CURRICULUM VITAE

Hüseyin Sami Sözüer

January 2023

Personal

Date of Birth:	June 1, 1958
Place of Birth:	Salihli, Turkey
Address:	Department of Physics Izmir Institute of Technology Gulbahce, Urla 35430 Izmir, Turkey
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Education

1983	B.Sc. in Physics, Boğaziçi University
1992	Ph.D. in Physics, University of Wyoming Thesis Title: “Photon bands”

Employment

1983-1992	Graduate Assistant Department of Physics and Astronomy, University of Wyoming
1984-1985	Research Assistant Department of Physics, Tandem Laboratory, University of Pennsylvania
1992-1994	Postdoctoral Research Associate Department of Physics, Rensselaer Polytechnic Institute
1994-1995	Lecturer and Postdoctoral Research Associate Department of Physics, Mississippi State University
1996-1997	Research and Development Chief Hesfibel Fiber-Optic Inc., Kayseri
1997-1999	Assistant Professor Department of Physics, Dokuz Eylul University
1999-2016	Assistant Professor Department of Physics, Izmir Institute of Technology
2016-present	Associate Professor Department of Physics, Izmir Institute of Technology
2008-2016	Taught undergraduate physics courses Department of Chemical Engineering, Ege University

Research Areas

- Optics
- Photonic crystals
- Theoretical condensed matter physics
- Computational physics
- Parallel computing

Research Projects (as Principal Investigator)

- *Photonic Crystals for Optoelectronics*,
  Co-Principal Investigator (with J.W. Haus),
  Jointly funded by the National Science Foundation and the Army Research Office, 1993.

- *Stable photonic-crystal based optical fiber and the design of one-dimensional waveguides with random defects*,
  Principal Investigator,
  TUBITAK Project 107T569, 2007.

- BAP Project I

- BAP Project II

Research Visits

- University of St. Andrews,
  Sponsored by the High-Performance Computing (HPC) Europa Program,
  September-December 2005.

- Technical University of Kaiserslautern,
  Sponsored by the research group of Prof. Dr. E. Oesterschulze,
  July-September 2007.

Administrative Duties

- Vice Chairperson, Center for Computational Research and Applications,
  Izmir Institute of Technology, 2000-2002

- Vice Dean, School of Graduate Studies,
  Izmir Institute of Technology, 2002-2006

- Vice Chairperson, Physics Department,
  Izmir Institute of Technology, 2008-2010.

- Member of the Executive Board, Center for Continuing Education,
  Izmir Institute of Technology, 2008-2009

Graduate Students Supervised

- Koray Sevim, M.Sc. student, graduated in 2004,
  M.Sc. Thesis Title: "One-dimensional photonic crystal waveguide".
- Duygu Şengün, M.Sc. student, graduated in 2009.
  M.Sc. Thesis Title: "Photonic Crystal Assisted L-shaped Waveguide Bend"
- Adem Enes, M.Sc. student, graduated in 2009.
  M.Sc. Thesis Title: "Frequency Splitting with Two-Dimensional Triangular Photonic Crystal"
- Zebih Çetin, M.Sc. student, graduated in 2013.
  M.Sc. Thesis Title: "Improving coupling Efficiency by using adiabatic transition in photonic crystal waveguides."
- Neslihan Eti, Ph.D. student, graduated in 2014.
  PhD Thesis title: "Mathematical modeling of light propagation in photonic crystal waveguides."
- Yiğit Tunçtürk, M.Sc. student, graduated in 2022.
  M.Sc. Thesis Title: "Effect of random structural variations on the optical properties of honeycomb photonic crystals."
- Zebih Çetin, Ph.D. student, graduated in 2022.
  PhD thesis title: "Photonic Crystal Textiles"

Journal Refereeing

- Journal of Lightwave Technology
- Journal of the Optical Society of America B
- Modern Physics Letters
- International Journal of Modern Physics B

Conferences

- *Performance of a 4π Multi-Segment Charged Particle Detector*,
  T. Chapuran, D.P. Balamuth, H.S. Sözüer, J. Görres, and J. Arrison,
  Annual Meeting of the American Physical Society, Baltimore, 1985.

- *Convergence Problems in Photonic Band Calculations*,
  H.S. Sözüer, R. Inguva, and J.W. Haus,
  Annual Meeting of the Optical Society of America, San Jose, 1991.

- *Bilgisayar laboratuvarında ince istemci mimarisi ile paralel küme oluşturulması*,
  Conference on Academic Information Technology, Dumlupınar University, Kütahya, 2007.

- *Bir boyutlu fotonik kristal dalga kılavuzu*,
  Koray Sevim, H. Sami Sözüer,
  Türk Fizik Derneği 22. Fizik Kongresi, Bodrum, 2004

- *Bir boyutlu fotonik kristallerin bant yapısında rastgele hataların etkileri*,
  Koray Sevim, H. Sami Sözüer,
  Türk Fizik Derneği 22. Fizik Kongresi, Bodrum, 2004

- *A Second Look at Disorder in 2D Photonic Crystals*,
  H. Sami Sözüer,
  Transnational Access Meeting (TAM) HPC Europa, Barcelona, 2006.

- *Photonic Crystal Assisted 90^0 Waveguide Bend,*
  H. Duygu Şengün and H. Sami Sözüer,
  5th National Nano-science and Nano-technology Conference,
  Eskişehir Anadolu University, 2009.

- *Photonic Crystal Assisted 90^0 Waveguide Bend,*
  H. Duygu Şengün and H. Sami Sözüer,
  International Conference on Nanomaterials and Nanosystems,
  Istanbul Technical University, 2009.

Membership

Optical Society of America

Courses Taught

Introductory physics I	Freshman level, 2009
Introductory physics II	Freshman level, 2010
Optics	Sophomore level,
Classical mechanics	sophomore level,
Quantum mechanics	Junior level,
Computational physics	Junior level,
Electricity and magnetism	Junior level,
Statistical physics	Junior level,
Solid state physics	Senior level,
Photonic Structures,	Undergraduate level,
C Programming	Undergraduate level,
Electricity and magnetism	Graduate level,

Attachments:

1) Web of Science record of publications.
2) Google Scholar record of publications and citations.
3) US Patent Office list of patents citing published work of Sami Sozuer.

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Authors

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- Sozuer, Huseyin Sami 7
- Haus, Joseph W. 4
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- Dowling, JONATHAN P 1

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Publication Years

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Document Types

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1 Fully three-dimensional analysis of a photonic crystal assisted silicon on insulator waveguide bend

Etj, N; Cetin, Z and Sozuer, HS

Dec 20 2018 | INTERNATIONAL JOURNAL OF MODERN PHYSICS B 32 (31)

A detailed numerical study of low-loss silicon on insulator (SOI) waveguide bend is presented using the fully three-dimensional (3D) finite-difference time-domain (FDTD) meth ... Show more

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1 Citation 36 References Related records

2 High transmission through a 90 degrees bend in a polarization-independent single-mode photonic crystal waveguide

Erol, AE and Sozuer, HS

Dec 14 2015 | OPTICS EXPRESS 23 (25) , pp.32690-32695

We propose a polarization-independent single-mode waveguide, using a two-dimensional square photonic crystal with a complete band gap. The waveguide is tuned such that both TE a ... Show more

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11 Citations 17 References Related records

3 PHOTONIC CRYSTAL ASSISTED 90 degrees WAVEGUIDE BEND

Sozuer, HS and Sengun, HD

Jun 30 2011 | INTERNATIONAL JOURNAL OF MODERN PHYSICS B 25 (16) , pp.2167-2182

The 90 degrees waveguide bend is an important component of optical circuit applications. We propose several models for such a bend, some of them assisted by a two-dimensional photonic crystal with a bandgap

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3 Citations 19 References Related records

4 Robustness of one-dimensional photonic band gaps under random variations of geometrical parameters

Sozuer, HS and Sevim, K

13 Citations 17 References

- Optics 4
- Physics Applied 4
- Physics Condensed Matter 4
- Materials Science Multidisciplinary 2
- Physics Mathematical 2

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Affiliations

- IZMIR INSTITUTE OF TECHNOLOGY 4
- RENSSELAER POLYTECHNIC INSTITUTE 3
- UNIVERSITY OF WYOMING 3
- UNIVERSITY OF TOKYO 2
- NASA MARSHALL SPACE FLIGHT CENTER 1

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Publication Titles

- INTERNATIONAL JOURNAL OF MODERN PH... 2
- JOURNAL OF MODERN OPTICS 2
- PHYSICAL REVIEW B 2
- JOURNAL OF THE OPTICAL SOCIETY OF AM... 1
- OPTICS EXPRESS 1

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Publishers

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Nov 2005 | PHYSICAL REVIEW B 72 (19)

The supercell method is used to study the variation of the photonic bandgaps in one-dimensional photonic crystals under random perturbations to thicknesses of the layers. T ... Show more

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Related records

5 PHOTONIC BAND CALCULATIONS FOR WOODPILE STRUCTURES

168 Citations

16 References

SOZUER, HS and DOWLING, JP

Feb 1994 | JOURNAL OF MODERN OPTICS 41 (2) , pp.231-239

Photonic band structure has been computed for 'woodpile' structures having the periodicity of the simple tetragonal lattice. Bandgaps have been found. Further research directions are explored.

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6 PHOTONIC BANDS - SIMPLE-CUBIC LATTICE

145 Citations

21 References

SOZUER, HS and HAUS, JW

Feb 1993 |

JOURNAL OF THE OPTICAL SOCIETY OF AMERICA B-OPTICAL PHYSICS

10 (2) , pp.296-302

Photonic band structures have been calculated for various structures with the periodicity of the simple-cubic lattice. Band gaps have been found, and the conditions for the appearances of such gaps are

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7 PHOTONIC BANDS - ELLIPSOIDAL DIELECTRIC ATOMS IN AN FCC LATTICE

36 Citations

24 References

HAUS, JW; SOZUER, HS and INGUVA, R

Oct 1992 | JOURNAL OF MODERN OPTICS 39 (10) , pp.1991-2005

Photonic band structure has been computed using ellipsoidal grains in f.c.c. lattice. Bandgaps have been found and the conditions for the appearance of such gaps are discussed. The effective long-wavelength

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8 PHOTONIC BANDS - CONVERGENCE PROBLEMS WITH THE PLANE-WAVE METHOD

409 Citations

22 References

SOZUER, HS; HAUS, JW and INGUVA, R

Jun 15 1992 | PHYSICAL REVIEW B 45 (24) , pp.13962-13972

The problems associated with the poor convergence of the Fourier transform of the hard-sphere dielectric function are discussed. A significant band gap between the eighth an ... Show more

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9 ELECTRON PHOTON ANALOGY ANALYZED

1 Citation

4 References

SOZUER, HS; INGUVA, R and HAUS, JW

Apr 1992 | PHYSICS TODAY 45 (4) , pp.121-122

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Photonic bands: Convergence problems with the plane-wave method HS Sözüer, JW Haus, R Inguva Physical Review B 45 (24), 13962	675	1992
Photonic band calculations for woodpile structures HS Sözüer, JP Dowling Journal of Modern Optics 41 (2), 231-239	288	1994
Photonic bands: simple-cubic lattice HS Sözüer, JW Haus JOSA B 10 (2), 296-302	234	1993
Photonic bands: ellipsoidal dielectric atoms in an FCC lattice JW Haus, HS Sözüer, R Inguva Journal of Modern Optics 39 (10), 1991-2005	56	1992
Robustness of one-dimensional photonic band gaps under random variations of geometrical parameters HS Sözüer, K Sevim Physical Review B 72 (19), 195101	22	2005
High transmission through a 90° bend in a polarization-independent single-mode photonic crystal waveguide AE Erol, HS Sözüer Optics Express 23 (25), 32690-32695	16	2015
Photonic crystal assisted 90 waveguide bend H Sami Sözüer, H Duygu Şengün International Journal of Modern Physics B 25 (16), 2167-2182	6	2011
Fully three-dimensional analysis of a photonic crystal assisted silicon on insulator waveguide bend N Eti, Z Çetin, HS Sözüer International Journal of Modern Physics B 32 (31), 1850344	1	2018
Photonic bands: Convergence problems with the plane-wave method HS Sozuer, JW Haus, R Inguva SPIE MILESTONE SERIES MS 182, 165	4	2006
Photonic bands: Convergence problems with the plane-wave method HS Sozuer, JW Haus, R Inguva SPIE MILESTONE SERIES MS 182, 165	1	2006
Photonic bands-convergence problems with the plane-wave method HS Sozuer, JW Haus, R Inguva Physical Review B 45 (24), 13962-13972	1	1992
Electron-photon analogy analyzed HS Sözüer, R Inguva, JW Haus, S John Physics Today 45 (4), 121	1	1992

TITLE	CITED BY	YEAR
PHOTONIC CRYSTAL ASSISTED 90 {\textdegree} WAVEGUIDE BEND H Sözüer, H Şengün		2011
Photonic Band Structures for Optoelectronics. JW Haus, HS Sozuer RENSSELAER POLYTECHNIC INST TROY NY		1994
Photonic band structures for optoelectronics(Final Report, 20 Aug. 1993-19 Aug. 1994) J HAUS, H SOZUER		1994
Photonic bands. HS Sozuer		1993
How reliable are photonic band calculations? HS Sozuer, JW Haus, R Inguva OSA Annual Meeting, MQ2		1991
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1	US-7820365-B1	Preview PDF	Method to fabricate a tilted logpile photonic crystal	Williams; John D. et al.	2010-10-26	17
2	US-7709095-B2	Preview PDF	Infra-red reflecting layered structure	Persoone; Peter et al.	2010-05-04	13
3	US-20080043248-A1	Preview PDF	PHOTONIC CRYSTAL SENSORS USING BAND EDGE AND/OR DEFECT MODE MODULATION	Ozcan; Meric	2008-02-21	15
4	US-6812482-B2	Preview PDF	Method to fabricate layered material compositions	Fleming; James G. et al.	2004-11-02	18
5	US-6813064-B2	Preview PDF	Electro-actively tunable photonic bandgap materials	John; Sajeev et al.	2004-11-02	24

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7	US-6660551-B1	Preview PDF	Semiconductor process	Pabla; Arbinder S	2003-12-09	8
8	US-6597851-B2	Preview PDF	Periodic dielectric structure having a complete three-dimensional photonic band gap	Johnson; Steven G. et al.	2003-07-22	18
9	US-6589334-B2	Preview PDF	Photonic band gap materials based on spiral posts in a lattice	John; Sajeev et al.	2003-07-08	40
10	US-6538794-B1	Preview PDF	Efficient non-linear phase shifting using a photonic band gap structure	D'Aguanno; Giuseppe et al.	2003-03-25	19
11	US-6414780-B1	Preview PDF	Photonic signal reflectivity and transmissivity control using a photonic band gap structure	D'Aguanno; Giuseppe et al.	2002-07-02	18
12	US-20020074537-A1	Preview PDF	Electro-actively tunable photonic bandgap materials	John, Sajeev et al.	2002-06-20	29
13	US-6396617-B1	Preview PDF	Photonic band gap device and method using a periodicity defect region doped with a gain medium to increase photonic signal delay	Scalora; Michael	2002-05-28	31
14	US-20020059897-A1	Preview PDF	Photonic band gap materials based on spiral posts in a lattice	John, Sajeev et al.	2002-05-23	50
15	US-6339493-B1	Preview PDF	Apparatus and method for controlling optics propagation based on a transparent metal stack	Scalora; Michael et al.	2002-01-15	14
16	US-6304366-B1	Preview PDF	Photonic signal frequency conversion using a photonic band gap structure	Scalora; Michael et al.	2001-10-16	24

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17	US-6262830-B1	Preview PDF	Transparent metallo-dielectric photonic band gap structure	Scalora; Michael	2001-07-17	25
18	US-6002522-A	Preview PDF	Optical functional element comprising photonic crystal	Todori; Kenji et al.	1999-12-14	18
19	US-5784400-A	Preview PDF	Resonant cavities employing two dimensionally periodic dielectric materials	Joannopoulos; John D. et al.	1998-07-21	13
20	US-5682401-A	Preview PDF	Resonant microcavities employing one-dimensionally periodic dielectric waveguides	Joannopoulos; John D. et al.	1997-10-28	15
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22	US-5440421-A	Preview PDF	Three-dimensional periodic dielectric structures having photonic bandgaps	Fan; Shanhui et al.	1995-08-08	9