M. PINAR MENGÜÇ

FIBA Renewable Energy Endowed Chair Professor (2022-)

Professor of Mechanical Engineering (Founding Head, 2008-2018)
Founding Director, Center for Energy, Environment and Economy (CEEE/EÇEM, 2009-)

Özyeğin University, Istanbul

ORCID: 0000-0001-5483-587X
Scopus Author ID: 35781248000
Web of Science ResearcherID: O-3114-2013

Impact: Foundational contributions to radiative transfer and light–matter interactions across scales, with translation to diagnostic and engineered energy systems**.**

TECHNICAL SUMMARY OF CV (link to the long archival CV is given at the end)

M. Pinar Mengüç's work advances the theory, computation, and engineering implementation of radiative transfer phenomena across length scales.

His research established rigorous formulations for radiative transfer in absorbing and anisotropically scattering media, including multidimensional spherical harmonics methods, inverse radiation analysis, and predictive modeling of particulate combustion systems.

He subsequently integrated electromagnetic light scattering theory with radiative transfer to enable non-intrusive particle diagnostics based on elliptically polarized scattering inversion methodologies.

Building on this foundation, his work extended radiative transfer into the near-field regime, incorporating fluctuational electrodynamics, surface phonon–polaritons, and nanoscale photon–phonon–electron coupling. These developments connected classical transport theory with nanostructured energy systems.

A unifying theme is multiscale radiative energy transport linking participating combustion media, electromagnetic scattering, nanoscale photon–phonon–electron coupling, and engineered spectral energy systems within a consistent transport framework. This career-long effort reflects continuity of radiative transport physics from theory to diagnostics, from nanoscale phenomena to engineered energy systems.

Foundational Radiative Transfer Theory

Mengüç developed multidimensional formulations of the radiative transfer equation (RTE) in absorbing and anisotropically scattering media, including systematic spherical harmonics (PN) implementations and angular closure strategies applicable to optically thick and thin regimes. He has also developed Monte Carlo approaches, which were applied to photons, phonons, electrons as carriers within a unified Boltzmann transport framework.

His work addressed:

- Inhomogeneous, anisotropically scattering enclosures
- Coupled radiation–turbulence interactions
- Inverse radiation problems and tomographic reconstruction
- Determination of spectral radiative properties of coal, soot, and particulate media

These contributions strengthened predictive modeling capability in combustion systems, furnaces, and high-temperature participating media.

Light Scattering and Optical Diagnostics

Extending classical RTE analysis, Mengüç integrated electromagnetic scattering theory with transport modeling to characterize complex particulate systems.

Key contributions include:

- Scattering matrix characterization of fractal soot agglomerates
- Dependent and independent scattering regime analysis
- Surface-wave scattering approaches for nanoparticle diagnostics
- Elliptically polarized light scattering concepts for particle characterization

This work connected radiative transfer studies with measurable optical properties, enabling non-intrusive diagnostics and optical characterization.

Commercial Implementation in Diagnostic and Engineered Systems

A distinguishing aspect of Mengüç's work is translation of radiation transport and light-scattering theory into deployable diagnostic systems.

As co-founder of Synergetic Technologies, he contributed to the development of particle characterization instrumentation based on polarized scattering inversion methodologies.

This implementation required:

- Reduction of scattering-matrix formulations to computationally efficient algorithms
- Real-time inversion under measurement uncertainty

• Robust parameter estimation in industrial environments
• Calibration and validation against controlled particulate systems

The resulting instrumentation was deployed for industrial particle characterization and was recognized with an R&D 100 Award and multiple SBIR grants from NSF, DOE, and NIH.

This work demonstrates continuity from electromagnetic scattering theory and radiative transfer modeling to engineered diagnostic realization.

Near-Field Thermal Radiation and Nanoscale Energy Transport

Mengüç contributed to the extension of radiative transfer into the near-field regime, incorporating fluctuational electrodynamics and surface phonon-polariton coupling in thin films and nanostructures.

His research includes:

• Dyadic Green's function formulations for layered media
• Surface plasmon resonance interactions
• Near-field thermophotovoltaic modeling
• Local density of electromagnetic states analysis

These studies linked macroscopic radiation theory with nanoscale electromagnetic energy transfer.

Nano-Manufacturing and Energy Coupling

Parallel to theoretical developments, Mengüç integrated radiation transport concepts into nanoscale processing and diagnostics:

• Electron-beam-induced nano-machining
• Coupled phonon–electron–photon Monte Carlo simulations
• Field emission–induced thermal transport
• Plasmon-enhanced absorption in nanostructures

This work bridged radiative heat transfer, solid-state transport, and nano-fabrication systems.

Translation to Energy Systems and Radiative Cooling

Building on nanoscale radiative transport research, Mengüç extended spectral and transport-based methodologies to engineered energy systems and building-scale applications.

His work in this domain includes:

• Spectrally selective coatings for passive radiative cooling
• Near-field radiation–assisted thermophotovoltaic systems

• Optical property control for high-efficiency solar receivers
• Radiative–convective coupling for high-performance buildings

and demonstrates integration of radiative transfer modeling, heat transfer analysis, materials, and system-level optimization.

These methodologies were also implemented in large-scale EU and national projects, including future buildings and energy-positive systems carried out by CEEE/EÇEM he established at Özyeğin University. This body of work preserves continuity with foundational radiative transport theory while demonstrating scalability from nano-structured materials to building-integrated energy systems.

Summary: Intellectual Scope

Across four decades, Mengüç's work connects:

Radiative transport theory
+ Electromagnetic light scattering
+ Near-field nanoscale energy transfer
+ Development of diagnostic instrumentation
+ Engineered energy systems

The unifying framework is radiation–light-matter interactions across scales, from particulate combustion environments to nanostructured materials and energy-efficient systems.

HONORS AND AWARDS

Major National and International Awards

1. **ASME Heat Transfer Memorial Award (Art of Practice Category)**
   American Society of Mechanical Engineers (ASME), 2018.
   Lifetime achievement recognition in heat transfer engineering. (One of ~130 recipients since 1959.)
2. **Michael I. Mishchenko Medal**
   Journal of Quantitative Spectroscopy and Radiative Transfer (Elsevier), 2023. Awarded for outstanding scholarly contributions to light scattering and radiative transfer.
3. **Parlar Foundation Honor Award**
   Middle East Technical University, (ODTÜ/METU), Ankara, 2024.
   (One of 11 recipients of this Honor Award since its establishment in 1989.)
4. **Purdue University Outstanding Mechanical Engineer Award**, 2020.
   Selective alumni recognition among Purdue Mechanical Engineering graduates.
5. **R&D 100 Award**
   For Particle Characterization System, Synergetic Technologies, 2005.Recognizing technological innovation and commercial impact.

6. **Alumni Association Professor of Engineering**, University of Kentucky (2008–2011). Alumni Association Professor Emeritus (2011-2018).
7. **FIBA Renewable Energy (FYE) Endowed Chair Professor,** Özyeğin University, (2022-) (the first at OzU, one of the first in Türkiye)
8. **Elected Member**, Science Academy, Turkey, 2016.
   Executive Committee Member (2017-2024)
9. Fellow, American Society of Mechanical Engineers (ASME), 1999.
10. Fellow, International Center for Heat and Mass Transfer (ICHMT), 2002.

MAJOR RESEARCH GRANTS AWARDED

Served as Principal Investigator or Co-Principal Investigator on more than 68 externally funded projects across the United States, Europe, and Türkiye.

Total cumulative funding exceeds **$14 million USD** (converted at time of award). See Appendix B for details of some of the major grants. The summary is given here:

USA Federal

• NSF Engineering Initiation Award (PI), 1987–1989
• DOE Advanced University Coal Research (PI), 1987–1996 (2 separate ones)
• NSF NIRT Nanoscale Engineering (Co-PI), 2002–2008
• NSF NER Surface-Wave Diagnostics (PI), 2004–2006
• NSF Nano-Melting Program (PI), 2007–2009

European Commission

• FP7 Marie Curie IRG (PI), 2009–2012
• FP7 NEED4B (PI, ÖzU Lead), 2012–2018
• Horizon 2020 TRIBE (PI), 2015–2019
• Horizon Innovation Action LEGO-FIT (PI), 2023–2027

Türkiye National Competitive

• TÜBİTAK 1001 (PI), 2009–2011
• TÜBİTAK 2501 (PI), 2013–2016

Translational / Industry-Linked Research

• NSF/DOE/NIH SBIR – Particle Characterization Systems (PI, Co-Founder), 2004-2008
• NSF nano-manufacturing instrumentation initiatives (co-PI)
• EU Horizon 2020 Program: BRICKER (PI, Özyeğin University Lead), 2014-2018

SELECTED PLENARY TALKS (see the archival CV for details)

"Radiative Transfer and Light–Matter Interactions: Foundations for Particle Diagnostics and Micro/Nanoscale Engineering," 8th Micro/Nanoscale Heat and Mass Transfer International Conference, MNHMT conference in honor of Chang-Lin Tien, Plenary Lecture, Napoli, Italy, January 9-11, 2027.

"History of Radiative Transfer," International CNRS Thematic School on Radiative Transfer in Semi-Transparent Media, Dinner Lecture, Hendaye, France, 3-9 October 2026.

"Light, Heat, Particles, Plasmons & Engineering," ELS'XXI, 21. Electromagnetic Light Scattering Conference, Plenary Lecture, Milazzo, Sicily, Italy, June 23, 2025.

"In Pursuit of an Integro-Differential Equation: Light, Heat, and the Metaphor of Society," Mustafa Parlar Foundation Honor Award Acceptance Lecture, METU/ODTÜ, Ankara, Türkiye, April 13, 2025.

"Particles, Plasmons, and Engineering," Weiglhofer Symposium on Electromagnetic Theory, Edinburgh, Scotland, Invited Talk, 18 July 2022.

DOCTORAL DISSERTATIONS SUPERVISED

I. Main or co- Ph.D. Advisor

(Chronological Order)

1. **Siva Manickavasagam**
   "Effective Optical and Radiative Properties of Pulverized Coal and Char"
   University of Kentucky, Ph.D., 1993.
2. **S. Mukerji**
   "Radiation–Turbulence Interactions"
   University of Kentucky, Ph.D., 1997 (Co-advised with J.M. McDonough).
3. **C. Crofcheck**
   "Identification of Optical/Radiative Properties of Dairy Products"
   University of Kentucky, Ph.D., 2001.
4. **Basil T. Wong**, "Thermal Heat Transport at the Nano-Scale Level and its Application to Nano-Machining"
   University of Kentucky, Ph.D., 2006.
5. **J.N. Swamy**
   "Polarized Light Scattering Techniques to Characterize Liquid Foams"
   University of Kentucky, Ph.D., 2007.

6. **M. Kozan**
   "Characterization of Agglomeration of Nanostructures"
   University of Kentucky, Ph.D., 2007.
7. **Ellie Hawes (Derbyshire)**
   "Directed Self-Assembly of Nano-Size Particles"
   University of Kentucky, Ph.D., 2007.
8. **Jaime Sanchez**
   "Electron Field-Emission from Carbon Nanotubes for Nanomachining Applications"
   University of Kentucky, Ph.D., 2008.
9. **Illay (Victor) Kunadian**
   "Carbon Nanotube-Based Energy Devices"
   University of Kentucky, Ph.D., 2008.
10. **K.-F. Hii**
    "Precision Instrumentation for Nanomachining"
    University of Kentucky, Ph.D., 2008.
11. **Mathieu Francoeur**
    "Near-Field Radiation Transfer and Nanoparticle Characterization"
    University of Kentucky, Ph.D., 2010.
    Recipient: 2011 JQSRT/Elsevier Young Scientist Award. Currently Editor-in-Chief, JQSRT
12. **Azadeh Didari**
    "Near- and Far-Field Radiation Transfer in Metamaterials and Development of the NF-RAD-FDTD Algorithm"
    Özyeğin University, Ph.D., 2016.
    Recipient: 2017 JQSRT/Elsevier Young Scientist Award.
13. **Farhad Kazemi Khosroshahi**
    "Design of Spectrally Selective Coatings for High Efficiency Power Generation Devices"
    Boğaziçi University (Co-advised), Ph.D., 2017.
14. **Layth Ismael Al-Ghebory**
    "Effect of pH on Particle Agglomeration and Radiative Transfer in Nanoparticle Suspensions"
    Özyeğin University, Ph.D., 2018.
15. **Hayder Mohammed**
    "Thermal and Radiative Energy/Exergy Analyses for Parabolic Trough Systems"
    Özyeğin University, Ph.D., 2018.
16. **Raaid Aldoury**
    "Energy and Exergy Efficiency Analyses of High-Performance Buildings"
    Özyeğin University, Ph.D., 2018.
17. **Roxana Family**
    "Radiative Cooling by Spectrally Selective Materials for Buildings"
    Özyeğin University, Ph.D., 2018.
18. **Cem Keskin**
    "Augmenting Occupant Thermal Experience with Cyber-Physical-Social Systems"
    Özyeğin University, Ph.D., 2020. Post-Doc, 2020-2025

19. **Tufan Akba**
    "Micro-Scale Concentrating Solar Power System Design and Construction"
    Özyeğin University, Ph.D., 2023.
20. **Gökçe Ersel**
    "Transdisciplinary System Design for Sustainability Transitions"
    Özyeğin University, Ph.D., 2026.
21. **Canan Özsoy**
    "A Transdisciplinary Design Methodology for Energy Transition"
    Özyeğin University, Ph.D., 2027.

II. Co-Advised / Committee-Supervised Doctoral Students

- Benoit Gay – INSA Lyon (Polarized Imaging)
- Gazi M. Huda – University of Kentucky EE (AFM-Based Nanomanufacturing)
- Erdem Ogut – Sabancı University (Plasmonic-Magnetic Integration)
- Elif Begüm Elçioğlu – METU (Near-Field Radiation Devices)
- Ersin Yıldız – Özyeğin University (Radiative Heat Treatment Furnaces)
- Tolga Altınoluk – Özyeğin University (Glass Melting Radiation)
- Berkay Halvaşi – Özyeğin University (Radiative Combustion Systems)
- Gökçe Tomrukçu – Özyeğin University (Architecture and Sustainability Systems)

Generational Impact Summary

- 21 primary Ph.D. dissertations directed
- 8 additional doctoral students co-advised or supervised
- Students placed in academia (USA, Turkey, Iraq, Malaysia, South Korea)
- Two recipients of the JQSRT/Elsevier Young Scientist Award
- Alumni employed at Intel, Qualcomm, Ford Otosan, TOGG, TATA, and international research universities
- Expansion from classical radiative transfer to nano-optics, metamaterials, and transdisciplinary sustainability systems

REFEREED JOURNAL ARTICLES (More than 155, full citations are in Appendix A)

SELECTED SEMINAL CONTRIBUTIONS (Organized by Key Topics)

A. Radiative Transfer Foundations

1. Mengüç, M.P. and Viskanta, R., *Radiative Transfer in Three-Dimensional Rectangular Enclosures Containing Inhomogeneous, Anisotropically Scattering Media*, JQSRT, 1985.(Selected among top 20 papers of JQSRT for 50th anniversary.)
2. Viskanta, T. and Mengüç, M.P., "*Radiative Heat Transfer in Combustion Systems,*" Progress in Energy and Combustion Sciences, 1987.
3. Mengüç, M.P. and Iyer, R.K., *Multiple Spherical Harmonics Approximation for Radiative Transfer*, JQSRT, 1988.

4. Mengüç, M.P. and Subramaniam, S., *Inverse Radiation Problems in Participating Media*, IJHMT, 1991.
5. Wong, B.T. and Mengüç, M.P., *Monte Carlo Methods in Radiative Transfer*, JQSRT, 2004.
6. Howell, J.R. and Mengüç, M.P., *Challenges for Radiative Transfer*, JQSRT, 2018.

B. Light Scattering & Particle Diagnostics

7. Mackowski, D.W., Altenkirch, R.A., and Mengüç, M.P., *Electromagnetic vs RTE Analysis of Coal Particles*, Combustion and Flame, 1989.
8. Agarwal B.M. and Mengüç, M.P.,"*Single and Multiple Scattering of Collimated Radiation in an Axisymmetric System*," IJHMT, 1991.
9. Manickavasagam, S. and Mengüç, M.P., *Scattering Matrix Elements of Fractal Soot Agglomerates*, Applied Optics, 1997.
10. Ivezic, Z. and Mengüç, M.P., *Dependent/Independent Scattering Regimes*, IJHMT, 1996.
11. Mengüç, M.P. and Dutta, P., *Scattering Tomography in Sooting Flames,* ASME JHT, 1994. (ASME Best Paper Award)
12. Aslan, M.M., Mengüç, M.P., Manickavasagam, S. and Saltiel, C. ,*"Size and Shape Prediction of Colloidal Metal Oxide MgBaFeO Particles from Light Scattering Measurements,"* J of Nanoparticle Research, 2006.

C. Near-Field and Nanoscale Radiative Energy Transport

13. Francoeur, M., Vaillon, R., Mengüç, M.P., *Dyadic Green's Function Solution for Near-Field Radiation*, JQSRT, 2009.
14. Loke, V. and Mengüç, M.P., *Surface Wave and AFM Probe Near-Field Coupling*, JOSA A, 2010.
15. Francoeur, M., Vaillon, R., and Mengüç, M.P. "*Impacts of Thermal Effects on the Performance of Nanoscale-Gap Thermophotovoltaic Power Generators,*" IEEE Transactions on Energy Conversion, 2011.
16. B.T. Wong, B.T., M. Francoeur, M. and Mengüç, M.P., "*A Monte Carlo Simulation for Phonon Transport Within Silicon Structures at Nanoscales with Heat Generation*," IJHMT, 2011.
17. Didari, A. and Mengüç, M.P., *Near-Field Thermal Emission between Structured Surfaces*, JQSRT, 2015.
18. Didari, A. and Mengüç, M.P., *Biomimicry Design for Nanoscale Radiative Cooling*, Scientific Reports, 2018.
19. Elcioğlu, E.B. Didari, A., Okutucu-Özyurt, T. and Mengüç, M.P., "*Tunable Near-Field Radiative Transfer by III–V Group Compound Semiconductors*," J of Physics D: Applied Physics, 2019.

D. Multiscale Translation to Engineered Systems

20. Wong, B.T., Mengüç, M.P., Vallance, R.R., *Electron-Beam-Induced Thermal Conduction*, IJHMT, 2007.
21. Hawes, E.A., Hastings, J.T., Mengüç, M.P., *Plasmon-Enhanced Selective Heating of Nanoparticles*, Optics Letters, 2008.
22. Kecebas, M.A., Mengüç, M.P., A. Koşar, and K. Sendur, *Spectrally Selective Filters for Passive Radiative Cooling*, JOSA B, 2020.

BOOKS

1. Mengüç, M.P. and Wong, B.T. *Thermal Transport for Applications in Micro/Nanomachining*, Springer, 2008, ISBN: 978-3540736059.
2. Howell, J.R., Siegel, R., and Mengüç, M.P. *Thermal Radiation Heat Transfer*, (5th Edition). CRC Press, Boca Raton, FL, 2010. ISBN: 978-1439805336.
3. Howell, J.R., Mengüç, M.P., Siegel, R., *Thermal Radiation Heat Transfer*, (6th Edition), CRC Press, Boca Raton, FL, 2015. ISBN: 978-1466593268.
4. Kulacki, FA, ….Mengüç, M.P. *Handbook of Heat Transfer,* (One of the 8 Editors), Springer, 2018. ISBN: 978-3319266954
5. Howell, J.R., Mengüç, M.P., Daun, K, and Siegel, R., *Thermal Radiation Heat Transfer*, (7th Edition), CRC Press, Boca Raton, FL, 2020. ISBN: 978-0367347079.
6. Howell, J.R., Mengüç, M.P., Daun, K, *Thermal Radiation: An Introduction,* CRC Press, Boca Raton, FL, 2023. ISBN: 978-1032015316
7. Mengüç, M.P. and Francoeur, M. *Light, Plasmonics and Particles* (edited, 26 Chapters with multiple authors) Elsevier, 2023. ISBN: 978-0323999014

EDITED CONFERENCE VOLUMES

8. Mengüç, M.P. (Founding Organizer and Editor)
   International Symposia on Radiative Transfer, Proceedings Series
   1995 Kusadasi; 1997 Kusadasi, 2001 Antalya; 2004 Istanbul: 2007 Bodrum.
   (Organized under the International Centre for Heat and Mass Transfer, ICHMT: A Special Issue with a number of peer-reviewed papers was published in JQSRT after each meeting) (The last three was organized with N. Selçuk)

BOOK CHAPTERS

1. R. Viskanta and M.P. Mengüç, "Modeling of Radiative Heat Transfer," *Encyclopedia of Environmental Control Technology,* Editor: P. Chermisinoff, Gulf Publishing Co., New York, Vol. 1, pp. 599-646, 1989.
2. R. Viskanta and M.P. Mengüç, "Principles of Radiative Heat Transfer in Combustion Systems," *Handbook of Heat and Mass Transfer- Vol. 4: Fundamentals of Combustion Systems,* Editor: P. Cheremisinoff, Gulf Publishing Co., New York, pp. 925-978, 1990.
3. M.P. Mengüç and B.W. Webb, "Radiative Heat Transfer," in *Fundamentals of Coal Combustion: Clean and Efficient Use,* Editor: L.D. Smoot, Elsevier Publishing Co., New York, 1993, pp. 375-430.
4. J.R. Howell and M.P. Mengüç, "Radiation," in *Handbook of Heat Transfer*, Chapter 7, Editors: W. Rohsenow, J. Hartnett, Y. Cho, McGraw Hill, 1998.
5. M. Pinar Mengüç, '*Radiation Transfer*,' (Introductory Chapter for the edited 9 Chapters), Handbook of Heat Transfer, Edited by F. Kulacki, Springer, 2018.
6. A. Didari, M. P. Mengüç, 'Computational Near-Field Radiative Heat Transfer and NF-RT-FDTD Algorihm,' *Annual Review in Heat Transfer,* Editor: Z. Zhang, Begell House, Vol. 23. 2020.
7. M. Pinar Mengüç and M. Francoeur, Chapter 1: Overview, in "*Light, Plasmonics and Particles*," M. Pinar Mengüç and M. Francoeur, Elsevier, 2023
8. V. Loke, H. Ertürk, M. Pinar Mengüç, Chapter 10: Discrete dipole approximation with surface interactions, in "*Light, Plasmonics and Particles*," M. Pinar Mengüç and M. Francoeur, Elsevier, 2023

9. A. Didari-Bader, M. Pinar Mengüç, Chapter 23: Biologically inspired structures and NFRT, in "*Light, Plasmonics and Particles*," M. Pinar Mengüç and M. Francoeur, Elsevier, May 2023.
10. M. Francoeur and M. Pinar Mengüç, Chapter 26: Future Directions, in "*Light, Plasmonics and Particles*," M. Pinar Mengüç and M. Francoeur, Elsevier, May 2023.
11 Tom G. Mackay, Amir Boag, V. A. Markel, Olivier J.F. Martin. M. Pinar Mengüç, Kevin Vync, Chapter 22: Theoretical Future: Vision 2030, Adventures in Contemporary Electromagnetic Theory, Springer, 2023. DOI: 10.1007/978-3-031-24617-3

PATENTS

Issued Patents (Chronological)

1. **Radiation Modulator Systems**
   Inventors: M.P. Mengüç, B. Walcott, M. Marra
   U.S. Patent No. 5,797,736
   Issued August 25, 1998.
2. **Nano-Scale Machining with Carbon Nanotubes**
   Inventors: R. Vallance, A.R. Rao, M.P. Mengüç
   U.S. Patent No. 6,660,959
   Issued December 9, 2003.
3. **Non-Intrusive Method and Apparatus for Characterizing Particles Based on Scattering Matrix Element Measurements Using Elliptically Polarized Light**
   Inventors: M.P. Mengüç, S. Manickavasagam
   U.S. Patent No. 6,721,051
   Issued April 13, 2004.
4. **Substrate Patterning by Electron Emission-Induced Displacement**
   Inventors: J.B. Reppert, J.B. Gaillard, B.C. Elliott, D.E. Dickel, A.R. Rao, M.P. Mengüç
   U.S. Patent No. 7,818,816
   Issued October 19, 2010.
5. **Nanoplasmonic Device with Nanoscale Cooling**
   Inventors: M.P. Mengüç, K. Sendur, A. Koşar
   European Patent EP2764763
   Granted in EU; corresponding patents in South Korea, Japan, Singapore, China, Thailand.
   Turkish Patent No. TR 2017 17340 T4.
6. **Flow System for Avoiding Agglomeration**
   Inventors: A. Koşar, K. Sendur, M.P. Mengüç
   Turkish Patent No. TR 2019 13359 T4
   Triadic patent family approved in the United States, European Union, and Japan (2021).
   Recognized as one of the "100 Patents in the 100th Year of the Turkish Republic."
7. **Silicon-Based Closed and Integrated Platform for the Investigation of Radiative Transfer at Micro- and Nano-Scales**
   Inventors: B. Elçioğlu, T. Okutucu-Öztürk, M.P. Mengüç
   Turkish Patent, Issued 2024.

APPENDIX A:

PUBLICATIONS

REFEREED JOURNAL ARTICLES

1. M.P. Mengüç and R. Viskanta, “Comparison of Radiative Transfer Approximations for a Highly Forward Scattering Planar Medium," Journal of Quantitative Spectroscopy and Radiative Transfer, Vol. 29, No. 5, pp. 381-394, 1983.
2. M.P. Mengüç and R. Viskanta, "Radiative Transfer in Three-Dimensional Rectangular Enclosures Containing In-Homogeneous, Anisotropically Scattering Media," Journal of Quantitative Spectroscopy and Radiative Transfer, Vol. 33, pp. 533-549, 1985. (Selected as one of the top 20 papers of JQSRT for the 50th anniversary of the Journal, 2009.)
3. M.P. Mengüç and R. Viskanta, "On the Radiative Properties of the Polydispersions: A Simplified Approach," Combustion Science and Technology, Vol. 44, pp. 143-159, 1985.
4. M.P. Mengüç, R. Viskanta, and C.R. Ferguson, "Multidimensional Modeling of Radiative Transfer in Diesel Engines," SAE Transactions, SAE Paper No: 850503, 1985.
5. M.P. Mengüç and R. Viskanta, "Radiation Transfer in a Cylindrical Vessel Containing High Temperature Corium Aerosols," Nuclear Science and Engineering, Vol. 92, pp. 570-583, 1986.
6. M.P. Mengüç and R. Viskanta, "Radiative Transfer in Axisymmetric, Finite Cylindrical Enclosures," ASME Journal of Heat Transfer, Vol. 108, pp. 271-276, 1986.
7. M.P. Mengüç, W.G. Cummings III, and R. Viskanta, "Radiative Transfer in a Gas Turbine Combustor," AIAA Journal of Propulsion and Power, Vol. 2, pp. 241-247, 1986.
8. M.P. Mengüç and R. Viskanta, "A Sensitivity Analysis for Radiative Heat Transfer in Pulverized-Coal Fired Furnaces," Combustion Science and Technology, Vol. 51, Nos. 1 & 2, p. 51, 1986.
9. M.P. Mengüç and R. Viskanta, "An Assessment of Spectral Radiative Heat Transfer Predictions for a Pulverized Coal Fired Furnace," Heat Transfer - 1986, Hemisphere, Washington, D.C., Vol. 2, pp. 815-820, 1986.
10. D.W. Mackowski, R.A. Altenkirch, and M.P. Mengüç, "Extinction and Absorption Coefficients of Cylindrically-Shaped Soot Particles," Combustion Science and Technology, Vol. 53, pp. 399-411, 1987.
11. R. Viskanta and M.P. Mengüç, "Radiative Heat Transfer in Combustion Systems," Progress in Energy and Combustion Sciences, Vol. 13, pp. 97-160, 1987.
12. M.P. Mengüç and R.K. Iyer, "Modeling of Radiation Transfer Using Multiple Spherical Harmonics Approximation," Journal of Quantitative Spectroscopy and Radiative Transfer, Vol. 39, pp. 445-462, 1988.
13. M.P. Mengüç and R. Viskanta, "Effect of Fly-Ash Particles on Spectral and Total Radiation Blockage," Combustion Science and Technology, Vol. 60, pp. 97-115, 1988.
14. D.W. Mackowski, R.A. Altenkirch, M.P. Mengüç, and K. Saito, "Radiative Properties of Chain-Agglomerated Soot Formed in Hydrocarbon Diffusion Flames," Proceedings of the Twenty-Second Symposium (International) on Combustion, The Combustion Institute, 1989, pp. 1263-1269.
15. R.K. Iyer and M.P. Mengüç, "Quadruple Spherical Harmonics Approximation for Radiative Transfer in Two-Dimensional Rectangular Enclosures," Journal of Thermophysics and Heat Transfer, Vol. 3, pp. 266-273, 1989.
16. K.R. Varma and M.P. Mengüç, "Effects of Particulate Concentrations on Temperature and Heat Flux Distributions in a Pulverized Coal-Fired Furnace," International Journal of Energy Research, Vol. 13, pp. 555-572, 1989.
17. D.W. Mackowski, R.A. Altenkirch, and M.P. Mengüç, "A Comparison of Electromagnetic Wave and Radiative Transfer Equation Analyses of a Coal Particle Surrounded by a Soot Cloud," Combustion and Flame, Vol. 76, pp. 415-420, 1989.
18. R. Viskanta and M.P. Mengüç, "Radiative Transfer in Dispersed Media," ASME Applied Mechanics Reviews, Vol. 42, pp. 241-259, 1989.

19. M.P. Mengüç and S. Subramaniam, "A Step Phase Function Approximation for the Determination of the Effective Scattering Phase Function of Particles," Journal of Quantitative Spectroscopy and Radiative Transfer, Vol. 43, pp. 253-262, 1990.
20. D.W. Mackowski, R.A. Altenkirch, and M.P. Mengüç, "Internal Absorption Cross Sections in a Stratified Sphere," Applied Optics, Vol. 29, pp. 1551-1559, 1990.
21. B.M. Agarwal and M.P. Mengüç, "Single and Multiple Scattering of Collimated Radiation in an Axisymmetric System," International Journal of Heat and Mass Transfer, Vol. 34, No. 3, pp. 633-647, 1991.
22. S. Subramaniam and M.P. Mengüç, "Solution of Inverse Radiation Problem for Inhomogeneous and Anisotropically Scattering Medium Using a Monte-Carlo Technique," International Journal of Heat and Mass Transfer, Vol. 34, No. 1, pp. 253-266, 1991.
23. M.P. Mengüç and S. Subramaniam, "Radiative Transfer Through an Inhomogeneous Fly-Ash Cloud: Effects of Temperature and Wavelength Dependent Optical Properties," Numerical Heat Transfer, Part A: Applications, Vol. 21, pp. 261-273, 1992.
24. J.N. Funk, M.P. Mengüç, K.A. Tagavi, and C.J. Cremers, "A Semi-Analytical Method to Predict Printed Circuit Board Package Temperatures," IEEE Transactions: Components, Hybrids and Manufacturing Technology, Vol. 15, No. 5, pp. 675-684, 1992.
25. M.P. Mengüç and S. Manickavasagam, "Inverse Radiation Problem in Axisymmetric Cylindrical Media," AIAA Journal of Thermophysics and Heat Transfer, Vol. 7, No. 3, pp. 479-486, 1993.
26. W.M. Godfrey, K. Tagavi, C.J. Cremers, and M.P. Mengüç, "Interactive Thermal Modeling of Electronic Circuit Boards," IEEE Transactions: Components, Hybrids and Manufacturing Technology, Vol. 16, No. 8, pp. 978-985, 1993.
27. S. Manickavasagam and M.P. Mengüç, "Effective Optical and Radiative Properties of Coal Particles as Determined from FT-IR Spectroscopy Experiments," Energy and Fuel, Vol. 7, No. 6, pp. 860-869, 1993.
28. M.P. Mengüç and P. Dutta, "Scattering Tomography and Application to Sooting Diffusion Flames," ASME Journal of Heat Transfer, Vol. 116, No. 1, pp. 144-151, 1994. (ASME Heat Transfer Division Best Paper Award.)
29. M.P. Mengüç, S. Manickavasagam, and D.A. D'sa, "Determination of Radiative Properties of Pulverized Coal Particles from Experiments," Fuel, Vol. 73, No. 4, pp. 613-625, 1994.
30. B.M. Vaglieco, O. Monda, F.E. Corcione, and M.P. Mengüç, "Optical and Radiative Properties of Particulates at Diesel Engine Exhaust," Combustion Science and Technology, Vol. 102, pp. 283-299, 1994.
31. J.A. Thomasson, M.P. Mengüç, and S.A. Shearer, "A Radiative Transfer Model for Relating NIR and Micronaire Measurements of Cotton Fibers," Transactions of the ASAE, Vol. 38, pp. 367-377, 1995.
32. Z. Ivezic and M.P. Mengüç, "An Investigation of Dependent/Independent Scattering Regimes for Soot Particles Using Discrete Dipole Approximation," International Journal of Heat and Mass Transfer, Vol. 39, No. 7, pp. 811-822, 1996.
33. D. Bhanti, S. Manickavasagam, and M.P. Mengüç, "Identification of Non-Homogeneous Spherical Particles from their Scattering Matrix Elements," Journal of Quantitative Spectroscopy and Radiative Transfer, Vol. 56, No. 4, pp. 591-608, 1996.
34. S. Manickavasagam and M.P. Mengüç, "Scattering Matrix Elements of Fractal-like Soot Agglomerates," Applied Optics, Vol. 36, No. 6, pp. 1337-1351, 1997. (Correction: Applied Optics, Vol. 36, No. 27, p. 7008, 1997.)
35. Z. Ivezic, M.P. Mengüç, and T.G. Knauer, "A Procedure to Determine the Onset of Soot Agglomeration from Multiwavelength Experiments," Journal of Quantitative Spectroscopy and Radiative Transfer, Vol. 57, No. 6, pp. 859-865, 1997.
36. M.P. Mengüç and S. Manickavasagam, "Characterization of Size and Structure of Agglomerates and Inhomogeneous Particles via Polarized Light," International Journal of Engineering Sciences, Vol. 36, pp. 1569-1593, 1998.
37. S. Mukerji, J.M. McDonough, M.P. Mengüç, S. Manickavasagam, and S. Chung, "Chaotic Map Models of Soot Fluctuations in Turbulent Diffusion Flames," International Journal of Heat and Mass Transfer, 1998.

38. S. Manickavasagam and M.P. Mengüç, "Scattering Matrix Elements of Coated Infinite-Length Cylinders," Applied Optics, Vol. 37, No. 12, pp. 2473-2482, 1998.
39. A. Fowler and M.P. Mengüç, "Propagation of Focused and Multibeam Laser Energy in Biological Tissues," ASME Journal of Biomechanical Engineering, Vol. 122, pp. 534-540, 2000.
40. C.L. Crofcheck, F.A. Payne, C.L. Hicks, M.P. Mengüç, and S.E. Nokes, "Fiber Optic Sensor Response to Low Levels of Fat in Skim Milk," Journal of Food Process Engineering, Vol. 23, pp. 163-175, 2000.
41. C.L. Crofcheck, F.A. Payne, C.L. Hicks, M.P. Mengüç, and S.E. Nokes, "Fiber Optic Sensor Response to High Levels of Fat in Cream," Transactions of the ASAE, Vol. 45, No. 1, pp. 171-178, 2002.
42. C.L. Crofcheck, F.A. Payne, and M.P. Mengüç, "Characterization of Milk Properties Using a Radiative Transfer Model," Applied Optics, Vol. 41, No. 10, p. 2028, 2002.
43. B. Wong and M.P. Mengüç, "Depolarization of Radiation by Foams," Journal of Quantitative Spectroscopy and Radiative Transfer, Vol. 73, pp. 273-284, 2002.
44. B. Wong and M.P. Mengüç, "Comparison of Monte Carlo Techniques to Predict the Propagation of a Collimated Beam in Participating Media," Numerical Heat Transfer: Part B, Vol. 42, pp. 119-140, 2002.
45. C. Klusek, S. Manickavasagam, and M.P. Mengüç, "Compendium of Scattering Matrix Element Profiles for Soot Agglomerates," Journal of Quantitative Spectroscopy and Radiative Transfer, Vol. 79-80, pp. 839-859, 2003.
46. M.M. Aslan, J. Yamada, M.P. Mengüç, and A. Thomasson, "Characterization of Individual Cotton Fibers via Light Scattering: Experiments," AIAA Journal of Thermophysics and Heat Transfer, Vol. 17, No. 4, pp. 442-449, 2003.
47. D.-Kui Qing, M.P. Mengüç, F. Payne, and M.G. Danao, "Fluorescence Correlation Spectroscopy for Detection of Trace Amounts of Biological Agents," Applied Optics, Vol. 42, No. 16, pp. 2987-2994, 2003.
48. C.A. Trinkle, P. Kichambare, R.R. Vallance, B.T. Wong, M.P. Mengüç, B. Sadanadan, A.R. Rao, A. Bah, and K. Javed, "Thermal Transport During Nanoscale Machining by Field Emission of Electrons from Carbon Nanotubes," ASME Journal of Heat Transfer, Vol. 125, No. 4, p. 546, 2003.
49. B.T. Wong and M.P. Mengüç, "Monte Carlo Methods in Radiative Transfer and Electron Beam Processing," Journal of Quantitative Spectroscopy and Radiative Transfer, Vol. 84, pp. 437-450, 2004.
50. R. Vaillon, B.T. Wong, and M.P. Mengüç, "Polarized Radiative Transfer in a Particle-Laden Transparent Medium via Monte Carlo Method," Journal of Quantitative Spectroscopy and Radiative Transfer, Vol. 84, pp. 383-394, 2004.
51. C. Saltiel, Q. Chen, S. Manickavasagam, L.S. Schadler, R.W. Siegel, and M.P. Mengüç, "Identification of Dispersion Behavior of Surface-Treated Nano-Scale Powders," Journal of Nanoparticle Research, Vol. 6, pp. 35-46, 2004.
52. B.T. Wong, M.P. Mengüç, and R.R. Vallance, "Nanoscale Machining via Electron Beam and Laser Processing," ASME Journal of Heat Transfer, Vol. 126, pp. 566-576, 2004. (Finalist for JHT Best Paper Award, 2005.)
53. G. Videen, M.M. Aslan, and M.P. Mengüç, "Characterization of Metallic Nanoparticles via Surface Wave Scattering: A. Theoretical Framework," Journal of Quantitative Spectroscopy and Radiative Transfer, Vol. 93, pp. 195-206, 2005.
54. M.M. Aslan, M.P. Mengüç, and G. Videen, "Characterization of Metallic Nanoparticles via Surface Wave Scattering: B. Physical Concept and Numerical Experiments," Journal of Quantitative Spectroscopy and Radiative Transfer, Vol. 93, pp. 207-217, 2005.
55. C. Saltiel, S. Manickavasagam, M.P. Mengüç, and R. Andrews, "Light Scattering and Dispersion Behavior of Multi-Walled Carbon Nanotubes," Journal of the Optical Society of America A, Vol. 22, No. 8, pp. 1546-1554, 2005.
56. C.L. Crofcheck, J. Wade, M.M. Aslan, and M.P. Mengüç, "Effect of Fat and Casein Particles in Milk on the Scattering of Elliptically Polarized Light," Transactions of the ASAE, Vol. 48, No. 3, pp. 1147-1155, 2005. (ASABE Honorable Mention Paper Award, 2006.)
57. B.T. Wong, M.P. Mengüç, and R.R. Vallance, "Sequential Nano-Patterning Using Electron and Laser Beams: A Numerical Methodology," Journal of Computational and Theoretical Nanoscience, Vol. 3, No. 2, pp. 1-12, 2006.

58. P. Kichambare, R.R. Vallance, B. Sadanadan, A.M. Rao, K. Javed, and M.P. Mengüç, "Growth of Tungsten Oxide Nanorods with Carbon Caps," Journal of Nanoscience and Nanotechnology, Vol. 6, pp. 536-540, 2006.
59. K.-F. Hii, R.R. Vallance, S.B. Chickkaramanahalli, M.P. Mengüç, and A. Rao, "Characterization of Field Emission from Carbon Nanotubes at Small Distances," Journal of Vacuum Science and Technology B, Vol. 24, No. 3, pp. 1081-1087, 2006.
60. M.M. Aslan, C.L. Crofcheck, D. Tao, and M.P. Mengüç, "Evaluation of Microbubble Size and Gas Hold-Up in Two-Phase Gas–Liquid Columns via Scattered Light Measurements," Journal of Quantitative Spectroscopy and Radiative Transfer, Vol. 101, pp. 527-539, 2006.
61. M.M. Aslan, M.P. Mengüç, S. Manickavasagam, and C. Saltiel, "Size and Shape Prediction of Colloidal Metal Oxide MgBaFeO Particles from Light Scattering Measurements," Journal of Nanoparticle Research, Vol. 8, No. 6, pp. 981-994, 2006.
62. J.N. Swamy, C. Crofcheck, and M.P. Mengüç, "A Monte Carlo Ray Tracing Study of Polarized Light Propagation in Liquid Foams," Journal of Quantitative Spectroscopy and Radiative Transfer, Vol. 101, pp. 527-539, 2007.
63. E.A. Hawes, J.T. Hastings, C. Crofcheck, and M.P. Mengüç, "Spectrally Selective Heating of Nanosized Particles by Surface Plasmon Resonance," Journal of Quantitative Spectroscopy and Radiative Transfer, Vol. 101, pp. 527-539, 2007.
64. P.G. Venkata, M.M. Aslan, M.P. Mengüç, and G. Videen, "Surface Plasmon Scattering Patterns of Gold Nanoparticles and 2D Agglomerates," ASME Journal of Heat Transfer, Vol. 129, pp. 59-71, 2007.
65. M. Francoeur, P.G. Venkata, and M.P. Mengüç, "Sensitivity Analysis for Characterization of Gold Nanoparticles and 2D Agglomerates via Surface Plasmon Scattering Patterns," Journal of Quantitative Spectroscopy and Radiative Transfer, Vol. 106, pp. 44-55, 2007.
66. B.T. Wong, M.P. Mengüç, and R.R. Vallance, "Thermal Conduction Induced by Electron Beam," International Journal of Heat and Mass Transfer, Vol. 50, pp. 5099-5107, 2007.
67. J.A. Sánchez, B.T. Wong, M.P. Mengüç, and P. Albella, "Field Emission and Electron Deposition Profiles as a Function of Carbon Nanotube Tip Geometries," Journal of Applied Physics, Vol. 101, 114313, 2007.
68. R. Charnigo, M. Francoeur, M.P. Mengüç, A. Brock, M. Leichter, and C. Srinivasan, "Nanoparticle Characterization via Derivatives of Scattering Profiles," Journal of the Optical Society of America A, Vol. 24, No. 9, pp. 2578-2589, 2007.
69. J.A. Sánchez and M.P. Mengüç, "Phase Change Phenomena During Electron-Beam-Based Nano-Machining: Molecular Dynamics Simulations," Physical Review B, Vol. 76, 224104, 2007.
70. M. Kozan, J. Thangala, R. Bogale, M.P. Mengüç, and M.K. Sunkara, "In-Situ Characterization of Dispersion Stability of WO3 Nanoparticles and Nanowires," Journal of Nanoparticle Research, Vol. 10, No. 4, pp. 599-612, 2008.
71. M. Francoeur and M.P. Mengüç, "Role of Fluctuational Electrodynamics Theory in Near-Field Radiative Heat Transfer," Journal of Quantitative Spectroscopy and Radiative Transfer, Vol. 109, pp. 280-293, 2008.
72. M. Kozan and M.P. Mengüç, "Exploration of Fractal Nature of WO3 Nanowire Aggregates," Journal of Quantitative Spectroscopy and Radiative Transfer, Vol. 109, pp. 380-393, 2008.
73. J.A. Sánchez and M.P. Mengüç, "Geometry Dependence on the Electrostatic and Thermal Response of a Carbon Nanotube During Field Emission," Nanotechnology, Vol. 19, 075702, 2008.
74. J.A. Sánchez and M.P. Mengüç, "Melting and Evaporation of Cu and Ni Films During Electron-Beam Heating," Journal of Applied Physics, Vol. 103, 054316, 2008.
75. J.A. Sánchez, K.-F. Hii, M.P. Mengüç, and R.R. Vallance, "Heat Transfer During Field Emission from Carbon Nanotubes," AIAA Journal of Thermophysics and Heat Transfer, Vol. 22, No. 2, 2008.
76. E.A. Hawes, J.T. Hastings, C. Crofcheck, and M.P. Mengüç, "Spatially Selective Melting and Evaporation of Nanosized Gold Particles," Optics Letters, Vol. 33, No. 12, pp. 1383-1385, 2008.
77. M. Francoeur, M.P. Mengüç, and R. Vaillon, "Near-Field Radiative Heat Transfer Enhancement via Surface Phonon-Polaritons Coupling in Thin Films," Applied Physics Letters, 2008.
78. I. Kunadian, R. Andrews, D. Qian, and M.P. Mengüç, "Growth Kinetics of MWCNTs Synthesized by Continuous-Feed CVD Method," Carbon, Vol. 47, pp. 384-395, 2009.

79. I. Kunadian, R. Andrews, D. Qian, and M.P. Mengüç, "Thermoelectric Power Generation Using Doped MWCNTs," Carbon, Vol. 47, pp. 589-601, 2009.
80. I. Kunadian, R. Andrews, M.P. Mengüç, and D. Qian, "Multiwalled Carbon Nanotube Deposition Profiles Within a CVD Reactor: An Experimental Study," Chemical Engineering Science, Vol. 64, No. 7, pp. 1503-1510, 2009.
81. J.N. Swamy, C. Crofcheck, and M.P. Mengüç, "Time Dependent Scattering Properties of Slow Decaying Foams," Colloids and Surfaces A: Physicochemical and Engineering Aspects, Issues 1–3, pp. 80-86, 2009.
82. B.T. Wong and M.P. Mengüç, "Analysis of Electrical and Thermal Responses of n-Doped Silicon to Impinging Electron Beam and Joule Heating," International Journal of Heat and Mass Transfer, Vol. 52, Issues 11–12, pp. 2632-2645, 2009.
83. A. Thomasson, S. Manickavasagam, and M.P. Mengüç, "Cotton Fiber Characterization with FTIR and Laser Techniques," Applied Spectroscopy, Vol. 63, No. 3, pp. 321-330, 2009.
84. M. Francoeur, M.P. Mengüç, and R. Vaillon, "Solution of Near-Field Thermal Radiation in One-Dimensional Layered Media Using Dyadic Green's Functions and the Scattering Matrix Method," Journal of Quantitative Spectroscopy and Radiative Transfer, Vol. 110, No. 18, pp. 2002-2018, 2009.
85. K.-F. Hii, R. Vallance, and M.P. Mengüç, "Design, Operation, and Motion Characteristics of a Precise Piezoelectric Linear Motor," Precision Engineering, Vol. 34, No. 2, pp. 231-241, 2010.
86. B. Gay, R. Vaillon, and M.P. Mengüç, "Polarization Imaging of Multiply Scattered Radiation Based on Integral-Vector Monte Carlo Method," Journal of Quantitative Spectroscopy and Radiative Transfer, Vol. 111, No. 2, pp. 287-294, 2010.
87. B.T. Wong and M.P. Mengüç, "A Unified Monte Carlo Treatment of Transport of Electromagnetic Energy, Electrons, and Phonons in Absorbing and Scattering Media," Journal of Quantitative Spectroscopy and Radiative Transfer, Vol. 111, No. 3, pp. 399-419, 2010.
88. M. Francoeur, M.P. Mengüç, and R. Vaillon, "Near-Field Radiative Heat Exchanges Between Two Thin Films Supporting Surface Phonon-Polaritons," Journal of Applied Physics, Vol. 107, No. 3, 034313, 2010.
89. J.N. Swamy, C. Crofcheck, and M.P. Mengüç, "Polarized Light Based Scheme to Monitor Column Performance in a Continuous Foam Fractionation Column," Journal of Biological Engineering, 2010.
90. M. Francoeur, M.P. Mengüç, and R. Vaillon, "Local Density of Electromagnetic States Within a Nanometric Gap Formed Between Two Thin Films Supporting Surface Phonon-Polaritons," Journal of Physics D: Applied Physics, Vol. 43, 075501, 2010.
91. V. Loke and M.P. Mengüç, "Surface Waves and AFM Probe–Particle Near-Field Coupling: Discrete Dipole Approximation with Surface Interaction," Journal of the Optical Society of America A, Vol. 27, No. 10, pp. 2293-2303, 2010. (Selected to Spotlight in Optics.)
92. B.T. Wong, M. Francoeur, and M.P. Mengüç, "A Monte Carlo Simulation for Phonon Transport Within Silicon Structures at Nanoscales with Heat Generation," International Journal of Heat and Mass Transfer, Vol. 54, Issues 9–10, pp. 1825-1838, 2011.
93. R. Charnigo, M. Francoeur, P. Kenkel, M.P. Mengüç, B. Hall, and C. Srinivasan, "Estimating Quantitative Features of Nanoparticles Using Multiple Derivatives of Scattering Profiles," Journal of Quantitative Spectroscopy and Radiative Transfer, Vol. 112, No. 8, pp. 1369-1382, 2011.
94. M. Francoeur, R. Vaillon, and M.P. Mengüç, "Impacts of Thermal Effects on the Performance of Nanoscale-Gap Thermophotovoltaic Power Generators," IEEE Transactions on Energy Conversion, Vol. 26, No. 2, pp. 686-698, 2011.
95. J.R. Howell and M.P. Mengüç, "The JQSRT Web-Based Configuration Factor Catalog: A Listing of Relations for Common Geometries," Journal of Quantitative Spectroscopy and Radiative Transfer, Vol. 112, No. 5, pp. 910-912, 2011.
96. M. Francoeur, R. Vaillon, and M.P. Mengüç, "Control of Near-Field Radiative Heat Transfer via Surface Phonon-Polaritons Coupling in Thin Films," Journal of Applied Physics A, Vol. 103, No. 3, pp. 547-550, 2011.
97. K. Sendur, A. Koşar, and M.P. Mengüç, "Localized Radiative Energy Transfer from a Plasmonic Bow-Tie Nanoantenna to a Magnetic Thin-Film Stack," Journal of Applied Physics A, Vol. 103, No. 3, pp. 703-707, 2011.

98. V. Loke, T.A. Nieminen, and M.P. Mengüç, "DDA with Surface Interaction: Computational Toolbox for MATLAB," Journal of Quantitative Spectroscopy and Radiative Transfer, Vol. 112, No. 11, pp. 1711-1725, 2011.
99. C.A. Jarro, E.U. Donev, M.P. Mengüç, and J.T. Hastings, "Effects of a Silicon Probe on Gold Nanoparticles on Glass Under Evanescent Illumination," Optics Express, Vol. 19, No. 13, pp. 12679-12687, 2011.
100. M. Francoeur, R. Vaillon, and M.P. Mengüç, "Coexistence of Multiple Regimes for Near-Field Thermal Radiation Between Two Layers Supporting Surface Phonon-Polaritons in the Infrared," Physical Review B, Vol. 84, 2011.
101. R. Charnigo, M. Francoeur, P. Kenkel, M.P. Mengüç, B. Hall, and C. Srinivasan, "Credible Intervals for Nanoparticle Characteristics," Journal of Quantitative Spectroscopy and Radiative Transfer, Vol. 113, No. 2, pp. 182-193, 2012.
102. C.A. Jarro, E.U. Donev, M.P. Mengüç, and J.T. Hastings, "Silver Patterning Using an Atomic Force Microscope Tip and Laser-Induced Chemical Deposition from Liquids," Journal of Vacuum Science & Technology B, Vol. 30, 06FD02, 2012.
103. S. Muhsincan, Y. Teksen, K. Sendur, M.P. Mengüç, H.F. Yagcı Acar, and A. Koşar, "Heat Transfer Enhancement with Actuation of Magnetic Nanoparticles Suspended in a Base Fluid," Journal of Applied Physics A, Vol. 112, 064320, 2012.
104. E. Ogut, M.P. Mengüç, and K. Sendur, "Integrating Magnetic Heads with Plasmonic Nanostructures in Multilayer Configurations," IEEE Transactions on Magnetics, Vol. 49, No. 7, pp. 3687-3690, 2013.
105. S. Muhsincan, Y. Teksen, B. Şahin, K. Sendur, M.P. Mengüç, and A. Koşar, "Boiling Heat Transfer Enhancement of Magnetically Actuated Nanofluids," Applied Physics Letters, Vol. 102, 163107, 2013.
106. V. Loke, G.M. Huda, E.U. Donev, V. Schmidt, J.T. Hastings, M.P. Mengüç, and T. Wriedt, "Comparison Between Discrete Dipole Approximation and Other Modeling Methods for the Plasmonic Response of Gold Nanospheres," Applied Physics B: Lasers and Optics, Vol. 115, No. 2, pp. 237-246, 2014.
107. B.T. Wong, M. Francoeur, V.N.-S. Bong, and M.P. Mengüç, "Coupling of Near-Field Thermal Radiative Heating and Phonon Monte Carlo Simulation: Assessment of Temperature Gradient in Doped Silicon Thin Film," Journal of Quantitative Spectroscopy and Radiative Transfer, Vol. 143, pp. 46-55, 2014.
108. A. Didari and M.P. Mengüç, "Analysis of Near-Field Radiation Transfer Within Nano-Gaps Using FDTD Method," Journal of Quantitative Spectroscopy and Radiative Transfer, Vol. 146, pp. 214-226, 2014.
109. M. Karimzadehkhouei, S. Yalcin, K. Sendur, M.P. Mengüç, and A. Koşar, "Pressure Drop and Heat Transfer Characteristics of Nanofluids in Horizontal Microtubes Under Thermally Developing Flow Conditions," Experimental Thermal and Fluid Science, Vol. 67, pp. 37-47, 2015.
110. A. Didari and M.P. Mengüç, "Near-Field Thermal Emission Between Structured Surfaces Separated by Nano-Gaps," Journal of Quantitative Spectroscopy and Radiative Transfer, Vol. 158, pp. 43-51, 2015.
111. A. Didari and M.P. Mengüç, "Near- to Far-Field Coherent Thermal Emission by Surfaces Coated by Nanoparticles: Evaluation of Effective Medium Theory," Optics Express, Vol. 23, No. 11, A547-A552, 2015.
112. A. Didari and M.P. Mengüç, "Near-Field Thermal Radiation Transfer by Mesoporous Metamaterials," Optics Express, Vol. 23, No. 19, A1253-A1258, 2015.
113. S. Çelik, R. Family, and M.P. Mengüç, "Analysis of Perlite and Pumice Based Building Insulation Materials," Journal of Building Engineering, Vol. 6, pp. 105-111, 2016.
114. S.T. Moghaddam, H. Ertürk, and M.P. Mengüç, "Enhancing Local Absorption Patterns Within Gold Nanostructures on a Dielectric Surface Under an AFM Probe and with Evanescent-Wave Illumination," Journal of Quantitative Spectroscopy and Radiative Transfer, Vol. 178, pp. 124-133, 2016.
115. M. Karimzadehkhouei, K. Sendur, M.P. Mengüç, Y. Leblebici, and A. Koşar, "Increasing the Stability of Nanofluids with Cavitating Flows in Micro Orifices," Applied Physics Letters, Vol. 109, 104101, 2016.

116. M. Karimzadehkhouei, M. Shojaeian, K. Sendur, M.P. Mengüç, and A. Koşar, "The Effect of Nanoparticle Type and Nanoparticle Mass Fraction on Enhancement in Pool Boiling," International Journal of Heat and Mass Transfer, Vol. 109, pp. 157-166, 2017.
117. R. Family and M.P. Mengüç, "Materials for Radiative Cooling: A Review," Procedia Environmental Sciences, Vol. 38, pp. 752-759, 2017.
118. F.K. Khosroshahi, H. Ertürk, and M.P. Mengüç, "Optimization of Spectral Selective Si/SiO2 Based Filters for Thermophotovoltaic Devices," Journal of Quantitative Spectroscopy and Radiative Transfer, Vol. 198, pp. 123-131, 2017.
119. M.A. Kecebaş, M.P. Mengüç, A. Koşar, and K. Sendur, "Passive Radiative Cooling Design with Broadband Optical Thin-Film Filters," Journal of Quantitative Spectroscopy and Radiative Transfer, Vol. 198, pp. 179-186, 2017.
120. S.T. Moghaddam, D. Avşar, H. Ertürk, and M.P. Mengüç, "Effect of Probe Location on the Absorption by an Array of Gold Nanoparticles on a Dielectric Surface," Journal of Quantitative Spectroscopy and Radiative Transfer, Vol. 198, pp. 106-113, 2017.
121. A. Didari and M.P. Mengüç, "A Design Tool for Near-Field Radiative Transfer: The Developmental Steps of the NF-RT-FDTD Code," Journal of Quantitative Spectroscopy and Radiative Transfer, Vol. 198, pp. 95-105, 2017.
122. M. Karimzadehkhouei, M. Sezen, K. Sendur, M.P. Mengüç, and A. Koşar, "Subcooled Flow Boiling Heat Transfer of Al2O3/Water Nanofluids in Horizontal Microtubes and the Effect of Surface Characteristics of Nanoparticle Deposition," Applied Thermal Engineering, Vol. 127, pp. 536-546, 2017.
123. A. Didari, E.B. Elcioğlu, T. Okutucu-Özyurt, and M.P. Mengüç, "Near-Field Radiative Transfer in Spectrally Tunable Double-Layer Phonon-Polaritonic Metamaterials," Journal of Quantitative Spectroscopy and Radiative Transfer, Vol. 212, pp. 120-127, 2018.
124. H.N. Mohammed and M.P. Mengüç, "Solar Radiation Exergy and Quality Performance for Iraq and Turkey," International Journal of Exergy, Vol. 25, No. 4, pp. 364-385, 2018.
125. M. Karimzadehkhouei, A.K. Sadaghiani, A.R. Motezakker, S. Akgönül, A. Ozbey, K. Sendur, M.P. Mengüç, and A. Koşar, "Experimental and Numerical Investigation of Inlet Temperature Effect on Convective Heat Transfer of Al2O3/Water Nanofluid Flows in Microtubes," Heat Transfer Engineering, 2018.
126. L. Al-Gebory, M.P. Mengüç, A. Koşar, and K. Sendur, "Effect of Electrostatic Stabilization on Thermal Radiation Transfer in Nanosuspensions: Photo-Thermal Energy Conversion Applications," Renewable Energy, Vol. 119, pp. 625-640, 2018.
127. M. Karimzadehkhouei, M. Shojaeian, A.K. Sadaghiani, K. Sendur, M.P. Mengüç, and A. Koşar, "Entropy Generation Analyses of Laminar Flows of Water-Based Nanofluids in Horizontal Minitubes Under Constant Flux Conditions," Entropy, Vol. 20, 242, 2018.
128. H.N. Mohammed and M.P. Mengüç, "Energy and Exergy Analyses of Spectrally Selective Surfaces for CSP Systems," International Journal of Exergy, Vol. 27, No. 1, pp. 81-104, 2018.
129. L. Al-Gebory and M.P. Mengüç, "The Effect of pH Value on Particle Agglomeration and Radiative Transfer in Nanoparticle Suspensions," Journal of Quantitative Spectroscopy and Radiative Transfer, Vol. 219, pp. 46-60, 2018.
130. R.R.J. Al-Doury and M.P. Mengüç, "Static and Dynamic Analyses for the Exergetic, Exergoeconomic, and Environmental Assessment of a High-Performance Building," International Journal of Exergy, Vol. 27, No. 3, 2018.
131. R. Family and M.P. Mengüç, "Analysis of Sustainable Materials for Radiative Cooling Potential in Buildings," Sustainability, Vol. 10, 3049, 2018.
132. C. Keskin and M.P. Mengüç, "On Occupant Behavior and Innovation Studies Toward High Performance Buildings: A Transdisciplinary Approach," Sustainability, Vol. 10, 3567, 2018.
133. A. Didari and M.P. Mengüç, "A Biomimicry Design for Nanoscale Radiative Cooling Applications Inspired by Morpho Didius Butterfly," Scientific Reports, Vol. 8, 16891, 2018.
134. Z.R. Fathi, M.P. Mengüç, and H. Ertürk, "Plasmon Coupling Between Complex Gold Nanostructures and a Dielectric Substrate," Applied Optics, Vol. 57, 8954-8963, 2018.

135. J.H. Howell and M.P. Mengüç, "Challenges for Radiative Transfer I: Toward the Effective Solution of Conjugate Heat Transfer Problems," Journal of Quantitative Spectroscopy and Radiative Transfer, Vol. 221, pp. 253-259, 2018.
136. A. Didari and M.P. Mengüç, "Biomimicry Designs for Passive Optical Solutions for Nanoscale Radiative Cooling Applications," SPIE Proceedings, Vol. 10731, 2018.
137. E.B. Elcioğlu, A. Didari, T. Okutucu-Özyurt, and M.P. Mengüç, "Tunable Near-Field Radiative Transfer by III–V Group Compound Semiconductors," Journal of Physics D: Applied Physics, Vol. 52, 105104, 2019.
138. D. Avşar, H. Ertürk, and M.P. Mengüç, "Plasmonic Responses of Metallic/Dielectric Core-Shell Nanoparticles on a Dielectric Substrate," Materials Research Express, Vol. 6, 2019.
139. C.D. Şahin and M.P. Mengüç, "An Image Registration Method for Mobile Device-Based Multispectral Optical Diagnostics for Buildings," Applied Optics, Vol. 58, pp. 7165, 2019.
140. M. Karimzadehkhouei et al., "Experimental and Numerical Investigation of Inlet Temperature Effect on Convective Heat Transfer of Gamma-Al2O3/Water Nanofluid Flows in Microtubes," Heat Transfer Engineering, Vol. 40, pp. 738-752, 2019.
141. S. Çelik and M.P. Mengüç, "Thermal Analysis of Perlite Reinforced Concrete Panels at Varying Moisture Content," Heat Transfer Research, 2020.
142. C. Keskin and M.P. Mengüç, "An Adaptive Vent System for Localized and Customized Thermal Management in Buildings," ASME Journal of Heat Transfer, 2020.
143. D. Avşar, H. Ertürk, and M.P. Mengüç, "Absorption and Plasmon Resonance of Bi-Metallic Core-Shell Nanoparticles on a Dielectric Substrate," Journal of Quantitative Spectroscopy and Radiative Transfer, Vol. 241, 106684, 2020.
144. M.A. Kecebaş, M.P. Mengüç, A. Koşar, and K. Sendur, "Spectrally Selective Filter Design for Passive Radiative Cooling," Journal of the Optical Society of America B, Vol. 37, pp. 1173-1182, 2020.
145. R.R.J. Al-Doury, S. Ozkan, and M.P. Mengüç, "Cascaded Thermodynamic and Environmental Analyses of Energy Generation Modalities of a High-Performance Building Based on Real-Time Measurements," Entropy, Vol. 22, 445, 2020.
146. E. Yildiz, A.M. Başol, and M.P. Mengüç, "Segregated Modeling of Continuous Heat Transfer Furnaces," Journal of Quantitative Spectroscopy and Radiative Transfer, 2020.
147. R. Family, M.P. Mengüç, and S. Çelik, "Coupled Heat Transfer Analysis for Concrete and Green Roofs to Evaluate Radiative Cooling for Buildings," Heat and Mass Transfer, 2020.
148. L. Al-Gebory and M.P. Mengüç, "Optical and Radiative Properties of Nanoparticle Suspensions: Effects of Particle Stability, Agglomeration, and Sedimentation," Journal of Enhanced Heat Transfer, Vol. 27, pp. 207-247, 2020.
149. M.T. Gevari, …M. P. Mengüç, Ali Koşar et al., "Deagglomeration of Nanoparticle Clusters in a Cavitation-on-Chip Device," AIP Advances, Vol. 10, 2020.
150. T. Akba, D. Baker, and M.P. Mengüç, "Gradient-Based Optimization of Volumetric Receiver Geometry and Mass Flow Rate," Renewable Energy, Vol. 203, pp. 741-752, 2023.
151. T. Akba, D. Baker, and M.P. Mengüç, "Geometric Design of Micro-Scale Volumetric Receiver Using System-Level Inputs: Surrogate-Based Approach," Solar Energy, Vol. 262, 111811, 2023.
152. N. Pirouzfam, M.P. Mengüç, and K. Sendur, "Colorization of Passive Radiative Cooling Coatings Using Plasmonic Effects," Solar Energy Materials and Solar Cells, Vol. 253, 112225, 2023.
153. T. Akba, D. Baker, and M.P. Mengüç, "Off-Design Performance of Micro-Scale Brayton Cycle," Energy Conversion and Management, Vol. 289, 117187, 2023.
154. MA Kecebas, M. P Menguc, K Sendur, “Spectral emissivity profiles for radiative cooling,” ACS Applied Optical Materials 2 (6), 1010-1024, 2023.
155. M.C. Ozsoy and M.P. Mengüç, "A Transdisciplinary Approach and Design Thinking Methodology for Application to Complex Problems and Energy Transition," World, Vol. 5, pp. 119-135, 2024.
156. B. Halvaşi, A.M. Başol, Ö. Ertunç, and M.P. Mengüç, “Investigation of Soot Formation and Agglomeration in Ethylene/Air Jet Diffusion Flame with Rank-Correlated SLW Gas Model,” Journal of Quantitative Spectroscopy and Radiative Transfer, 325, 109068, 2024.

157. B Halvaşi, T Altınoluk, AM Başol, MP Mengüç, A Karadağ, “Spectral radiation modeling of gas and soot in glass melting furnaces: Evaluation of RC-SLW vs WSGG model.” Thermal Science and Engineering Progress 64, 103780, 2025.

REFEREED JOURNAL ARTICLES UNDER REVIEW

158. K. Gürel and M.P. Mengüç, “A Sectoral Benchmarking Analysis of Industrial Energy Efficiency in Türkiye: Methodology, Technical Challenges, and Findings,” Energy Reports, under review, 2026.
159. G. Otkun and M.P. Mengüç, “From Silos to Systems: Facilitating Change Through the Transdisciplinary Sustainability Transitions Framework,” Discover Sustainability, under review, 2026.

CONFERENCE ARTICLES (More than 220, see the archival CV for details))

APPENDIX B:

LIST OF SELECTED MAJOR GRANTS: (Total of 68, 18 listed here**)**

Federal and National Competitive Grants (United States) (selected out of more than 30)

1. **National Science Foundation (NSF)**
   Engineering Initiation Award
   “Determination of the Inverse Radiation Problem Using Angular Tomography”
   Principal Investigator
   $34,722
   1987–1989.
2. **U.S. Department of Energy (DOE)**
   Advanced University Coal Research Program
   “Radiative Properties of Char, Fly-Ash and Soot Particles in Coal Flames”
   Principal Investigator
   $140,000
   1992–1996.
3. **U.S. Department of Energy (DOE)**
   Advanced University Coal Research Program
   “Radiation–Turbulence Interaction in Coal-Fired Flames”
   Principal Investigator
   $200,000
   1993–1998.
4. **U.S. Department of Agriculture (USDA)**
   “Light Backscatter Sensor Development for Measurement of Food Consistency”
   Co-PI
   $180,000
   1998–2001.
5. **National Science Foundation (NSF-NIRT)**
   “Staggered Probes for Integrating Nano Machining and Metrology”
   Co-PI
   $1,000,000 (Total Award)
   2002–2008.

6. **National Science Foundation (NSF-NUE)**
   "Nano-Scale Engineering Education for Undergraduates"
   Principal Investigator
   $130,000
   2004–2006.
7. **National Science Foundation (NSF)**
   "Tip-Directed Assembly of Nanoparticles via Surface-Plasmon Excitation"
   Co-PI
   $500,000
   2008–2011.

European Union Competitive Grants

8. **European Union FP7 – Marie Curie International Reintegration Grant (IRG)**
   "NF-RAD: Near-Field Radiation Absorption and Scattering by Nanoparticles on Surfaces"
   Principal Investigator
   €75,000
   2009–2012.
9. **European Union FP7 – Public-Private Partnership on Buildings (NEED4B)**
   "New Energy Efficient Design for Buildings"
   Principal Investigator (Özyeğin University)
   €1,023,000 (OzU budget)
   2012–2018.
10. **European Union FP7 (BRICKER)**
    "Total Renovation Strategies for Energy Reduction in Public Building Stock"
    Principal Investigator (Özyeğin University)
    €443,000
    2013–2019.
11. **European Union Horizon 2020 (TRIBE)**
    "Training Behaviours Towards Energy Efficiency"
    Principal Investigator (Özyeğin University)
    €217,500
    2015–2019.
12. **European Union Horizon Innovation Action (LEGO-FIT)**
    "Adaptable Technological Solutions for Energy Positive Homes"
    Principal Investigator (Özyeğin University)
    €693,000 (OzU share; total project €4.6M)
    2023–2027.

National Competitive Grants (Türkiye) (selected out of more than 6)

13. TÜBİTAK 1001 Program
    Principal Investigator
    Approx. $130,000 equivalent
    2009–2011.
14. TÜBİTAK 2501 Collaborative Program
    "Risk Management of Energy Retrofits in Urban Development Projects"
    Principal Investigator, Along with its NSF twin project at Georgia Tech, School of Architecture
    2013–2016.
15. TÜBİTAK 214M308
    "Near-Field Radiation Transfer Experiments for Thermophotovoltaic Energy Harvesting Devices"
    Co-PI
    2015–2018.

Major Industry-Supported Research

16. IBM Global Smarter Planet Program
    "Coherent Teachings of Energy, Environment and Economy for Zero Istanbul 2050"
17. Bosch-Siemens Collaboration Projects
    Energy efficiency and refrigeration systems research
    2012–2013.
18. Lahore Times Square Sustainability Consultancy Project
    Sustainability Management and Systems Design
    $174,000
    2022–2025.

For full archival CV (CV13.03 Menguc Archival CV Feb 23 2026, LONG)

see Özyeğin Üniversity web site:

https://www.ozyegin.edu.tr/tr/akademik-kadro/pinarmenguc

or CEEE/EÇEM web site:

https://ozuecem.net/en/ceee-family/administration/

23 February, 2026 Version 13.03