, 640 pages, 173 illustrations, 3082 references.

- 20. A. Bejan, *Advanced Engineering Thermodynamics*, Third Edition, John Wiley & Sons, Hoboken, 2006, 920 pages, 352 illustrations, 764 references.
- 21. A. Bejan, S. Lorente, A. F. Miguel and A. H. Reis, *Along with Constructal Theory*, UNIL · FGSE Workshop Series No. 1, J. Hernandez and M. Cosinschi, eds., University of Lausanne, Faculty of Geosciences and the Environment, 2006, 204 pages, 96 figures, 184 references.
- 22. A. Bejan and G. W. Merkx, Eds., *Constructal Theory of Social Dynamics*, Springer, New York, 2007, 350 pages, 141 illustrations, 521 references.
- 23. A. Bejan and S. Lorente, *Design with Constructal Theory*, Wiley, Hoboken, 2008, 551 pages, 322 illustrations, 348 references.

Romanian translation: A. Bejan and S. Lorente, *Teoria Constructală*, Editura AGIR, Bucharest, 2011, 502 pages.

- 24. A. Bejan, S. Lorente, A. F. Miguel and A. H. Reis, Eds., *Constructal Human Dynamics, Security and Sustainability*, IOS Press, Amsterdam, 2009, 177 pages, 81 illustrations, 250 references.
- 25. A. Bejan and J. P. Zane, DESIGN IN NATURE, How the Constructal Law Governs Evolution in Biology, Physics, Technology, and Social Organization, Doubleday, New York, 2012. Paperback edition: Anchor Books, New York, 2013.

Japanese translation: Shape and Flow, Kinokuniya, Tokyo, 23 August 2013.

Romanian translation: Design in Natură, AGIR, Bucharest, 21 February 2014.

- 26. D. A. Nield and A. Bejan, *Convection in Porous Media*, Fourth Edition, Springer, New York, 2013, 778 pages.
- 27. L. A. O. Rocha, S. Lorente and A. Bejan, eds., *Constructal Law and the Unifying Principle of Design*, Springer, New York, 2013, 328 pages.
- 28. A. Bejan, Convection Heat Transfer, 4th ed., Wiley, Hoboken, 2013, 658 pages.
- 29. A. Bejan, *The Physics of Life: The Evolution of Everything*, St. Martin's Press, New York, 2016, 261 pages.
- 30. A. Bejan, Advanced Engineering Thermodynamics, 4th ed., Wiley, Hoboken, 2016, 746 pages.
- 31. D. A. Nield and A. Bejan, *Convection in Porous Media*, 5th ed., Springer, New York, 2017, 1005 pages.

Edited Volumes:

- 1. A. Bejan, P. Vadász and D. G. Kröger, eds., *Proceedings of the USA-RSA Bi-National Energy and Environment Workshop*, University of Durban-Westville, South Africa, June 8-12, 1998, 334 pages.
- 2. A. Bejan, M. Feidt, M. J. Moran and G. Tsatsaronis, eds., *Efficiency, Cost, Optimization, Simulation and Environmental Aspects of Energy Systems and Processes*, Proceedings of the ECOS '98 Congress, University Henri Poincaré, Nancy, France, July 8-10, 1998, two volumes.

- 3. A. Bejan and E. Mamut, eds., *Thermodynamics and the Optimization of Complex Energy Systems*, Proceedings of the NATO Advanced Study Institute, Neptun, Romania, July 13-24, 1998.
- 4. A. Bejan, M. Feidt and E. Mamut, eds., *Energy Conversion, Conservation and Environmental Impact*, special issue of the *International Journal of Energy Research*, Vol. 26, No. 7, 2002.
- 5. A. Bejan, I. Dincer, S. Lorente, A. F. Miguel and A. H. Reis, *Porous and Complex Flow Structures in Modern Technologies*, Course Notes, University of Evora, Evora, Portugal, 2002.
- 6. H. M. Badr, H. I. Abualhamayel, M. A. I. El-Shaarawi, S. M. Zubair, J. R. Howell and A. Bejan, eds., *Theme Issue on Heat and Fluid Flow*, special issue of *The Arabian Journal of Science and Engineering*, Vol. 27, No. 2C, December 2002.
- 7. A. Bejan, D. B. Ingham and E. Mamut, eds., *Heat and Mass Transfer in Porous Media*, special issue of the *International Journal of Energy Research*, Vol. 27, No. 10, 2003.
- 8. A. Bejan, ed., *The Galati-Feidt Symposium*, special issue of the *International Journal of Heat & Technology*, Vol. 22, no. 1, 2004.
- 9. A. E. Bergles, I. Golobic, C. H. Amon and A. Bejan, eds., *Thermal Sciences 2004*, Proceedings of the ASME-ZSIS International Thermal Science Seminar II, 13-16 June 2004, Bled Slovenia.
- A. Bejan, H. Heperkan and U. Kesgin, *Thermodynamic Optimization and Constructal Design of Energy Systems*, Special issue of the *International Journal of Energy Research*, Vol. 29, No. 7, 2005.
- 11. A. E. Bergles, I. Golobic, C. H. Amon and A. Bejan, *Journal of Mechanical Engineering* (*Strojniški Vestnik*), Vol. 51, 2005, Nos. 7-8, pp. 363-540.
- 12. A. Bejan, ed., special issue of *Energy*, Vol. 31, 2006, pp. 551-552.
- 13. A. Bejan and G. Grazzini, *Shape and Thermodynamics*, International Workshop, Firenze University Press, Florence, 2008.
- 14. A. Bejan, Special Issue on "Constructal Theory", *International Journal of Design & Nature and Ecodynamics*, Vol. 5, No. 3, 2010.
- 15. G. Lorenzini, A. Bejan and C. Biserni, Constructal Law & Second Law Conference 2015, *International Journal of Heat and Technology*, Vol. 34, Special Issue 1, January 2016.

Peer-reviewed Publications:

1. A. Bejan, "Superconductive Field Winding for a 2 MVA Synchronous Generator," S.M. Thesis, Department of Mechanical Engineering, Massachusetts Institute of Technology, May 1972.

- 2. P. Thullen, A. Bejan, B. Gamble, J.L. Kirtley, Jr. and J.L. Smith, Jr., "MIT-EEI Superconducting Synchronous Machine," *Advances in Cryogenic Engineering*, Vol. 18, 1973, pp. 372-381.
- 3. A. Bejan, T. A. Keim, J. L. Kirtley, Jr., J. L. Smith, Jr., P. Thullen and G. E. Wilson, "Superconducting Alternator Test Results," *Advances in Cryogenic Engineering*, Vol. 19, pp. 53-58, 1974.
- 4. A. Bejan and J. L. Smith, Jr., "Thermodynamic Optimization of Mechanical Supports for Cryogenic Apparatus," *Cryogenics*, Vol. 14, March 1974, pp. 158-163.
- 5. A. Bejan, "Material Selection for the Torque Tubes of Large Superconducting Rotating Machinery," *Cryogenics*, Vol. 14, June 1974, pp. 313-315.
- 6. A. Bejan, "Improved Thermal Design of the Cryogenic Cooling System for the Rotor of a Superconducting Generator," Ph.D. Thesis, Department of Mechanical Engineering, Massachusetts Institute of Technology, February 1975.
- 7. P. Thullen, R. W. Stecher, A. Bejan, "Flow Instabilities in Gas-Cooled Cryogenic Current Leads," *IEEE Transactions on Magnetics*, Vol. MAG-11, No. 2, March 1975, pp. 573-575.
- 8. A. Bejan, "Discrete Cooling of Low Heat Leak Supports to 4.2°K," *Cryogenics*, Vol. 15, pp. 290-292, May 1975.
- 9. M. O. Hoenig, Y. Iwasa, D. B. Montgomery and A. Bejan, "Cryostabilized Single-Phase Helium Cooled Bundled Conductors for Large High Field Superconducting Magnets," presented at the Sixth Symposium on Engineering Problems of Fusion Research, San Diego, Nov. 18-21, 1975.
- 10. A. Bejan, "Refrigeration for Rotating Superconducting Windings of Large ac Electric Machines," *Cryogenics*, Vol. 16, No. 3, March 1976, pp. 153-160.
- 11. M. O. Hoenig, Y. Iwasa, D. B. Montgomery and A. Bejan, "Supercritical Helium Cooled, Cabled, Superconducting Hollow Conductors for Large High Field Magnets," presented at the *6th International Cryogenic Engineering Conference*, Grenoble, France, May 11-14, 1976.
- 12. A. Bejan and J. L. Smith, Jr., "Heat Exchangers for Vapor-Cooled Conducting Supports of Cryostats," *Advances in Cryogenic Engineering*, Vol. 21, pp. 247-256, 1976.
- 13. A. Bejan and E. M. Cluss, Jr., "Criterion for Burn-Up Conditions in Gas-Cooled Cryogenic Current Leads," *Cryogenics*, Vol. 16, No. 9, pp. 515-518, September 1976.
- A. Bejan and H. M. Paynter, SOLVED PROBLEMS IN THERMODYNAMICS, Department of Mechanical Engineering, Massachusetts Institute of Technology, Cambridge, Massachusetts, 1976, 178 pages.

- 15. A. Bejan and M. O. Hoenig, "Method for Estimating the Refrigeration Costs of Supercritical Helium Cooled Cabled Superconductors," *IEEE Transactions on Magnetics*, Vol. MAG-13, No. 1, pp. 686-689, January 1977.
- 16. A. Bejan and P. Thullen, "Thermal Performance of the Rotor of the MIT-EPRI 3 MVA Superconducting Alternator," *IEEE Transactions on Magnetics*, Vol. MAG-13, No. 1, pp. 763-766, January 1977.
- 17. A. Bejan, "Refrigerator-Recirculator Systems for Large Forced-Cooled Superconducting Magnets," *Cryogenics*, Vol. 17, No. 2, pp. 97-105, February 1977.
- 18. A. Bejan, "Graphic Techniques for Teaching Engineering Thermodynamics," *Mechanical Engineering News*, pp. 26-28, May 1977.
- 19. A. Bejan, "The Concept of Irreversibility in Heat Exchanger Design: Counter- Flow Heat Exchangers for Gas-to-Gas Applications," *Journal of Heat Transfer*, Vol. 99, No. 3, pp. 374-380, August 1977.
- 20. A. Bejan and C. L. Tien, "Transient Behavior of Normal Zones in One-Dimensional Composite Superconductors," ASME Paper No. 77-HT-74, National Heat Transfer Conference, Salt Lake City, August 15-17, 1977.
- 21. A. Bejan, "Transient Heat Conduction in Cryogenic Current Cables Following a Loss-of-Coolant Accident," *Journal of Heat Transfer*, Vol. 99, No. 4, pp. 689-691, November 1977.
- 22. A. Bejan, "General Criterion for Rating Heat Exchanger Performance," *International Journal of Heat and Mass Transfer*, Vol. 21, pp. 655-658, May 1978.
- 23. A. Bejan and C. L. Tien, "Natural Convection in a Horizontal Porous Medium Subjected to an End-to-End Temperature Difference," *Journal of Heat Transfer*, Vol. 100, No. 2, pp. 191-198, May 1978.
- 24. A. Bejan and C. L. Tien, "Fully Developed Natural Counterflow in a Long Horizontal Pipe with Different End Temperatures," *International Journal of Heat and Mass Transfer*, Vol. 21, pp. 701-708, June 1978.
- 25. A. Bejan and C. L. Tien, "Effect of Axial Conduction and Metal-Helium Heat Transfer on the Local Stability of Superconducting Composite Media," *Cryogenics*, Vol. 18, pp. 433-441, July 1978.
- 26. A. Bejan, "Natural Convection in Infinite Porous Medium with Concentrated Heat Source," *Journal of Fluid Mechanics*, Vol. 89, pp. 97-107, 1978.
- 27. A. Bejan, "Two Thermodynamic Optima in the Design of Sensible Heat Units for Energy Storage," *Journal of Heat Transfer*, Vol. 100, No. 4, pp. 708-712, November 1978.

- 28. A. Bejan and C. L. Tien, "Laminar Natural Convection Heat Transfer in a Horizontal Cavity with Different End Temperatures," *Journal of Heat Transfer*, Vol. 100, No. 4, pp. 641-647, November 1978.
- 29. A. Bejan and C. L. Tien, "Laminar Free Convection Heat Transfer through Horizontal Duct Connecting Two Fluid Reservoirs at Different Temperatures," *Journal of Heat Transfer*, Vol. 100, No. 4, pp. 725-727, November 1978.
- 30. A. Bejan, "Note on Gill's Solution for Free Convection in a Vertical Enclosure," *Journal of Fluid Mechanics*, Vol. 90, part 3, pp. 561-568, 1979.
- 31. A. Bejan, "A General Variational Principle for Thermal Insulation System Design," *International Journal of Heat and Mass Transfer*, Vol. 22, February 1979, pp. 219-228.
- 32. A. Bejan, "On the Boundary Layer Regime in a Vertical Enclosure Filled with a Porous Medium," *Letters in Heat and Mass Transfer*, Vol. 6, No. 2, 1979, pp. 93-102.
- 33. A. Bejan and C. L. Tien, "Natural Convection in Horizontal Space Bounded by Two Concentric Cylinders with Different End Temperatures," *International Journal of Heat and Mass Transfer*, Vol. 22, June 1979, pp. 919-928.
- 34. A. Bejan and J. Imberger, "Heat Transfer by Forced and Free Convection in a Horizontal Channel with Differentially Heated Ends," *Journal of Heat Transfer*, Vol. 101, August 1979, pp. 417-421.
- 35. A. Bejan, "A Study of Entropy Generation in Fundamental Convective Heat Transfer," *Journal* of Heat Transfer, Vol. 101, November 1979, pp. 718-725.
- 36. A. Bejan, "Second Law Analysis in Heat Transfer," *Energy—The International Journal*, Vol. 5, 1980, pp. 721-732.
- 37. F. Kreith, D. Kearney and A. Bejan, "End-Use Matching of Solar Energy Systems," *Energy The International Journal*, Vol. 5, 1980, pp. 875-890.
- 38. A. Bejan and P. A. Pfister, Jr., "Evaluation of Heat Transfer Augmentation Techniques Based on Their Impact on Entropy Generation," *Letters in Heat and Mass Transfer*, Vol. 7, 1980, pp. 97-106.
- 39. A. Bejan, "A Synthesis of Analytical Results for Natural Convection Heat Transfer across Rectangular Enclosures," *International Journal of Heat and Mass Transfer*, Vol. 23, 1980, pp. 723-726.
- 40. A. Bejan, "Natural Convection in a Vertical Cylindrical Well Filled with Porous Medium," *International Journal of Heat and Mass Transfer*, Vol. 23, 1980, pp. 726-729.
- W. R. Ouellette and A. Bejan, "Conservation of Available Work (Exergy) by Using Promoters of Swirl Flow in Forced Convection Heat Transfer," *Energy—The International Journal*, Vol. 5, 1980, pp. 587-596.

- 42. S. Kimura and A. Bejan, "Experimental Study of Natural Convection in a Horizontal Cylinder with Different End-Temperatures," *International Journal of Heat and Mass Transfer*, Vol. 23, 1980, pp. 1117-1126.
- 43. R. Anderson and A. Bejan, "Natural Convection on Both Sides of a Vertical Wall Separating Fluids at Different Temperatures," *Journal of Heat Transfer*, Vol. 102, 1980, pp. 630-635.
- 44. S. Kimura and A. Bejan, "Numerical Study of Natural Circulation in a Horizontal Duct with Different End-Temperatures," *Wärme-und Stoffübertragung*, Vol. 14, 1980, pp. 269-280.
- 45. A. Bejan, Discussion on "A Parametric Analysis of the Performance of Internally Finned Tubes for Heat Exchanger Application," *Journal of Heat Transfer*, Vol. 102, Aug. 1980, pp. 586-587.
- 46. A. Bejan and R. B. Yewell, "The Effect of Hydrogen Bubbles on the Thymol Blue Velocity Measurement Technique," *International Journal of Heat and Fluid Flow*, Vol. 2, No. 4, December 1980, pp. 201-204.
- 47. A. Bejan, D. W. Kearney and F. Kreith, "Second Law Analysis and Synthesis of Solar Collector Systems," *Journal of Solar Energy Engineering*, Vol. 103, Feb. 1981, pp. 23-28.
- 48. A. Bejan and A. N. Rossie, "Natural Convection in Horizontal Duct Connecting Two Fluid Reservoirs," *Journal of Heat Transfer*, Vol. 103, Feb. 1981, pp. 108-113.
- 49. A. Bejan and S. Kimura, "Penetration of Free Convection into a Lateral Cavity," *Journal of Fluid Mechanics*, Vol. 103, February 1981, pp. 465-478.
- 50. A. Bejan, "Lateral Intrusion of Natural Convection into a Horizontal Porous Structure," *Journal of Heat Transfer*, Vol. 103, May 1981, pp. 237-241.
- 51. A. Bejan, "On the Buckling Property of Inviscid Jets and the Origin of Turbulence," *Letters in Heat and Mass Transfer*, Vol. 8, May/June 1981, pp. 187-194.
- 52. A. Bejan and R. Anderson, "Heat Transfer across a Vertical Impermeable Partition Imbedded in Porous Medium," *International Journal of Heat and Mass Transfer*, Vol. 24, July 1981, pp. 1237-1245.
- 53. A. Bejan, A. A. Al-Homoud and J. Imberger, "Experimental Study of High Rayleigh Number Convection in Horizontal Cavity with Different End Temperatures," *Journal of Fluid Mechanics*, Vol. 109, August 1981, pp. 283-299.
- 54. A. Bejan, "Comments on Viscous Buckling of Thin Fluid Layers," *The Physics of Fluids*, Vol. 24, September 1981, pp. 1764, 1765.
- R. Anderson and A. Bejan, "Heat Transfer through Single and Double Vertical Walls in Natural Convection: Theory and Experiment," *International Journal of Heat and Mass Transfer*, Vol. 24, October 1981, pp. 1611-1620.

- 56. A. Bejan, "Second Law Analysis in Heat Transfer and Thermal Design," *Advances in Heat Transfer*, Vol. 15, pp. 1-58, 1982.
- 57. A. Bejan and D. Poulikakos, "Natural Convection in an Attic-Shaped Space Filled with Porous Material," *Journal of Heat Transfer*, Vol. 104, pp. 241-247, May 1982.
- 58. A. Bejan, "The Meandering Fall of Paper Ribbons," *The Physics of Fluids*, Vol. 25, No. 5, May 1982, pp. 741, 742.
- 59. M. Bejan and A. Bejan, "A Supply-Side Approach to Energy Policy," *Energy Policy*, Vol. 10, pp. 153-157, June 1982.
- 60. A. Bejan, "Extraction of Exergy from Solar Collectors under Time-Varying Conditions," *International Journal of Heat and Fluid Flow*, Vol. 3, June 1982, pp. 67-72.
- 61. A. Bejan and W. Schultz, "Optimum Flowrate History for Cooldown and Energy Storage Processes, *International Journal of Heat and Mass Transfer*, Vol. 25, August 1982, pp. 1087-1092.
- 62. R. Yewell, D. Poulikakos and A. Bejan, "Transient Natural Convection Experiments in Shallow Enclosures," *Journal of Heat Transfer*, Vol. 104, August 1982, pp. 533-538.
- 63. A. Bejan, "Theoretical Explanation for the Incipient Formation of Meanders in Straight Rivers," *Geophysical Research Letters*, Vol. 9, No. 8 August 1982, pp. 831-834.
- 64. M. G. Stockman and A. Bejan, "The Nonaxisymmetric (Buckling) Flow Regime of Fast Capillary Jets," *The Physics of Fluids*, Vol. 25, No. 9, September 1982, pp. 1506-1511.
- 65. A. Bejan, "Theory of Instantaneous Sinuous Structure in Turbulent Buoyant Plumes," *Wärmeund Stoffübertragung*, Vol. 16, No. 4, 1982, pp. 237-242.
- 66. D. Poulikakos and A. Bejan, "Fin Geometry for Minimum Entropy Generation in Forced Convection," *Journal of Heat Transfer*, Vol. 104, November 1982, pp. 616-623.
- 67. A. Bejan and R. Anderson, "Natural Convection at the Interface between a Vertical Porous Layer and an Open Space," *Journal of Heat Transfer*, Vol. 105, February 1983, pp. 124-129.
- 68. W. Schultz and A. Bejan, "Exergy Conservation in Parallel Thermal Insulation Systems, *International Journal of Heat and Mass Transfer*, Vol. 26, March 1983, pp. 335-340.
- 69. D. Poulikakos and A. Bejan, "Unsteady Natural Convection in a Porous Layer," *The Physics of Fluids*, Vol. 26(5), May 1983, pp. 1183-1191.
- 70. A. Bejan, "Natural Convection Heat Transfer in a Porous Layer with Internal Flow Obstructions," *International Journal of Heat and Mass Transfer*, Vol. 26, June 1983, pp. 815-822.

- 71. A. Bejan, "The Boundary Layer Regime in a Porous Layer with Uniform Heat Flux from the Side," *International Journal of Heat and Mass Transfer*, Vol. 26, pp. 1339-1346, September 1983.
- 72. D. Poulikakos and A. Bejan, "The Fluid Dynamics of an Attic Space," *Journal of Fluid Mechanics*, Vol. 131, 1983, pp. 251-269.
- 73. D. Poulikakos and A. Bejan, "Numerical Study of Transient High Rayleigh Number Convection in an Attic-Shaped Porous Layer," *Journal of Heat Transfer*, Vol. 105, 1983, pp. 476-484.
- 74. D. Poulikakos and A. Bejan, "Natural Convection Experiments in a Triangular Enclosure," *Journal of Heat Transfer*, Vol. 105, 1983, pp. 652-655.
- A. Bejan and G. R. Cunnington, "Theoretical Considerations of Transition to Turbulence in Natural Convection near a Vertical Wall," *International Journal of Heat and Fluid Flow*, Vol. 4, September 1983, pp. 131-139.
- 76. S. Kimura and A. Bejan, "Mechanism for Transition to Turbulence in Buoyant Plume Flow," *International Journal of Heat and Mass Transfer*, Vol. 26, October 1983, pp. 1515-1532.
- 77. R. Anderson and A. Bejan, "Buckling of a Turbulent Jet Surrounded by a Highly Flexible Duct," *The Physics of Fluids*, Vol. 26(11), November 1983, pp. 3193-3200.
- 78. S. Kimura and A. Bejan, "The 'Heatline' Visualization of Convective Heat Transfer," *Journal of Heat Transfer*, Vol. 105, 1983, pp. 916-919.
- 79. D. Poulikakos and A. Bejan, "Natural Convection in Vertically and Horizontally Layered Porous Media Heated from the Side," *International Journal of Heat and Mass Transfer*, Vol. 26, pp. 1805-1814, December 1983.
- 80. N. N. Lin and A. Bejan, "Natural Convection in a Partially Divided Enclosure," *International Journal of Heat and Mass Transfer*, Vol. 26, pp. 1867-1878, December 1983.
- 81. S. Kimura and A. Bejan, "The Buckling of a Vertical Liquid Column," *Journal of Fluids Engineering*, Vol. 105, December 1983, pp. 469-473.
- 82. S. Kimura and A. Bejan, "The Boundary Layer Natural Convection Regime in a Rectangular Cavity with Uniform Heat Flux from the Side," *Journal of Heat Transfer*, Vol. 106, February 1984, pp. 98-105.
- 83. K. R. Blake and A. Bejan, "Experiments on the Buckling of Thin Fluid Layers Undergoing End-Compression," *Journal of Fluids Engineering*, Vol. 106, March 1984, pp. 74-78.
- 84. A. Bejan and D. Poulikakos, "The nonDarcy Regime for Vertical Boundary Layer Natural Convection in a Porous Medium," *International Journal of Heat and Mass Transfer*, Vol. 27, May 1984, pp. 717-722.

- 85. A. Bejan, Solutions Manual for Convection Heat Transfer, John Wiley & Sons, New York, 1984, 218 pages.
- 86. A. Bejan, Solutions Manual for Entropy Generation through Heat and Fluid Flow, John Wiley & Sons, New York, 1984, 50 pages.
- 87. A. Bejan, "Second-Law Aspects of Heat Transfer Engineering," *Multi-Phase Flow and Heat Transfer* III, Vol. 1A, T.N. Veziroglu and A.E. Bergles, Eds., Elsevier, Amsterdam, 1984, pp. 1-22.
- 88. A. Bejan and R. L. Reid, Eds., Second Law Aspects of Thermal Design, ASME HTD-Vol. 33, 1984.
- 89. D. Poulikakos and A. Bejan, "Penetrative Convection in Porous Medium Bounded by a Horizontal Wall with Hot and Cold Spots," *International Journal of Heat and Mass Transfer*, Vol. 27, October 1984, pp. 1749-1758.
- D. Poulikakos and A. Bejan, "Natural Convection in a Porous Layer Heated and Cooled Along One Vertical Side," *International Journal of Heat and Mass Transfer*, Vol. 27, October 1984, pp. 1879-1891.
- K. R. Blake, D. Poulikakos and A. Bejan, "Natural Convection near 4°C in a Horizontal Water Layer Heated from Below," *The Physics of Fluids*, Vol. 27(11), November 1984, pp. 2608-2616.
- 92. K. R. Blake, A. Bejan and D. Poulikakos, "Natural Convection Near 4°C in a Water Saturated Porous Layer Heated from Below," *International Journal of Heat and Mass Transfer*, Vol. 27, December 1984, pp. 2355-2364.
- 93. S. Kimura and A. Bejan, "Natural Convection in a Stably Heated Corner Filled with Porous Medium," *Journal of Heat Transfer*, Vol. 107, May 1985, pp. 293-298.
- 94. A. Bejan and K. R. Khair, "Heat and Mass Transfer by Natural Convection in a Porous Medium," *International Journal of Heat and Mass Transfer*, Vol. 28, May 1985, pp. 909-918.
- 95. R. Anderson and A. Bejan, "The Instability of a Round Jet Surrounded by an Annular Shear Layer," *Journal of Fluids Engineering*, Vol. 107, 1985, pp. 258-263.
- 96. A. Bejan, "The Method of Scale Analysis: Natural Convection in Fluids," chapter in S. Kakac, W. Aung and R. Viskanta, Eds., *Natural Convection: Fundamentals and Applications,* Hemisphere, Washington, D.C., 1985, pp. 75-94.
- 97. A. Bejan, "The Method of Scale Analysis: Natural Convection in Porous Media," chapter in S. Kakac, W. Aung and R. Viskanta, Eds., *Natural Convection: Fundamentals and Applications*, Hemisphere, Washington, D.C., 1985, pp. 548-572.
- 98. D. E. Chelghoum and A. Bejan, "Second-Law Analysis of Solar Collectors with Energy Storage Capability," *Journal of Solar Energy Engineering*, Vol. 107, August 1985, pp. 244-251.

- O. V. Trevisan and A. Bejan, "Natural Convection with Combined Heat and Mass Transfer Buoyancy Effects in a Porous Medium," *International Journal of Heat and Mass Transfer*, Vol. 28, August 1985, pp. 1597-1611.
- 100. A. Bejan, "Mass and Heat Transfer by Natural Convection in a Vertical Cavity," *International Journal of Heat and Fluid Flow*, Vol. 6, No. 3, September 1985, pp. 149-160.
- 101. S. Kimura and A. Bejan, "Natural Convection in a Differentially Heated Corner Region," *The Physics of Fluids*, Vol. 28, No. 10, October 1985, pp. 2980-2989.
- 102. S. Kimura, A. Bejan and I. Pop, "Natural Convection Near a Cold Plate Facing Upward in a Porous Medium," *Journal of Heat Transfer*, Vol. 107, November 1985, pp. 819-825.
- 103. K. R. Khair and A. Bejan, "Mass Transfer to Natural Convection Boundary Layer Flow Driven by Heat Transfer," *Journal of Heat Transfer*, Vol. 107, November 1985, pp. 979-981.
- 104. D. Poulikakos and A. Bejan, "The Departure from Darcy Flow in Natural Convection in a Vertical Porous Layer," *The Physics of Fluids*, Vol. 28(12), December 1985, pp. 3477-3484.
- 105. O. V. Trevisan and A. Bejan, "Mass and Heat Transfer by Natural Convection in a Vertical Slot Filled with Porous Medium," *International Journal of Heat and Mass Transfer*, Vol. 29, March 1986, pp. 403-415.
- 106. A. Anand and A. Bejan, "Transition to Meandering Rivulet Flow in Vertical Parallel-Plate Channels," *Journal of Fluids Engineering*, Vol. 108, June 1986, pp. 269-272.
- 107. D. Poulikakos, A. Bejan, B. Selimos and K. R. Blake, "High Rayleigh Number Convection in a Fluid Overlaying a Porous Bed," *International Journal of Heat and Fluid Flow*, Vol. 7, June 1986, pp. 109-116.
- 108. A. Bejan, "Engineering Thermodynamics," *Mechanical Engineers' Handbook*, M. Kutz, ed., Wiley, New York, 1986, chapter 54, pp. 1530-1548.
- 109. K. E. Lankford and A. Bejan, "Natural Convection in a Vertical Enclosure Filled with Water Near 4°C," *Journal of Heat Transfer*, Vol. 108, November 1986, pp. 755-763.
- 110. O. V. Trevisan and A. Bejan, "Convection Driven by the Nonuniform Absorption of Thermal Radiation at the Free Surface of a Stagnant Pool," *Numerical Heat Transfer*, Vol. 10, 1986, pp. 483-506.
- 111. A. Bejan, "Buckling Flows: A New Frontier in Convection Heat Transfer," Lat. Am. J. Heat Mass Transfer, Vol. 10, 1986, pp. 83-103.
- 112. A. Bejan, "Thermodynamics of Solar Energy Engineering," *Heat Transfer: Korea-U.S.A. Seminar on Thermal Engineering and High Technology*, J.H. Kim, S.T. Ro and T.S. Lee, Eds., Hemisphere, Washington, D.C., 1987, pp. 363-381.

- 113. A. Bejan, "Unification of Three Different Theories Concerning the Ideal Conversion of Enclosed Radiation," *Journal of Solar Energy Engineering*, Vol. 109, February 1987, pp. 46-51.
- 114. O. V. Trevisan and A. Bejan, "Combined Heat and Mass Transfer by Natural Convection in a Vertical Enclosure," *Journal of Heat Transfer*, Vol. 109, February 1987, pp. 104-112.
- 115. A. Bejan, "The Basic Scales of Natural Convection Heat and Mass Transfer in Fluids and Fluid-Saturated Porous Media," *International Communications in Heat Mass Transfer*, Vol. 14, 1987, pp. 107-123.
- 116. A. Bejan, "Buckling Flows: A New Frontier in Fluid Mechanics," Chapter 5 in *Annual Review* of *Numerical Fluid Mechanics and Heat Transfer*, T.C. Chawla, Ed., Vol. 1, 1987, Hemisphere Publishing Corporation, Washington, D.C., pp. 262-304.
- 117. A. Bejan, "Second Law Aspects of Solar Energy Conversion," *Solar Energy Utilization*, H. Yüncü, E. Paykoc and Y. Yener, Eds., Martinus Nijhoff Publishers, Dordrecht, the Netherlands, 1987, pp. 145-187.
- 118. Z. Zhang and A. Bejan, "The Horizontal Spreading of Thermal and Chemical Deposits in a Porous Medium," *International Journal of Heat and Mass Transfer*, Vol. 30, November 1987, pp. 2289-2303.
- 119. O. V. Trevisan and A. Bejan, "Mass and Heat Transfer by High Rayleigh Number Convection in a Porous Medium Heated from Below," *International Journal of Heat and Mass Transfer*, Vol. 30, November 1987, pp. 2341-2356.
- 120. M. Wang and A. Bejan, "Heat Transfer Correlation for Bénard Convection in a Fluid Saturated Porous Layer," *International Communications in Heat and Mass Transfer*, Vol. 14, November-December 1987, pp. 617-626.
- 121. A. Bejan, "Convective Heat Transfer in Porous Media," Chapter 16 in *Handbook of Single-Phase Convective Heat Transfer*, S. Kakac, R.K. Shah and W. Aung, Eds., Wiley, New York, 1987.
- 122. A. Bejan, "The Thermodynamic Design of Heat and Mass Transfer Processes and Devices," *International Journal of Heat and Fluid Flow*, Vol. 8, 1987, pp. 258-276.
- 123. P. A. Litsek and A. Bejan, "Transient Natural Convection between Two Zones in an Insulated Enclosure," *Journal of Heat Transfer*, Vol. 110, February 1988, pp. 116-125.
- 124. A. Bejan, "Heat Transfer-Based Reconstruction of the Concepts and Laws of Classical Thermodynamics," *Journal of Heat Transfer*, Vol. 110, February 1988, pp. 243-249.
- 125. A. Bejan, "The Buckling Property of Inviscid Streams," in *Experiments in Fluid Mechanics*, R.A. Granger, Ed., Holt, Rinehart and Winston, New York, 1988, pp. 410-415.

- 126. A. Bejan, "A Second Look at the Second Law," *Mechanical Engineering*, Vol. 110, No. 5, May 1988, pp. 58-65.
- 127. P. Jany and A. Bejan, "The Scales of Melting in the Presence of Natural Convection in a Rectangular Cavity Filled with Porous Medium," *Journal of Heat Transfer*, Vol. 110, 1988, pp. 526-529.
- 128. A. Bejan, "Blending Geometry with Numerical Computation: Charts for the Enthalpy, Absolute Entropy and Flow Exergy of Twelve Gases at Low Pressures, *International Journal of Heat and Fluid Flow*, Vol. 9, June 1988, pp. 251-253.
- 129. A. Bejan, "Theory of Heat Transfer-Irreversible Power Plants," *International Journal of Heat and Mass Transfer*, Vol. 31, June 1988, pp. 1211-1219.
- 130. P. Jany and A. Bejan, "Scaling Theory of Melting with Natural Convection in an Enclosure," *International Journal of Heat and Mass Transfer*, Vol. 31, June 1988, pp. 1221-1235.
- 131. A. Bejan, *Solutions Manual for Advanced Engineering Thermodynamics*, John Wiley & Sons, New York, 1988, 160 pages.
- 132. A. Bejan, "Research into the Origins of Engineering Thermodynamics," *International Communications in Heat and Mass Transfer*, Vol. 15, Number 5, 1988, pp. 571-580.
- 133. P. Jany and A. Bejan, "Ernst Schmidt's Approach to Fin Optimization: an Extension to Fins with Variable Conductivity and the Design of Ducts for Fluid Flow," *International Journal of Heat and Mass Transfer*, Vol. 31, August 1988, pp. 1635-1644.
- 134. P. S. Beloff, A. Bejan and A. Campo, "Transient Natural Convection Heat Transfer in a Large-Diameter Cylinder," *Experimental Thermal and Fluid Science*, Vol. 1, No. 3, 1988, pp. 267-274.
- 135. W. J. Wepfer, N. Lior and A. Bejan, Eds., Second-Law Analysis in Heat/Mass Transfer and Energy Conversion, ASME AES-Vol. 6, or HTD-Vol. 97, 1988.
- 136. A. Bejan, "The Process of Melting by Rolling Contact," *International Journal of Heat and Mass Transfer*, Vol. 31, November 1988, pp. 2273-2283.
- 137. J. D. Hall, A. Bejan and J. B. Chaddock, "Transient Natural Convection in a Rectangular Enclosure with One Heated Side Wall," *International Journal of Heat and Fluid Flow*, Vol. 9, December 1988, pp. 396-404.
- 138. A. Bejan, "The Fundamentals of Sliding Contact Melting and Friction," *Journal of Heat Transfer*, Vol. 111, 1989, pp. 13-20.
- 139. A. Bejan and P. A. Litsek, "The Contact Heating and Lubricating Flow of a Body of Glass," *International Journal of Heat and Mass Transfer*, Vol. 32, April 1989, pp. 751-760.

- 140. A. Bejan, "Theory of Rolling Contact Heat Transfer," *Journal of Heat Transfer*, Vol. 111, May 1989, pp. 257-263.
- 141. A. Bejan, "Theory of Melting with Natural Convection in an Enclosed Porous Medium," *Journal of Heat Transfer*, Vol. 111, May 1989, pp. 407-415.
- 142. Z. Zhang and A. Bejan, "Melting in an Enclosure Heated at Constant Rate," *International Journal of Heat and Mass Transfer*, Vol. 32, June 1989, pp. 1063-1076.
- 143. A. Bejan, "Minimizing Entropy in Thermal Systems," *Mechanical Engineering*, Vol. 111, No. 8, August 1989, pp. 88-91.
- 144. A. Bejan, "Analysis of Melting by Natural Convection in an Enclosure," *International Journal of Heat and Fluid Flow*, Vol. 10, No. 3, September 1989, pp. 245-252.
- 145. A. Bejan, "Theory of Heat Transfer-Irreversible Refrigeration Plants," *International Journal of Heat and Mass Transfer*, Vol. 32, September 1989, pp. 1631-1639.
- 146. A. Bejan, "Buckling Flows: Exploring the Origins and Structure of Turbulence," *Mechanical Engineering*, Vol. 111, November 1989, pp. 70-74.
- 147. O. V. Trevisan and A. Bejan, "Mass and Heat Transfer by Natural Convection above a Concentrated Source Buried at the Base of a Shallow Porous Layer," *Multiphase Transport in Porous Media 1989*, ASME HTD-Vol. 127, 1989, pp. 47-54.
- 148. Z. Zhang and A. Bejan, "The Problem of Time-Dependent Natural Convection Melting with Conduction in the Solid," *International Journal of Heat and Mass Transfer*, Vol. 32, 1989, pp. 2447-2457.
- 149. R. A. Gore, C. T. Crowe and A. Bejan, "Experimental Observations on Transition to Turbulence in Confined Coaxial Jets and Other Boundary Layer Flows," ASME FED-Vol. 94, 1990, pp. 79-83.
- 150. O. V. Trevisan and A. Bejan, "Combined Heat and Mass Transfer by Natural Convection in a Porous Medium," *Advances in Heat Transfer*, Vol. 20, 1990, pp. 315-352.
- 151. J. L. Lage and A. Bejan, "Convection from a Periodically Stretching Plane Wall," *Journal of Heat Transfer*, Vol. 112, 1990, pp. 92-99.
- 152. A. Bejan, "Optimum Hair Strand Diameter for Minimum Free-Convection Heat Transfer from a Surface Covered with Hair," *International Journal of Heat and Mass Transfer*, Vol. 33, 1990, pp. 206-209.
- 153. Z. Zhang and A. Bejan, "Solidification in the Presence of High Rayleigh Number Convection in an Enclosure Cooled from the Side," *International Journal of Heat and Mass Transfer*, Vol. 33, 1990, pp. 661-671.

- 154. M. De Lucia and A. Bejan, "Thermodynamics of Energy Storage by Melting Due to Conduction or Natural Convection," *Journal of Solar Energy Engineering*, Vol. 112, May 1990, pp. 110-116.
- 155. R. A. Gore, C. T. Crowe and A. Bejan, "The Geometric Similarity of the Laminar Sections of Boundary Layer-type Flows," *International Communications in Heat and Mass Transfer*, Vol. 17, No. 4, 1990, pp. 465-475.
- 156. P. A. Litsek and A. Bejan, "Convection in the Cavity Formed between Two Cylindrical Rollers," *Journal of Heat Transfer*," Vol. 112, 1990, pp. 625-631.
- 157. A. Bejan, "Theory of Heat Transfer from a Surface Covered with Hair," Journal of Heat Transfer, Vol. 112, 1990, pp. 662-667.
- 158. A. Bejan and J. L. Lage, "The Prandtl Number Effect on the Transition in Natural Convection along a Vertical Surface," *Journal of Heat Transfer*, Vol. 112, 1990, pp. 787-790.
- 159. P. A. Litsek and A. Bejan, "Sliding Contact Melting: The Effect of Heat Transfer in the Solid Parts," *Journal of Heat Transfer*, Vol. 112, 1990, pp. 808-812.
- 160. J. L. Lage and A. Bejan, "Numerical Study of Forced Convection near a Surface Covered with Hair," *International Journal of Heat and Fluid Flow*, Vol. 11, No. 3, September 1990, pp. 242-248.
- 161. G. Tsatsaronis, M. J. Moran and A. Bejan, Eds., *Education in Thermodynamics and Energy* Systems, ASME AES-Vol. 20, 1990.
- 162. A. Bejan, Z. Zhang and P. Jany, "The Horizontal Intrusion Layer of Melt in a Saturated Porous Medium," *International Journal of Heat and Fluid Flow*, Vol. 11, No. 4, December 1990, pp. 284-289.
- 163. A. Bejan and D. A. Nield, "Transient Forced Convection near a Suddenly Heated Plate in a Porous Medium," *International Communications in Heat and Mass Transfer*, Vol. 18, No. 1, January-February 1991, pp. 83-91.
- 164. J. L. Lage and A. Bejan, "The Ra-Pr Domain of Laminar Natural Convection in an Enclosure Heated From the Side," *Numerical Heat Transfer*, Part A: Applications, Vol. 19, No. 1, January-February 1991, pp. 21-41.
- 165. P. A. Litsek, Z. Zhang and A. Bejan, "Convection in the Cavity Between Two Rollers: the Effect of Thermal Boundary Conditions," *Journal of Heat Transfer*, Vol. 113, February 1991, pp. 249-251.
- 166. A. Bejan, "Predicting the Pool Fire Vortex Shedding Frequency," *Journal of Heat Transfer*, Vol. 113, February 1991, pp. 261-263.
- 167. A. Bejan, "Thermodynamics of an 'Isothermal' Flow: the Two-Dimensional Turbulent Jet," *International Journal of Heat and Mass Transfer*, Vol. 34, No. 2, February 1991, pp. 407-413.

- 168. A. Bejan, "Film Condensation on an Upward Facing Plate with Free Edges," *International Journal of Heat and Mass Transfer*, Vol. 34, No. 2, February 1991, pp. 578-582.
- 169. M. De Lucia and A. Bejan, "Thermodynamics of Phase-Change Energy Storage: The Effects of Liquid Superheating during Melting, and Irreversibility during Solidification," *Journal of Solar Energy Engineering*, Vol. 113, February 1991, pp. 2-10.
- 170. J. L. Lage and A. Bejan, "Natural Convection from a Vertical Surface Covered with Hair," *International Journal of Heat and Fluid Flow*, Vol. 12, No. 1, March 1991, pp. 46-53.
- 171. Z. Zhang, A. Bejan and J. L. Lage, "Natural Convection in a Vertical Enclosure with Internal Permeable Screen," *Journal of Heat Transfer*, Vol. 113, 1991, pp. 377-383.
- 172. J. L. Lage, A. Bejan and J. Georgiadis, "On the Effect of the Prandtl number on the Onset of Bénard Convection," *International Journal of Heat and Fluid Flow*, Vol. 12, 1991, pp. 184-188.
- 173. A. Adorjan and A. Bejan, Eds., Cryogenic Heat Transfer 1991, ASME HTD-Vol. 167, 1991.
- 174. J. L. Lage, A. Bejan and R. Anderson, "Efficiency of Transient Contaminant Removal from a Slot Ventilated Enclosure," *International Journal of Heat and Mass Transfer*, Vol. 34, October 1991, pp. 2603-2615.
- 175. A. Bejan, "Melting in the Presence of Natural Convection in a Saturated Porous Medium," *Convection Heat and Mass Transfer in Porous Media*, S. Kakac, et al., Eds., Kluwer Academic Publishers, Dordrecht, The Netherlands, 1991, pp. 739-772.
- 176. A. Bejan and J. L. Lage, "Heat Transfer from a Surface Covered with Hair," *Convection Heat and Mass Transfer in Porous Media*, S. Kakac, et al., Eds., Kluwer Academic Publishers, Dordrecht, The Netherlands, 1991, pp. 823-845.
- 177. A. J. Fowler and A. Bejan, "The Effect of Shrinkage on the Cooking of Meat," *International Journal of Heat and Fluid Flow*, Vol. 12, December 1991, pp. 375-383.
- 178. J. S. Lim, A. Bejan and J. H. Kim, "Thermodynamics of Energy Extraction from Fractured Hot Dry Rock," *International Journal of Heat and Fluid Flow*, Vol. 13, March 1992, pp. 71-77.
- 179. J. S. Lim, A. Bejan and J. H. Kim, "Thermodynamic Optimization of Phase-Change Energy Storage Using Two or More Materials," *Journal of Energy Resources Technology*, Vol. 114, March 1992, pp. 84-90.
- 180. J. L. Lage, J. S. Lim and A. Bejan, "Natural Convection with Radiation in a Cavity with Open Top End," *Journal of Heat Transfer*, Vol. 114, May 1992, pp. 479-486.
- 181. A. Bejan and P. A. Tyvand, "The Pressure Melting of Ice Under a Body with Flat Base," *Journal of Heat Transfer*, Vol. 114, May 1992, pp. 529-531.

- 182. P. A. Tyvand and A. Bejan, "The Pressure Melting of Ice Due to an Embedded Cylinder," *Journal of Heat Transfer*, Vol. 114, May 1992, pp. 532-535.
- 183. J. L. Lage, A. Bejan and R. Anderson, "Removal of Contaminant Generated by a Discrete Source in a Slot Ventilated Enclosure," *International Journal of Heat and Mass Transfer*, Vol. 35, May 1992, pp. 1169-1180.
- 184. A. Bejan, "Comment on Natural Convection from Isothermal Plates Embedded in Thermally Stratified Porous Media," *Journal of Thermophysics and Heat Transfer*, Vol. 6, No. 3, 1992, pp. 574-575.
- 185. J. S. Lim, A. Bejan and J. H. Kim, "The Optimal Thickness of a Wall with Convection on One Side," *International Journal of Heat and Mass Transfer*, Vol. 35, July 1992, pp. 1673-1679.
- 186. A. Bejan, "Single Correlation for Theoretical Contact Melting Results in Various Geometries," *International Communications in Heat and Mass Transfer*, Vol. 19, July-August 1992, pp. 473-483.
- 187. J. S. Lim and A. Bejan, "The Prandtl Number Effect on Melting Dominated by Natural Convection," *Journal of Heat Transfer*, Vol. 114, August 1992, pp. 784-787.
- 188. A. Bejan, "Surfaces Covered with Hair: "Optimal Strand Diameter and Optimal Porosity for Minimum Heat Transfer," *Biomimetics*, Vol. 1, No. 1, pp. 23-38, 1992.
- 189. A. Bejan and E. Sciubba, "The Optimal Spacing of Parallel Plates Cooled by Forced Convection," *International Journal of Heat and Mass Transfer*, Vol. 35, December 1992, pp. 3259-3264.
- 190. J. L. Lage, A. Bejan and J. G. Georgiadis, "The Prandtl Number Effect Near the Onset of Bénard Convection in a Porous Medium," *International Journal of Heat and Fluid Flow*, Vol. 13, December 1992, pp. 408-411.
- 191. A. Bejan, "Lubrication by Close-Contact Melting," *Fundamental Issues in Small Scale Heat Transfer*, ASME HTD-Vol. 227, 1992, pp. 61-68.
- 192. A. Bejan, Solutions Manual for Heat Transfer, John Wiley & Sons, New York, 1993, 488 pages.
- 193. A. Bejan, "How to Distribute a Finite Amount of Insulation on a Wall with Nonuniform Temperature," *International Journal of Heat and Mass Transfer*, Vol. 36, January 1993, pp. 49-56.
- 194. A. Bejan and A. M. Morega, "Optimal Arrays of Pin Fins and Plate Fins in Laminar Forced Convection," *Journal of Heat Transfer*, Vol. 115, February 1993, pp. 75-81.
- 195. A. J. Fowler and A. Bejan, "Contact Melting During Sliding on Ice, "International Journal of Heat and Mass Transfer, Vol. 36, March 1993, pp. 1171-1179.

- 196. J. L. Lage and A. Bejan, "The Resonance of Natural Convection in an Enclosure Heated Periodically from the Side," *International Journal of Heat and Mass Transfer*, Vol. 36, May 1993, pp. 2027-2038.
- 197. A. Bejan, "Power and Refrigeration Plants for Minimum Heat Exchanger Inventory," *Journal of Energy Resources Technology*, Vol. 115, June 1993, pp. 148-150.
- 198. A. Bejan, Al. M. Morega, S. W. Lee and S. J. Kim, "The Cooling of a Heat-Generating Board inside a Parallel-Plate Channel," *International Journal of Heat and Fluid Flow*, Vol. 14, June 1993, pp. 170-176.
- 199. Al. M. Morega, A. M. Filip, A. Bejan and P. A. Tyvand, "Melting Around a Shaft Rotating in a Phase-Change Material," *International Journal of Heat and Mass Transfer*, Vol. 36, July 1993, pp. 2499-2509.
- 200. A. Bejan and Al. M. Morega, "Thermal Contact Resistance Between Two Flat Surfaces that Squeeze a Film of Lubricant," *Journal of Heat Transfer*, Vol. 115, August 1993, pp. 763-767.
- 201. S. Mereu, E. Sciubba and A. Bejan, "The Optimal Cooling of a Stack of Heat Generating Boards with Fixed Pressure Drop, Flowrate or Pumping Power," *International Journal of Heat and Mass Transfer*, Vol. 36, October 1993, pp. 3677-3686.
- 202. J. S. Lim, A. J. Fowler and A. Bejan, "Spaces Filled with Fluid and Fibers Coated with a Phase-Change Material," *Journal of Heat Transfer*, Vol. 115, November 1993, pp. 1044-1050.
- Al. M. Morega and A. Bejan, "Heatline Visualization of Forced Convection Laminar Boundary Layers," *International Journal of Heat and Mass Transfer*, Vol. 36, November 1993, pp. 3957-3966.
- 204. A. J. Fowler and A. Bejan, "Correlation of Optimal Sizes of Bodies with External Forced Convection Heat Transfer," *International Communications in Heat and Mass Transfer*, Vol. 21, January-February 1994, pp. 17-27.
- 205. A. Bejan, "Power Generation and Refrigeration Models with Heat Transfer Irreversibilities," *Thermal Science and Engineering*, Vol. 33, No. 128, 1994, pp. 68-75.
- 206. A. Bejan, "Contact Melting Heat Transfer and Lubrication," *Advances in Heat Transfer*, Vol. 24, 1994, pp. 1-38.
- 207. Al. M. Morega and A. Bejan, "Heatline Visualization of Convective Heat Transfer in Porous Media," *International Journal of Heat and Fluid Flow*, Vol. 15, February 1994, pp. 42-47.
- 208. A. Bejan, J. V. C. Vargas and J. S. Lim, "When to Defrost a Refrigerator and When to Remove the Scale from the Heat Exchanger of a Power Plant," *International Journal of Heat and Mass Transfer*, Vol. 37, February 1994, pp. 523-532.

- 209. A. Bejan and S. W. Lee, "Optimal Geometry of Convection Cooled Electronic Packages," *Cooling of Electronic Systems*, S. Kakac, H. Yuncu and K. Hijikata, eds., Kluwer Academic Publishers, Dordrecht, The Netherlands, 1994, pp. 277-291.
- 210. M. Morega and A. Bejan, "Plate Fins with Variable Thickness and Height for Air-Cooled Electronic Modules," *International Journal of Heat and Mass Transfer*, Vol. 37, Suppl. 1, 1994, pp. 433-445.
- 211. A. J. Fowler and A. Bejan, "Forced Convection in Banks of Inclined Cylinders at Low Reynolds Numbers," *International Journal of Heat and Fluid Flow*, Vol. 15, April 1994, pp. 90-99.
- 212. Al. M. Morega and A. Bejan, "The Optimal Spacing of Parallel Boards with Discrete Heat Sources Cooled by Laminar Forced Convection," *Numerical Heat Transfer, Part A*, Vol. 25, 1994, pp. 373-392.
- 213. A. Bejan and Al. M. Morega, "The Optimal Spacing of a Stack of Plates Cooled by Turbulent Forced Convection," *International Journal of Heat and Mass Transfer*, Vol. 37, April 1994, pp. 1045-1048.
- 214. A. Bejan and Z. Zhang, "Natural Convection Melting of a Slab of Ice," *Experiments in Heat Transfer and Thermodynamics*, R. A. Granger, Ed., Cambridge University Press, Cambridge, 1994, pp. 54-60.
- 215. J. V. C. Vargas, A. Bejan and A. Dobrovicescu, "The Melting of an Ice Shell on a Heated Horizontal Cylinder," *Journal of Heat Transfer*, Vol. 116, August 1994, pp. 702-708.
- 216. A. Bejan, "Heat Transfer as a Design-Oriented Course: Mechanical Supports as Thermal Insulators," *International Journal of Mechanical Engineering Education*, Vol. 22, 1994, No. 1, pp. 29-41.
- 217. J. S. Lim and A. Bejan, "Two Fundamental Problems of Refrigerator Thermal Insulation Design," *Heat Transfer Engineering*, Vol. 15, No. 3, 1994, pp. 35-40.
- 218. S. Petrescu, C. M. Harman and A. Bejan, "The Carnot Cycle with External and Internal Irreversibilities," *FLOWERS'94*, E. Carnevale, G. Manfrida and F. Martelli, SGEditoriali, Padova, Italy, 1994.
- A. Bejan, "Theory of Heat Transfer Irreversible Power Plants II. The Optimal Allocation of Heat Exchange Equipment," *International Journal of Heat and Mass Transfer*, Vol. 38, No. 3, February 1995, pp. 433-444.
- 220. A. M. Morega, A. Bejan and S. W. Lee, "Free Stream Cooling of a Stack of Parallel Plates," *International Journal of Heat and Mass Transfer*, Vol. 38, No. 3, February 1995, pp. 519-531.
- 221. A. Bejan, Solutions Manual for Convection Heat Transfer, Second Edition, John Wiley & Sons, New York, 1995, 534 pages.

- 222. A. Bejan, S. J. Kim, Al. M. Morega and S. W. Lee, "Cooling of Stacks of Plates Shielded by Porous Screens, "*International Journal of Heat and Fluid Flow*, Vol. 16, No. 1, February 1995, pp. 16-24.
- 223. A. J. Fowler and A. Bejan, "Forced Convection from a Surface Covered with Flexible Fibers," *International Journal of Heat and Mass Transfer*, Vol. 38, No. 5, March 1995, pp. 767-777.
- 224. V. Radcenco, J. V. C. Vargas, A. Bejan and J. S. Lim, "Two Design Aspects of Defrosting Refrigerators," *International Journal of Refrigeration*, Vol. 18, No. 2, 1995, pp. 76-86.
- 225. A. Bejan, "Fundamental Optima in Thermal Science, *The Symposium on Thermal Science and Engineering in Honor of Chancellor Chang-Lin Tien*, R. O. Buckius, ed., University of California, Berkeley, 1995, pp. 523-530.
- 226. J. V. C. Vargas, T. A. Laursen and A. Bejan, "Nonsimilar Solutions for Mixed Convection on a Wedge Embedded in a Porous Medium," *International Journal of Heat and Fluid Flow*, Vol. 16, No. 3, June 1995, pp. 211-216.
- 227. A. Bejan, A. J. Fowler and G. Stanescu, "The Optimal Spacing between Horizontal Cylinders in a Fixed Volume Cooled by Natural Convection," *International Journal of Heat and Mass Transfer*, Vol. 38, No. 11, July 1995, pp. 2047-2055.
- 228. A. Bejan, "The Optimal Spacing for Cylinders in Crossflow Forced Convection," *Journal of Heat Transfer*, Vol. 117, August 1995, pp. 767-770.
- 229. J. V. C. Vargas and A. Bejan, "Fundamentals of Ice Making by Convection Cooling Followed by Contact Melting," *International Journal of Heat and Mass Transfer*, Vol. 38, No. 15, October 1995, pp. 2833-2841.
- 230. A. Bejan, Solutions Manual for Entropy Generation Minimization, CRC Press, Boca Raton, FL, 1995, 92 pages.
- 231. A. M. Morega, J. V. C. Vargas and A. Bejan, "Optimization of Pulsating Heaters in Forced Convection," *International Journal of Heat and Mass Transfer*, Vol. 38, No. 16, November 1995, pp. 2925-2934.
- 232. A. Bejan, J. V. C. Vargas and M. Sokolov, "Optimal Allocation of a Heat-Exchanger Inventory in Heat Driven Refrigerators," *International Journal of Heat and Mass Transfer*, Vol. 38, No. 16, November 1995, pp. 2997-3004.
- 233. J. V. C. Vargas and A. Bejan, "Optimization Principle for Natural Convection Pulsating Heating," *Journal of Heat Transfer*, Vol. 117, November 1995, pp. 942-947.
- 234. A. Bejan, Z. Zhang and J. H. Kim, "Analytical Advances on Melting by Natural Convection," W. Aung, ed., *International Symposium on Manufacturing and Materials Processing*, Vol. 1, pp. 269-291, Begell House, New York, 1997.

- 235. A. Bejan, "Entropy Generation Minimization (EGM) in Heat Transfer Devices," *Heat Exchanger Design Update*, G. F. Hewitt, ed., Begell House, New York, Vol. 2, Issue 4, Section 1.8, 1995.
- 236. G. Stanescu, A. J. Fowler and A. Bejan, "The Optimal Spacing of Cylinders in Free-Stream Cross-Flow Forced Convection," *International Journal of Heat and Mass Transfer*, Vol. 39, pp. 311-317, 1996.
- 237. A. Bejan, G. Tsatsaronis and M. Moran, *Solutions Manual for Thermal Design and Optimization*, Wiley, New York, 1996, 175 pages.
- 238. T. Basak, K. K. Rao and A. Bejan, "A Model for Heat Transfer in a Honey Bee Swarm," *Chemical Engineering Science*, Vol. 51, No. 3, 1996, pp. 387-400.
- 239. A. Bejan, "Entropy Generation Minimization: The New Thermodynamics of Finite-Size Devices and Finite-Time Processes," *Journal of Applied Physics*, Vol. 79, February 1, 1996, pp. 1191-1218.
- 240. D. Homentcovschi, G. Stanescu and A. Bejan, "Cooling of a Two-Dimensional Space with One or More Streams Making One or More Passes," *International Journal of Heat and Fluid Flow*, Vol. 17, February 1996, pp. 78-88.
- 241. A. Bejan, "Maximum Power from Fluid Flow," International Journal of Heat and Mass Transfer, Vol. 39, No. 6, April 1996, pp. 1175-1181.
- 242. A. Bejan and G. Ledezma, "Thermodynamic Optimization of Cooling Techniques for Electronic Packages," *International Journal of Heat and Mass Transfer*, Vol. 39, 1996, No. 6, pp. 1213-1221.
- 243. A. Bejan, "Geometric Optimization of Cooling Techniques," chapter 1 in S. J. Kim and S. W. Lee, eds., *Air Cooling Technology for Electronic Equipment*, CRC Press, Boca Raton, FL, 1996, pp. 1-46.
- 244. J. V. C. Vargas, M. Sokolov and A. Bejan, "Thermodynamic Optimization of Solar-Driven Refrigerators," *Journal of Solar Energy Engineering*, Vol. 118, 1996, pp. 130-135.
- 245. G. Ledezma and A. Bejan, "Heat Sinks with Sloped Plate Fins in Natural and Forced Convection," *International Journal of Heat and Mass Transfer*, Vol. 39, No. 9, June 1996, pp. 1773-1783.
- 246. A. Bejan, "The Equivalence of Maximum Power and Minimum Entropy Generation Rate in the Optimization of Power Plants," *Journal of Energy Resources Technology*, Vol. 118, June 1996, pp. 98-101.
- 247. A. Bejan and N. Dan, "Analogy between Electrical Machines and Heat Transfer-Irreversible Heat Engines," *International Journal of Heat and Mass Transfer*, Vol. 39, 1996, pp. 3659-3666.

- 248. G. Ledezma, A. M. Morega and A. Bejan, "Optimal Spacing between Fins with Impinging Flow," *Journal of Heat Transfer*, Vol. 118, August 1996, pp. 570-577.
- 249. A. Bejan, "Models of Power Plants that Generate Minimum Entropy While Operating at Maximum Power," *American Journal of Physics*, Vol. 64, August 1996, pp. 1054-1059.
- 250. A. Bejan, "Street Network Theory of Organization in Nature," Journal of Advanced Transportation, Vol. 30, No. 2, 1996, pp. 85-107.
- 251. A. Bejan, "Fundamental Optima in Thermal Science: Time-Dependent (On & Off) Processes," In R. M. Manglik and A. D. Kraus, Eds., *Process, Enhanced, and Multiphase Heat Transfer: A Festschrift for A. E. Bergles*, Begell House, New York, 1996, pp. 51-57.
- 252. A. Bejan, "Notes on the History of the Method of Entropy Generation Minimization (Finite Time Thermodynamics)," *Journal of Non-Equilibrium Thermodynamics*, Vol. 21, 1996, pp. 239-242.
- 253. A. Bejan, "Method of Entropy Generation Minimization, or Modeling and Optimization Based on Combined Heat Transfer and Thermodynamics," *Revue Generale de Thermique*, Vol. 35, pp. 637-646, 1996.
- 254. O. Craciunescu, A. Bejan, D. G. Cacuci and W. Schütz, Time-Dependent Interaction between Water at Supercritical Pressures and a Hot Surface," *Numerical Heat Transfer, Part A: Applications*, Vol. 30, No. 6, November 8, 1996, pp. 535-554.
- 255. A. Bejan, "Constructal-Theory Network of Conducting Paths for Cooling a Heat Generating Volume," *International Journal of Heat and Mass Transfer*, Vol. 40, 1997, pp. 799-816 (published on 1 November 1996).
- 256. A. Bejan and N. Dan, "Maximum Work from an Electric Battery Model," *Energy—The International Journal*, Vol. 22, No. 1, 1997, pp. 93-102.
- 257. A. J. Fowler, G. A. Ledezma and A. Bejan, "Optimal Geometric Arrangement of Staggered Plates in Forced Convection," *International Journal of Heat and Mass Transfer*, Vol. 40, 1997, pp. 1795-1805.
- 258. A. Bejan, "Theory of Organization in Nature: Pulsating Physiological Processes," *International Journal of Heat and Mass Transfer*, Vol. 40, 1997, pp. 2097-2104 (published on 4 February 1997).
- 259. A. Bejan, "Optimization of Pulsating Heating in Natural and Forced Convection," *Transient Convection Heat Transfer*, J. Padet and F. Arinc, eds., Begell House, New York, 1997, pp. 223-237.
- 260. J. V. C. Vargas and A. Bejan, "Optimization of Pulsating Heating in Pool Boiling," *Journal of Heat Transfer*, Vol. 119, May 1997, pp. 298-304.

- 261. G. A. Ledezma, A. Bejan and M. R. Errera, "Constructal Tree Networks for Heat Transfer," *Journal of Applied Physics*, Vol. 82, No. 1, July 1, 1997, pp. 89-100.
- 262. A. Bejan, "How Nature Takes Shape," *Mechanical Engineering*, Vol. 119, No. 10, October 1997, pp. 90-92.
- 263. A. Bejan, "Thermodynamic Optimization of Heat Transfer and Fluid Flow Processes," chapter 7 in R. F. Boehm, ed., *Developments in the Design of Thermal Systems*, Cambridge University Press, Cambridge, UK, 1997.
- 264. A. Bejan, "Constructal Tree Network for Fluid Flow between a Finite-Size Volume and One Source or Sink," *Revue Générale de Thermique*, Vol. 36, 1997, pp. 592-604.
- 265. A. Bejan, "Fundamental Optima in Thermal Science," *The International Journal of Mechanical Engineering Education*, Vol. 25, 1997, pp. 33-48.
- 266. A. Bejan, "The Constructal Law of Structure Formation in Natural Systems with Internal Flows," ASME AES-Vol. 37, 1997, pp. 257-264.
- 267. G. A. Ledezma and A. Bejan, "Optimal Geometric Arrangement of Staggered Vertical Plates in Natural Convection," *Journal of Heat Transfer*, Vol. 119, November 1997, pp. 700-708.
- 268. A. Bejan, N. Dan, D. G. Cacuci and W. Schütz, "On the Thermodynamic Efficiency of Energy Conversion during the Expansion of a Mixture of Hot Particles, Steam and Liquid Water," *Energy—The International Journal*, Vol. 22, No. 12, 1997, pp. 1119-1133.
- 269. A. Bejan, *Solutions Manual for Advanced Engineering Thermodynamics*, Second Edition, John Wiley & Sons, New York, 1997, 169 pages.
- 270. A. Bejan and M. R. Errera, "Deterministic Tree Networks for Fluid Flow: Geometry for Minimal Flow Resistance between a Volume and One Point," *Fractals*, Vol. 5, No. 4, 1997, pp. 685-695.
- 271. A. Bejan and D. Tondeur, "Equipartition, Optimal Allocation, and the Constructal Approach to Predicting Organization in Nature, "*Revue Générale de Thermique*, Vol. 37, 1998, pp. 165-180.
- 272. A. Bejan, "Thermodynamics Fundamentals," chapter 41 in M. Kutz, ed., *Mechanical Engineers' Handbook*, second edition, Wiley, New York, 1998.
- 273. A. Bejan, "Exergy Analysis and Entropy Generation Minimization," chapter 42 in M. Kutz, ed., *Mechanical Engineers' Handbook*, second edition, Wiley, New York, 1998.
- 274. A. Bejan, Y. Ikegami and G. A. Ledezma, "Constructal Theory of Natural Crack Pattern Formation for Fastest Cooling," *International Journal of Heat and Mass Transfer*, Vol. 41, 1998, pp. 1945-1954.
- 275. A. Bejan and M. R. Errera, "Maximum Power from a Hot Stream," International Journal of *Heat and Mass Transfer*, Vol. 41, 1998, pp. 2025-2036.

- 276. R. A. Nelson, Jr. and A. Bejan, "Constructal Optimization of Internal Flow Geometry in Convection," *Journal of Heat Transfer*, Vol. 120, 1998, pp. 357-364.
- 277. R. A. Nelson, Jr. and A. Bejan, "Self-Organization of the Internal Flow Geometry in Convective Heat Transfer", Proc. 7th AIAA/ASME Joint Thermophysics and Heat Transfer Conference, ASME HTD-Vol. 357-3, 1998, pp. 149-161.
- 278. Y. Ikegami and A. Bejan, "On the Thermodynamic Optimization of Power Plants with Heat Transfer and Fluid Flow Irreversibilities," *Journal of Solar Energy Engineering*, Vol. 120, May 1998, pp. 139-144.
- 279. A. Bejan, "Constructal Optimization of Paths for Heat Transfer," chapter in G. E. Tupholme and A. S. Wood, eds., *Mathematics of Heat Transfer*, Clarendon Press, Oxford, UK, 1998.
- 280. A. Bejan and G. A. Ledezma, "Streets Tree Networks and Urban Growth: Optimal Geometry for Quickest Access Between a Finite-Size Volume and One Point," *Physica A*, Vol. 255, 1998, pp. 211-217.
- 281. A. Bejan, "Thermodynamic Optimization in Heat Transfer," in J. S. Lee, ed., *Heat Transfer* 1998, Vol. 1, Taylor & Francis, Philadelphia, PA, 1998, pp. 41-50.
- 282. V. Radcenco, J. V. C. Vargas and A. Bejan, "Thermodynamic Optimization of a Gas Turbine Power Plant with Pressure Drop Irreversibilities," *Journal of Energy Resources Technology*, Vol. 120, 1998, pp. 233-240.
- 283. A. Bejan, "Questions in Fluid Mechanics: Natural Tree-Shaped Flows," *Journal of Fluids Engineering*, Vol. 120, 1998, pp. 429-430.
- 284. N. Dan and A. Bejan, "Constructal Tree Networks for the Time-Dependent Discharge of a Finite-Size Volume to One Point," *Journal of Applied Physics*, Vol. 84, No. 6, 1998, pp. 3042-3050.
- 285. M. R. Errera and A. Bejan, "Deterministic Tree Networks for River Drainage Basins," *Fractals*, Vol. 6, No. 3, 1998, pp. 245-261.
- 286. N. Dan, A. Bejan, D. G. Cacuci and W. Schütz, "Evolution of a Mixture of Hot Particles, Steam, and Water Immersed in a Water Pool," *Numerical Heat Transfer, Part A: Applications*, Vol. 34, No. 5, 1998, pp. 463-478.
- 287. A. Bejan, "Constructal Theory: From Thermodynamic and Geometric Optimization to Predicting Shape in Nature, "*Energy Conversion and Management*, Vol. 39, No. 16-18, 1998, pp. 1705-1718.
- 288. G. A. Ledezma and A. Bejan, "Constructal Three-Dimensional Trees for Conduction between a Volume and One Point," *Journal of Heat Transfer*, Vol. 120, November 1998, pp. 977-984.

- 289. A. Bejan, N. Dan, D. G. Cacuci and W. Schütz, Exergy Analysis of Energy Conversion during the Thermal Interaction between Hot Particles and Water," *Energy—The_International Journal*, Vol. 23, No. 11, 1998, pp. 913-928.
- 290. A. Bejan, "Modeling and Optimization in Thermal Science: from Engineering to Predicting Organisation in Nature," Chapter 1 in B. Sunden and M. Faghri, eds., *Modelling of Engineering Heat Transfer Phenomena*, WIT Press, Southampton, UK, 1999.
- 291. J. V. C. Vargas and A. Bejan, "Optimisation of Film Condensation with Periodic Wall Cleaning," *International Journal of Thermal Sciences (Revue Générale de Thermique)*, Vol. 38, No. 2, 1999, pp. 113-120.
- 292. A. Bejan, "Constructal Theory: Natural Flow Structure as the Result of Thermodynamic Optimization," *Thermal Science & Engineering*, Vol. 7, No. 1, 1999, pp. 1-10.
- 293. A. Bejan and N. Dan, "Two Constructal Routes to Minimal Heat Flow Resistance via Greater Internal Complexity," *Journal of Heat Transfer*, Vol. 121, 1999, pp. 6-14.
- 294. A. Bejan, "Thermodynamic Optimization of Inanimate and Animate Flow Systems," Chapter 2 in A. Bejan and E. Mamut, eds., *Thermodynamic Optimization of Complex Energy Systems*, Kluwer Academic Publishers, Dordrecht, The Netherlands, 1999, pp. 45-60.
- 295. A. Bejan, "Constructal Flow Geometry Optimization," Chapter 3 in A. Bejan and E. Mamut, eds., *Thermodynamic Optimization of Complex Energy Systems*, Kluwer Academic Publishers, Dordrecht, The Netherlands, 1999, pp. 61-72.
- 296. A. Bejan, "The Method of Entropy Generation Minimization," Chapter 2 in A. Bejan, P. Vadász and D. G. Kröger, eds., *Energy and the Environment*, Kluwer Academic Publishers, Dordrecht, The Netherlands, 1999, pp. 11-22.
- 297. M. R. Errera and A. Bejan, "Tree Networks for Flows in Porous Media," Journal of Porous Media, Vol. 2, 1999, pp.1-18.
- 298. A. Alebrahim and A. Bejan, "Constructal Trees of Circular Fins for Conductive and Convective Heat Transfer," *International Journal of Heat and Mass Transfer*, Vol. 42, 1999, pp. 3585-3597.
- 299. M. Almogbel and A. Bejan, "Conduction Trees with Spacings at the Tips," *International Journal of Heat and Mass Transfer*, Vol. 42, 1999, pp. 3739-3756.
- 300. M. Neagu and A. Bejan, "Constructal-Theory Tree Networks of 'Constant' Thermal Resistance," *Journal of Applied Physics*, Vol. 86, No. 2, 15 July 1999, pp. 1136-1144.
- 301. A. Bejan, "How Nature Takes Shape: Extensions of Constructal Theory to Ducts, Rivers, Turbulence, Cracks, Dendritic Crystals and Spatial Economics," *International Journal of Thermal Sciences (Revue Générale de Thermique)*, Vol. 38, 1999, pp. 653-663.

- 302. A. Bejan, "The First NATO Advanced Study Institute on Thermodynamic Optimization," *Energy—The International Journal*, Vol. 24, 1999, pp.753-759.
- 303. A. Bejan and N. Dan, "Constructal Trees of Convective Fins," *Journal of Heat Transfer*, Vol. 121, 1999, pp. 675-682.
- 304. A. Bejan, "Thermodynamic Optimization of Structure and Form in Nature and Engineering" (in Russian), *Refrigeration Engineering and Technology*, Odessa State Academy of Refrigeration, Vol. 62, 1999, pp. 12-24.
- 305. A. Bejan, "A Role for Exergy Analysis and Optimization in Aircraft Energy-System Design," ASME AES-Vol. 39, 1999, pp. 209-218.
- 306. A. Bejan, "Thermodynamic Optimization Alternatives: Minimization of Physical Size Subject to Fixed Power," *International Journal of Energy Research*, Vol. 23, 1999, pp. 1111-1121.
- 307. J. C. Ordonez, J.V.C. Vargas and A. Bejan, "Combined Power and Refrigeration from a Hot Stream," *International Journal of Applied Thermodynamics*, Vol. 2, 1999, pp. 49-57.
- 308. J. Lewins and A. Bejan, "Vortex Tube Optimization Theory," *Energy—The International Journal*, Vol. 24, November 1999, pp. 931-943.
- 309. M. Neagu and A. Bejan, "Three-Dimensional Tree Constructs of 'Constant' Thermal Resistance," *Journal of Applied Physics*, Vol. 86, No. 12, 15 December 1999, pp. 7107-7115.
- 310. A. Alebrahim and A. Bejan, "Entropy Generation Minimization in a Ram-Air Cross-Flow Heat Exchanger," *International Journal of Applied Thermodynamics*, Vol. 2, 1999, pp. 145-157.
- 311. A. Bejan, "Heat Transfer in Porous Media," *Heat Exchanger Design Update*, G. F. Hewitt, ed., Begell House, New York, Volume 6, Issue 2, Section 2.11, 1999.
- 312. J. V. C. Vargas, J. C. Ordonez and A. Bejan, "Thermodynamic Optimization of Power Extraction from a Hot Stream in the Presence of Phase Change," *International Journal of Heat and Mass Transfer*, Vol. 43, 2000, pp. 191-201.
- 313. J. V. C. Vargas and A. Bejan, "Thermodynamic Optimization of the Match between Two Streams with Phase Change," *Energy—The International Journal*, Vol. 25, January 2000, pp. 15-33.
- 314. A. Bejan and M. Almogbel, "Constructal T-Shaped Fins," *International Journal of Heat and Mass Transfer*, Vol. 43, 2000, pp. 2101-2115.
- 315. A. Bejan, V. Badescu and A. De Vos, "Constructal Theory of Economics Structure Generation in Space and Time," *Energy Conversion and Management*, Vol. 41, 2000, pp. 1429-1451.
- 316. A. Bejan and M. R. Errera, "Convective Trees of Fluid Channels for Volumetric Cooling," *International Journal of Heat and Mass Transfer*, Vol. 43, 2000, pp. 3105-3118.

- 317. A. Bejan, V. Badescu and A. De Vos, "Constructal Theory of Economics," *Applied Energy*, Vol. 67, 2000, pp. 37-60.
- 318. J. C. Ordonez and A. Bejan, "Entropy Generation Minimization in Parallel-Plates Counterflow Heat Exchangers," *International Journal of Energy Research*, Vol. 24, 2000, pp. 843-864.
- 319. A. Bejan, *Solutions Manual for Shape and Structure, from Engineering to Nature*, Cambridge University Press, Cambridge, UK, 2000, 61 pages.
- 320. M. Almogbel and A. Bejan, "Cylindrical Trees of Pin Fins," *International Journal of Heat and Mass Transfer*, Vol. 43, 2000, pp. 4285-4297.
- 321. A. Bejan, "From Heat Transfer Principles to Shape and Structure in Nature: Constructal Theory," *Journal of Heat Transfer*, Vol. 122, August 2000, pp. 430-449.
- 322. A. Bejan, L. A. O. Rocha and S. Lorente, "Thermodynamic Optimization of Geometry: T- and Y- Shaped Constructs of Fluid Streams," *International Journal of Thermal Sciences (Revue Générale de Thermique*), Vol. 39, October-December 2000, pp. 949-960.
- 323. A. Bejan, "Thermodynamic Optimization of Geometry in Environmental Control Systems for Aircraft", *International Journal of Heat and Technology*, Vol. 18, No. 2, 2000, pp. 3-10.
- 324. A. Bejan, "The Tree of Convective Heat Streams: Its Thermal Insulation Function and the Predicted 3/4-Power Relation between Body Heat Loss and Body Size," *International Journal of Heat and Mass Transfer*, Vol. 44, February 2001, pp. 699-704.
- 325. L. A. O. Rocha and A. Bejan, "Geometric Optimization of Periodic Flow and Heat Transfer in a Volume Cooled by Parallel Tubes," *Journal of Heat Transfer*, Vol. 123, April 2001, pp. 233-239.
- 326. A. Bejan and A. Alebrahim, "The Extraction of Power from a Hot Stream," *International Journal of Energy Research*, Vol. 25, 2001, pp. 507-518.
- 327. T. Shiba and A. Bejan, "Thermodynamic Optimization of Geometric Structure in the Counterflow Heat Exchanger for an Environmental Control System", *Energy—The International Journal*, Vol. 26, 2001, pp. 493-511.
- 328. W. Wechsatol, S. Lorente and A. Bejan, "Tree-Shaped Insulated Designs for the Uniform Distribution of Hot Water over an Area," *International Journal of Heat and Mass Transfer*, Vol. 44, August 2001, pp. 3111-3123.
- 329. J. V. C. Vargas, A. Bejan and D. L. Siems, "Integrative Thermodynamic Optimization of the Crossflow Heat Exchanger for an Aircraft Environmental Control System," *Journal of Heat Transfer*, Vol. 123, August 2001, pp. 760-769.
- 330. J. V. C. Vargas and A. Bejan, "Integrative Thermodynamic Optimization of the Environmental Control System of an Aircraft," *International Journal of Heat and Mass Transfer*, Vol. 44, October 2001, pp. 3907-3917.
- 331. M. Almogbel and A. Bejan, "Constructal Optimization of Nonuniformly Distributed Tree-Shaped Flow Structures for Conduction," *International Journal of Heat and Mass Transfer*, Vol. 44, November 2001, pp. 4185-4195.
- 332. A. Alebrahim and A. Bejan, "Thermodynamic Optimization of Heat-Transfer Equipment Configuration in an Environmental Control System," *International Journal of Energy Research*, Vol. 25, 2001, pp. 1127-1150.
- 333. J. V. C. Vargas and A. Bejan, "Thermodynamic Optimization of Finned Crossflow Heat Exchangers of Aircraft Environmental Control Systems", *International Journal of Heat and Fluid Flow*, Vol. 22, 2001, pp. 657-665.
- 334. A. Bejan, "Constructal Theory: From Engineering Design to Predicting Shape and Structure in Nature," *Engenharia Termica*, No. 1, 2001, pp. 27-31.
- 335. P. G. Cizmas and A. Bejan, "Optimal Placement of Cooling Flow Tubes in a Wall Heated from the Side," *International Journal of Transport Phenomena*, Vol. 3, No. 4, 2001, pp. 331-343.
- 336. M. Neagu and A. Bejan, "Constructal Placement of High-Conductivity Inserts in a Slab: Optimal Design of Roughness", *Journal of Heat Transfer*, Vol. 123, December 2001, pp. 1184-1189.
- 337. A. Bejan and D. Siems, "The Need for Exergy Analysis and Thermodynamic Optimization in Aircraft Development", *Exergy, an International Journal*, Vol. 1, No. 1, 2001, pp. 14-24.
- 338. A. Bejan, "Entropy Generation Minimization: the Method and Its Applications" *Strojniski Vestnik (Journal of Mechanical Engineering),* Vol. 47, No. 8, 2001, pp. 345-355.
- 339. L. A. O. Rocha, M. Neagu, A. Bejan and R. S. Cherry, "Convection with Phase Change During Gas Formation from Methane Hydrates," *Journal of Porous Media*, Vol. 4, No. 4, 2001, pp. 283-295.
- 340. A. Bejan, "Thermodynamic Optimization of Geometry in Engineering Flow Systems", *Exergy, an International Journal*, Vol. 1, No. 4, 2001, pp. 269-277.
- 341. A. Bejan and S. Lorente, "Thermodynamic Optimization of Flow Geometry in Mechanical and Civil Engineering", *Journal of Non-Equilibrium Thermodynamics*, Vol. 26, No. 4, 2001, pp. 305-354.
- 342. V. Arion, A. Cojocari and A. Bejan, "Generalized Indicators of Performance for Tree-Shaped Structures", *Meridian Ingineresc*, Vol. 2, 2001, pp. 13-20.
- 343. A. Bejan, "Constructal Design: Optimal Flow-System Geometry Deduced from Thermodynamic Optimization and Constraints", *Termotehnica*, Vol. 6, No. 2, 2001, pp. 4-9.
- 344. A. Bejan, "Constructal Theory: An Engineering View on the Generation of Geometric Form in Living (Flow) Systems", *Comments on Theoretical Biology*, Vol. 6, No. 4, 2001, pp. 279-302.
- 345. W. Wechsatol, S. Lorente and A. Bejan, "Development of Tree-Shaped Flows by Adding New Users to Existing Networks of Hot Water Pipes," *International Journal of Heat and Mass Transfer*, Vol. 45, February 2002, pp. 723-733.

- 346. L. A. O. Rocha, S. Lorente and A. Bejan, "Constructal Design for Cooling a Disc-Shaped Area by Conduction", *International Journal of Heat and Mass Transfer*, Vol. 45, April 2002, pp. 1643-1652.
- 347. A. Bejan, "Constructal Law: Optimal Geometric Form for Heat and Fluid Flow Systems," *Heat and Mass Transfer 2002*, S. K. Saha, S. P. Venkateshan, B. V. S. S. Prasad and S. S. Sadhal, eds., Tata McGraw-Hill, New Delhi, 2002.
- 348. A. Bejan, "Thermodynamic Optimization of Thermal Energy Storage Systems", Chapter 9 in *Thermal Energy Storage*, I. Dincer and M. A. Rosen, eds., Wiley, Chichester, UK, 2002.
- 349. A. Bejan, "Fundamentals of Exergy Analysis, Entropy Generation Minimization, and the Generation of Flow Architecture", *International Journal of Energy Research*, Vol. 26, No. 7, 2002, pp. 545-565.
- 350. S. Lorente, W. Wechsatol and A. Bejan, "Tree-Shaped Flow Structures Designed by Minimizing Path Lengths," *International Journal of Heat and Mass Transfer*, Vol. 45, No. 16, 2002, pp. 3299-3312.
- 351. S. Lorente and A. Bejan, "Combined 'Flow and Strength' Geometric Optimization: Internal Structure in a Vertical Insulating Wall with Air Cavities and Prescribed Strength," *International Journal of Heat and Mass Transfer*, Vol. 45, No. 16, 2002, pp. 3313-3320.
- 352. A. Bejan, L. A. O. Rocha and R. S. Cherry, "Methane Hydrates in Porous Layers: Gas Formation and Convection", chapter 14 in *Transport Phenomena in Porous Media II*, D. B. Ingham and I. Pop, Eds., Pergamon, Amsterdam, 2002.
- 353. A. Bejan, "Constructal Theory of Organization in Nature: Dendritic Flows, Allometric Laws and Flight", *Design and Nature*, C. A. Brebbia, L. Sucharov and P. Pascolo, Eds., WIT Press, Southampton, UK, 2002, pp. 57-66.
- 354. A. Bejan, "Dendritic Constructal Heat Exchanger with Small-Scale Crossflows and Larger-Scales Counterflows", *International Journal of Heat and Mass Transfer*, Vol. 45, No. 23, November 2002, pp. 4607-4620.
- 355. W. Wechsatol, S. Lorente and A. Bejan, "Optimal Tree-Shaped Networks for Fluid Flow in a Disc-Shaped Body," *International Journal of Heat and Mass Transfer*, Vol. 45, No. 25, December 2002, pp. 4911-4924.
- 356. A. Bejan, "Energiesysteme Optimal Konfigurieren", *Bulletin ETH Zürich*, Nr. 287, November 2002, pp. 48-50.
- 357. J. V. C. Vargas and A. Bejan, "The Optimal Shape of the Interface between Two Conductive Bodies with Minimal Thermal Resistance", *Journal of Heat Transfer*, Vol. 124, December 2002, pp. 1218-1221.
- 358. A. Morega and A. Bejan, "A Constructal Approach to the Optimization of the Volume-to-Point Conduction Problems", in G. Marinoschi and S. Ion, eds., *Mathematical Modelling of Environmental Problems*, Editura Academiei Romana, Bucharest, 2002, pp. 97-110.

- 359. A. Bejan, and S. Lorente, "Thermodynamic Optimization of Flow Architecture: Dendritic Structures and Optimal Sizes of Components", ASME Paper IMECE2002-33158, International Mechanical Engineering Congress and Exposition, New Orleans, 17-22 November 2002.
- 360. A. Bejan, "Constructal Optimization of Tree-Shaped Paths for the Collection and Distribution of Fluid, Electricity, Goods and People", *New and Renewable Technologies for Sustainable Development*, N. H. Afgan and M. G. Carvalho, eds., Kluwer Academic Publishers, Boston, 2002, pp. 117-134.
- 361. V. Arion, A. Cojocari and A. Bejan, "Comparison and Ordering of Tree Network Models Based on the Criterion of Robustness", *Meridian Ingineresc*, Vol. 4, 2002, pp. 11-16.
- 362. S. Lorente, W. Wechsatol and A. Bejan, "Fundamentals of Tree-Shaped Networks of Insulated Pipes for Hot Water and Exergy", *Exergy, an International Journal*, Vol. 2, 2002, pp. 227-236.
- 363. V. Arion, A. Cojocari and A. Bejan, "Constructal Tree Shaped Networks for the Distribution of Electric Power", *Energy Conversion and Management*, Vol. 44, 2003, pp. 867-891.
- 364. V. Arion, A. Cojocari and A. Bejan, "Integral Measures of Electric Power Distribution Networks: Load-Length Curves and Line-Network Multipliers", *Energy Conversion and Management*, Vol. 44, 2003, pp. 1039-1051.
- 365. A. Bejan, "Constructal Theory: Tree-Shaped Flows and Energy Systems for Aircraft", *Journal of Aircraft*, Vol. 40, No. 1, January-February 2003, pp. 43-48.
- 366. A. Bejan, "Constructal Tree-Shaped Paths for Conduction and Convection", *International Journal of Energy Research*, Vol. 27, 2003, pp. 283-299.
- 367. T. Bello-Ochende and A. Bejan, "Fitting the Duct to the 'Body' of the Convective Flow", *International Journal of Heat and Mass Transfer*, Vol. 46, 2003, pp. 1693-1701.
- 368. J. C. Ordonez and A. Bejan, "System-Level Optimization of the Sizes of Organs for Heat and Fluid Flow Systems," *International Journal of Thermal Sciences*, Vol. 42, 2003, pp. 335-342.
- 369. C. Zamfirescu and A. Bejan, "Constructal Tree-Shaped Two-Phase Flow for Cooling a Surface", International *Journal of Heat and Mass Transfer*, Vol. 46, No. 15, July 2003, pp. 2785-2797.
- 370. M. Favre-Marinet, S. Le Person and A. Bejan, "Maximum Heat Transfer Rate Density in Two-Dimensional Minichannels and Microchannels", The First International Conference on Microchannels and Minichannels Proceedings ASME, Editor S. G. Kandlikar, April 2003, pp. 765-772.
- 371. A. Bejan, "Optimal Internal Structure of Volumes Cooled by Single-Phase Forced and Natural Convection," *Journal of Electronic Packaging*, Vol. 125, June 2003, pp. 200-207.
- 372. S. Lorente, W. Wechsatol and A. Bejan, "Optimization of Tree-Shaped Flow Distribution Structures over a Disc-Shaped Area", *International Journal of Energy Research*, Vol. 27, 2003, pp. 715-723.
- 373. J. C. Ordonez and A. Bejan, "Minimum Power Requirement for Environmental Control of Aircraft", *Energy*, Vol. 28, 2003, pp. 1183-1202.

- 374. A. Bejan, "Flows in Environmental Fluids and Porous Media", *International Journal of Energy Research*, Vol. 27, 2003, pp. 825-846.
- 375. A. Bejan, "Forced Convection: Internal Flows", Chapter 5 in A. Bejan and A. D. Kraus, eds., *Heat Transfer Handbook*, Wiley, New York, 2003.
- 376. A. Bejan, "Porous Media", Chapter 15 in A. Bejan and A. D. Kraus, eds., *Heat Transfer Handbook*, Wiley, New York, 2003.
- 377. A. Bejan and Y. Fautrelle, "Constructal Multi-Scale Structure for Maximal Heat Transfer Density", *Acta Mechanica*, Vol. 163, 2003, pp. 39-49.
- 378. W. Wechsatol, S. Lorente and A. Bejan, "Dendritic Heat Convection on a Disc", *International Journal of Heat and Mass Transfer*, Vol. 46, 2003, pp. 4381-4391.
- 379. A. Bejan, "Simple Methods for Convection in Porous Media: Scale Analysis and the Intersection of Asymptotes", *International Journal of Energy Research*, Vol. 27, 2003, pp. 859-874.
- 380. S. Lorente, W. Wechsatol and A. Bejan, Tree-Shaped Networks for the Distribution of Hot Water, *R & D Journal*, Vol. 19, No. 1, March 2003, pp. 12-15.
- 381. J. C. Ordonez, A. Bejan and R. S. Cherry, "Designed Porous Media: Optimally Nonuniform Flow Structures Connecting One Point with More Points", *International Journal of Thermal Sciences*, Vol. 42, 2003, pp. 857-870.
- 382. A. Rivera-Alvarez and A. Bejan, "Constructal Geometry and Operation of Adsorption Processes", *International Journal of Thermal Sciences*, Vol. 42, 2003, pp. 983-994.
- 383. J. Bonjour, L.A.O. Rocha, A. Bejan and F. Meunier, "Dendritic Fins Optimization for a Coaxial Two-Stream Heat Exchanger", *International Journal of Heat and Mass Transfer*, Vol. 47, 2004, pp. 111-124.
- 384. A. K. da Silva, S. Lorente and A. Bejan, "Optimal Distribution of Discrete Heat Sources on a Wall with Natural Convection", *International Journal of Heat and Mass Transfer*, Vol. 47, 2004, pp. 203-214.
- 385. R. S. Matos, J. V. C. Vargas, T. A. Laursen and A. Bejan, "Optimally Staggered Finned Circular and Elliptic Tubes in Forced Convection", *International Journal of Heat and Mass Transfer*, Vol. 47, 2004, pp. 1347-1359.
- 386. A. K. da Silva, S. Lorente and A. Bejan, "Optimal Distribution of Discrete Heat Sources on a Plate with Laminar Forced Convection", *International Journal of Heat and Mass Transfer*, Vol. 47, 2004, pp. 2139-2148.
- 387. S. Lorente, W. Wechsatol and A. Bejan, "Tree-Shaped Flow Structures for Human-Scale and Small-Scales Applications", *International Journal of Heat & Technology*, Vol. 22, no. 1, 2004, pp. 15-26.
- 388. A. Bejan and S. Lorente, "Equilibrium and Nonequilibrium Flow System Architectures", *International Journal of Heat & Technology*, Vol. 22, No. 1, 2004, pp. 85-92.

- 389. A. Bejan, "Fundamentals of Scale Analysis, Heatline Visualization, and the Intersection of Asymptotes", D. B. Ingham, A. Bejan, E. Mamut and I. Pop, Eds., *Emerging Technologies and Techniques in Porous Media*, Kluwer Academic Publishers, Dordrecht, The Netherlands, 2004, pp. 13-24.
- 390. A. Bejan, "Designed Porous Media", D. B. Ingham, A. Bejan, E. Mamut and I. Pop, Eds., *Emerging Technologies and Techniques in Porous Media*, Kluwer Academic Publishers, Dordrecht, The Netherlands, 2004, pp. 337-350.
- 391. J. V. C. Vargas and A. Bejan, "Thermodynamic Optimization of Internal Structure in a Fuel Cell", *International Journal of Energy Research*, Vol. 28, 2004, pp. 319-339.
- 392. C. Biserni, L. A. O. Rocha and A. Bejan, "Inverted Fins: Geometric Optimization of the Intrusion into a Conducting Wall", *International Journal of Heat and Mass Transfer*, Vol. 47, 2004, pp. 2577-2586.
- 393. L. Gosselin and A. Bejan, "Constructal Thermal Optimization of an Electromagnet", *International Journal of Thermal Sciences*, Vol. 43, 2004, pp. 331-338.
- 394. R. S. Matos, T. A. Laursen, J. V. C. Vargas and A. Bejan, "Three-dimensional Optimization of Staggered Finned Circular and Elliptic Tubes in Forced Convection", *International Journal of Thermal Sciences*, Vol. 43, 2004, pp. 477-487.
- 395. A. Bejan, "Designed Porous Media: Maximal Heat Transfer Density at Decreasing Length Scales", *International Journal of Heat Mass Transfer*, Vol. 47, 2004, pp. 3073-3083.
- 396. A. Bejan and S. Lorente, "The Constructal Law and the Thermodynamics of Flow Systems with Configuration", *International Journal of Heat Mass Transfer*, Vol. 47, 2004, pp. 3203-3214.
- 397. L. Gosselin, A. Bejan and S. Lorente, "Combined 'Heat Flow and Strength' Optimization of Geometry: Mechanical Structures Most Resistant to Thermal Attack", *International Journal of Heat Mass Transfer*, Vol. 47, 2004, pp. 3477-3489.
- 398. W. Wechsatol, S. Lorente and A. Bejan, "Tree-Shaped Flow Structures: Are Both Thermal-Resistance and Flow-Resistance Minimisations Necessary?", *International Journal of Exergy*, Vol. 1, No. 1, 2004, pp. 2-17.
- 399. A. Bejan, "Designed Porous and Multi-Scale Flow Structures", *Design and Nature II*, M. W. Collins and C. A. Brebbia, eds., WIT Press, Southampton, UK, 2004, pp. 307-316.
- 400. J. V. C. Vargas, J. Ordonez and A. Bejan, Constructal flow structure for a PEM fuel cell, *International Journal of Heat Mass Transfer*, Vol. 47, 2004, pp. 4177-4193.
- 401. A. K. da Silva, C. Vasile and A. Bejan, Disc cooled with high-conductivity inserts that extend inward from the perimeter, *International Journal of Heat Mass Transfer*, Vol. 47, 2004, pp. 4257-4263.
- 402. A. K. da Silva, S. Lorente and A. Bejan, "Constructal Multi-Scale Tree-Shaped Heat Exchangers", *Journal of Applied Physics*, Vol. 96(3), 1 August 2004, pp. 1709-1718.

- 403. A. K. da Silva, A. Bejan and S. Lorente, "Maximal Heat Transfer Density in Vertical Morphing Channels with Natural Convection", *Numerical Heat Transfer, Part A*, Vol. 45, 2004, pp. 135-152.
- 404. T. Bello-Ochende and A. Bejan, Maximal Heat Transfer Density: Plates with Multiple Lengths in Forced Convection, *International Journal of Thermal Sciences*, Vol. 43, 2004, pp. 1181-1186.
- 405. L. Gosselin and A. Bejan, "Constructal Heat Trees at Micro and Nanoscales", *Journal of Applied Physics*, Vol. 96, No. 10, 15 November 2004, pp. 5852-5859.
- 406. T. Bello-Ochende and A. Bejan, "Optimal Spacings for Mixed Convection", *Journal of Heat Transfer*, Vol. 126, December 2004, pp. 956-962.
- 407. M. Favre-Marinet, S. Le Person and A. Bejan, Maximum heat transfer rate density in twodimensional minichannels and microchannels, *Microscale Thermophysical Engineering*, Vol. 8, 2004, pp. 225-237.
- 408. A. Bejan, S. Lorente, A course on flow-system configuration and multi-scale design, International Mechanical Engineering Congress and Exposition, Paper IMECE2004-59203, Anaheim, CA., November 2004.
- 409. A. K. da Silva and A. Bejan, "Constructal Multi-Scale Structure for Maximal Heat Transfer Density in Natural Convection", *International Journal of Heat and Fluid Flow*, Vol. 26, No. 1, 2005, pp. 34-44.
- 410. W. Wechsatol, S. Lorente and A. Bejan, "Tree-Shaped Networks with Loops", *International Journal of Heat and Mass Transfer*, Vol. 48, 2005, pp. 573-583.
- 411. L. Gosselin and A. Bejan, "Tree Networks for Minimal Pumping Power", *International Journal of Thermal Sciences*, Vol. 44, 2005, pp. 53-63.
- 412. T. Bello-Ochende and A. Bejan, "Constructal Multi-Scale Cylinders in Crossflow", *International Journal of Heat and Mass Transfer*, Vol. 48, 2005, pp. 1373–1383.
- 413. C. Zamfirescu and A. Bejan, "Tree-Shaped Structures for Cold Storage", *International Journal of Refrigeration*, Vol. 28, March 2005, pp. 231-241.
- 414. A. Bejan and A. H. Reis, "Thermodynamic Optimization of Global Circulation and Climate", *International Journal of Energy Research*, Vol. 29, 2005, pp. 303-316.
- 415. A. K. da Silva, G. Lorenzini and A. Bejan, "Distribution of Heat Sources in Vertical Open Channels with Natural Convection", *International Journal of Heat and Mass Transfer*, Vol. 48, 2005, pp. 1462-1469.
- 416. A. Bejan, "The Constructal Law of Organization in Nature: Tree-Shaped Flows and Body Size", *Journal of Experimental Biology*, Vol. 208(9), 2005, pp. 1677-1686.
- 417. A. K. da Silva, S. Lorente and A. Bejan, Constructal multi-scale structures with asymmetric heat sources of finite thickness, *International Journal of Heat and Mass Transfer*, Vol. 48, 2005, pp. 2662-2672.

- 418. A. Bejan, Constructal theory: the generation of flow-system architecture, from engineering to nature, *Ingenieria Mecanica Tecnologia y Desarrollo*, Vol. 1, No. 6, Year 4, March 2005, pp. 195-201.
- 419. A. Bejan and S. Lorente, Constructal multi-scale and multi-objective structures, *International Journal of Energy Research*, Vol. 29, No. 7, 2005, pp. 689-710.
- 420. J. V. C. Vargas, J. C. Ordonez and A. Bejan, Constructal PEM fuel cell stack design, International Journal of Heat and Mass Transfer, Vol. 48, 2005, pp. 4410-4427.
- 421. A. Bejan and S. Lorente, Constructal theory of energy-system and environment flow configurations, *International Journal of Exergy*, Vol. 2, No. 4, 2005, pp. 335-347.
- 422. T. Bello-Ochende and A. Bejan, Constructal multi-scale cylinders with natural convection, *International Journal of Heat and Mass Transfer*, Vol. 48, 2005, pp. 4300-4306.
- 423. A. M. Morega and A. Bejan, A constructal approach to the optimal design of photovoltaic cells, *International Journal of Green Energy*, Vol. 2, 2005, pp. 233-242.
- 424. W. Wechsatol, A. Bejan and S. Lorente, Tree-shaped flow architectures: strategies for increasing optimization speed and accuracy, *Numerical Heat Transfer, Part A*, Vol. 48, 2005, pp. 731-744.
- 425. L. Gosselin and A. Bejan, Emergence of asymmetry in constructal tree flow networks, *Journal* of *Applied Physics*, Vol. 98, 2005, 104903.
- 426. J. V. C. Vargas, J. C. Ordonez, C. Zamfirescu, M. C. Campos and A. Bejan, Optimal ground tube length for cooling of electronics shelters, *Heat Transfer Engineering*, Vol. 26, 2005, pp. 8-20.
- 427. S. Lorente and A. Bejan, Svelteness, freedom to morph, and constructal multi-scale flow structures, *International Journal of Thermal Sciences*, Vol. 44, 2005, pp. 1123-1130.
- 428. A. Bejan and S. Lorente, Constructal design and thermodynamic optimization, *Annual Review of Heat Transfer*, Vol. 14, 2005, pp. 511-527.
- 429. J. Bonjour and A. Bejan, Optimal distribution of cooling during gas compression, *Energy*, Vol. 31, 2006, pp. 409-424.
- 430. S. Lorente, A. Bejan, Svelteness, freedom to morph, and the constructal design of multi-scale flow structures, International Mechanical Engineering Congress and Exposition, Paper No. IMECE2005-80027, Orlando, FL, November 2005.
- 431. A. K. da Silva, S. Lorente and A. Bejan, Constructal multi-scale structures for maximal heat transfer density, *Energy*, Vol. 31, No. 5, 2006, pp. 620-635.
- 432. A. Bejan and J. H. Marden, Unifying constructal theory for scale effects in running, swimming and flying, *Journal of Experimental Biology*, Vol. 209, 2006, pp. 238-248.
- 433. A. Bejan, Thermodynamic fundamentals, chapter 3 in M. Kutz, *Mechanical Engineers' Handbook, Energy and Power*, 3rd ed., Wiley, Hoboken, 2006.

- 434. A. Bejan, Exergy analysis, entropy generation minimization and constructal theory, chapter 4 in M. Kutz, *Mechanical Engineers' Handbook, Energy and Power*, 3rd ed., Wiley, Hoboken, 2006.
- 435. A. Bejan and S. Lorente, Design with constructal theory, *International Journal of Engineering Education*, Vol. 22, No. 1, 2006, pp. 140-147.
- 436. K. Vafai, A. Bejan, W. J. Minkowycz and K. Khanafer, A critical synthesis of pertinent models for turbulent transport through porous media, Chapter 12 in W. J. Minkowycz, E. M. Sparrow and J. Y. Murthy, eds., *Numerical Heat Transfer*, second edition, Wiley, Hoboken, 2006.
- 437. V. D. Zimparov, A. K. da Silva and A. Bejan, Thermodynamic optimization of tree-shaped flow geometries, *International Journal of Heat and Mass Transfer*, Vol. 49, 2006, 1619-1630.
- 438. A. H. Reis and A. Bejan, Constructal theory of global circulation and climate, *International Journal of Heat and Mass Transfer*, Vol. 49, 2006, pp. 1857-1875.
- 439. A. H. Reis, A. F. Miguel and A. Bejan, Constructal theory of particle agglomeration and design of air-cleaning devices, *Journal of Physics D: Applied Physics*, Vol. 39, 2006, pp. 2311-2318.
- 440. A. Bejan and D. Gobin, Constructal theory of droplet impact geometry, *International Journal of Heat and Mass Transfer*, Vol. 49, 2006, pp. 2412-2419.
- 441. L. A. O. Rocha, S. Lorente and A. Bejan, Conduction tree networks with loops for cooling a heat generating volume, *International Journal of Heat and Mass Transfer*, Vol. 49, 2006, pp. 2626-2635.
- 442. A. Bejan and J. H. Marden, Constructing animal locomotion from new thermodynamics theory, *American Scientist*, Vol. 94, July-August 2006, pp. 342-349.
- 443. W. Wechsatol, S. Lorente and A. Bejan, Tree-shaped flow structures with local junction losses, *International Journal of Heat and Mass Transfer*, Vol. 49, 2006, pp. 2957-2964.
- 444. W. Dai, A. Bejan, X. Tang, L. Zhang and R. Nassar, Optimal temperature distribution in a 3D triple layered skin structure with embedded vasculature, *Journal of Applied Physics*, Vol. 99, 2006, 104702.
- 445. A. Bejan, S. Lorente and K.-M. Wang, Networks of channels for self-healing composite materials, *Journal of Applied Physics*, Vol. 100, 2006, 033528.
- 446. K.-M. Wang, S. Lorente and A. Bejan, Vascularized networks with two optimized channels sizes, *Journal of Physics D: Applied Physics*, Vol. 39, 2006, pp. 3086-3096.
- 447. A. Bejan and J. H. Marden, Locomotion: une même loi pour tous, *Pour la Science*, No. 346, August 2006.
- 448. A. K. da Silva and A. Bejan, Dendritic counterflow heat exchanger experiments, *International Journal of Thermal Sciences*, Vol. 45, 2006, pp. 860-869.
- 449. V. D. Zimparov, A. K. da Silva and A. Bejan, Constructal tree-shaped parallel flow heat exchangers, *International Journal of Heat and Mass Transfer*, Vol. 49, 2006, pp. 4558-4566.

- 450. A. Bejan and S. Lorente, Constructal theory of generation of configuration in nature and engineering, *Applied Physics Reviews*, *Journal of Applied Physics*, Vol. 100, 2006, 041301: selected for the Sept. 1, 2006 issue of the *Virtual Journal of Biological Physics Research*.
- 451. A. Bejan and J. H. Marden, Termodinámica de la locomoción animal, *Investigación y Ciencia*, October 2006, pp. 6-14.
- 452. X. Tang, W. Dai, R. Nassar and A. Bejan, Optimal temperature distribution in a threedimensional triple-layered skin structure embedded with artery and vein vasculature, *Numerical Heat Transfer, Part A*, Vol. 50, No. 9, 2006, pp. 809-834.
- 453. A. I. Ciobanas, A. Bejan and Y. Fautrelle, Dendritic solidification morphology viewed from the perspective of constructal theory, *Journal of Physics D: Applied Physics*, Vol. 39, 2006, pp. 5252-5266.
- 454. S. Lorente and A. Bejan, Heterogeneous porous media as multiscale structures for maximum flow access, *Journal of Applied Physics*, Vol. 100, 2006, 114909.
- 455. S. Kim, K.-M. Wang, S. Lorente and A. Bejan, Vascularized materials: grids of channels and trees matched canopy to canopy, ASME Paper IMECE2006-13200, International Mechanical Engineering Congress and Exposition, Chicago, 5-10 Nov., 2006.
- 456. S. Kim, S. Lorente and A. Bejan, Vascularized materials: tree-shaped flow architectures matched canopy to canopy, *Journal of Applied Physics*, Vol. 100, 2006, 063525.
- 457. V. D. Zimparov, A. K. da Silva and A. Bejan, Thermodynamic optimization of tree-shaped flow geometries with constant channel temperature, *International Journal of Heat and Mass Transfer*, Vol. 49, 2006, pp. 4839-4849.
- 458. A. Bejan and S. Lorente, Constructal tree-shaped flow structures, *Applied Thermal Engineering*, Vol. 27, 2007, pp. 755-761.
- 459. A. Bejan, Constructal theory of pattern formation, *Hydrology and Earth System Sciences*, Vol. 11, 2007, pp. 753-768.
- 460. A. Bejan and S. Lorente, Constructal theory and its relevance to green energy, *International Journal of Green Energy*, Vol. 4, 2007, pp. 105-117.
- 461. H. Wang, W. Dai and A. Bejan, Optimal temperature distribution in a 3D triple-layered skin structure embedded with artery and vein vasculature and induced by electromagnetic radiation, *International Journal of Heat and Mass Transfer*, Vol. 50, 2007, pp. 1843-1854.
- 462. H. Zhang, S. Lorente and A. Bejan, Vascularization with trees that alternate with upside-down trees, *Journal of Applied Physics*, Vol. 101, 2007, 094904: selected for the May 15, 2007 issue of *Virtual Journal of Biological Physics Research*.
- 463. S. Kim, S. Lorente and A. Bejan, Vascularized materials with heating from one side and coolant forced from the other side, *International Journal of Heat and Mass Transfer*, Vol. 50, 2007, pp. 3498-3506.
- 464. E. J. Walsh, K. P. Nolan, D. M. McEligot, R. J. Volino and A. Bejan, Conditionally-sampled turbulent and nonturbulent measurements of entropy generation rate in the transition region of

boundary layers, Journal of Fluids Engineering, Vol. 129, 2007, pp. 659-664.

- 465. K.-M. Wang, S. Lorente and A. Bejan, Vascularization with grids of channels: multiple scales, loops and body shapes, *Journal of Physics D: Applied Physics*, Vol. 40, 2007, pp. 4740-4749.
- 466. D. Queiros-Conde, J. Bonjour, W. Wechsatol and A. Bejan, Parabolic scaling of tree-shaped constructal network, *Physica A*, Vol. 384, 2007, pp. 719-724.
- 467. S. Lorente and A. Bejan, Vascularized svelte (compact) flow architectures, Paper IMECE2007-41060, ASME International Mechanical Engineering Congress and Exposition, 11-15 November 2007, Seattle, WA.
- 468. T. Bello-Ochende, L. Liebenberg, A. G. Malan, A. Bejan and J. P. Meyer, Constructal conjugate heat transfer in three-dimensional cooling channels, *Journal of Enhanced Heat Transfer*, Vol. 14(4), 2007, pp. 279-293.
- 469. A. Bejan, Why university rankings do not change: education as a natural hierarchical flow architecture, *International Journal of Design & Nature*, Vol. 2, No. 4, 2007, pp. 319-327.
- 470. A. Bejan, "The Many and the Few", *Mechanical Engineering*, Vol. 129, No. 7, July 2007, pp. 42-43.
- 471. J. Lee, S. Kim, S. Lorente and A. Bejan, Vascularization with trees matched canopy to canopy: diagonal channels with multiple sizes, *International Journal of Heat and Mass Transfer*, Vol. 51, 2008, pp. 2029-2040.
- 472. A. Bejan, Rankings puzzle solved, Prism, March 2008, p. 80.
- 473. A. Bejan, Design in nature: tinkering and the constructal law, *Quarterly Review of Biology*, Vol. 83, No. 1, March 2008, pp. 91-94.
- 474. A. Bejan and J. H. Marden, Laufen = Fliegen = Schwimmen, *Spektrum der Wissenschaft*, June 2008, pp. 34-41.
- 475. S. Kim, S. Lorente, A. Bejan, W. Miller and J. Morse, The emergence of vascular design in three dimensions, *Journal of Applied Physics*, Vol. 103, 2008, 123511.
- 476. A. Bejan, The constructal law of "designedness" in nature, in *Meeting the Entropy Challenge*, G. P. Beretta, A. F. Ghoniem and G. N. Hatsopoulos, eds., AIP conference Proceedings 1033, 2008, pp. 207-212.
- 477. A. Bejan, S. Lorente and J. Lee, Unifying constructal theory of tree roots, canopies and forests, *Journal of Theoretical Biology*, Vol. 254(3), 7 October 2008, pp. 529-540.
- 478. W. Dai, H. Wang, P. M. Jordan, R. E. Mickens and A. Bejan, A mathematical model for skin burn injury induced by radiation heating, *International Journal of Heat and Mass Transfer*, Vol. 51, 2008, pp. 5497-5510.
- 479. S. Kim, S. Lorente and A. Bejan, Dendritic vascularization for countering intense heating from the side, *International Journal of Heat and Mass Transfer*, Vol. 51, 2008, pp. 5877-5886.
- 480. S. Kim, S. Lorente and A. Bejan, Design with constructal theory: vascularized composites for volumetric cooling, Paper IMECE2008-66334, ASME International Mechanical Engineering

Congress and Exposition, October 31-November 6, 2008, Boston, MA.

- 481. A. Bejan, Constructal self-organization of research: empire building versus the individual investigator, *International Journal of Design & Nature and Ecodynamics*, Vol. 3, No. 3, 2008, pp. 177-189.
- 482. A. Bejan and S. Lorente, Vascularized multi-functional materials and structures, *Advanced Materials Research*, Vol. 47-50, pp. 511-514, 2008.
- 483. R. Revellin, J. R. Thome, A. Bejan and J. Bonjour, Constructal tree-shaped microchannel networks for maximizing the saturated critical heat flux, *International Journal of Thermal Sciences*, Vol. 48, 2009, pp. 342-352.
- 484. A. F. Miguel and A. Bejan, The principle that generates dissimilar patterns inside aggregates of organisms, *Physica A*, Vol. 388, 2009, pp. 727-731.
- 485. K.-M. Wang, S. Lorente and A. Bejan, Vascular materials cooled with grids and radial channels, *International Journal of Heat and Mass Transfer*, Vol. 52, 2009, pp. 1230-1239.
- 486. Y. S. Kim, S. Lorente and A. Bejan, Constructal stream generator architecture, *International Journal of Heat and Mass Transfer*, Vol. 52, 2009, pp. 2362-2369.
- 487. A. Bejan, Science and technology as evolving flow architectures, *International Journal of Energy Research*, Vol. 33, 2009, pp. 112-125.
- 488. S. Lorente and A. Bejan, Constructal design of vascular porous materials and electrokinetic mass transfer, *Transport in Porous Media*, Vol. 77, 2009, pp. 305-322.
- 489. J. Lee, S. Lorente, A. Bejan and M. Kim, Vascular structures with flow uniformity and small resistance, *International Journal of Heat Mass Transfer*, Vol. 52, 2009, pp. 1761-1768.
- 490. S. Lorente and A. Bejan, Vascularized smart materials: designed porous media for self-healing and self-cooling, *Journal of Porous Media*, Vol. 12(1), 2009, pp. 1-18.
- 491. A. Bejan and S. Lorente, La loi constructale et la structure des végétaux, *Alliage*, No. 64, March 2009, pp. 65-72.
- 492. A. Bejan and J. H. Marden, The Constructal unification of biological and geophysical design, *Physics of Life Reviews*, Vol. 6, 2009, pp. 85-102.
- 493. T. Bello-Ochende, J. P. Meyer and A. Bejan, Constructal ducts with wrinkled entrances, *International Journal of Heat and Mass Transfer*, Vol. 52, 2009, pp. 3628-3633.
- 494. A. Bejan, Thermodynamics fundamentals, ch. 14 in M. Kutz, ed., *Eshbach's Handbook of Engineering Fundamentals*, fifth ed., Wiley, Hoboken, 2009, pp. 802-817.
- 495. J. Lee, S. Lorente and A. Bejan, Vascular design for thermal management of heated structures, *The Aeronautical Journal*, Vol. 113, 2009, pp. 397-407.
- 496. K.-M. Wang, S. Lorente and A. Bejan, The transient response of vascular composites cooled with grids and radial channels, *International Journal of Heat and Mass Transfer*, Vol. 52, 2009, pp. 4175-4183.

- 497. H. Zhang, S. Lorente and A. Bejan, Vascularization with line-to-line trees in counterflow heat exchange, *International Journal of Heat and Mass Transfer*, Vol. 52, 2009, pp. 4327-4342.
- 498. L. A. O. Rocha, S. Lorente and A. Bejan, Tree-shaped vascular wall designs for localized intense cooling, *International Journal of Heat and Mass Transfer*, Vol. 52, 2009, pp. 4535-4544.
- 499. J. D. Charles and A. Bejan, The evolution of speed, size and shape in modern athletics, *Journal* of *Experimental Biology*, Vol. 212, 2009, pp. 2419-2425.
- 500. A. Bejan and S. Lorente, Natural design with constructal theory, *Mechanical Engineering*, Vol. 131, No. 9, September 2009, pp. 44-48.
- 501. Y. S. Kim, S. Lorente and A. Bejan, Distribution of size in steam turbine power plants, *International Journal of Energy Research*, Vol. 33, 2009, pp. 989-998.
- 502. L. Combelles, S. Lorente and A. Bejan, Leaflike architecture for cooling a flat body, *Journal of Applied Physics*, Vol. 106, 044906, 2009.
- 503. S. Kim, S. Lorente and A. Bejan, Transient behavior of vascularized walls exposed to sudden heating, *International Journal of Thermal Sciences*, Vol. 48, 2009, pp. 2046-2052.
- 504. W. Wechsatol, S. Lorente, A. Bejan and J. C. Ordonez, Elemental T and Y shapes of tree networks of ducts with various cross-sectional shapes, *Journal of Hydraulic Engineering*, Vol. 52, February 2009, pp.132-139.
- 505. J. Lee, S. Lorente and A. Bejan, Transient cooling of smart vascular materials for self-cooling, *Journal of Applied Physics*, Vol. 105, 2009, 064904.
- 506. A. Bejan, The Golden Ratio predicted: vision, cognition and locomotion as a single design in nature, *International Journal of Design & Nature and Ecodynamics*, Vol. 4, No. 2, 2009, pp. 97-104.
- 507. A. Bejan, Two hierarchies in science: the free flow of ideas and the academy, *International Journal of Design & Nature and Ecodynamics*, Vol. 4, No. 4, 2009, pp. 386-394.
- 508. A. Koonsrisuk, S. Lorente and A. Bejan, Constructal solar chimney configuration, *International Journal of Heat and Mass Transfer*, Vol. 53, 2010, pp. 327-333.
- 509. S. Lorente and A. Bejan, Global distributed energy systems, chapter in C. A. Brebbia, N. Jovanovic and E. Tiezzi, eds., *Management of Natural Resources, Sustainable Development and Ecological Hazards II*, WIT Press, Southampton, 2010, pp. 251-269.
- 510. D.-H. Kang, S. Lorente and A. Bejan, Constructal architecture for heating a stream by convection, *International Journal of Heat and Mass Transfer*, Vol. 53, 2010, pp. 2248-2255.
- 511. T. Bello-Ochende, J. P. Meyer and A. Bejan, Constructal multi-scale pin fins, *International Journal of Heat and Mass Transfer*, Vol. 53, 2010, pp. 2773-2779.
- 512. A. Bejan and S. Lorente, The constructal law of design and evolution in nature, *Philosophical Transactions of the Royal Society B, Biological Sciences*, Vol. 365, 2010, pp. 1335-1347.
- 513. X. Zeng, W. Dai and A. Bejan, Vascular countercurrent network for 3-D triple-layered skin

structure with radiation heating, Numerical Heat Transfer, Part A, Vol. 57, 2010, pp. 369-391.

- 514. S. Lorente, J. Lee and A. Bejan, The "flow of stresses" concept: the analogy between mechanical strength and heat convection, *International Journal of Heat and Mass Transfer*, Vol. 53, 2010, pp. 2963-2968.
- 515. K-M. Wang, S. Lorente, A. Bejan, Vascular structures for volumetric cooling and mechanical strength, *J. Applied Physics*, Vol. 107, 044901, 2010.
- 516. A. Bejan and S. Lorente, Constructal design principles for vascular smart structures, ch. 1 in *Constructal Theory and Multi-Scale Geometries*, D. Queiros-Conde and M. Feidt, eds., Presses de L'ENSTA, Paris, 2010, pp. 15-24.
- 517. A. Bejan, The constructal-law origin of the wheel, size, and skeleton in animal design, *American Journal of Physics*, Vol. 78 (7), 2010, pp. 692-699.
- 518. K.-H. Cho, J. Lee, H. S. Ahn, A. Bejan and M. H. Kim, Fluid flow and heat transfer in vascularized cooling plates, *International Journal of Heat and Mass Transfer*, Vol. 53, 2010, pp. 3607-3614.
- 519. A. Bejan, E. C. Jones and J. D. Charles, The evolution of speed in athletics: why the fastest runners are black and swimmers white, *International Journal of Design & Nature and Ecodynamics*, Vol. 5, No. 3, 2010, pp. 199-211.
- 520. S. Lorente and A. Bejan, Few large and many small: hierarchy in movement on earth, *International Journal of Design & Nature and Ecodynamics*, Vol. 5, No. 3, 2010, pp. 254-267.
- 521. E. Cetkin, S. Lorente and A. Bejan, Natural constructal emergence of vascular design with turbulent flow, *Journal of Applied Physics*, Vol. 107, 2010, 114901; selected for the June 15, 2010 issue of *Virtual Journal of Biological Physics Research*.
- 522. D.-H. Kang, S. Lorente and A. Bejan, Constructal dendritic configuration for the radiation heating of a solid stream, *Journal of Applied Physics*, Vol. 107, 2010, 114910.
- 523. Y. Kim, S. Lorente and A. Bejan, Constructal multi-tube configuration for natural and forced convection in cross-flow, *International Journal of Heat and Mass Transfer*, Vol. 53, 2010, pp. L. 5121-5128.
- 524. K.-H. Cho, J. Lee, M.-H. Kim and A. Bejan, Vascular design of constructal structures with low flow resistance and nonuniformity, *International Journal of Thermal Sciences*, Vol. 49, No. 12, 2010, pp. 2309-2318.
- 525. A. Bejan, La loi constructale des schémas d'organisation dans la nature: Espèces <<humaines et techniques>> et animals, A. Fleischer, ed., *Vitesses Limites*, Le Genre Humain, Editions du Seuil, Paris, 2010.
- 526. A. Bejan, Design in nature, thermodynamics, and the constructal law, *Physics of Life Reviews*, Vol. 7, 2010, pp. 467-470.
- 527. S. Lorente, A. Koonsrisuk and A. Bejan, Constructal distribution of solar chimney power plants: few large and many small, *International Journal of Green Energy*, Vol. 7, 2010, pp. 577-592.

- 528. L. A. O Rocha, S. Lorente and A. Bejan, Distributed energy tapestry for heating the landscape, *Journal of Applied Physics*, Vol. 108, 2010, 124904.
- 529. L. Xia, S. Lorente, and A. Bejan, Constructal design of distributed cooling on the landscape. *International Journal of Energy Research*, Vol. 35, No. 9, July 2011, pp. 805-812.
- 530. A. Bejan and S. Lorente, The constructal law and the design of the biosphere: nature and globalization, *Journal of Heat Transfer*, Vol. 133, January 2011, 011001, pp. 1-7.
- 531. A. Bejan, S. Lorente, B. S. Yilbas and A. Z. Sahin, The effect of size on efficiency: Power plants and vascular designs, *International Journal of Heat and Mass Transfer*, Vol. 54, 2011, pp. 1475-1481.
- 532. M. Clausse, F. Meunier, A. H. Reis and A. Bejan, Climate change, in the framework of the Constructal Law, *Earth System Dynamics Discussions*, Vol. 2, 2011, pp. 241-270.
- 533. Y. Kim, S. Lorente and A. Bejan, Steam generator structure: continuous model and constructal design, *International Journal of Energy Research*, Vol. 35, 2011, pp. 336-345.
- 534. E. Cetkin, S. Lorente and A. Bejan, Vascularization for cooling and mechanical strength, *International Journal of Heat and Mass Transfer*, Vol. 54, 2011, pp. 2774-2781.
- 535. A. Bejan, Animals spinning their wheels, *Mechanical Engineering*, Vol. 133, No. 6, June 2011, pp. 44-47.
- 536. A. Bejan and S. Lorente, The constructal law origin of the logistics S curve, *Journal of Applied Physics*, Vol. 110, 2011, 024901, pp. 1-4.
- 537. J. Jung, S. Lorente, R. Anderson and A. Bejan, Configuration of heat sources or sinks in a finite volume, *Journal of Applied Physics*, Vol. 110, 2011, 023502.
- 538. A. Bejan, Stressing the science of engineering, *Mechanical Engineering*, Vol. 183, No. 10, 2011, pp. 40-43.
- 539. E. Cetkin, S. Lorente and A. Bejan, Hybrid grid and tree structures for cooling and mechanical strength, *Journal of Applied Physics*, Vol. 110, 2011, 064910.
- 540. A. Bejan and S. Lorente, The constructal law and the evolution of design in nature, *Physics of Life Reviews*, Vol. 8, 2011, pp. 209-240.
- 541. A. Bejan and S. Lorente, The constructal law makes biology and economics be like physics, *Physics of Life Reviews*, Vol. 8, 2011, pp. 261-263.
- 542. A. Bejan, Thermodynamics, Entropy Generation Minimization, and the Constructal Law, chapter 11 in *Exergy Analysis and Design Optimization for Aerospace Vehicles and Systems*, J. A. Camberos and D. J. Moorhouse, Eds., Progress in Astronautics and Aeronautics, Vol. 238, AIAA, Reston, Virginia, 2011.
- 543. A. Bejan and S. Lorente, The physics of spreading ideas, *International Journal of Heat and Mass Transfer*, Vol. 55, 2012, pp. 802-807.
- 544. L. Combelles, S. Lorente, R. Anderson and A. Bejan, Tree-shaped fluid flow and heat storage in a conducting solid, *Journal of Applied Physics*, Vol. 111, 2012, paper 014902.

- 545. H. Kobayashi, S. Lorente, R. Anderson and A. Bejan, Serpentine thermal coupling between a stream and a conducting body, *Journal of Applied Physics*, Vol. 111, 2012, 044911.
- 546. C. H. Lui, N. K. Fong, S. Lorente, A. Bejan and W. K. Chow, Constructal design for pedestrian movement in living spaces: Evacuation configurations, *Journal of Applied Physics*, 111, 2012, 054903.
- 547. S. Lorente, A. Bejan, K. Al-Hinai, A. Z. Sahin and B. S. Yilbas, Constructal design of distributed energy systems: solar power and water desalination, *International Journal of Heat and Mass Transfer*, Vol. 55, 2012, pp. 2213-2218.
- 548. A. Bejan and S. Lorente, The S-curves are everywhere, *Mechanical Engineering*, May 2012, pp. 44-47.
- 549. A. Bejan and J. P. Zane, Design in nature, Mechanical Engineering, June 2012, pp. 42-47.
- 550. E. Cetkin, S. Lorente and A. Bejan, The steepest S curve of spreading and collecting: Discovering the invading tree, not assuming it, *Journal of Applied Physics*, Vol. 111, 2012, 114903.
- 551. H. Kobayashi, S. Lorente, R. Anderson and A. Bejan, Freely morphing tree structures in a conducting body, *International Journal of Heat and Mass Transfer*, Vol. 55, 2012, pp. 4744-4753.
- 552. S. Lorente, E. Cetkin, T. Bello-Ochende, J. P. Meyer and A. Bejan, The constructal-law physics of why swimmers must spread their fingers and toes, *Journal of Theoretical Biology*, Vol. 308, 2012, pp. 141-146.
- 553. A. Bejan, Why we want power: Economics is physics, *International Journal of Heat and Mass Transfer*, Vol. 55, 2012, pp. 4929 4935.
- 554. A. Bejan & P. Haynsworth, The natural design of hierarchy: basketball versus academics, *International Journal of Design & Nature and Ecodynamics*. Vol. 7, No. 1, 2012, pp. 14–25.
- 555. A. Bejan, Why the bigger live longer and travel farther: animals, vehicles, rivers and the winds. *Nature Scientific Reports*, Vol. 2, no. 594; DOI: 10.1038/srep00594 (2012).
- 556. M. Clausse, F. Meunier, A. H. Reis and A. Bejan, Climate change, in the framework of the constructal law, *International Journal of Global Warming*, Vol. 4, Nos. 3/4, 2012, pp. 242-260.
- 557. L. A. O. Rocha, S. Lorente A. Bejan and R. Anderson, Constructal design of underground heat sources or sinks for the annual cycle, *International Journal of Heat and Mass Transfer*, Vol. 55, 2012, pp. 7832-7837.
- 558. E. Cetkin, S. Lorente and A. Bejan, Vascularization for cooling a plate heated by a randomly moving source, *Journal of Applied Physics*, Vol. 112, 2012, no. 084906.
- 559. A. Bejan and S. Lorente, Letter to the Editor, *Chemical Engineering and Processing: Process Intensification*, Vol. 56, 2012, p. 34.
- 560. H. Kobayashi, S. Lorente, R. Anderson and A. Bejan, Trees and serpentines in a conducting body, *International Journal of Heat and Mass Transfer*, Vol. 56, 2013, pp. 488-494.
- 561. T. Bello-Ochende, O. T. Olakoyejo, J. P. Meyer, A. Bejan and S. Lorente, Constructal flow orientation in conjugate cooling channels with internal heat generation, *International Journal of Heat and Mass Transfer*, Vol. 57, 2013, pp. 241-249.

- 562. D.-H. Kang, S. Lorente and A. Bejan, Constructal distribution of multi-layer insulation, International Journal of Energy Research, Vol. 37, 2013, pp. 153-160.
- 563. A. Bejan, Entropy generation minimization, exergy analysis, and the constructal law, *Arabian Journal for Science and Engineering*, Vol. 38, No. 2, 2013, pp. 329-340.
- 564. A. Bejan, Entropy generation minimization and the constructal law, *Physics-based Modeling & Simulation for Aerospace Systems*, J. Camberos, J. Wolff and G. Paniagua, Lecture Series 2012-05, von Karman Institute for Fluid Dynamics, Rhòde Saint Genèse, Belgium, 2012.
- 565. C. H. Lui, N. K. Fong, S. Lorente, A. Bejan, and W. K. Chow, Constructal design of pedestrian evacuation from an area, *Journal of Applied Physics*, Vol. 113, 2013, 034904.
- 566. H. Kobayashi, S. Lorente, R. Anderson and A. Bejan, Underground heat flow patterns for dense neighborhoods with heat pumps, *International Journal of Heat and Mass Transfer*, Vol. 62, 2013, pp. 632-637.
- 567. A. Bejan and S. Lorente, Constructal law of design and evolution: Physics, biology, technology, and society, *Journal of Applied Physics*, Vol. 113, 2013, 151301.
- 568. A. Bejan, S. Lorente, B. S. Yilbas and A. Z. Sahin, Why solidification has an S-shaped history, *Nature Scientific Reports* 3, 1711; DOI: 10.1038/ srep01711 (2013).
- 569. A. Bejan, S. Lorente, J. Royce, D. Faurie, T. Parran, M. Black and B. Ash, The constructal evolution of sports with throwing motion: baseball, golf, hockey and boxing, *International Journal of Design & Nature and Ecodynamics*, Vol. 8, 2013, pp. 1-16.
- 570. J. D. Charles and A. Bejan, The evolution of long distance running and swimming, *International Journal of Design & Nature and Ecodynamics*, Vol. 8, 2013, pp. 17-28.
- 571. M. Alalaimi, S. Lorente, R. Anderson and A. Bejan, Effect of size on ground-coupled heat pump performance, *International Journal of Heat and Mass Transfer*, Vol. 64, 2013, pp. 115-121.
- 572. A. Bejan, Culture and the Constructal-Law evolution of the human and machine species, *Physics of Life Reviews*, Vol. 10, 2013, pp. 151-153.
- 573. A. Bejan, Constructal law: Pleasure, golden ratio, animal locomotion and the design of pedestrian evacuation, *Physics of Life Reviews*, Vol. 10, 2013, pp. 199-201.
- 574. E. Cetkin, S. Lorente and A. Bejan, Constructal paddle design with "fingers", *Journal of Applied Physics*, Vol. 113, 2013, 194902.
- 575. M. R. Errera, S. Lorente, R. Anderson and A. Bejan, One underground heat exchanger for multiple heat pumps, *International Journal of Heat and Mass Transfer*, Vol. 65, 2013, pp. 727-738.
- 576. S. Lorente, J. Lee, Y. Kim and A. Bejan, Power from a hot gas stream with multiple superheaters and reheaters, *International Journal of Heat and Mass Transfer*, Vol. 67, 2013, pp. 153-158.
- 577. A. Bejan and S. Lorente, Stepping on the water, *Mechanical Engineering*, Vol. 135, October 2013, pp. 38-41.
- 578. A. Bejan, Technology evolution, from the constructal law, chapter 3 in *Advances in Heat Transfer*, Vol. 45, 2013, pp. 183-207; E. M. Sparrow, Y. I. Cho, J. P. Abraham and J. M. Gorman, eds.; Academic Press, Burlington.

- 579. A. Bejan, S. Lorente and D. H. Kang, Constructal design of regenerators, *International Journal of Energy Research*, Vol. 37, 2013, pp. 1509-1518.
- 580. J. Lee, Y. Kim, S. Lorente and A. Bejan, Constructal design of a comb-like channel network for self-healing and self-cooling, *International Journal of Heat and Mass Transfer*, Vol. 66, 2013, pp. 898-905.
- 581. A. Bejan, S. Lorente and R. Anderson, Constructal underground designs for ground-coupled heat pumps, *Journal of Solar Energy Engineering*, Vol. 136, February 2014, 011019.
- 582. S. Lorente, A. Bejan and J. L. Niu, Phase change heat storage in an enclosure with vertical pipe in the center, *International Journal of Heat and Mass Transfer*, Vol. 72, 2014, pp. 329-335.
- 583. A. Bejan, Maxwell's demons everywhere: evolving design as the arrow of time, *Nature Scientific Reports*, Vol. 4, No. 4017, 10 February 2014, DOI: 10.1038/srep04017.
- 584. Y. Pan, S. Lorente, A. Bejan, L. Xia and S. Deng, Distribution of size in multi-evaporator air conditioning systems, *International Journal of Energy Research*, Vol. 38, 2014, pp. 652-657.
- 585. A. Bejan, "Entransy", and its lack of content in physics, *Journal of Heat Transfer*, Vol. 136, 2014, 055501.
- 586. A. Bejan, S. Lorente, Y. Kim and J. Lee, Power from a hot gas stream with superheater and reheater in parallel, *International Journal of Heat and Mass Transfer*, Vol. 73, 2014, pp. 29-32.
- 587. A. Bejan, S. Ziaei and S. Lorente, Evolution: Why all plumes and jets evolve to round cross sections, *Nature Scientific Reports*, Vol. 4, 4730; DOI: 10.1038/srep04730 (2014).
- 588. L. A. O Rocha, S. Lorente and A. Bejan, Vascular design for reducing hot spots and stresses, *Journal of Applied Physics*, Vol. 115, 2014, article no. 174904.
- 589. M. R. Errera, S. Lorente and A. Bejan, Assemblies of heat pumps served by a single underground heat exchanger, *International Journal of Heat and Mass Transfer*, Vol. 75, 2014, pp. 327-336.
- 590. H. Kobayashi, T. Maeno, S. Lorente and A. Bejan, Double tree structure in a conducting body, *International Journal of Heat and Mass Transfer*, Vol. 77, 2014, pp. 140-146.
- 591. M. Alalaimi, S. Lorente and A. Bejan, Thermal coupling between a spiral pipe and a conducting volume, *International Journal of Heat and Mass Transfer*, Vol. 77, 2014, pp. 202-207.
- 592. A. Bejan, Go with the flow and you'll find that evolution belongs in physics, *The Conversation*, 30 July 2014.
- 593. A. Bejan, J. D. Charles and S. Lorente, The evolution of airplanes, *Journal of Applied Physics*, Vol. 116, 2014, 044901.
- 594. A. Bejan, S. Lorente and D.-H. Kang, Constructal design of thermoelectric power packages, *International Journal of Heat and Mass Transfer*, Vol. 79, 2014, pp. 291-299.
- 595. A. Bejan, S. Ziaei and S. Lorente, The S curve of energy storage by melting, *Journal of Applied Physics*, Vol. 116, 2014, 114902.
- 596. L. E. Band, J. J. McDonnell, J. M. Duncan, A. Barros, A. Bejan, T. Burt, W. E. Dietrich, R. E.

Emanuel, T. Hwang, G. Katul, Y. Kim, B. McGlynn, B. Miles, A. Porporato, C. Scaife and P. A. Troch, Ecohydrological flow networks in the subsurface, *Ecohydrology*, Vol. 7, 2014, pp. 1073-1078.

- 597. A. Bejan and M. R. Errera, Technology evolution, from the constructal law: heat transfer designs, *International Journal of Energy Research*, Vol. 39, 2015, pp. 919-928, doi:10.1002/er.3262.
- 598. A. Bejan, Comment on "Application of entransy analysis in self-heat recuperation technology", *Industrial & Engineering Chemistry Research*, Vol. 53, 2014, pp. 1274-1285.
- 599. E. Cetkin, S. Lorente and A. Bejan, Vascularization for cooling and reduced thermal stresses, *International Journal of Heat and Mass Transfer*, Vol. 80, 2015, pp. 858-864.
- 600. A. Bejan, A bird? A plane? It's all evolution, Aerospace America, November 2014, pp. 14-17.
- 601. S. Lorente, A. Bejan and J. L. Niu, Constructal design of latent heat energy storage with vertical spiral heaters, *International Journal of Heat and Mass Transfer*, Vol. 81, 2015, pp. 283-288.
- 602. A. Bejan, Heatlines (1983) versus synergy (1998), International Journal of Heat and Mass Transfer, Vol. 81, 2015, pp. 654-658.
- 603. A. Bejan, Every snowflake is Not unique, Mechanical Engineering, January 2015, pp. 40-41.
- 604. C. H. Lui, N. K. Fong, S. Lorente, A. Bejan and W. K. Chow, Constructal design of evacuation from a three-dimensional living space, *Physica A*, Vol. 422, 2015, pp. 47-57.
- 605. M. Alalaimi, S. Lorente and A. Bejan, Thermal coupling between a helical pipe and a conducting volume, *International Journal of Heat and Mass Transfer*, Vol. 83, 2015, pp. 762-767.
- 606. A. Bejan, Constructal law: Optimization as Design Evolution, *Journal of Heat Transfer*, Vol. 137, 2015, paper no. 061003.
- 607. A. Bejan, J. Lee, S. Lorente and Y. Kim, The evolutionary design of condensers, *Journal of Applied Physics*, Vol. 117, 2015, No. 125101.
- 608. C. Hadjistassou, A. Bejan and Y. Ventikos, Cerebral oxygenation and optimal brain organization, J. R. Soc. Interface, Vol. 12, 13 May 2015, 20150245.
- 609. A. Bejan, Why humans build fires shaped the same way, *Nature Scientific Reports*, Vol. 5, 11270, 8 June 2015; DOI: 10.1038/srep11270.
- 610. S. Ziaei, S. Lorente and A. Bejan, Morphing tree structures for latent heat thermal energy storage, *Journal of Applied Physics*, Vol. 117, 2015, No. 224901.
- 611. A. Almerbati, S. Lorente and A. Bejan, Energy design for dense neighborhoods: One heat pump rejects heat, the other absorbs heat from the same loop, *International Journal of Thermal Sciences*, Vol. 96, 2015, pp. 227-235.
- 612. M. Alalaimi, S. Lorente, W. Wechsatol and A. Bejan, The robustness of the permeability of constructal tree-shaped fissures, *International Journal of Heat and Mass Transfer*, Vol. 90, 2015, pp. 259-265.

- 613. A. Bejan, S. Lorente, J. Lee and Y. Kim, Constructal design of gas-cooled electric power generators, self-pumping and atmospheric circulation, *International Journal of Heat and Mass Transfer*, Vol. 91, 2015, pp. 647-655.
- 614. A. Bejan, Sustainability: the water and energy problem, and the natural design solution, *European Review*, Vol. 23, 2015, pp. 481-488.
- 615. A. Bejan, Letter to the editor of renewable and sustainable energy reviews, *Renewable and Sustainable Energy Reviews*, Vol. 53, 2016, pp. 1636-1637.
- 616. A. Bejan, J. D. Charles, S. Lorente and E. H. Dowell, Evolution of airplanes, and What price speed? *AIAA Journal*, Vol. 54, No. 3, 2016, pp. 1116-1119.
- 617. A. Bejan, Constructal thermodynamics, *International Journal of Heat and Technology*, Vol. 34, Special Issue 1, 2016, pp. S1-S8, <u>http://dx.doi.org/10.18280/ijht.34S101</u>.
- 618. A. Bejan, Rolling stones and turbulent eddies: why the bigger live longer and travel farther, *Nature Scientific Reports*, Vol. 6, 2016, No. 21445, doi:10.1038/srep21445.
- 619. A. Bejan and M. R. Errera, Complexity, organization, evolution, and constructal law, *Journal of Applied Physics*, Vol. 119, 2016, 074901, <u>http://dx.doi.org/10.1063/1.4941554</u>.
- 620. A. Bejan and R. W. Wagstaff, The physics origin of the hierarchy of bodies in space, *Journal of Applied Physics*, Vol. 119, 2016, 094901, <u>http://dx.doi.org/10.1063/1.4941986</u>.
- 621. A. Bejan, Accelerated evolution, Mechanical Engineering, April 2016, pp. 38-43.
- 622. D. González, J. Amigo, S. Lorente, A. Bejan and F. Suárez, Constructal design of salt-gradient solar pond fields, *International Journal of Energy Research*, Vol. 40, 2016, pp. 1428-1446, DOI: 10.1002/er.3539.
- 623. A. Bejan, A. Almerbati, S. Lorente, A. S. Sabau and J. W. Klett, Arrays of flow channels with heat transfer embedded in conducting walls, *International Journal of Heat and Mass Transfer*, Vol. 99, 2016, pp. 504-511.
- 624. A. Bejan, M. Alalaimi, S. Lorente, A. Sabau and J. W. Klett, Counterflow heat exchanger with core and plenums at both ends, *International Journal of Heat and Mass Transfer*, Vol. 99, pp. 622-629, 2016.
- 625. A. Bejan, Life and evolution as physics, *Communicative & Integrative Biology*, Vol. 9, No. 3, e1172159 (13 pages), 2016, <u>http://dx.doi.org/10.1080/19420889.2016.1172159</u>.
- 626. R. Chen, C. Y. Wen, S. Lorente and A. Bejan, The evolution of helicopters, *Journal of Applied Physics*, Vol. 120, article 014901, 2016.
- 627. A. Bejan, Evolution as Physics: The human and machine species, *European Review*, Vol. 25, No. 1, 2017, pp. 140-149.
- 628. A. Bejan, A. Almerbati and S. Lorente, Economies of scale: The physics basis, *Journal of Applied Physics*, Vol. 121, article 044907, 2017.
- 629. A. Bejan and M. R. Errera, Wealth inequality: The physics basis, *Journal of Applied Physics*, Vol. 121, 124903, 2017.

- 630. A. Bejan, Evolution in thermodynamics, Applied Physics Reviews, Vol. 4, No. 1, 011305, 2017.
- 631. C. Orndorff, S. Ponomarev, W. Dai and A. Bejan, Thermal analysis in a triple-layered skin structrure with embedded vasculature, tumor, and gold nanoshells, *International Journal of Heat and Mass Transfer*, Vol. 111, pp. 677-695 (2017).
- 632. A. Bejan, A. Almerbati and S. Lorente, Response to Comment on Economies of Scale: The physics basis, *Journal of Applied Physics*, Vol. 121, 2017, no. 206102.
- 633. A. Bejan, R. Chen, S. Lorente and C. Y. Chen, Hierarchy in air travel: Few large and many small, *Journal of Applied Physics*, Vol. 122, 024904 (2017).
- 634. A. Bejan and S. Lorente, La loi constructale et sa place dans la thermodynamique, *Techniques de l'Ingenieur*, Vol. B 8 111, 14 pages, 11 July 2017.
- 635. A. Bejan, M. Alalaimi, A. S. Sabau and S. Lorente, Entrance-length dendritic heat exchangers, *International Journal of Heat and Mass Transfer*, Vol. 114, pp. 1350-1356, 2017.
- 636. A. Bejan, S. Lorente, L. Martins, and J. P. Meyer, The constructal size of a heat exchanger, *Journal of Applied Physics*, Vol. 122, 064902, 2017.
- 637. Y. Fan, Y. Li, A. Bejan, Y. Wang and X. Yang, Horizontal extent of the urban heat dome flow, *Scientific Reports*, Vol. 7, 2017, No. 11681.
- 638. A. Almerbati, S. Lorente and A. Bejan, The evolutionary design of cooling a plate with one stream, *International Journal of Heat and Mass Transfer*, Vol. 116, 2018, pp. 9-15.
- 639. L. A. O. Rocha, S. Lorente and A. Bejan, Constructal theory in heat transfer, chapter in F. Kulacki, ed., *Handbook of Thermal Science and Engineering*, Springer, New York, 2018.
- 640. A. S. Sabau, A. H. Nejad, J. W. Klett, A. Bejan and K. Ekici, Novel evaporator architecture with entrance-length crossflow-paths for supercritical organic cycles, *International Journal of Heat and Mass Transfer*, Vol. 119, 2018, pp. 208-222.
- 641. A. Bejan, Comment on "Study on the consistency between field synergy principle and entransy dissipation extremum principle", *International Journal of Heat and Mass Transfer*, Vol. 120, 2018, pp. 1187-1188.
- 642. A. Bejan, Evolution as physics, *Romanian Journal of Technical Sciences Applied Mechanics*, Vol. 62, 2017, pp. 18-29.
- 643. A. Bejan, Personal Aircraft: why the revolution won't happen, *Aerospace America*, May 2018, pp. 46-49.
- 644. L. A. O. Rocha, S. Lorente and A. Bejan, Constructal theory in heat transfer, in F. A. Kulacki, ed., *Handbook of Thermal Science and Engineering*, Springer, New York, 2018.
- 645. A. Bejan, Without engineering, civilization does not exist, *Mechanical Engineering*, May 2018, pp. 42-47.
- 646. A. Bejan, Constructal law, twenty years after, Proceedings of the Romanian Academy Series A, Vol. 19, No. 2, pp. 309-311.

647. A. Bejan, Letter to the Editor on "Temperature-heat diagram analysis method for heat recovery physical adsorption refrigeration cycle—Taking multi stage cycle as an example, *International Journal of Refrigeration*, Vol. ?, 2018, pp. ?-?.

Patents

- 1. D.-H. Kang, A. Bejan and S. Lorente, Radiation-Type Heating Apparatus, No. KR1203728, November 15, 2012, Republic of Korea.
- 2. D.-H. Kang, A. Bejan and S. Lorente, Constructal architecture of convection heating apparatus, No. KR10-1275001, June 10, 2013, Republic of Korea.

Letters, Articles in Magazines and Interviews:

- 1. A. Bejan, Book review, *Optimization Criteria for Irreversible Thermal Processes*, by V. Radcenco, Editura Technica, Bucharest (1977), in *International Journal of Heat and Mass Transfer*, Vol. 22, 1979, p. 986.
- 2. A. Bejan, Reply to "Comments on a Synthesis of Analytical Results for Natural Convection Heat Transfer across Rectangular Enclosures," *International Journal of Heat and Mass Transfer*, Vol. 24, No. 9, September 1981, pp. 1557-1558.
- 3. A. Bejan, "Another Look Worthwhile," Mechanical Engineering, May 1982, p. 5.
- 4. A. Bejan, Comment on "Natural convection from isothermal plates embedded in thermally stratified porous media," *Journal of Thermophysics and Heat Transfer*, Vol. 6, July-September 1992, pp. 574-575.
- 5. A. Bejan, Comments on "Coupled heat and mass transfer by natural convection from vertical surfaces in porous media," *International Journal of Heat and Mass Transfer*, Vol. 35, December 1992, p. 3498.
- 6. A. Bejan, Comments on "Analysis of close-contact melting for octadecane and ice inside isothermally heated horizontal rectangular capsule," *International Journal of Heat and Mass Transfer*, Vol. 36, February 1993, p. 832.
- 7. A. Bejan, "Mechanical Engineering," Engineering Horizons, Springer 1993, p. 10.
- 8. J. L. Lage, J. S. Lim and A. Bejan, "Authors' Closure," *Journal of Heat Transfer*, Vol. 115, November 1993, p. 1086.
- 9. A. Bejan, "Engineering Advances on Finite-Time Thermodynamics," *American Journal of Physics*, Vol. 62, January 1994, pp. 11-12.
- 10. J. N. Gunther, "Indoor Pollution", Interview with A. Bejan, *Popular Science*, November 1995, p. 27.
- 11. A. Bejan, P. Cheng, D. M. France, A. Haji-Sheikh, J. P. Hartnett, T. F. Irvine, Jr., O. G. Martynenko, E. M. Sparrow, C. L. Tien and R. Viskanta, "Professor W. J. Minkowycz on His 60th Birthday and His 30th Year as Editor of the International Journal of Heat and Mass Transfer," *International Journal of Heat and Mass Transfer*, Vol. 40, 1997, pp. 3997-3998.
- 12. A. Bejan, P. Cheng, D. M. France, A. Haji-Sheikh, J. P. Hartnett, T. F. Irvine, Jr., O. G. Martynenko, E. M. Sparrow, C. L. Tien and R. Viskanta, "Milestones for Professor W. J.

Minkowycz and Numerical Heat Transfer," Numerical Heat Transfer, Part A: Applications, Vol. 32, 1997, pp. iii-vi; also in Numerical Heat Transfer, Part B: Fundamentals, Vol. 32, 1997, pp. iii-vi.

- 13. A. Bejan, "Editorial," Journal of Porous Media, Vol. 3, No. 3, 2000, pp. v-vi.
- 14. A. Bejan, "Message from the Honorary Editor", *Exergy, an International Journal*, Vol. 1, No. 1, 2001, p. 2.
- 15. A. Bejan, Book review, *The Physics of Pulsatile Flow*, by M. Zamir, Springer-Verlag, New York (2000), <u>www.amazon.com</u>.
- 16. A. Bejan, M. Feidt and E. Mamut, "Foreword", *International Journal of Energy Research*, Vol. 26, No. 7, 2002, pp. 543-544.
- 17. A. Bejan, "Constructal Comment on a Fermat-Type Principle for Heat Flow", *International Journal of Heat and Mass Transfer*, Vol. 46, 2003, pp. 1885-1886.
- 18. A. Bejan, D. B. Ingham and E. Mamut, "Foreword", *International Journal of Energy Research*, Vol. 27, 2003, p. 857.
- 19. J. Lewins, "Bejan's Constructal Theory of Equal Potential Distribution", *Int. J. Heat Mass Transfer*, Vol. 46, 2003, pp. 1541-1543.
- 20. H. Poirier, "Une théorie explique l'intelligence de la nature", Interview with A. Bejan, *Science & Vie*, No. 1034, November 2003, pp. 44-63.
- M. Torre, "La Natura, vi svelo le formule della perfezione", *La Macchina del Tempo*, January February 2004, No. 1–2, Year 5, pp. 36-46.
- 22. A. Bejan, "Foreword", *International Journal of Heat & Technology*, Vol. 22, no. 1, 2004, pp. 3-4.
- 23. G. Guerreri, "Forma e struttura, dall'ingegneria alla natura, *ICP-Industria Chimica e Petrochimica*, year 32, no. 6, June 2004, pp. 134-136.
- 24. D. Ulieriu and D. Nicolescu, The future will be constructal, *Descopera*, No. 13, 2004, pp. 50-53.
- 25. R. N. Rosa, A. H. Reis and A. F. Miguel, Eds., *Bejan's Constructal Theory of Shape and Structure*, Évora Geophysics Center, University of Évora, Portugal, 2004, 231 pages.
- 26. A. Bejan, "Preface", *Transferts Termiques*, by A.- M. Bianchi, Y. Fautrelle and J. Etay, Presses Polytechniques et Universitaires Romandes, Lausanne, 2004.
- 27. "La Tour Eiffel a livré son equation", Interview with A. Bejan, *Science & Vie*, No. 1050, March 2005, pp. 18-19.
- 28. A. Bejan, "Constructing a Theory for Scaling and More", *Physics Today*, July 2005, p. 20.
- 29. M. Wittlin, "A Finger on the Pulse of the World: Constructal Theory, once Used to Explain

River Basin Shape, Predicts All Animal Locomotion", *SEED* Magazine, 13 January 2006. http://www.seedmagazine.com/news/2006/01/a_finger_on_the_pulse_of_the_w.php

- 30. "Evolution of Movement Design is Deterministic", Interview with A. Bejan, Astrobiology Magazine, 31 December 2005. <u>http://www.astrobio.net/news/modules.php?op=modload&name=News&file=article&sid=1820</u>
- 31. "Traquers de formes: Quand les morphologues réinventent la nature" (Pursuers of shapes: when the morphologists reinvent nature), *Science & Vie*, No. 1067, August 2006, Supplement, pp. 47-50.
- 32. Response of A. Bejan and J. Marden, Pour la Science, No. 347, September 2006, p. 33.
- 33. R. Bliwise, "Going With the Flow", DUKE Magazine, September-October 2007, pp. 32-29.
- 34. P. J. Zane, Going with the flow, The News & Observer, Raleigh, 30 December 2007.
- 35. J. J. Hermes, "Fixed Rankings?", *The Chronicle of Higher Education*, Vol. 54, Issue 27, Page A6, 14 March 2008.
- 36. C. Lascu, "Nature is constructal", National Geographic-Romania, April 2008, pp. 36-44.
- 37. A. Bejan, "Go with the flow of new college rankings", Contra Costa Times, 8 August 2008.
- 38. A. Bejan, "Get into the flow of college rankings", *The News & Observer*, Raleigh, NC, 13 August 2008.
- 39. Fabienne Lemarchand, La pyramide ou la géometrie du moindre effort (The Pyramid or the geometry of least effort), *Les Cahiers de Science & Vie*, No. 106, August-September 2008, pp. 52-61.
- 40. J. L. Lage et al., Professor Adrian Bejan on his 60th birthday, *International Journal of Heat and Mass Transfer*, Vol. 51, 2008, pp. 5759-5761.
- 41. R. R. Britt, Is Einstein the last great genius? Yahoo News, 5 December 2008, http://news.yahoo.com/s/livescience/20081205/sc_livescience/iseinsteinthelastgreatgenius
- 42. Richard Merritt, Collaboration of soloists makes the best science, Socius, 4 December 2008.
- 43. Richard Merritt, Tree branching key to efficient flow in nature and novel materials, Duke News, 17 July 2008.
- 44. M. Lord, Capstone Redesign, Prism, April 2009, pp. 45-47.
- 45. Tree Museum, The Bronx Museum of the Arts, 2 August 25 October 2009, Bronx, New York.
- 46. K. McVeigh, "The bigger they get, the faster they go the rise of the superhuman athlete", *The Guardian*, 17 July 2009.
- 47. R. Alleyne, "Size matters: bigger athletes dwarf efforts of smaller rivals", *The Daily Telegraph*, 17 July 2009.

- 48. Elizabeth Cooney, "The quickest grow fastest", The Boston Globe, 20 July 2009.
- 49. "Higher, taller, faster: study suggests", Vancouver Sun, 20 July 2009.
- 50. R. Boswell, "The skinny on today's Olympic athletes", National Post, Canada, 20 July 2009.
- 51. Lee Dye, "Are giants taking over sports?", ABC News, 22 July 2009.
- 52. Emanuela di Pasqua, "Generazione di fenomeni <<crescono>>", Corriere della Sera, 17 July 2009.
- 53. Paola Mariano, Nuoto e corsa/ Atleti più veloci? La causa e il fisico "ingigantito", *ilsussidiario.net*, 17 June 2009.
- 54. Elizabeth Landau, Olympic speed winners getting taller, heavier, CNN.com, 5 August 2009.
- 55. A. Bejan, Book review, *Thermodynamics: Frontiers and Foundations*, J. D. Lewins (2009). 441 pp., Annals of Nuclear Energy, Vol. 36 (2009), p. 1472.
- 56. Matthew Futterman, Behind the NFL's touchdown binge, *The Wall Street Journal*, 10 September 2009, p. D8.
- 57. A. Bejan, Book Preface, *Convective Heat Transfer*, M. Favre-Marinet and S. Tardu, Wiley, UK, 2009.
- 58. Steve Connor, Why some shapes are more pleasing to the eye than others, *The Independent*, London, UK, 21 December 2009.
- 59. Karen McVeigh, Why golden ratio pleases the eye: US academic says he knows art secret, *The Guardian*, London, UK, 28 December 2009.
- 60. Paola Mariano, Cervello: nei nostri occhi il segreto bellezza opere d'arte, l'Unità, Italy, 21 December 2009.
- 61. Richard Merritt, Why winning athletes are getting bigger, PhysOrg 17 July 2009.
- 62. Richard Merritt, Reinventing the wheel—Naturally, National Science Foundation, 15 June 2010.
- 63. Massimo Piattelli-Palmarini, Così occhio e mente cologno la bellezza, *Corriere della Sera*, 12 January 2010, p. 36.
- 64. Frédérique Doyon, Le secret de la beauté démystifié, Le Devoir, Montreal, 21 January 2010.
- 65. Matthew Moore, Centre of gravity theory for dominance of black sprinters and white swimmers, *The Daily Telegraph*, 12 July 2010.
- 66. Karin Zeitvogel, Belly-buttons key to success in sport: study, Yahoo News, 12 July 2010.
- 67. Karen Rowan, Scientists theorize why black athletes run fastest, Live Science, 13 July 2010.

- 68. William Saletan, Lose the race. Can the black-white performance gap be hereditary but not racial? *Slate*, 13 July 2010.
- 69. Jeremy Berlin, Gaudi's Masterpiece, National Geographic, December 2010, pp. 24-27.
- 70. Tara Bruno, Higher navel, faster feet, Science World, October 18, 2010, Vol. 67, No. 3, p. 5.
- 71. Jeannine Stein, The key to an athlete's speed may be the body's center of gravity, *Los Angeles Times*, Health, 12 July 2010.
- 72. L. A. Kime, J. Clark and B. K. Michael, *Explorations in College Algebra*, 5th ed., Wiley, Hoboken, 2011, p. 463.
- 73. L. Valich, Just go with the flow to pick March Madness winners, *Medill Reports*, 1 March 2011.
- 74. A. Boyle, Why March Madness isn't that mad, MSNBC, 2 March 2011.
- 75. Richard Merritt, Seeing the S-curve in everything, Duke News, August 2011.
- 76. E. Brennan, Circular evolution in the NCAA tournament, ESPN, 3 March 2011.
- 77. C. Arnold, Universal Law of Basketball, US News & World Report, 21 March 2011.
- 78. Lindsey Emery, Athletic blessings in disguise, ESPN W, 11 May 2011
- 79. Pourquoi les coureurs d'origine africaine sont-ils meilleurs que les autres?, *Science et Vie*, July 2011, pp. 126-129.
- 80. A. Bejan and J. P. Zane, Why Occupy Wall Street's non-hierarchical vision is unobtainable, *The Daily Caller*, 3 November 2011.
- 81. Esses are everywhere, Science Daily, 20 July 2011.
- 82. Seeing the S-curve in everything, Science Codex, 20 July 2011.
- 83. Justin Gafiuc, Povestea lui Adrian Bejan, fost baschetbalist devenit membru al Academiei Romane: "Sportul m-a ajutat să fac performanța în știință", *Gazeta Sporturilor*, 20 December 2011.
- 84. A. Bejan and J. P. Zane, The physics of freedom, *The Daily Caller*, 9 January 2012.
- 85. M. Ulieriu, Universul lui Bejan (Bejan's Universe), Stiinta si Tehnica, January 2012, p. 120, Bucharest.
- 86. A. Bejan and J. P. Zane, In defense of flip-flopping, Salon, 26 January 2012.
- 87. A. W. Kosner, There's a new law in physics and it changes everything, *Forbes*, 29 February 2012.
- 88. A. W. Kosner, "Freedom is good for design", How to use Constructal Theory to liberate any

flow system, Forbes, 18 March 2012.

- 89. Jonathan Mitchell, Constructal Law: A Theory of Everything, Studio 360, 2 March 2012.
- 90. Moira Gunn, TechNation: Adrian Bejan—The Nature of Design, IT Conversations, 22 March 2012.
- 91. Julian Spector, Bejan finds order in chaos, *The Chronicle*, 23 March 2012.
- 92. A. Bejan and J. P. Zane, Why everything wants more power, *The Daily Caller*, 28 March 2012.
- 93. Molly Hrudka, The Natural Flow, Interview with Adrian Bejan on the Constructal Law of Design in Nature, *The Campus BluePrint*, University of North Carolina chapel Hill, April 2012.
- 94. A. W. Kosner, "Talk about flow: NASA helps us visualize the world's oceans, and everything else", *Forbes*, 8 april 2012.
- 95. Mark Matthews, Clues to the Universe and Disaster, From the Editor, Prism, April 2012.
- 96. A. Bejan and J. P. Zane, Can't say no to the latest gadget? Don't blame Apple, blame physics, *The Daily Caller*, 4 May 2012.
- 97. A. Bejan and J. P. Zane, In design, nature goes with the flow, News & Observer, 8 May 2012.
- 98. A. Bejan and S. Lorente, Letter to the Editor: X.-B. Liu, Q. Chen, M. Wang, N. Pan and Z.-Y. Guo, Multi-dimensional effect on optimal network structure for fluid distribution, Chemical Engineering and Processing 49 (2010) 1038-1043, *Chemical Engineering and Processing*, Vol. 56, 2012, p. 34.
- 99. Stephanie Pappas, Fastest swimmers make webbed hands out of water, *LiveScience*, 30 June 2012.
- 100. Sharon Begley, Newton at the Games: Sports science, Reuters, 16 July 2012.
- 101. Sharon Begley, Faster Olympic swimmers paddle like a duck, kick like a dolphin, *Reuters*, 18 July 2012.
- 102. Matthew Futterman, Bodies built for Gold, The Wall Street Journal, 27 July 2012.
- 103. Natalie Wolchover, What are the ingredients of an Olympian?, *Life's Little Mysteries*, 30 July 2012.
- 104. Pauline Gravel, La physique constructale à l'épreuve de l'eau?, Le Devoir, Montreal, 31 July 2012.
- 105. Wade Goodwyn, Perfect physiques, interview on NPR Boston, WBUR, 1 August 2012.
- 106. Karin Zeitvogel, SPORTS: Researchers point to fingers as key to speed in the water, *WaterWonksBeta*, 2 August 2012.
- 107. Lee Charles Kelley and Kevin Behan, Empathy & evolution: how dogs convert stress into

flow, Psychology Today, 6 August 2012.

- 108. Michael Donlevy, Could your child be an Olympian?, Yano, 15 August 2012.
- 109. A. W. Kosner, Not just hot: Striking NASA data show warmer and wilder summers, *Forbes*, 19 August 2012.
- 110. A. W. Kosner, Big data not required: the benefits of a less complex model of climate change, *Forbes*, 12 October 2012.
- 111. G. M. Lloyd, Duke professor takes simpler approach to climate change, *The Chronicle*, 22 October 2012.
- 112. L. C. Kelley, The canine mind bows to the Constructal Law, *Psychology Today* 16 October 2012.
- 113. The Week, UK, The Hobbit film leaves fans with an unexpected thickness, 2 December 2012.
- 114. Laura Cox, Hobbit's visual effects leaves some fans feeling sick, *Herald Sun*, Melbourne, Australia, 2 December 2012.
- 115. Cover story and cover design, Dukengineer magazine, 2011-2012, pp. 22-27.
- 116. B. Elkas, Constructal theory of social dynamics, *News Bulletin of the General Directorate of Highways, Turkey*, Issue 575, 2012, pp. 40-42.
- 117. Max Borders, The most important idea you probably didn't know about, *The Freeman*, 31 January 2013.
- 118. A. W. Kosner, The (not so) evil strategy behind everything Google, Forbes, 3 February 2013.
- 119. L. C. Kelly, Hierarchies without dominance: The pack as a flow system?, *Psychology Today*, 8 February 2013.
- 120. Lance Hosey, Why We Love Beautiful Things, New York Times, 15 February 2013.
- 121. Phil Patton, Designers of Aston-Martin Rapide S Embrace Golden Ratio, *New York Times*, 20 February 2013.
- 122. A. W. Kosner, The Sports Car, The Laptop And The Science Behind The Golden Proportion, *Forbes*, 22 February 2013.
- 123. Tony Shan, Golden ratio gives sports car natural appeal, The Chronicle, 26 February 2013.
- 124. Marjorie Senechal, Gold or Brass? Huffington Post, 27 February 2013.
- 125. Matthew Futterman, Here Come The Flamethrowers, *The Wall Street Journal*, 29 March 2013, pp. D1-D2.
- 126. Ira Katz A Law for Almost Everything, American Daily Herald, 3 June 2013.

- 127. Anne Hart, Are neurotoxins making people less intelligent?, Sacramento Healthy Trends Examiner, 6 June 2013.
- 128. Richard Merritt, In baseball, bigger is better, <u>http://eurekalert.org/pub_releases/2013-07/du-ibb070813.php</u>, 8 July 2013.
- 129. Laura Candler, Why baseball pitchers (and other athletes) are getting taller, *WUNC Science and Technology*, 10 July 2013.
- 130. *Through the Wormhole, with Morgan Freeman: Did God Create Evolution?*, Science Channel, 31 July 2013.
- 131. Karl Gruber, Spreading your fingers improves your swimming, *The Munich Eye*, 9 September, 2013.
- 132. A. W. Kosner, Winter wonderland: Snowflakes are predictably diverse, but not unique, *Forbes*, 22 December 2013.
- 133. Stephanie Pappas, How snowflakes form: new video explains, *Live Science*, 23 December 2013.
- 134. Not so unique, The News & Observer, Raleigh, 20 December 2013.
- 135. Matthew Futterman, Imperfect bodies chase gold, The Wall Street Journal, 7 February 2014.
- 136. V. Jinescu, Legea Constructală a lui Adrian Bejan, Stiința și Tehnică, Aprilie 2014, pp. 76-81.
- 137. A. W. Kosner, Famo.us Part I: New Concepts Will Increase the Flow of Highly Dynamic Web 3.0 Apps, Forbes 27 May 2014.
- 138. David Levins, A Kind Voice on Big Ideas & Philosophy, blogtalkradio.com, 8 June 2014.
- 139. A. Bejan and J. P. Zane, The World Cup's light-color advantage, The Daily Caller, 7 July 2014.
- 140. Paola Mariano, Brasile o Germania, parla l'esperto <<Favorite squadre con maglie più chiare>>, *Il Messaggero*, 8 July 2014.
- 141. Tanya Lewis, Survival of the flight test: Airplanes evolve, too, *Live Science, Yahoo News*, 23 July 2014.
- 142. Physics law explains airplane evolution: research, Nature World News, 23 July 2014.
- 143. Ks Lim, Physics Constructal Law describes airplane evolution, Argyll free press, 23 July 2014.
- 144. Clive Cookson, Evolutionary physics: Could Darwin have predicted the Airbus? *Financial Times*, 1 August 2014.
- 145. Alex Chavers, Evolution works on planes too? Scientists compare planes with living things, *News Ledge*, 23 July 2014.
- 146. Anne Francis, Airplanes evolve just like how flying animals do: Study, Tech Times, 25 July

2014.

- 147. Vikas Shukla, Airplanes evolving in the pattern of biological evolution: Scientists, *Value Walk*, 23 July 2014.
- 148. Joe Chivers, Airplanes evolve like animals, engineering professor claims, *Science Recorder*, 22 July 2014.
- 149. Law of physis governs aeroplane evolution, Pally News, 22 July 2014.
- 150. Anthony Wing Kosner, It's a bird, it's a plane, it's an iPhone! Why evolution makes things larger and faster, *Forbes*, 26 July 2014.
- 151. A. Malhammar, Lois de la physique et évolution, *L'immigrant*, 27 July 2014.
- 152. The evolution of airplanes, AIP Publishing, 22 July 2014.
- 153. Ken Kingery, Law of physics governs airplane evolution, *PhysOrg*, 22 July 2014.
- 154. Physics law helps explain evolution of passenger airplanes, Sci-News.com, 23 July 2014.
- 155. Hannah Osborne, Evolution study: Concorde was doomed from the start, *International Business Times*, 22 July 2014.
- 156. Deborah Paulson, Birds and aircrafts evolve in a similar manner, a mechanical engineer says, *Dumb Out*, 23 July 2014.
- 157. Brian Owens, Do airplanes evolve like birds?, The Christian Science Monitor, 22 July 2014.
- 158. Robert Lam, Evolution killed the supersonic airlines, Stuff to Blow Your Mind, 22 July 2014.
- 159. Vasudevan Mukunth, The new and large fly the farthest, *The Last Why*, 23 July 2014.
- 160. David J. Tenenbaum, On the wing: Birds, skeeters, jet planes: Same design rule applies!, *The Why Files*, 27 July 2014.
- 161. James Maynard, airplanes may have evolved like birds: Applying law of physics to evolution, *Tech Times*, 26 July 2014.
- 162. Julie S., Airplane designs mimic evolution patterns of flying animals, *Headlines & Global News*, 26 July 2014.
- 163. Aircraft evolution rooted in natural physics, says mechanical engineer, Knovel, 29 July 2014.
- 164. The evolution of airplanes, Space Daily, 30 July 2014.
- 165. The evolution of airplanes, One News Page, 30 July 2014
- 166. Development of airplanes is like evolution of birds: Study, Delhi Daily News, 23 July 2014.
- 167. Pauline Gravel, L'architecture des flocons de neige, Le Devoir, 10 January 2015, Montreal.

- 168. Knowledge Keepers: Design in Nature, <u>www.kogainon.com/K/Pages/Bejan/Title.html</u>.
- 169. Alan S. Brown and Brittany Logan, How fiction puts the science in engineering, *Mechanical Engineering*, February 2015, pp. 32-39.
- 170. Beth Anne Austein, Are all snowflakes unique?, Montana Public Radio, 1 February 2015.
- 171. A. Bejan, Book review *The Origin of Life Circus: How to Make Life Extravaganza*, by Suzan Mazur, *Astrobiology* magazine, 5 March 2015.
- 172. Anthony Wing Kosner, What really scares tech leaders about artificial intelligence?, *Forbes*, 20 April 2015.
- 173. Suzan Mazur, Adrian Bejan: Growth is not evolution, Huffington Post, 20 April 2015.
- 174. Hannah Osborne, Why we have been building fires the same way since the dawn of time, *International Business Times*, 8 June 2015.
- 175. Kristina Killgrove, Food, fighting, fun, and 7 other reasons our ancestors used fire, *Forbes*, 8 June 2015.
- 176. Colin Fernandez, How to build the perfect fire: Structures should be as wide as they are tall to generate the best flow of heat and air, *Daily Mail*, 8 June 2015.
- 177. Melissa Bryer, How to build the perfect fire, *TreeHugger*, 8 June 2015.
- 178. Martin Wieweg, Der perfeckte Feuerhaufen, Bild der Wissenschaft, 8 June 2015.
- 179. Pancras Dijk, Het perfecte kampvuur, National Geographic, Nederland-Belgie, 8 June 2015.
- 180. Daniela Zeibig, Das perfekte Lagerfeuer ist so hoch vie breit, *Spektrum der Wissenchaft*, 8 June 2015.
- 181. Siemens, The shape of a perfect fire, Innovations Report, 8 June 2015.
- 182. Shontee Pant, Science reveals how to build the perfect fire, *The Christian Science Monitor*, 9 June 2015.
- 183. Tom Whipple, The perfect shape for a fire is ... exactly what you'd expect, *The Times*, London, 9 June 2015.
- 184. Business Standard, Perfect shape for a fire is pyramid, 9 June 2015.
- 185. Beth Mole, Common campfire build confirmed as best, *ScienceNews*, 9 June 2015.
- 186. James Maynard, Secret to the perfect fire found just in time for summer, *Tech Times*, 9 June 2015.
- 187. Catherine Offord and James Lloyd, How to build the perfect campfire, *Science World, BBC Focus Magazine*, 9 June 2015.

- 188. James Sullivan, Building the perfect campfire, *Science Recorder*, 10 June 2015.
- 189. Nachrichten.at, Das perfekte Lagerfeuer, 10 June 2015.
- 190. *Empire State Tribune*, Ever wondered how to build the perfect fire without getting your hands 'charcoaled', 10 June 2015.
- 191. Jakob Nielsen, The perfect fire has fascinated people for millions of years, *Apex & Tribune*, 10 June 2015.
- 192. Jenna Iacurci, The 'perfect fire' exists, and here's what it looks like, *Nature World News*, 10 June 2015.
- 193. Andrew Liszewski, Scientists have figured out the perfect way to build a fire, *Gizmodo*, 10 June 2015.
- 194. Joep Engels, Het perfecte kampvuur is zo hoog als het breed is, Trouw, 10 June 2015.
- 195. John Wenz, Humans been building perfect campfires for millennia, science says, *Popular Mechanics*, 10 June 2015.
- 196. Oliver Libaw, Perfect shape for a campfire—as proven by science, *Yahoo Makers*, 10 June 2015.
- 197. Hervé Ratel, La meilleure façon de construire un feu, Science et Avenir, 11 June 2015.
- 198. Helen Thompson, How to build the perfect campfire, Smithsonian, 11 June 2015.
- 199. Mary Nichols, Scientists figure out how to build the 'perfect' fire, *Design & Trend*, 11 June 2015.
- 200. AZO Materials, Tree-shaped architecture improves efficiency of phase change energy storage systems, 11 June 2015.
- 201. Garth Olson and Willem Larsen, "Design in Nature with Adrian Bejan", *The Art of Tracking*, blog radio show, 87 min, 28 June 2015.
- 202. Gaurav Agnihotri, Nature provides novel solution to energy storage problem, *OILPRICE.COM*, 28 June 2015.
- 203. Linda Ly, Building the perfect campfire according to the law of physics, *SoCal Wanderer*, 30 June 2015.
- 204. Michael Kennedy, How to build perfect campfire—with math, *Bangor Daily News*, 16 July 2015.
- 205. Bridget Cunningham, Improving phase change energy storage: a natural approach, *COMSOL Blog*, 15 July 2015.
- 206. Anders Hoeg Nissen, Videnskaben hjaelper: Det perfekte lejerbål er lige så hojt som, *Viden*, 9 June 2015.

- 207. Mikko Puttonen, Tutkimus: Paras nuotio on yhtä korkea kuin pohjalta leveä, *Helsinkin Sanomat*, 9 June 2015.
- 208. Lisa Thornton, Building a fire scientifically: There's no better way than the caveman's, *The Charlotte Observer*, 26 July 2015.
- 209. Jim Festante, The perfect campfire, mathematically, Slate, 13 June 2015.
- 210. NEWS in Birmingham, Camp fire's work best when it is as tall as it is wide, 8 June 2015.
- 211. SDA, Ingenieur bestimmt die ideale Form für Lagerfeuer, Freibuger Nachrichten, 9 June 2015.
- 212. Sam Radwany, How to build the perfect campfire, according to science, *CBS Minnesota*, 18 June 2015.
- 213. *The Daily Star*, The shape of fire, 19 June 2015.
- 214. Ryan Brower, How to make the perfect campfire, *Network A*, 18 June 2015.
- 215. Atomic Surgery, How to build the perfect campfire, 9 June 2015.
- 216. Improving energy storage with a cue from nature, *Science and Technology Research News*, 27 August 2015.
- 217. Living & Green, Some like it hot! Campfire in your backyard, 2 October 2015.
- 218. Jeremy Berlin, 133 years later, Gaudí's Cathedral nears completion, *National Geographic*, 5 November 2015.
- 219. Tom Pohlmann, What design thinking means for data and analytics, *datanami*, 16 February 2016.
- 220. Shaena Montanari, Why rolling stones and elephants live longer and travel farther, *Forbes*, 17 February 2016.
- 221. Ken Kingery, Rolling stones, turbulence connect evolution to physics, *EurekAlert*, 17 February 2016.
- 222. Will Parker, Generalized constructal law shows that evolution doesn't apply only to biological things, *Science a Gogo*, 17 February 2016.
- 223. Jonathan Madison, The power of harmony, The San Mateo Daily Journal, 23 February 2016.
- 224. Yaiza Martinez, Piedras y remolinos que evolucionan como los animales, *Madrid*, 26 February 2016.
- 225. Catherine Meyers, Why celestial bodies come in different sizes, AIP Publishing, 1 March 2016.
- 226. Ken Kingery, Celestial bodies born like cracking paint, EurekAlert!, 1 March 2016.
- 227. EarthSky, Why space bodies come in different sizes, EarthSky, 1 March 2016.

- 228. Stefano Parisini, Così funziona la gerarchia cosmica, Media INAF, 1 March 2016.
- 229. Alfredo Carpineti, Why do planet and stars come in different sizes?, *IFL Science*, 1 March 2016.
- 230. Belinda Smith, Gas giants and mini meteoroids relieve gravitational tension, *Cosmos magazine*, 1 March 2016.
- 231. Juan Scaliter, Por qué los planetas tienen distintos tamaños?, Quo, 1 March 2016.
- 232. Vozpopuli, Por qué los planetas tienen tamaños tan diferentes, Vozpopulí, 1 March 2016.
- 233. Europa Press, El Universo tiene algunos objetos grandes y muchos pequeños para aliviar más rápido la tensión gravitacional, *Lavozlibre*, 1 March 2016.
- 234. Groottevariatie van hemellichamen verklaard, allesoversterrenkunde.nl, 1 March 2016.
- 235. Europa Press, Por qué los cuerpos celestes tienen diferentes tamaños?, *cienciaplus.com*, 1 March 2016.
- 236. Die Physik erklärt den Unterschied der Gröβen der Körper im Universum, *HotNews*, 2 March 2016.
- 237. Ryan O'Hare and Russ Swan, Why do stars and planets come in different sizes? Expert claims our universe follows a "law of hierarchy" that stops it tearing apart, *Daily Mail*, 2 March 2016.
- 238. Caroline Kraaijvanger, Daarom zijn hemellichamen er in verschillende maten, *scientias.nl*, 2 March 2016.
- 239. Catherine Griffin, Celestial bodies are born like cracking paint: why planets are different sizes, *Headlines & Global News*, 2 March 2016.
- 240. Why celestial bodies come in different sizes, Astronomy magazine, 2 March 2016.
- 241. GoSouthOnline, Why space bodies come in different sizes, GoSouthOnline, 2 March 2016.
- 242. Dianne Depra, Researchers use "cracking paint" to explain why celestial bodies range in size, *TECH TIMES*, 3 March 2016.
- 243. Nancy Young, Cracking paint exemplifies why space objects have different sizes, *Argyll Free Press*, 3 March 2016.
- 244. Astrobiology Magazine, Celestial bodies born like cracking paint, *Astrobiology Magazine*, 3 March 2016.
- 245. Bryan Nelson, Planets form much like snowflakes do, says scientist, *mother nature network*, 4 March 2016.
- 246. Deccan Chronicle, Why objects in the universe have different sizes, *DECCAN CHRONICLE*, 5 March 2016.

- 247. René Fransen, Diversiteit in zonnestelsel verklarad, nederlands dagblad, 5 March 2016.
- 248. Greece, Why celestial bodies have different sizes, Prison Planet, 5 March 2016.
- 249. Technology Vista, Ever thought why objects in the Universe is (sic) of same size? *TechnologyVista*, 5 March 2016.
- 250. Lola Gayle, The University is full of objects large and small. But why does that happen? *STEAM Register*, 7 March 2016.
- 251. Gianluca Casponi, Perché i pianeti hanno dimensioni così diverse, Galileo, 8 March 2016.
- 252. Soledad García-Huidobro, Los hilos del arte de Juana Gómez, La Tercera, 21 March 2016.
- 253. Blanca Téllez, Baloncesto de la NBA: cooperación y adaptación para la sobrevivencia, *La Gran Época*, 5 April 2016.
- 254. Diálogo entre la ciencia y el arte en la exposción "Ley Constructal" de María Santos, *Noroeste Madrid*, 5 April 2016.
- 255. Tobiasz Wojnar, Dlaczego gwiazdy i planety maja rózine rozmiary? AstroNEWS, 6 April 2016.
- 256. Olivia Goldhill, You can use physics to describe almost anything in life, Quartz, 30 April 2016.
- 257. Ken Kingery, Artists draw inspiration from the constructal law, Duke University, Pratt School of Engineering, 12 May 2016.
- 258. Jeremy Berlin, What's the Meaning of Life? Physics. *National Geographic, Book Talk*, 30 May 2016.
- 259. Shawn Fitzmaurice, If Papa Was a Rolling Stone, He'd Obey the Laws of Physics, *SciWorks Radio*, NPR, 88.5 FM WFDD in the Triad, 100.1 FM in Boone, 5 June 2016.
- 260. Alison Li, A physics law predicts the evolution of aviation design, excel@PolyU, July 2016, Issue 85.
- 261. *Redactie Express Business*, Waarom zwarten snel kunnen lopen maar niet snel kunnen zwemmen, 26 July 2016.
- 262. Tom Spears, Science of Summer: Not too small, not too tall: Engineer researches perfect campfire, *Ottawa Citizen*, 24 July 2016.
- 263. Paulina Sepúlveda Garrido, Estamos llegando al fin de los récords? *La Tercera*, Santiago, Chile, 9 August 2016.
- 264. Silvia De Stefano, Nuotare non é solo questione di stile, Scientificast.it, 9 August 2016.
- 265. Brian Resnick, Campfires, explained, Vox 10 August 2016.
- 266. Los deportístas profesionales podrán alcanzar nuevos récords? Gestion, Peru, 11 August 2016.

- 267. Matthew Futterman, Rio Games: Why Olympians shatter records in swimming but not track, *The Wall Street Journal*, 12 August 2016.
- 268. Por que negros são melhores velocistas e brancos são melhores natadres? *Charlezine.com*, Brazil, 12 August 2016.
- 269. Ashley Kirk, 100m sprint: How does Usain Bolt compare to Olympians across the decades? *The Telegraph*, London, 15 August 2016.
- 270. Ivan Pérez, La gente detrás del éxito del hombre más voloz del mundo, *Forbes Mexico*, 16 August 2016.
- 271. Taller athletes are faster, study finds, True Viral News (TVN), 18 August 2016.
- 272. Andrea Dukakis, For athletes, including Denver's new QB, bigger and taller may be better, *Colorado Public Radio*, 24 August 2016.
- 273. Richard Joyner, The Physics of Life: The Evolution of Everything, *Times Higher Education*, 25 August 2016.
- 274. Will Michaels & Frank Stasio, 'The Physics of Life': Duke Professor Redefines our Existence, The State of things, NPR, WUNC, 25 August 2016.
- 275. Raluca Ion, Ori de câte ori s-a instituit uniformitatea într-o societate, aceasta s-a transformat într-o nouă ierarhie, Republica.ro, 11 October 2016.
- 276. Jodi Henke, Building the perfect campfire, livingcountrylife.com, 7 October 2016.
- 277. Parag Khanna, Want to understand how Trump happened? Study quantum physics, *Quartz*, 11 November 2016.
- 278. Hans Wong, Prof. Adrian Bejan predicted Donald Trump will win, Hong Kong Polytechnic University, 11 November 2016, <u>www.youtube.com/watch?v=-pkwqujBqp8</u>.
- 279. Costel Crangan, Un român este între primii 100 de savanti ai lumii, adevarul.ro, 7 February 2017.
- 280. Sally Johnson, Physics can predict wealth inequality, American Institute of Physics, 28 March 2017.
- 281. Ian Johnston, Capitalism inevitably creates a 'sad' unfair world, physicist says I prove, The Independent, UK, 29 March 2017.
- 282. Ken Kingery, The physics of wealth inequality, Duke University, 28 March 2017.
- 283. Robert Palmisano, Duke professor Adrian Bejan develops theory that laws of physics drive wealth inequality, Duke Chronicle, 30 March 2017.
- 284. The Australian, The laws of physics, 30 March 2017.
- 285. Trisha Jones, Income disparity and physics: Explaining economic condition of a country with

the help of laws of physics, Science World Report, 29 March 2017.

- 286. Wu Li Heron, Physics promotes wealth inequality, The Hip Forums, 29 March 2017.
- 287. Alton Parrish, Physics can predict wealth inequality, Ideas, Inventions and Innovations, <u>www.ineffableisland.com</u>, 29 March 2017.
- 288. Le Scienze, Un modello fisico delle disuguaglianze economiche, 29 marzo 2017.
- 289. Jacqueline Charpentier, Une loi physique pour expliquer l'inégalité de la richesse?, Actualité Houssenia Writing, 29 mars 2017.
- 290. <u>www.europapress.es</u>, cienciaplus, La Física puede predicir la desigualdad de la riqueza, 28 March 2017.
- 291. <u>www.tendencias21.net</u>, Tendencias Sociales, La desigualdad social se basa en las leyes de Física, según una nueva teoría, 29 marzo 2017.
- 292. <u>www.ecoavant.com/es</u>, Explicar la pobreza a través de la física: El modelo evolutivo de la organización social tiende a crecer, crear jerarquías y desigualdades, 30 marzo 2017.
- 293. <u>www.econjobrumors.com</u>, Genious physicist achieves unification of physics and economics! 29 March 2017.
- 294. wn.com, Wealth inequality: it's physical and flowing, 28 March 2017.
- 295. Michael Byrne, Can physics explain wealth inequality?, Motherboard, 30 March 2017.
- 296. Canada Community, Law of physics explains natural drivers of wealth inequality, 30 March 2017.
- 297. nmas1.org, Cientifícos explican por qué la desigualdad es inevitable usando las leyes de la física, 31 marzo 2017.
- 298. Korea: Science Times, 'Inequality of wealth' predicted by physics, 28 March 2017.
- 299. Bev, Physis income and wealth inequality prediction: How to change it, The Science Times, 31 March 2017.
- 300. De Kennis Van Nu (Current Knowledge in Dutch), Natuurkundige wet als verklaring voor welvaartsongeliikheid, 1 April 2017.
- Luis Manuel Silveira, Gostava de conhecer melhor a teoria constructal?, Rotinas Inteligentes, 31 March 2017.
- 302. Diómedes Tejada Gómes, La fisica explica los factores naturales de la desigualdad de la riqueza, Diario Digital RD, 29 March 2017.
- 303. Ana María Cervantes, Desiguldad y leyes físicas, Ponlotú, 1 April 2017.
- 304. Luis Manuel Silveira, A aprendizagem é um acontecimento rizomático, Rotinas Inteligentes, 2
April 2017.

- 305. Periodismo.com, La desigualdad social se basa en las leyes de la Física, según un a nueva teoría, 3 April 2017.
- 306. Harun Kayar, Fizik yasasi, servet eşitsizliğinin doğal nedenlerini açıkladı, Haber, 3 April 2017.
- 307. Zach Graham, Capitalism is killing us and no one seems to care, INQUISITR, 3 April 2017.
- 308. ADAM.sk, Nerobte si ilúzie o kapitalizme, nahráva len bohatým. Prečo?, 4 April 2017.
- 309. Nicholas Gruen, The living and the dead: government's arteries and capillaries have lost symbiosis, The MANDARIN, 7 April 2017.
- 310. NSF News From The Field, The physics of wealth inequality, 28 March 2017.
- 311. Las matemáticas ocultas de la desigualdad, LuKasnet Blog, 20 May 2017.
- 312. Suzan Mazur, PART 2: Ranging conversation with physicist Geoffrey West on life, evolution and US presidential politics, *Huffington Post*, 17 April 2016.
- 313. Suzan Mazur, Hell and the West Village: Where is the Next Jan Jacobs?, *Huffington Post*, 6 July 2017.
- 314. Jakki Kerubo, Physics can describe how inequality happens—but can it solve the problem?, *Quartz*, 14 July 2017.
- 315. Ira Katz, Equality \neq Equal Quality, LewRockwell.com, 21 July 2017.
- 316. Vanessa Hauguel, Réussir son feu de camp grâce à la science!, <u>www.sympatico.ca</u>, 25 July 2017.
- 317. Monica Andrei, Ideiile-mi sunt visurile, Ziarul Metropolis, 1 August 2017.
- 318. Vladimir Adrian Costea, Interviu/Prof. Adrian Bejan, Universitatea Duke (SUA): "Sumarul organizării sociale prezise de legea consructalā e "puţini mari cu mulţi mici, curgând în armonie," <u>www.europunkt.ro</u>, 1 August 2017.
- 319. Radio interview, Hot Tech-Cool Science, KWMR-FM, 24 August 2017.
- 320. Simon Devos, Sa vitesse cache une théorie de la masse, *Science & Vie*, October 2017, pp. 75-77.
- 321. Ephrat Livni, Everything, including the growing income disparity, can be explained by physics, *Quarz*, 23 September 2017.
- 322. Anca Melinte, Primul român distins cu Medalia Benjamin Franklin. Gălățeanul Adrian Bejan, alături de Tesla, Einstein și Bill Gates, *Viața Liberă*, 21 November, 2017.
- 323. Mixed Mental Arts, Ep297 The Physics of Life: Prof. Adrian Bejan enters the Dojo, 22 December 2017.

- 324. J. Peder Zane, Duke professor's beautiful law of human progress, *The News & Observer*, Raleigh, 10 April 2018.
- 325. Ephrat Livni, Everything created is predicted by nature: A new video explains the physics of flow, *Quartz*, 26 April 2018.
- 326. Anca Melinte, Tricolor pentru medalia Benjamin Franklin, decernată profesorului gălățean Adrian Bejan, *Viața Liberă*, 2 May 2018.
- 327. Philip Perry, This little-known physics law silently controls your life, Big Think, 6 May 2018.
- 328. BBC Mundo, La ley de física que discretamente controla tu vida y puede ayudarte a mejorarla, 13 May 2018.
- 329. BBC Brasil, A lei de física que controla discretamente sua vida e pode ajudar a melhorá-la, 20 May 2018.
- 330. Christelle Gérand, Ce n'est pas grâce à l'altitude que les coureurs éthiopiens et Kenyans sont si forts, Slate FR, 1 June 2018.

Invited Short Courses:

Current Topics in Heat Transfer, National Sun Yat-Sen University, Kaohsiung, Taiwan, November 4-8, 1991.

Thermodynamic Design, University of Florence, Italy, April 20-22, 1993.

Entropy Generation Minimization, Keio University, Yokohama, Japan, May 19-30, 1998.

Thermodynamic Optimization, Tokyo A & T University, Tokyo, Japan, August 20, 1998.

Thermodynamics and Sustainability, Delft University of Technology, Delft, The Netherlands, Nov. 5, 1998.

Advanced Thermodynamics, Universidad Pontificia Bolivariana, Medellin, Colombia, Fall 1999.

Energy Conversion, Conservation and Environmental Impact, Ovidius University, Constanta, Romania, July 21-30, 2000.

Heat Transfer in Porous Media, Ovidius University, Constanta, Romania, July 25-August 3, 2001.

Flow and Heat Transfer in Porous Media, Institut National Polytechnique, Grenoble, France, May 13-17, 2002.

Porous and Complex Flow Structures in Modern Technologies, Evora University, Evora, Portugal, June 17-21, 2002.

Thermodynamic Optimization and Constructal Design, Yildiz University, Istanbul, Turkey, 19-24 July 2004.

Along with Constructal Theory (Autour de la Théorie Constructale), University of Lausanne, Faculty of Geosciences and the Environment, Switzerland, 25-29 October 2004.

Constructal Design of Porous and Complex Flow Structures, Memorial University of Newfoundland, Canada, 21-24 September 2005.

Constructal Theory and Application, Shanghai Jiaotong University, P. R. China, 16 October 2006.

Constructal Theory and Design in Nature and Engineering, University of Pretoria, South Africa, 1 March 2007.

Design with Constructal Theory, International Institute for Water and Environmental Engineering, Ouagadougou, Burkina Faso, 9-10 March 2009.

Design with Constructal Theory, International Institute for Water and Environmental Engineering, Ouagadougou, Burkina Faso, 21-22 March 2010.

Design with Constructal Theory, King Fahd University of Petroleum and Minerals, Dhahran, Saudi Arabia, 9-10 May 2010.

Design with Constructal Theory, University of Pretoria, South Africa, 26-27 September 2011.

Design with Constructal Theory, University of Pretoria, South Africa, 17-18 September 2012.

Design with Constructal Theory, University of Pretoria, South Africa, 16-17 September 2013.

Constructal Law & Design in Nature, Pontifical Catholic University of Chile, Santiago, 18-19 November 2013.

Design with Constructal Theory, University of Pretoria, South Africa, 15-16 September 2014.

Design with Constructal Theory, Pontifical Catholic University, Santiago, Chile, 9-13 March 2015.

Design with Constructal Theory, University of Pretoria, South Africa, 14-15 September 2015.

Modelos Constructales de Problemas de Ingeniería y Desarrollo Social, UNAM, National Autonomous University of Mexico, 13-14 March 2017.

Symposium on Renewable Energies and Thermal Sciences, University of Guanajuato, Salamanca, Mexico, 15-17 March 2017.

Life and Death: Mysteries and Meanings, MOOC, Hong Kong Polytechnic University, November 13, 2017.

Keynote and Invited Lectures:

Keynote Speaker at the 3rd Multi-Phase Flow and Heat Transfer Symposium-Workshop, Miami Beach, FL, April 18-20, 1983: "Second-Law Aspects of Heat Transfer Engineering".

Lecturer, NATO Advanced Study Institute on Natural Convection: Fundamentals and Applications, Izmir, Turkey, July 16-27, 1984.

Keynote Speaker (Invited Opening Address), Second Latin American Congress on Heat and Mass Transfer, Sao Paulo, Brazil, May 12-15, 1986: "Scale Analysis in Convection Heat Transfer Research".

Lecturer, NATO Advanced Study Institute on Solar Energy Utilization Fundamentals and Applications, Izmir, Turkey, June 23 - July 4, 1986.

Invited Speaker, Korea-U.S.A. Heat Transfer Seminar, October 16-22, 1986, Seoul, Korea: "Thermodynamics of Solar Energy Engineering".

Keynote Speaker at the session on Natural Convection in Enclosures, the 2nd ASME-JSME Joint Thermal Engineering Conference, Honolulu, Hawaii, March 22-27, 1987: "Stressing the 'Free' in Free Convection Research: The Basic Scales of Heat and Mass Transfer in Fluids and Fluid Saturated Porous Media", <u>Proceedings of the 1987 ASME-JSME Thermal Engineering Joint Conference</u>, Vol. 2, P.J. Marto and I. Tanasawa, eds., ASME, New York, 1987, pp. 195-202.

Invited Speaker to the U.S.A.-Italy Joint Seminar on Second Law Aspects of Thermal Design, May 25-30, 1987, Rome, Italy: "Thermodynamics of Heat Transfer Devices", <u>Second Law Analysis of Thermal</u> <u>Systems</u>, M. J. Moran and E. Sciubba, eds., ASME, New York, 1987, pp. 1-15.

University Visiting Scholar, The University of Rhode Island, February 1988.

Invited Speaker to the 1988 International Symposium on Geothermal Energy, as guest of the Geothermal Research Society of Japan, November 10-14, Kumamoto and Beppu, Japan: "The Scale Analysis of Convection in Porous Media".

Keynote Speaker, Symposium on Second-Law Analysis in Heat/Mass Transfer and Energy Conversion, Winter Annual Metting of the ASME, Chicago, IL, Dec. 1, 1988: "Modern Trends in Engineering Thermodynamics".

Lecturer, NATO Advanced Study Institute on Convective Heat and Mass Transfer in Porous Media, Izmir, Turkey, August 6-17, 1990.

Keynote Speaker to the XXII ICHMT International Symposium on Manufacturing and Materials Processing, Dubrovnik, Yugoslavia, August 27-31, 1990: "Analytical Advances on Melting by Natural Convection".

Invited Speaker at the 10th National Heat Transfer Congress of the Italian Thermo-fluid-dynamic Union, Genova, June 25-27, 1992: "Single Correlation for Contact Melting Results in Various Geometries".

Invited Speaker at the session on Significant Questions in Heat Transfer: Fundamental Issues in Small Scale Heat Transfer, Winter Annual Meeting of the ASME, Anaheim, CA, Nov. 9, 1992: "Lubrication by Close-Contact Melting".

Keynote Speaker at the 6th International Symposium on Transport Phenomena in Thermal Engineering (ISTP-6), May 9-13, 1993, Seoul, Korea: "Optimal Geometry of Convection Cooled Electronic Packages".

Invited Lecturer, International Symposium on Heat and Mass Transfer in Energy Systems and Environmental Effects, August 22-25, 1993, Cancun, Mexico: "Power and Refrigeration Plant Models with Heat Transfer Irreversibilities".

Invited Lecturer, International Conference on Comparative Assessments of Solar Power Technologies, Jerusalem, Israel, February 14-18, 1994: "Second Law Aspects of Solar Thermal Energy Conversion".

The Fifth Charles E. Foster Lecture, School of Aerospace and Mechanical Engineering, The University of Oklahoma, March 17, 1994.

Principal Speaker, First Gordon Research Conference on Modern Developments in Thermodynamics, Schwaebisches Bildungszentrum, Irsee, Germany, October 2-7, 1994.

Invited Speaker, Symposium on Thermodynamics and the Design, Analysis, and Improvement of Energy Systems: International Project to Calculate Exergetic Costs, Session AES-7A, International Mechanical Engineering Congress and Exposition, Chicago, Nov. 7, 1994.

Invited Speaker, Panel on Unanswered Questions and Technological Limitations Related to the Characterization of Material Interfaces in Heat Transfer Research and Applications, Session HT-10D, International Mechanical Engineering Congress and Exposition, Chicago, Nov. 7, 1994: "Solid-Fluid Contact," in J. A. C. Humphrey, S. Paolucci and M. M. Yovanovich, eds, ASME Paper No. 94-WA/HT-3.

Invited Speaker, International conference on "Second-Law Analysis of Energy Systems: Towards the 21st Century," Rome, July 5-7, 1995: "Entropy Generation Minimization in Heat Transfer".

Keynote Speaker, International Conference on "Efficiency, Costs, Optimization, Simulation and Environmental Impact of Energy Systems (ECOS '95)," Istanbul, July 11-14, 1995: "Entropy Generation Minimization: The Method of Thermodynamic Optimization of Finite-Size Systems and Finite-Time Processes".

Invited Lecturer, Journées Européennes de Thermodynamique Contemporaine IV, Nancy, September 27-29, 1995: "The Method of Entropy Generation Minimization, or Modeling and Optimization Based on Combined Heat Transfer and Thermodynamics".

Invited Speaker, International Conference on Porous Media and Their Applications in Science, Engineering and Industry, Kona, Hawaii, June 16-21, 1996.

Keynote Lecturer, ICHMT Symposium on "Transient Convective Heat Transfer," Cesme, Turkey, August 19-23, 1996: "Optimization of Pulsating Heating in Natural and Forced Convection".

Invited Participant, Second Gordon Conference on Modern Developments in Thermodynamics, Ventura, CA, Feb. 16-21, 1997.

Keynote Lecturer, International Workshop on Materials and Concepts for Conversion and Storage of Energy, Royal Netherlands Academy of Arts and Sciences, Amsterdam, April 9-11, 1997: "Entropy Generation Minimization: From Design in Engineering to Predicting Macroscopic Organization in Nature".

Keynote Lecturer, Florence World Energy Symposium (FLOWERS'97), Florence, Italy, July 30-August 1, 1997: "Constructal Theory: from Thermodynamic and Geometric Optimization to Predicting Organization in Nature".

Keynote Lecturer, 14th Brazilian Congress of Mechanical Engineering (COBEM 97), Bauru, SP, Brazil, December 8-12, 1997: "Constructal Theory: from Engineering to Shape and Structure in Nature".

Honored Speaker, International Symposium on "The Legacy of Adrian Bejan: Three Generations of Brazilian Scientists", Pontifical Catholic University of Parana, Curitiba, Brazil, December 12, 1997.

Invited Speaker, Engineering Foundation International Symposium on the Mechanics of Plants, Animals and Their Environments: Integrative Perspectives, Santa Barbara, CA, January 11-16, 1998.

Keynote Lecturer, Conference of the Heat Transfer Society of Japan, Nagoya, May 27-29, 1998: "Constructal Theory: Natural Flow Structure as the Result of Thermodynamic Optimization".

Lecturer, U.S.A.-South Africa Workshop on "Energy and the Environment," Durban, South Africa, June 8-12, 1998: "The Method of Entropy Generation Minimization".

Invited Speaker, Conference on "Mathematics in Heat Transfer," Bradford, U.K., June 29-July 1, 1998.

Keynote Lecturer, International Conference on "Efficiency, Costs, Optimization, Simulation and Environmental Aspects of Energy Systems (ECOS'98)," Nancy, France, July 8-10, 1998: "How Nature Takes Shape: Extensions of Constructal Theory".

Lecturer, NATO Advanced Study Institute on "Thermodynamics and the Optimization of Complex Energy Systems," Neptun, Romania, July 13-24, 1998.

Keynote Lecturer, 11th International Heat Transfer Conference, Kyongju, Korea, August 23-28, 1998: "Thermodynamic Optimization in Heat Transfer".

Invited Speaker, Gordon Research Conference on Modern Developments in Thermodynamics, Il Ciocco, Barga, Italy, April 18-23, 1999.

Invited Speaker, Luncheon of the Advanced Energy Systems Division, ASME, International Mechanical Engineering Congress and Exposition, Nashville, TN, Nov. 18, 1999.

Keynote Speaker, Workshop on Energy Conservation in Industrial Applications, King Fahd University of Petroleum and Minerals, Dhahran, Saudi Arabia, February 12-14, 2000.

Keynote Speaker, ASME-ZSITS International Thermal Science Seminar, Bled, Slovenia, June 11-14, 2000: "Entropy Generation Minimization: the Method and Its Applications".

Invited Lecturer, Euro Conference on "Renewable Technologies for Sustainable Development," Madeira Island, Portugal, June 26-29, 2000: "Constructal Optimization of Tree-Shaped Paths for the Collection and Distribution of Fluid, Electricity, Goods and People".

Keynote Speaker, The 7th Australasian Heat and Mass Transfer Conference, Townsville, Australia, July 3-6, 2000: "Constructal Tree Networks for Convection and Conduction Heat Transfer".

Keynote Lecturer, 12th International Symposium on Transport Phenomena (ISTP-12), Istanbul, July 16-20, 2000: "Constructal Tree-Shaped Paths for Conduction and Convection".

Keynote Lecturer, 12th International Symposium on Transport Phenomena (ISTP-12), Istanbul, July 16-20, 2000: "Thermodynamic Optimization of Geometry in Engineering Flow Systems".

Le Parrain de la Promotion (godfather of the graduating MS class) DESS Energétique et Mécanique, Institut National Polytechnique de Loraine et University Henri Poincaré, Nancy, France, September 19, 2000; lecture title: "Thermodynamic Optimization of Geometry in Environmental Control Systems for Aircraft."

Keynote Lecturer, SAIChE 2000, 9th National Meeting, Secunda, Mpumalanga, South Africa, October 9-12, 2000.

Keynote Lecturer, 9th International Flotherm User Conference, Orlando, Florida, October 18-19, 2000.

Keynote Lecturer, Annual Congress of Civil Engineers, Bucharest, Romania, 29 November-3 December, 2000.

Invited Speaker, 2001 ASHRAE Winter Meeting, Seminar on "How Second Law Can Save You Money," Atlanta, January 28, 2001.

Keynote Lecturer, The XIth National Conference on Thermodynamics, Galati, Romania, 17-19 May 2001.

Keynote Lecturer, XIII School-Seminar of Young Scientists and Specialists under the Leadership of Academician Professor A. I. Leontiev "Physical Principles of Experimental Heat and Mass Transfer and Gas Dynamics in Power Plant," St. Petersburg, Russia, May 20-25, 2001.

Keynote Lecturer, International Conference on "Efficiency, Costs, Optimization, Simulations and Environmental Impact of Energy Systems (ECOS '01), Instanbul, Turkey, July 4-6, 2001.

Keynote Speaker, International Conference on Heat and Powered Cycles, Paris, September 5-7, 2001: "The Generation of Physical Structure in Power and Refrigeration Systems".

Keynote Speaker, Thermal and Fluids Analysis Workshop, NASA Space Flight Center, Huntsville, AL, September 12, 2001: "Constructal Theory and Design: Optimal Geometric Form in Thermal Science and Engineering".

Invited Speaker, 2001 International Mechanical Engineering Congress and Exposition, Panel on "Exergetic Analysis Applied to Aircraft Design", New York, November 15, 2001.

Distinguished Lecturer, Euler Visiting Lecturers Programme, Swiss Federal Institute of Technology, Zurich, "The Generation of Physical Structure Based on Global Thermodynamic Optimization in Power and Refrigeration Systems", December 5, 2001.

Invited Speaker, Department of Anatomy, University of Bern, Bern, "Constructal theory and design: optimal flow architecture, body size and energy efficiency (the 3/4 power law)", December 4, 2001.

Invited Speaker, Federal University of Parana, Curitiba, Brazil, "Constructal Law: Optimal Geometric Form for Heat and Fluid Flow Systems", December 19, 2001.

Keynote Plenary Speaker, 16th National Heat and Mass Transfer Conference, and 5th ISHMT/ASME Heat and Mass Transfer Conference, Calcutta, 3-5 January 2002.

Invited Lecture on "Exergy Analysis of Complex Systems," Workshop on Exergy Analysis of Hypersonic Flight Vehicles, University of Rome 1, March 20-22, 2002, Rome, Italy.

Keynote Lecturer, First International Conference on Heat Transfer, Fluid Mechanics and Thermodynamics (HEFAT 2002), Skukuza, South Africa, April 8-10, 2002: "Constructal Design of Heat and Fluid Flow Systems."

Keynote Lecturer, First International Conference on Applications of Porous Media, Djerba, Tunisia, 2-8 June, 2002: "Designed Porous Media: Optimal Spacings and Constructal Design".

Keynote Lecturer, The 13th International Symposium on Transport Phenomena, Victoria, Canada, July 14-18, 2002: "The Constructal Law: Mechanical Structures and Flow Systems".

Invited Lecturer, NATO Advanced Study Institute on "Emerging Technologies and Techniques in Porous Media", 9-20 June 2003, Neptun, Romania.

Keynote Lecturer, The First International Exergy, Energy and Environment Symposium, 13-17 July 2003, Izmir, Turkey.

Invited speaker, European Workshop on Exergy Analysis for Aerospace Applications, 26-28 August, 2003, Bourges, France.

Keynote paper, Thermal Science Seminar II, "Maximal Heat Transfer Density: Optimal Distribution of Discrete Heat Sources on Vertical Walls in Channels and Enclosures with Natural Convection", 13-16 June 2004, Bled, Slovenia.

Keynote speaker, Union of Italian Thermo-fluid-dynamics Conference (UIT), Constructal Multi-scale Structures for Maximum Heat Transfer Density, 21-23 June 2004, Genova, Italy.

Keynote speaker, Design & Nature II, "Designed porous and multi-scale flow structures", 28-30 June 2004, Rhodes, Greece.

Keynote speaker, The First Cappadocia Mechanical Engineering Symposium, "Constructal Theory of Design in Engineering and Nature", 14-16 July 2004, Nigde, Turkey.

Invited speaker, Size as a Determinant of Biological Processes, Conference organized by the Journal of Experimental Biology, Centro Monte Verità, Ascona, Switzerland, 10-14 September, 2004: "The Constructal Law: Tree-Shaped Flows, Body Size and Heat Loss".

Invited Lecturer, A day in memory of Cesare Codegone, Turin Polytechnic, 20 September 2004: "Thermodynamic Optimization and Constructal Design: the Generation of Flow System Configuration".

Invited Lecturer, Giornata nel ricordo di Cesare Codegone (A day in memory of Prof. Cesare Codegone), Turin Politechnic, Department of Energetics, 20 Sept. 2004: "Thermodynamic Optimization and Constructal Design: the Generation of Energy System Configuration".

Keynote Speaker, The Seventh Annual Research Laboratory Fellows Awards Banquet, United States Air Force Museum, Dayton, Ohio, 29 Sept. 2004: "The Constructal Law of Shape and Structure, from Engineering to Nature".

Lead Speaker, Workshop Autour de la theorie constructle (Along with constructal theory), University of Lausanne, 25-29 October 2004.

Invited Speaker, Luncheon of the Process Industries Division, ASME, International Mechanical Engineering Congress and Exposition, Anaheim, CA, Nov. 16, 2004.

Invited Lecturer, Thermodynamics Spring School on Constructal Theory and Thermoeconomics, Pau, France, 6-9 June 2005.

Keynote Speaker, "Constructal theory of energy-system and environment flow configurations", International Green Energy Conference, Waterloo, Canada, 12-16 June 2005.

Invited Speaker, "Constructal Theory of Pattern Formation", Thresholds and Pattern Dynamics Conference, University of Western Australia, Perth, 3-8 July 2005.

Invited Speaker on "Constructal theory" at the workshop on *Natural Design: Theory, Observations, Applications*, University of Oxford, 18 November 2005.

Invited Lecturer, "Constructal theory", First Spring School on Optimization and Control of Flow and Transfer, 12-17 March 2006, Aussois, France.

Lead Speaker, "Constructal theory of animal locomotion: flying, running and swimming", Societé Française de Thermique, Symposium on *Multiscale Geometries, Constructal Theory and Exergy*, 16 March 2006, Nancy, France.

Keynote speaker, Second International Green Energy Conference, Oshawa, Ontario, 25-28 June 2006.

Keynote Speaker, 11th Latin American Congress of Heat and Mass Transfer, Mexico City, 8 September 2006.

Lead Speaker, First International Workshop on Constructal Theory and Application, Shanghai Jiao Tong University, 16-17 October 2006.

Lead Speaker, *Natural Design: Theory, History, Practice*, Oxford University, Continuing Education, 11 November 2006.

Invited Speaker, NSF Workshop on Frontiers in Transport Phenomena Research and Education, University of Connecticut, 17-18 May 2007.

Keynote Speaker, "The Constructal Law of Design in Nature", CANCAM 2007, Canadian Congress of Applied Mechanics, Toronto, Canada, 4 June 2007.

Co-Director, Second International Conference on Porous Media, Kauai, Hawaii, 17-21 June 2007.

Honorary Chairman and Keynote Speaker at the 3rd International Energy, Exergy and Environment Symposium, Evora, Portugal, 2-5 July 2007 (Keynote: "Science as an Evolving Flow Architecture").

Panel speaker, The Entropy Challenge, An International Thermodynamics Symposium In Honor and Memory of Professor Joseph Henry Keenan, MIT 4-5 October 2007.

Invited speaker, International Workshop "Shape and Thermodynamics", University of Florence, 25-26 September 2008: "The Constructal Law of Design in Nature".

Technical Keynote Speaker, 2009 ASHRAE Winter Conference, Chicago, 25 January 2009: Why are lungs and river basins tree-shaped? Why are larger animals faster, stronger and less active? Why is there "technology evolution"?

Invited Lecturer, Helsinki University of Technology, 25 September 2009: "Design with Constructal Theory".

Keynote Lecturer, Japan Society of Mechanical Engineers, Kanazawa, 26 October 2009: "The Constructal Law of Design in Nature".

Keynote Lecturer, COBEM 2009, Brazilian Congress of Mechanical Engineering, Gramado-RS, Brazil, 15-20 November 2009: "Design with Constructal Theory".

Keynote Lecturer, The 3rd Southern Conference on Computational Modeling, 23-25 November 2009, Rio Grande RS, Brazil: "Design with Constructal Theory: Nature and Engineering".

Invited paper, "Global Distributed Energy Systems", *The Ravage of the Planet*, Second International Conference on the Management of Natural Resources, Sustainable Development and Ecological Hazards, 15-17 December 2009, Gordon's Bay, South Africa.

Invited paper, "Few Large and Many Small: Hierarchy in Movement on Earth", Fifth International Conference on *Design and Nature 2010*, Pisa, Italy, 28-30 June 2010.

Three Keynote Lectures, International Workshop on Hydrology: Nature & Engineering, 20-21 March 2011, and World Water Day, 22 March 2011, at Sultan Qaboos University, Muscat, Oman: "Designed Porous Media", "Distributed Energy Systems", and "The Constructal Law of Design in Nature".

Keynote speaker, Constructal Law Conference, 1 December 2011, Porto Alegre, Brazil.

Keynote speaker, *The 2nd Asian-US-European Thermophysics Conference, Thermal Science for Sustainable World*, Hong Kong, 3 January 2012.

TEDx MidAtlantic speaker, Washington, DC, 26 October 2012.

Invited Lecture, Distinguished Scientist Seminar Series, Earth Sciences Division, Lawrence Berkeley National Laboratory, 16 November 2012: "Constructal Law of Design and Evolution in Nature".

Keynote Speaker, IEEE ITHERM Conference 2014, Lake Buena Vista (Orlando), Florida, 29 May 2014, "Sustainability: Its Physics and Natural Constructal Design".

Plenary Lecture, American Association of Physics Teachers (AAPT) Winter Meeting, San Diego, 4-7 January 2015, "Evolution, Life and Sustainability: What the Constructal Law Is, and How It Gives Us a New Worldwide View".

Invited Speaker, JUNTO, New York, 3 September 2015, "The Human & Machine Species: Life and Evolution as Physics".

Keynote Lecture, Academy of Europe 27th Annual Meeting, Darmstadt 9 September 2015, "The Human & Machine Species: Life and Evolution as Physics".

Invited Lecture, Hong Kong Polytechnic University, 14 October 2015, "Life and Evolution as Physics".

Distinguished Lecture, Jockey Club Institute for Advanced Study, Hong Kong University of Science and Technology, 16 March 2016, "The Physics of Life & Evolution".

Castle Lecture Series, Durham University, UK, "Life and Evolution, as Physics", 27 April 2016.

Dinner speaker, NSF Workshop on Biological Collections as a Resource for Technical Innovation, May 10, 2016, Washington, DC: "The Physics of Life & Evolution".

The Inaugural CBE Design Day Seminar, Rensselaer Polytechnic Institute, May 11, 2016: "Evolutionary Design & the Physics of Life".

Faculty of Engineering Distinguished Lecture, Chinese University of Hong Kong, 25 May 2016.

Provost's Lecture Series, Stony Brook University, "Life and Evolution as Physics," 30 March 2017.

Invited speaker, "Systems," Applied Brilliance 2017 Conference, Tulum, Mexico, 4-7 April 2017.

Invited speaker, Biomedical/Biotechnology Research Institute, North Carolina Central University, 13 April 2017.

Invited speaker, The Helix Center: "Design in Nature", New York, 22 April 2017.

Distinguished International Visitor Event: Constructal Law and Physical Geography, Durham University UK, 11 May 2017.

Keynote Lecturer, Conference on Complex Systems, Cancun, Mexico, 21 September 2017: "Constructal Law: Life and Evolution as Physics".

Invited speaker, Distinguished Lecture Series, Duke Medical Physics Graduate Program, 21 September 2017: "Life and Evolution as Physis".

Guest Speaker, The 2017 Thermodynamics of Emotion Symposium, Portland, Oregon, 13-15 October 2017: "Constructal Law: Thermodynamics and Emotion".

Ralph Coats Roe Medal Lecture: "The Evolution of Everything", International Mechanical Engineering Congress and Exhibition, Tampa, FL, 5 November 2017.

Keynote Lecture, "Constructal Law: The Evolution of Everything", 26th Annual International Conference of Iranian Society of Mechanical Engineers, 24-26 April 2018, Semnan, Iran.

Invited speaker, "Concluding observations, the field and its future", NSF Workshop – Constructal Theory, Villanova University, April 17-18, 2018.

Invited Speaker, "Thermodynamics, Constructal law, and Evolution as physics", Franklin Institute Symposium, Constructal Theory: What the Future Holds, April 18, 2018.

Invited Speaker, "Life and Evolution, as Physics", Evolutionary Studies Program, Binghamton University, The State University of New York, 30 April 2018.

Invited Speaker, Cannes Lions 2018, panel "What AI Teaches Us About Creativity and the Universe", Cannes, France, 21 June 2018.

Society Activity:

Fellow, American Society of Mechanical Engineers (ASME).

Member, American Academy of Mechanics.

Member, American Society of Heating, Refrigerating and Air Conditioning Engineers (ASHRAE).

Member, American Society of Engineering Education (ASEE).

Founding Member, International Center for Applied Thermodynamics.

Member of the Scientific Council of the International Centre for Heat and Mass Transfer (ICHMT), 1994-

Member, Pi Tau Sigma (Mechanical Engineering Honor Society).

Member, Tau Beta Pi (Engineering Honor Society).

Member of the Executive Committee, Workshop on Second Law Analysis in Engineering, George Washington University, Washington, D.C., August 1979.

Member of the K-18 Committee (Cryogenic Heat Transfer) of the ASME Heat Transfer Division.

Member of the Systems Analysis Technical Committee of the ASME Advanced Energy Systems Division.

Organizer of the two sessions on "Second Law Aspects of Thermal Design" at the 22nd National Heat Transfer Conference, Niagara Falls, New York, August 5-8, 1984.

Organizer of the session on "Second Law Aspects of Thermal Design" at the 1985 Winter Annual Meeting of the ASME, Miami Beach, Florida, November 17-22, 1985.

Organizer of the session on "Second Law Applications in Fluid Mechanics and Heat Transfer" at the U.S.A.-Italy Joint Seminar on Second Law Aspects of Thermal Design, May 25-30, 1987, Rome, Italy.

Chairman of a session on "Advanced Energy Systems" at the 1987 Winter Annual Meeting of the ASME, Boston, Massachusetts, Dec. 14-18, 1987.

Organizer of the symposium on "Second-Law/Thermodynamics Analysis in Heat/Mass Transfer and Energy Conversion," ASME Winter Annual Meeting, Nov. 28-Dec. 2, 1988, Chicago.

Organizer of a session on "Fundamentals of Systems Analysis" in the Symposium on "The Analysis and Design of Advanced Energy Systems," ASME Winter Annual Meeting, December 10-15, 1989, San Francisco.

Chairman of the session on "Second Law Analysis of Energy Systems," at the Florence World Energy Research Symposium, Florence, Italy, May 28-June 1, 1990.

Chairman of two sessions on "Education in Thermodynamics and Energy Systems," at the ASME Winter Annual Meeting, Nov. 26-30, 1990. Dallas.

Member of the organizing committee of the International Conference on the Analysis of Thermal and Energy Systems, Athens, Greece, June 3-6, 1991.

Chairman of the session on "Cryogenic Heat Transfer," at the National Heat Transfer Conference, July 28-31, 1991, Minneapolis.

Member of the Scientific Committee, International Conference on Energy Systems and Ecology (ENSEC '93), Cracow, Poland, July 5-9, 1993.

Member of the Scientific Committee, International Symposium on Heat and Mass Transfer in Energy Systems and Environmental Effects, August 22-25, 1993, Cancun, Mexico.

Member of the panel discussion on "Extending the Limits of Air Cooling," at the Fourth Intersociety on Thermal Phenomena in Electronic Systems, Washington, DC, May 4-7, 1994.

Member of the Scientific Committee, Florence World Energy Symposium (FLOWERS '94), Florence, Italy, July 6-8, 1994.

Member of the International Advisory Committee, Seventh International Symposium on Transport Phenomena in Manufacturing Processes (ISTP-7), Acapulco, Mexico, August 28-31, 1994.

Member of the Scientific Committee, Session Chairman and Panelist at the International conference on "Second-Law Analysis of Energy Systems: Towards the 21st Century," Rome, July 5-7, 1995.

Member of the Scientific Committee, International Scientific Conference on Efficiency, Costs, Optimization, Simulation and Environmental Impact of Energy Systems (ECOS '95), July 11-14, 1995, Istanbul, Turkey.

Chairman of the Panel on "Future of Teaching Thermal Engineering and Efficient Use of Energy," International Scientific Conference on Efficiency, Costs, Optimization, Simulation and Environmental Impact of Energy Systems (ECOS '95), July 11-14, 1995, Istanbul, Turkey.

Member of the Scientific Committee of the 10th Turkish National Conference on Thermal Sciences with International Participation, September 6-8, 1995, Ankara.

Member of the *E Group* (European working group on energy, exergy, entropy generation minimization, economics and environment), 1995-

Member of the International Scientific Advisory Committee of the Ninth Symposium on Transport Phenomena, Singapore, June 25-28, 1996.

Member of the Scientific Committee, International Scientific Conference on Efficiency, Costs, Optimization, Simulation and Environmental Impact of Energy Systems (ECOS '96), June 25-27, 1996, Stockholm.

Member of the Scientific Committee, "International Symposium on Transient Convective Heat Transfer," Cesme, Turkey, August 19-23, 1996.

Member of the Scientific Committee for the Meeting (Commissions B1, B2, E1 and E2) of the International Institute of Refrigeration, Bucharest, September 10-13, 1996.

Member of the Scientific Committee of the International Conference on Thermodynamic Analysis and Improvement of Energy Systems (TAIES'97), Beijing, China, June 10-13, 1997.

Member of the Scientific Committee, Florence World Energy Symposium (FLOWERS '97), Florence, Italy, July 30-August 1, 1997.

Chairman of the session on "Unconventional Thermodynamics" at the 1997 International Mechanical Engineering Congress & Exposition, of the ASME International, Dallas, TX, November 16-21, 1997.

Co-Director, U.S.A.-South Africa Workshop on "Energy and the Environment," Durban, South Africa, June 8-12, 1998.

Co-Chairman, International Conference on "Efficiency, Costs, Optimization, Simulation and Environmental Aspects of Energy Systems (ECOS '98)," Nancy, France, July 8-10, 1998.

Co-Director, NATO Advanced Study Institute on "Thermodynamics and the Optimization of Complex Energy Systems," Neptun, Constanta, Romania, July 13-24, 1998.

Session Organizer, Gordon Research Conference on Modern Developments in Thermodynamics, Il Ciocco, Barga, Italy, April 18-23, 1999.

Member of the International Scientific Committee, International Workshop on "Non-Compression Refrigeration and Cooling," Odessa, Ukraine, June 7-11, 1999.

Member of the Scientific Committee, International Conference on "Efficiency, Costs, Optimization, Simulation and Environmental Aspects of Energy Systems (ECOS '99)," Tokyo, Japan, June 8-10, 1999.

Member of the Advisory Committee and Discussion Leader, International Workshop on Optimization of Industrial and Living Systems, Leiden, The Netherlands, March 11-14, 2000.

Member of the Advisory Committee, ASME-ZSITS International Thermal Sciences Conference, Bled, Slovenia, June 11-14, 2000.

Member of the Scientific Committee, International Conference on "Efficiency, Costs, Optimization, Simulation and Environmental Aspects of Energy Systems (ECOS 2000)," Twente, The Netherlands, July 5-7, 2000.

Invited Participant, Gordon Conference on Modern Developments in Thermodynamics, Ventura, CA, March 11-16, 2001.

Member of the Technical Scientific Committee, "The 11th National Conference on Thermodynamics," Galati, Romania, May 17-19, 2001.

Member of the Scientific Advisory Committee and Session Chairman, XIII School-Seminar on Physical Principles of Experimental and Mathematical Simulation of Heat Transfer and Mass Transfer and Gas Dynamics in Power Plants, St. Petersburg, Russia, 20-25 May, 2001.

Co-chairman, International Conference on "Efficiency, Costs, Optimization, Simulation and Environmental Aspects of Energy Systems (ECOS 2001)," and "First International Conference on Applied Thermodynamics", Istanbul, Turkey, July 4-6, 2001.

Co-Director, International Summer School of "Heat Transfer in Porous Media", Neptun, Romania, July 25-August 3, 2001.

Member of the Scientific and Technical Committee, 2nd International Heat Powered Cycles Conference, September 5-7, 2001, Paris.

Member of the International Scientific Committee, International Workshop on "Non-Compression Refrigeration & Cooling", Odessa, Ukraine, October 3-5, 2001.

Member of the Honorary International Advisory Board, International Conference on Computational Heat and Mass Transfer, Federal University of Rio de Janeiro, Brazil, October 22-26, 2001.

Session Organizer, Workshop on Exergy Analysis of Hypersonic Flight Vehicles, University of Rome, March 20-22, 2002, Rome Italy.

Member of the Scientific Advisory Board, Dubrovnik Conference on Sustainable Development of Energy, Water and Environment Systems, June 2-7, 2002, Dubrovnik, Croatia.

Scientific Director, International Summer School on "Porous and Complex Flow Structures in Modern Technologies", University of Evora, Evora, Portugal, 17-21 June 2002.

Member of the Scientific Committee, International Conference on "Efficiency, Costs, Optimization, Simulation and Environmental Aspects of Energy Systems (ECOS'02)", Berlin, Germany, July 3-5, 2002.

Member of the Scientific Committee, Eurotherm Seminar No. 70 on "Physical and Mathematical Modelling of Fires in Enclosures and Fire Protection, Torino, Italy, October 7-8, 2002.

Member of the Scientific Board, International Conference on the occasion of Lars Onsager's 100th birthday: "Transport and Dissipation in Complex Systems", June 1-5, 2003, Trondheim, Norway.

Member of the Organizing Committee, NATO Advanced Study Institute on "Emerging Technologies and Techniques in Porous Media", 9-20 June 2003, Neptun, Romania.

Member of the International Scientific Committee, the Second International Conference on Heat Transfer, Fluid Mechanis and Thermodynamics, HEFAT 2003, Victoria Falls, Zambia, 23-25 June 2003.

Member of the Scientific Council, International Conference on "Efficiency, Costs, Optimization, Simulation and Environmental Aspects of Energy Systems (ECOS'03), Copenhagen, June 30 – July 2, 2003.

Member of the Scientific Committee, "International Symposium on Transient Convective Heat and Mass Transfer in Single and Two-Phase Flows", Cesme, Turkey, 17-22 August 2003.

Honorary Chair and Member of the International Scientific and Advisory Committee, The First International Exergy, Energy and Environment Symposium, 13-17 July 2003, Izmir, Turkey.

Member of the International Advisory Board, "The 5th Jordanian Mechanical Engineering Conference", Amman, Jordan, 15-17 December, 2003.

Co-chairman, ASME-ZSIS International Thermal Science Seminar, ITSS II, Bled, Slovenia, 13-16 June 2004.

Member of the International Advisory Committee, 3rd International Conference on Heat Transfer, Fluid Mechanics and Thermodynamics, HEFAT 2004, Cape Town, South Africa, 21-24 June 2004.

Member of the International Scientific Advisory Committee, and Session Organizer, Second International Conference on Design & Nature 2004, 28-30 June 2004, Rhodes, Greece.

Member of the Scientific Committee, International Conference on "Efficiency, Costs, Optimization, Simulation and Environmental Impact of Energy and Process Systems", Guanajuato, Mexico, 7-9 July 2004.

Member of the International Advisory Committee, The First Cappadocia Mechanical Engineering Symposium, 14-16 July 2004, Nigde, Turkey.

Director, International Summer School on "Thermodynamic Optimization and Constructal Design", 19-24 July 2004, Yildiz University, Istanbul, Turkey.

Member of the International Scientific Advisory Committee, 3rd International Conference on Heat Powered Cycles, 11-13 October 2004, Larnaca, Cyprus.

Member of the Scientific Committee, International Conference on "Water and Risks in the Saharan context", University Amar Telidji, Laghouat, Algeria, 11-12 December 2004.

Director, Workshop on "Constructal Theory of the Generation of Optimal Flow Configurations", University of Roma I, 16-18 March 2005.

Honorary Chair, Second International Conference on Applied Thermodynamics, 18-20 May 2005, Istanbul.

Member of the Scientific Committee, First International Conference on Thermal Engines and Environmental Engineering, University of Galati, Romania, 3-4 June 2005.

Honorary Chair, International Green Energy Conference, Waterloo, Canada 12-16 June, 2005.

Member of the Scientific Council for ECOS 2005, June 20-23, Trondheim, Norway.

Member of the Scientific Committee, the 14th International Conference on Thermal Engineering and Thermogrammetry (THERMO), 22-24 June 2005, Budapest, Hungary.

Member of the Organizing Committee, The Second International Exergy, Energy and Environment Symposium IEEES2, Kos, Greece, 3-7 July 2005.

Member of the Advisory Board, Thermal Theories of Continua: Survey and Developments, 25-30 September 2005, Messina, Italy.

Member of the Scientific Committee, ASME ATI Conference, Milano, Italy, 14-17 May 2006.

Member of the International Scientific Advisory Committee, Third International Conference on Design & Nature 2006, 24-26 May 2006, New Forest, UK.

Honorary Chair, 3rd International Conference on Applications of Porous Media, 29 May – 3 June 2006, Marrakesh, Morocco.

Member of the Scientific Committee, Engineering Systems Design and Analysis – ESDA 2006, Torino, Italy, 4-7 July 2006.

Member of the Scientific Committee for ECOS 2006, 12-14 July 2006, Crete, Greece.

Member of the International Scientific Advisory Committee of the 4th International Conference on "Urban Regeneration and Sustainability, 17-19 July 2006, Tallin, Estonia.

Honorary Chair, The Third International Energy, Exergy and Environment Symposium, IEEES-3, Évora, Portugal, 1-5 July 2007.

Vice President, Executive Committee of the International Center of Applied Thermodynamics, 2005-present.

Member of the Scientific Committee, ECOS 2007, Efficiency, Cost, Optimization, Simulation and Environmental Impact of Energy Systems, Padova, Italy, 25-28 June 2007.

Member of the Scientific Committee, 15th International Conference on Thermal Engineering and Thermogrammetry (THERMO), 27-29 June 2007, Budapest.

Member of the Scientific Committee, 4th International Conference on Applications of Porous Media, 19-24 May 2008, Istanbul.

Member of the Scientific Committee, International Scientific Conference on Efficiency, Costs, Optimization, Simulation and Environmental Impact of Energy Systems (ECOS '08), Krakow, Poland, 2008.

Member of the International Steering Committee, ISTP-19, Reykjavik, Iceland, 17-21 August 2008.

Member of the International Scientific Advisory Committee of the 5th International Conference on The Sustainable City 2008, 22-24 September 2008, Skiathos, Greece.

Member of the International Scientific Committee of the 16th THERMO Conference, 24-26 June 2009, Budapest.

Member of the Scientific Committee, International Scientific Conference on Efficiency, Costs, Optimization, Simulation and Environmental Impact of Energy Systems (ECOS '09), Foz do Iguacu, Brazil, 2009.

Co-chair, Advisory Committee, The 4th International Green Energy Conference, Beijing, China, 20-22 October 2008.

Member of the Honors and Awards Committee of the ASME Heat Transfer Division, July 2008 - June 2011.

Member of the Scientific Committee, the 11th UK Heat Transfer Conference, Queen Mary, University of London, September 2009.

Member of International Steering Committee, 20th International Symposium on Transport Phenomena (ISTP-20), Victoria, BC, Canada, 7-10 July 2009.

Member of the Scientific Committee, The First International Conference on Optimization using Exergy-based Methods and Computational Fluid Dynamics, 20-23 October 2009, Berlin.

Member of the Scientific Council of ECOS 2010, Efficiency, Cost, Optimization, Simulation and Environmental Impacts of Energy Systems, Lausanne, 14-17 June 2010.

Member of the International Advisory Committee of the 7th International Conference on Heat Transfer, Fluid Mechanics and Thermodynamics (HEFAT2008), Antalya, Turkey, June/July 2010.

Member of the International Scientific Committee, Sustainable City 2010 Conference, 14-16 April 2010, A Coruna, Spain.

Member of the International Scientific Committee, Design and Nature 2010, Pisa, Italy, 28-30 June 2010.

Member of the International Organizing Committee, The 1st TSME International Conference on Mechanical Engineering (ICoME 2010), Thai Society of Mechanical Engineers, 20-22 October 2010, Ubonratchathani, Thailand.

Member of the International Steering Committee, ISTP-21, International Symposium on Transport Phenomena, Kaohsiung, Taiwan, 2-5 November 2010.

Member of the International Scientific Advisory Committee of Ravage of the Planet III, 13-15 December 2011, Universiti Teknologi Mara, Malaysia.

Member of the International Scientific and Advisory Committee of The 6th International Green Energy Conference, Eskisehir, Turkey, 5-9 June 2011.

Member of the Advisory Committee of The Global Conference on Global Warming-2011, Lisbon, 9-14 July 2011.

Member of the International Scientific Committee and the Conference Organizing Committee, *The 2nd Asian-US-European Thermophysics Conference, Thermal Science for Sustainable World*, Hong Kong, 3-6 January 2012.

Member of Scientific Advisory Committee, Sustainable City 2012, WIT, Ancona, Italy 7-9 May 2012.

Member of the International Scientific Advisory Committee of the Design and Nature 2012 Conference, A Coruna, Spain, 11-13 June 2012.

Member of the International Organizing Committee, the Fourth International Conference on Porous Media and its Applications in Science, Engineering and Industry, Potsdam, Germany, 17-22 June 2012.

Member of the International Advisory Committee, the 5th BSME International Conference on Thermal Engineering, Dhaka, 21-23 December 2012.

Member of the Honorary Committee, the 3rd International Exergy, Life Cycle Assessment, and Sustainability Conference, Nisyros, Greece, 7-9 July 2013.

Member of the Scientific Advisory Committee, VIth InterPore Conference, Milwaukee, 2014.

Member of the International Organizing Committee, the Fifth International Conference on Porous Media and its Applications in Science, Engineering and Industry, Kona, Hawaii, 22-27 June, 2014.

Member of the International Advisory Committee, The 6th BSME International Conference on Thermal Engineering, 19-21 December 2014, Dhaka, Bangladesh.

Honorary Board, International Conference on Heat Transfer, Thermodynamics, Energy and Fluid Mechanics, 22-24 December 2014, Istanbul, Turkey.

Member of the Scientific Advisory Committee of "Complex Systems 2015", New Forest, UK, 12-14 May 2015.

Scientific Co-Chair of the ASME-ATI-UTI Conference on Thermal Energy Systems: Production, Storage, Utilization and the Environment, Napoli (Italy), 17-20 May 2015.

Chairman Scientific Committee, "Constructal Law & Second Law Conference", 18-19 May 2015, Parma, Italy.

Member of the International Scientific Advisory Committee of "Design and Nature 2016", New Forest, UK, 13-15 September 2016.

Member of the Scientific Council and Keynote Speaker, International Conference on Cryogenics, Technology and Refrigeration, 12-14 October 2016, Bucharest, Romania.

Member of the Scientific Board for SOLARTR 2016, Istanbul, 6-8 December 2016.

Member of the Scientific Committee, "Constructal Law & Second Law Conference", 15-16 May 2017, Bucharest.

Member of the Scientific Committee, International Technology Congress, Pune, India, December 28-29, 2017.

Member of the Scientific Committee, Energy Management and Environmental Protection, Belek, Antalya, Turkey, 1-3 February 2018.

Member of the Scientific committee, International Symposium on Naval Architecture and Maritime, Yildiz Technical University, Istanbul, Turkey, 23-25 April 2018.

Member of the advisory board, 26th Annual International conference of Iranian Society of Mechanical Engineers (ISME 2018), Semnan, Iran, 24-26 April 2018.

M.S. Theses Directed by Adrian Bejan:

- 1. Experimental Study of High Rayleigh Number Convection in Horizontal Cavity with Different End Temperature, Adnan A. Al-Homoud, 1979.
- 2. Entropy Generation Criterion Applied to Various Heat Transfer Augmentation Techniques, William R. Ouellette, 1979.
- 3. Natural Circulation in a Horizontal Duct with Different End-Temperatures, Shigeo Kimura, 1980.
- 4. Natural Convection on Both Sides of a Vertical Wall Separating Fluids at Different Temperatures, Ren S. Anderson, 1980.
- 5. Extended Surface Design for Minimum Irreversibility, Dimosthenis Poulikakos, 1980.
- 6. The Buckling Instability of Capillary Jets, Michael G. Stockman, 1981.
- 7. Viscous Buckling of Thin Fluid Layers Undergoing End Compression, Kenneth R. Blake, 1982.
- 8. Natural Convection in Partially Divided Rectangular Enclosures, Nien-Chuan Norman Lin, 1982.
- 9. Transition to Turbulence in Rivulet Flow between Two Parallel Plates, Anil Anand, 1983.
- 10. Heat and Mass Transfer by Natural Convection in a Porous-Medium, Khairy R. Khair, 1984.
- 11. Natural Convection in a Vertical Slot Filled with Water near 4°C, Kurt E. Lankford, 1984.
- 12. Second Law Analysis of Solar Collectors with Energy Storage Capability, Djamel E. Chelghoum, 1984.
- 13. Transient Natural Convection in a Large-Diameter Horizontal Cylinder, Pablo S. Beloff, 1986.
- 14. The Horizontal Spreading of Thermal and Chemical Deposits in a Porous Medium, Zongqin Zhang, May 1987.
- 15. Transient Natural Convection Heat Transfer between Two Zones in an Insulated Enclosure, Pedro A. Litsek, May 1987.
- 16. Heat Sinks with Sloped Plate Fins in Natural and Forced Convection, Gustavo A. Ledezma, May 1995.
- 17. Staggered Multi-Scale Structure for Maximal Heat Transfer Density in Natural Convection, Hsiangmin Yu, 9 December 2005.
- 18. The Natural Emergence of Vascular Design with Turbulent Flow, Erdal Cetkin, April 2010.
- 19. Effect of size on ground-coupled heat pump performance, M. Alalaimi, October 2013.

20. The Constructal Evolution of the Cross Sections of Jets toward the Round Shape, S. Ziaei, November 2013.

Ph.D. Theses Directed by Adrian Bejan:

- 1. Buckling of Turbulent Jets, Ren S. Anderson, May 1983.
- 2. Buckling Flow and Transition to Turbulence in Axisymmetric Plumes, Shigeo Kimura, May 1983.
- 3. Natural Convection in a Triangular Enclosure Filled with Newtonian Fluid or Fluid Saturated Porous Medium, Dimosthenis Poulikakos, May 1983.
- 4. Natural Convection by Double Diffusion in Cavities, Osvair V. Trevisan, May 1986.
- 5. Transient Natural Convection Heat Transfer in a Rectangular Enclosure with One Heated Side Wall, John David Hall, May 1987.
- 6. Convection in the Cavity Formed between Two Cylindrical Rollers, Pedro A. Litsek, May 1989.
- 7. Melting and Solidification with Natural Convection in a Rectangular Enclosure, Zongqin Zhang, August 1990.
- 8. Fundamental Aspects of Convection in Enclosed Fluids, Jose L. Lage, May 1991.
- 9. Thermodynamic and Heat Transfer Optimization of Energy Storage and Extraction Processes, Jong S. Lim, August 1991.
- 10. Optimal Geometry of Electronic Packages Cooled by Forced Convection, Alexandru M. Morega, August 1993.
- 11. Fundamental Topics in Heat Transfer through Deformable Two-Phase Media, Alex J. Fowler, December 1993.
- 12. Combined Heat Transfer and Thermodynamics Problems with Applications in Refrigeration, Jose V. C. Vargas, September 1994.
- 13. Geometric Optimization of Heat Transfer Devices, Gustavo A. Ledezma, April 1997.
- 14. Thermodynamics Fundamentals of Energy Conversion, Nicolae Dan, April 1998.
- 15. Thermodynamic Optimization of Flow Systems with Irreversibilities, Marcelo R. Errera, February 1999.
- 16. Characteristics and Optimization of Composite Systems with Heat Conduction, Maria Neagu, July 1999.
- 17. Constructal Optimization of Tree-Shaped Assemblies for Conduction, Majed Almogbel, July 2000.

- 18. Geometric Optimization of Thermal Systems, Asad Alebrahim, July 2000.
- 19. Analysis and Optimization of Convection in Channels and Porous Media, Luiz Alberto Oliveira Rocha, March 2002.
- 20. Two Paths to Study Structures on Complex Systems, Alejandro Rivera Alvarez, September 2002.
- 21. Integrative Energy-Systems Design: System Structure from Thermodynamic Optimization, Juan Carlos Ordonez, April 2003.
- 22. Multidisciplinary Optimization of Heat Transfer and Fluid Flow Systems, Louis Gosselin, April 2004.
- 23. Constructal Multi-Scale Convective Structures, Tunde Bello-Ochende, November 2004.
- 24. Constructal Dendritic Trees for Heating and Cooling, Wishsanuruk Wechsatol, February 2005.
- 25. Constructal Multi-Scale Heat Exchangers, Alexandre K. da Silva, June 2005.
- 26. Constructal Vascular Composites for Cooling and Heating, Sunwoo Kim, August 2008.
- 27. Constructal Vascularization for Self-Healing and Self-Cooling, Kuan-Min Wang, August 2008.
- 28. Constructal Design of Vascular Materials, Jaedal Lee, November 2008.
- 29. Design with Constructal Theory: Steam Generators, Turbines and Heat Exchangers, Yong Sung Kim, July 2010.
- 30. Constructal Vascularized Structures for Cooling and Mechanical Strength, Erdal Cetkin, May 2013.
- 31. Constructal Design of Energy Systems, Mohammad Alalaimi, April 2016.
- 32. Constructal Design of Latent Heat Storage Systems, Shiva Ziaei, April 2016.
- 33. The Method of Constructal Design in Heat Exchangers, Abdulrahman Salman Almerbati, May 2018.

Grants:

- Office of Naval Research, "Effective Techniques for Augmenting Heat Transfer," \$94,610, 10/1/78-9/30/80.
- National Science Foundation, "Natural Convection Heat Transfer in a Horizontal Rectangular Cavity with Different End Temperatures," \$79,255, 3/1/79-8/31/81.
- Office of Naval Research, "Analytical Prediction of Turbulent Heat Transfer Parameters," \$142,153, 10/1/80-9/30/83.
- National Science Foundation, "Unsteady Natural Convection in a Porous Layer Heated from the Side, \$91,041, 12/1/82-5/31/85.

- National Science Foundation, "Unsteady Natural Convection Experiments in a Horizontal Cylinder," \$15,443, 9/1/84-2/28/87.
- Duke University, University Research Council, "Unsteady Natural Convection Experiments in a Horizontal Cylinder," \$4,000, 7/1/85-6/30/86.
- Lord Foundation of North Carolina, Book on "Advanced Engineering Thermodynamics," \$6,000, summer 1986.
- Electric Power Research Institute, "Natural Convection Melting and Solidification," \$93,242, 9/1/86-8/31/89.
- National Science Foundation, "Judiciously Unconstrained Research on Controversial Topics in Thermal Engineering," \$38,245, 10/1/87-3/31/90.
- Lord Foundation of North Carolina, Book on "Heat Transfer," \$3,000, summer 1989.
- Midwest Research Institute, "Numerical Calculation of Pollutant Transport in Buildings," \$8,000, 8/1/89-8/31/90.
- Electric Power Research Institute, "Natural Convection Melting and Solidification," \$37,422, 1/1/90-12/31/90.
- Lord Foundation of North Carolina, Book on "Heat Transfer," \$3,000, summer 1990.
- Electric Power Research Institute, "Natural Convection Melting and Solidification," \$74,335, 1/1/91-8/31/92.
- IBM, "Optimal Geometry of Electronic Packages Cooled by Forced Convection," \$58,296, 9/1/91-8/31/92.
- Air Force Office of Scientific Research, "The Effect of a Flexible Fiber Cover on Controlling Boundary Layer Flow and Heat Transfer," \$61,000, 2/1/92-1/31/95.
- IBM, "Optimal Geometry of Electronic Packages Cooled by Forced Convection," \$58,296, 9/1/92-8/31/93.
- National Science Foundation, "Optimization of Defrosting Refrigerators and Ice Making Processes," \$110,002, 1/15/94-6/30/96.
- IBM, "Optimal Geometry of Electronic Packages Cooled by Forced Convection," \$29,148, 1/1/94-12/31/94.
- National Science Foundation, "Thermodynamic Optimization of Power Systems with Fluid Flow Irreversibilities," \$152,924, 11/15/95 10/31/97.
- National Science Foundation, "Thermodynamic Optimization of Systems with Heat and Fluid Flow Irreversibilities," \$180,000, 9/15/97 8/31/2000.
- Air Force Office of Scientific Research, "Optimized Exergy Methodology," \$55,000, 12/1/97 11/30/98.
- National Science Foundation, "US-South Africa Workshop: Energy and Environment, Durban, South Africa, June 1998," \$32,043, 3/1/98 2/28/99.

- NATO, "Advanced Study Institute on Thermodynamics and the Optimization of Complex Energy Systems, Neptun, Romania, July 1998," \$65,412.
- Air Force Office of Scientific Research, "Optimized Exergy Methodology Project, Phase II," \$201,000, 1/1/99 12/31/2001.
- Bechtel BWXT Idaho, LLC (BBWI) "Methane Hydrates in Complex Undersurface Media," \$56,206, 1/19/2000 9/30/2000.
- National Science Foundation, "Thermodynamic and Geometric Optimization of Systems with Flow Irreversibilities," \$205,710, 6/1/2000 5/31/2003.
- National Science Foundation, "Development of Design Methods for Cooling and Heating Systems Based on Constructal Theory", \$37,200, 9/1/2002 8/31/2003.
- National Science Foundation, "New 4th Year Undergraduate Course on Constructal Design of Energy-System Configuration", \$74,918, 7/1/2004 – 6/30/2006.
- Air Force Office of Scientific Research, "MURI: Micro-Vascular Autonomic Composites", \$877,792, 5/1/05-4/30/10.
- National Science Foundation, "Constructal Theory of Social Dynamics", \$79,988, 9/15/2005 8/31/2007.
- Air Force Office of Scientific Research, "Constructal Technology for Thermal Management of Aircraft", \$248,800, 2/15/06-11/30/08.
- National Science Foundation, "Exploratory Research with Constructal Theory", \$99,998, 07/01/08 06/30/2009.
- Air Force Office of Scientific Research, "CTair: Constructal Tree Structures for Mechanical Strength and Cooling of Aircraft", \$317,226.00, 07/01/2010 6/30/2013.
- National Renewable Energy Laboratory, "Optimal design of residential energy systems using constructal theory", \$630,772.00, 11/22/2010 11/21/2013.
- National Science Foundation, "EAGER: Heat Networks and energy & Environment Design", \$150,000, 1/1/2014 12/31/2015.

Department of Energy, "Geometries of Evaporator/Boiler", \$50,000, 10/13/2014 – 9/30/2015.