

BIOGRAPHY

CV - SUMMARY

Published journals (selected):

Nature, Nature Materials (4), Physical Review Letters, Physical Review B (6), Scientific Reports (4), Nano Letters (2), ACS Nano, ACS Sensor, Advanced Materials (3), Advanced Functional Materials, Analytical Chemistry (4), Applied Physics Letters (10), ACS Applied Materials and Interfaces (7), Optics Express (4), Applied Optics (4)

Number of articles:

+100 articles in high-impact journal

Patents: 8 (3 licensed)

Awards:

-Alexander von Humboldt, Friedrich Wilhelm Bessel Research Prize
-Turkish Academy of Sciences Young Scientists Award
-The Turkish Scientific and Technical Research Council Award
-OSA New Focus Student Award

Grants:

ERC Consolidator Grant (1st in Turkey)
ERC Proof of Concept
11 The Turkish Scientific and Technological Research Council and Industry Grants (~18M USD)

Teaching evaluation:

Student evaluation score: 4.4/5.0 (over 33 courses)

Student supervision: 30 PhD/MS thesis

Talks: >100 (45 invited)

Citations: ~7800, h-index: 47

Significant scientific contributions:

-In-fiber multimaterial devices
-A new top-down nanofabrication technique
-Fiber-based digital photonic nose
-A new propagation mechanism for light

Current research subjects:

-Nanophotonics
-Specialty fibers
-Nanostructured fibers for additive manufacturing
-X-ray scintillating fibers
-Biocompatible electroactive nanomaterials and sensors
-Slow-light nanostructures
-Functional nanostructures by design
-Perovskite fibers for conformal X-ray imaging
-Multifunctional fiber probes for optogenetics

www.mehmetbayindir.com



PROFESSOR MEHMET BAYINDIR

Dr. Bayindir received his Ph.D. degree in physics from Bilkent University in 2002. During the Ph.D. years, he studied physics and applications of photonic band gap materials. Particularly, his works on the coupled-cavity structures (slow-light) in photonic crystals have drawn considerable interest since early 2000s.

Dr. Bayindir worked as a postdoctoral researcher and later as a research scientist at the Research Laboratory of Electronics at Massachusetts Institute of Technology (MIT). He has contributed to the development of a new fabrication technique that allows integration of active multimaterial in-fiber devices composed of metal, insulator and semiconducting domains for the first time. This breakthrough earned critical acclaim and recognition and resulted in 5 publications in Nature, Nature Materials, and Advanced Materials, and 3 issued directly related patents (all licensed). These researches constituted the fundamentals of a multimaterial fiber concept and are considered as a milestone in thermally drawn fiber technology due to their potential in advanced fiber devices and functional fabrics.

After returning to Turkey, Dr. Bayindir undertook (together with Prof. Salim Ciraci) the role of establishing state of the art National Nanotechnology Research Center (UNAM), and served as the deputy director of UNAM from 2006-2013, and later director until

2016. The synergy of around 400 world-class researchers and staff, made UNAM one of the top research centers in the region during his tenure. They also initiated graduate programs under UNAM that have attracted more than 110 graduate students from 13 countries.

Dr. Bayindir's research group has been working on fiber-based micro- and nano-scale materials and their applications including a top-down nanofabrication method by thermal size reduction, piezoelectric polymer nanowires, functional nanostructured surfaces (including open microfluidics), nano-scale photonics, fiber-based devices and sensors (including digital photonic nose, and optoacoustic microphones), and active fibers for fiber lasers. His group is a frontier in the world on multimaterial fiber-based nanostructures and sensors. Dr. Bayindir has been awarded 18M USD grants through international and national projects.

Dr. Bayindir is the author of over 100 articles published in high-impact journals, and more than 40 refereed conference papers. He also holds 4 US (3 licensed), 2 WO, 1EU, 2 Turkish patents. Furthermore, he is an editor of Nature Scientific Reports journal and reviewer of numerous scientific journals including Nature Materials, Nature Communications, Advanced Materials, Nano Letters, ACS Nano and Physical Review Letters. 30 students completed their MS and PhD thesis under his supervision. His PhD students continue their careers at the top schools in the world including MIT, Cambridge, and National University of Singapore.

Dr. Bayindir was the winner of the Optical Society of America's 2001 New Focus Award and 2005 MIT best poster awards. He won the young scientist prize of the Turkish Scientific and Technical Research Council (TUBITAK) in 2006 and The Young Scientists Award of Turkish Academy of Sciences (TUBA) in 2007. He has been the winner of the Optical Society of America's 2001 New Focus Award. In 2012, Dr. Bayindir received the prestigious European Research Council-ERC consolidator grant (first ERC grant awarded to Turkey). Later, he has been awarded an ERC Proof of Concept grant to support commercialization of piezo nanosystems developed in ERC-funded research for smart skin, cardiac sensors, and energy harvesting applications. He recently received the Alexander von Humboldt Friedrich Wilhelm Bessel research award.

CURRICULUM VITAE

Professor Mehmet BAYINDIR

1. PERSONAL DATA

- Birth date and place: 1975, Ermenek, Turkey
- Address: Bernadottestraße 150B, 22605 Hamburg, Germany
- E-mail: mehmet.bayindir@uni-hamburg.de
- Webpage: <http://www.mehmetbayindir.com>

2. ACADEMIC DEGREES

- Professor, Bilkent University 03/2014
- Associate Prof., Bilkent University 03/2012
- Assistant Prof., Bilkent University 02/2006
- Ph. D., Physics, Bilkent University 06/2002
- M.S., Physics, Bilkent University 08/1997
- B.S., Physics, Bilkent University 06/1995

3. EMPLOYMENT HISTORY

- 02/20- : Alexander von Humboldt Fellow, V. Professor, Universität Hamburg
- 07/19- : President, 4U Nanotechnologies Inc.
- 03/18-04/19: General Coordinator, Eryigit Medical Inc.
- 03/14-10/16: Professor, Bilkent University, Department of Physics
- 02/13-12/15: Director, UNAM-National Nanotechnology Research Center, Bilkent University
- 02/13-12/15: Director, Institute of Materials Science and Nanotechnology, Bilkent University
- 02/13-12/15: Director, Graduate Programs in Mat. Science and Nanotechnology, Bilkent University
- 01/08-02/13: Deputy Director, Institute of Materials Science and Nanotechnology, Bilkent University
- 01/08-02/13: Deputy Director, UNAM-National Nanotechnology Research Center, Bilkent University
- 01/08-02/13: Deputy Director, Graduate Programs in Mat. Science and Nanotech., Bilkent University
- 03/12-03/14: Associate Professor, Bilkent University, Department of Physics
- 02/06-03/12: Assistant Professor, Bilkent University, Department of Physics
- 05/05-02/06: Research Scientist, Massachusetts Institute of Technology, Research Laboratory of Electronics
- 06/02-05/05: Postdoctoral Research Associate, Massachusetts Institute of Technology, Research Laboratory of Electronics

4. PROFESSIONAL AWARDS

- Friedrich Wilhelm Bessel Research Award, Alexander von Humboldt 2020
- European Research Council-ERC Proof of Concept Grant Award 2016
- European Research Council-ERC Starting Grant Award 2012
- The Young Scientists Award of Turkish Academy of Sciences (TUBA) 2007
- The Turkish Scientific and Technical Research Council (TUBITAK) Award 2006
- MIT Best Poster Award 2005
- Optical Society of America (OSA) New Focus Student Award 2001
- Top 30 in the university entrance exam over 1M candidates 1990

5. HONORS, SCHOLARLY AND PROFESSIONAL DUTIES AND ACHIEVEMENTS

- Refereeing for journals including Nature Materials, Nature Communications, Materials Today, Advanced Materials, ACS Nano, Nano Letters, Advanced Functional Materials, Physical Review Letters, Applied Physics Letters, Optics Letters, Physical Review B, Physical Review A, Physical Review E, Optics Express, Journal of Applied Physics, IEEE Journal of Quantum Electronics, IEEE Photonic Technology Letters, Optics Communications, ACS Applied Materials and Interfaces, Langmuir, Small, Nanoscale, ACS Inorganic Chemistry, Journal of Colloid and Interface Science, Polymer Chemistry, AIP Advances, Scientific Reports 2000-Present

- FP7 NMP delegate of Turkey: Nanotechnology, Materials Science and New Production
2007-2008
- Member of Panel on the review of projects submitted to State Planning Organization of Turkey
2008-Present
- Member of Panel on the review of projects submitted to The Turkish Scientific and Technical Research Council
2006-Present
- Editorial Board Member, Scientific Reports, Nature Publishing Group
2012-Present

6. SELECTED INVITED LECTURES AND INVITED TALKS

1. *Giant negative electrostriction effect in ferroelectric polymer nanostructures*, University of Hamburg, Nanoscience Colloquium, 5 April 2022.
2. *Transforming traditional fiber drawing into highly sophisticated NANOMANUFACTURING TOOLBOX: Kilometer-long nanostructures for photonics, electronics, mechanics*, Hamburg University of Technology, Hamburg, Germany 23 March 2021.
3. [Keynote speaker] *Multi-material fibers for smart textile: Current status, challenges, and future directions*, Aachen University, Germany, 2018.
4. *Extremely-long Nanostructures for Photonics and Electronics*, Aarhus University, Denmark, 25 September 2017.
5. *Micro and Nanostructured Fibers for Smart Surfaces, Triboelectric/Piezoelectric Energy Harvesting and Sensing*, MRS Spring Meeting, Phoenix, 16-22 April 2017.
6. *Kilometers-Long Piezoelectric Polymer Nanoribbon Arrays for Sensing and Energy Generation*, MRS Spring Meeting, Phoenix, 16-22 April 2017.
7. *Fiber-based micro and nano-devices for sensing and energy harvesting*, KAUST, Saudi Arabia, 29 March 2017.
8. *Piezoelectric Polymer Nanoribbons Produced by Iterative Size Reduction Technique for Electronic Skin, Artificial Hand and Electro Cardiac Devices*, 17 June 2016, NGPT Workshop, Rome, Italy.
9. *Realization of a novel nanofabrication scheme: Producing kilometer-long nanostructures*, UNIDO Workshop, UNAM, Ankara, 17 June 2015
10. *Excellence in Science – ERC Enables Young Researchers*, ERC, TÜBİTAK, TÜBA, İstanbul, 29 August 2014.
11. *ERC-Grantees Conference 2014, Frontiers in Chemistry – The Basis for Advanced Materials*, Berlin, Germany, 28 August 2014.
12. *A novel nanofabrication technique by thermal size reduction*, Turkish Physical Society Annual Meeting, İstanbul, 2013.
13. *A new top-to-bottom fabrication technique in nanotechnology: producing kilometer long insulating, piezoelectric, and semiconducting nanostructures*, KAUST, Jeddah, Saudi Arabia, 20 September 2013.
14. *Nanostructured sensors: Large-area nanowire circuitry and digital optoelectronic nose*, UNIDO Workshop, Ankara, 25 Jun-08 Jul 2012.
15. *A New Top-To-Bottom Nanofabrication Technique*, Applications of Nanotechnology in Industry, Opportunity of Integration among IDB Member States, Egypt, 29–31 January 2012.
16. *Nanotechnology for a Sustainable Development*, Applications of Nanotechnology in Industry, Opportunity of Integration among IDB Member States, Egypt, 29–31 January 2012.
17. [Keynote speaker] *Nanotechnology: Engineering a better future*, 4th Wief-UITM Global Discourse on Nanotechnology, Kuala Lumpur, Malesia, October 14, 2011.
18. *A new fabrication technique in nanotechnology*, Nanotechnology Informatics and New Economic Paradigms, Applied Econometrics Association, Ankara, October 2010
19. *Nanomaterials, nanofibers, nanodevices for sensing applications*, Ankara University, Ankara, April 2010.
20. *Nanotechnology in defense*, ANSAF'10, Ankara, October 2010.
21. *New trends in nanotechnology*, Turkish Physical Society, Bodrum, 2009.
22. *Nanomaterials, nanofibers and nanodevices for sensing applications*, İstanbul Technical University, İstanbul, 2009
23. *Investigation of nanophotonic structures*, National Spectroscopy Congress, Ankara, 2009.
24. *Nanomaterials, nanofibers and nanodevices for sensing applications*, Koc University, İstanbul, 2009
25. *Nanotechnology and photovoltaics*, İstanbul Chamber of Industry, İstanbul, 2008.

26. *Novel fibers and fiber-based devices*, Optics Summer School, Middle East Technical University, Ankara, 2008.
27. *Nanophotonics*, Nanoscience and Nanotechnology Conference III, Ankara, 2007.
28. *A new fabrication technique in nanotechnology*, Istanbul Technical University, Istanbul, 2007.
29. *Nanotechnology tools for defense applications*, Nanoscience and Nanotechnology Conference III, Ankara, 2007.
30. *A new fabrication technique: Kilometer-long nanostructures*, Nanoscience and Nanotechnology Conference II, Ankara, 2006.
31. *Nanotechnology and wearable intellegent fiber sensors*, Hacettepe University, Ankara, 2006.
32. *Multifunctional fiber-based sensors: Future smart fabrics*, Department of Defense, Ankara, 2006.
33. *Nanotechnology and wearable intellegent fiber sensors*, Ankara University, Ankara, 2006.
34. *Wearable intellegent fiber sensors*, Middle East Technical University, Ankara, 2006.
35. *Recent progress in meso-structured fibers and fiber devices*, SPIE Photonics West, San Jose, CA, 2005.
36. *Multi-functional fabrics and fabric systems for medical and military applications*, Bilkent University, Ankara, 2005.
37. *Thermal-sensing mesoscopic fiber devices by composite material processing*, SPIE Optics East, Boston, MA, 2005.
38. *A novel fabrication technique by composite material processing: Multi-functional fabrics and fabric systems for medical and military applications*, Koc University, Istanbul, 2005.
39. *Novel optoelectronic fibers and fiber devices: From raw materials to functional devices*, SPIE Optics East, Philadelphia, 2004.
40. *Coupled-cavity structures in photonic crystals*, MRS Meeting, San Francisco, CA, 2002.

7. TEACHING

▪ Graduate Courses:

- PHYS 588 Theoretical and Experimental Foundations of Nanophotonics
- MSN 517 Fundamentals of Nanoscience
- MSN 532 Selected Topics in Materials Science and Nanotechnology
- 63-310 Nanostructure Physics 1 (University of Hamburg)

▪ Undergraduate Courses:

- PHYS 101 General Physics I
- PHYS 102 General Physics II
- PHYS 200 Physics for Poets
- PHYS 230 Quantum Mechanics Laboratory
- PHYS 371 Numerical Methods in Physics
- Physik IV Solid State Physics (Recitation) (University of Hamburg)

8. GRADUATE STUDENT SUPERVISION

SUPERVISED PHD STUDENTS:

	Name	Current Institution	Year Graduated	Thesis Title
1	Pınar Beyazkılıç	University of California San Diego	2018	Nanomaterials for chemical/biomedical sensing and functional surface applications
2	Pelin Tören	OSTIM Technical University, Asst. Prof.	2016	Biological sensing applications of ultra high quality factor microtoroidal optical resonators with high sensitivity and selectivity
3	Mehmet Kanık	MIT	2015	Nanostructured materials and devices for sensing and energy harvesting applications

4	Adem Yildirim	Oregon Health and Science University, Asst. Prof.	2014	Nanostructured materials for biological imaging and chemical sensing
5	Erol Özgür	Arizona State University	2014	Design and development of novel large scale applications in micro/nanophotonics and nanobiotechnology
6	Ozan Aktaş	University of Cambridge	2014	Chalcogenide micro and nanostructures and applications
7	Tural Khudiyev	National University of Singapore, Asst. Prof.	2013	Fabrication of core-shell nanostructures for photonics applications
8	Hülya Budunoğlu	Aselsan / Turkey	2012	Organically modified silica based nanomaterials for functional surfaces
9	Ersin Hüseyinoğlu	Bilkent University	continuing student	Utilization of whispering gallery mode chalcogenide resonators for nonlinear and lasing applications
10	Bihter Dağlar	Bilkent University	deceased	AAO membranes for nanoscale templates, ordered arrays and surfaces

SUPERVISED MS STUDENTS:

	Name	Current Institution	Year Graduated	Thesis Title
1	Ahmet Faruk Yavuz	TUBITAK Space Technologies Research Institute	2017	Large-area triboelectric nanogenerators
2	Mehmet Girayhan Say	Linköping University	2016	Nanowire and nanoribbons for flexible and bio-inspired electronics applications
3	Abubakar Isa Adamu	Technical University of Denmark	2016	Binary coded identification of industrial chemical vapors with optofluidic nose
4	Abba Usman Saleh	Tampere University	2016	Development of multicore and tapered chalcogenide fibers for supercontinuum generation
5	Muhammad Yunusa	Max Planck Institute for Intelligent Systems	2015	Three-dimensional control of liquid spreading and transport with textured polymer fibers
6	Bekir Türedi	ETH	2015	Nonlinear optics in nanostructures fiber bundles
7	Urandelger Tuvshindorj	University of Bonn	2015	Organically modified silica nanostructures based functional coatings for practical applications
8	E. Fahri Öztürk	University of Bonn	2014	Artificial olfaction with hollow core bragg fiber arrays
9	Tamer Doğan	University of Twente	2014	Bio-inspired all-polymer photonic crystal fibers
10	Pınar Beyazkılıç	University of California San Diego	2013	Formation of pyrene excimers in mesoporous organically modified silica thin films for visual detection of nitroaromatic explosives
11	Muhammet Halit Dolaş	METU	2013	Light scattering from core-shell nano-structures: Structural coloration
12	Muhammet Çelebi	Tubitak Space Technologies Research Institute	2013	Silicon nanocrystal doped polymer nanowire arrays
13	Hüseyin Duman	Roketsan	2013	Design and fabrication of resonant nanoantennas on chalcogenide glasses for nonlinear photonic applications
14	Özlem Köylü	University of Delaware	2011	Polymer/glass hollow-core photonic band gap fibers for infrared laser beam delivery
15	Murat C. Kılınç	Aselsan	2010	Resonant plasmonics nanoantennas

16	Adem Yildirim	Oregon Health and Science University, Asst. Prof.	2009	Aerogel thin films for TNT sensing
17	Kemal Gürel	Garanti Bankası	2009	Coupled surface plasmon structures and applications
18	Y. Nuri Ertuş	Erciyes University, Asst. Prof.	2009	Microfluidics for plasmonic sensors and electromagnetic applications
19	Mert Vural	University of Maryland, College Park	2009	Hollow core photonic bandgap fibers for medical applications
20	Duygu Akbulut	University of Twente	2009	Lasing action and supercontinuum generation in nano- and micro-structures
21	Özlem Şenlik	Duke University	2008	Micro- and nano-structured devices for thermal analysis and plasmonic applications
22	Ozan Aktaş	University of Cambridge	2008	Multi-frequency fluxgate magnetic force microscopy

9. PATENTS

1. Household appliance component comprising a base element with a functional coating, Maria Carmen Artal Lahoz, Mehmet Bayindir, Miguel Angel Bunuel Magdalena, Cristina CASTRO LAPETRA, Bihter DAGLAR, Tugba DISPINAR, Elena Martinez Solanas, Javier SANZ NAVAL, Adem YILDIRIM, Murat Yücel, Dilara ÖKSÜZ, EP3324813B1, 2019.
2. Piezoelectricity PVDF materials and method for making the same, Mehmet Bayindir, Mehmet Kanik, US Patent App. 14/828,524, 2017.
3. Cellulose Based Sensor for Detection of Nitroaromatic Explosives, Turkey, Patent Application No. 2015/04051, April, 2015, Gokcen Birlik Demirel and Bihter Daglar (Patent Pending)
4. Thermal-sensing fiber devices with semiconducting element, Mehmet Bayindir, Fabien Sorin, Ayman Abouraddy, Ofer Shapira, Jerimy R. Arnold, Yoel Fink, John D. Joannopoulos, PCT, WO2007038718A1, 2007.
5. Optoelectronic fiber photodetector, Mehmet Bayindir, Fabien Sorin, Ayman F. Abouraddy, Dursen S. Hinczewski, Ofer Shapira, Jerimy Arnold, Jean F. Viens, Yoel Fink, John Joannopoulos, PCT, WO2006014360A2, 2006.
6. Thermal sensing fiber devices, M. Bayindir, F. Sorin, A. F. Abouraddy, O. Shapira, J. Arnold, Y. Fink, and J. D. Joannopoulos, U.S. Patent No: 7567740, Issued: Jul. 28, 2009. [licensed]
7. Optoelectronic fiber codrawn from conducting, semiconducting, and insulating materials, M. Bayindir, F. Sorin, D. S. Hinczewski, S. D. Hart, Y. Fink, and J. D. Joannopoulos, U.S. Patent No: 7295734, Issued: Nov. 13, 2007. [licensed]
8. Optoelectronic fiber photodetector, M. Bayindir, F. Sorin, A. F. Abouraddy, D. S. Hinczewski, O. Shapira, J. Arnold, J. F. Viens, Y. Fink, and J. D. Joannopoulos, U.S. Patent No: 7292758, Issued: Nov. 6, 2007. [licensed]
9. Piezoelectric fibers, Mehmet Bayindir, A. F. Abouraddy, J. D. Joannopoulos, and Y. Fink (pending, filed 2005).
10. Integrated fibres for self-monitored optical transport, Mehmet Bayindir, O. Shapira, D. S. Hinczewski, J. Viens, A. F. Abouraddy, J. D. Joannopoulos, and Y. Fink (pending, filed 2005).

10. SCHOLARLY PUBLICATIONS

Ph.D. Dissertation

1. Mehmet Bayindir, Physics and Applications of Coupled-Cavity Structures in Photonic Crystals, Bilkent University, 2002.

Published Books

1. Mehmet Bayindir, *Mekanik Problemleri (Challenging problems in classical mechanics)*, [in Turkish] (263 pages, 4th printing, TUBITAK, Ankara, 2001).

Reviews

1. P. Toren, E. Ozgur, and Mehmet Bayindir, *Oligonucleotide based label-free detection with optical microresonators: Strategies and challenges*, Lab on a Chip, volume 16, page 2572 (2016).
2. A. F. Abouraddy, M. Bayindir, G. Benoit, S. D. Hart, K. Kuriki, N. Orf, O. Shapira, F. Sorin, B. Temelkuran, Y. Fink, *Towards multimaterial multifunctional fibres that see, hear, sense and communicate*, Nature Materials, volume 6, page 336 (2007).
3. Mehmet Bayindir et al., *Kilometer-long ordered nanophotonic devices by preform-to-fiber fabrication*, IEEE Selected Topics in Quantum Electronics, Nanophotonics special issue, volume 12, 1202 (2006).

Articles in refereed journals (SCI journals)

1. M. Kanik, M. G. Say, D. A. E. Acar, H. S. Sen, and Mehmet Bayindir, Giant negative electrostriction in superparaelectric polymer innovates electroactive nanosystems, *Science Advances*, under review (2022).
2. A. F. Yavuz, H. T. Baytekin, and Mehmet Bayindir, Large-area nanostructured polymer films for high-performance triboelectric floor tiles, in preparation (2022).
3. M. Bayindir, On the origin of giant electrostriction and piezoelectricity, in preparation (2022).
4. P. Beyazkılıç, A. Saateh, Mehmet Bayindir, and C. Elbuken, Evaporation-induced biomolecule detection on versatile superhydrophilic patterned surfaces: Glucose and DNA assay, ACS Omega, volume 3, page 13503 (2018).
5. P. Toren, E. Ozgur, and Mehmet Bayindir, Label-free optical biodetection of pathogen virulence factors in complex media using microtoroids with multifunctional surface functionality, ACS Sensors, volume 3, page 352 (2018).
6. B. Daglar, G. B. Demirel, and Mehmet Bayindir, Fluorescent paper strips for highly sensitive and selective detection of nitroaromatic analytes in water samples, ChemistrySelect, volume 2, page 7735 (2017).
7. O. Aktas and Mehmet Bayindir, Tapered nanoscale chalcogenide fibers directly drawn from bulk glasses as optical couplers for high index resonators, Applied Optics, volume 56, page 385 (2017).
8. M. Yunusa, F. E. Ozturk, A. Yildirim, U. Tuvshindorj, M. Kanik, and Mehmet Bayindir, Bio-inspired hierarchically structured polymer fibers for anisotropic non-wetting surfaces, RSC Advances, 7, 15553 (2017).
9. M. Kanik, M. Marcali, M. Yunusa, C. Elbuken, and Mehmet Bayindir, Continuous triboelectric power harvesting and biochemical sensing inside poly(vinylidene fluoride) hollow fibers using microfluidic droplet generation, Advanced Materials Technologies, volume 1, page 1600190 (2016).
10. A. I. Adamu, F. E. Ozturk, and Mehmet Bayindir, Binary coded identification of industrial chemical vapors with an optofluidic nose, Applied Optics, volume 55, page 10247 (2016).
11. P. Toren, E. Ozgur, and Mehmet Bayindir, Oligonucleotide based label-free detection with optical microresonators: Strategies and challenges, Lab on a Chip, volume 16, page 2572 (2016).
12. P. Beyazkılıç, U. Tuvshindorj, A. Yildirim, C. Elbuken, and Mehmet Bayindir, Robust superhydrophilic patterning of superhydrophobic ORMOSIL surfaces for high-throughput on-chip screening applications, RSC Advances, volume 6, page 80049 (2016).
13. A. Yildirim, M. Turkaydin, B. Garipcan, and Mehmet Bayindir, Cytotoxicity of multifunctional surfactant containing capped mesoporous silica nanoparticles for combined chemotherapy and photodynamic therapy, RSC Advances, volume 6, page 32060 (2016).

14. M. Kanik, M. G. Say, B. Daglar, A. F. Yavuz, M. Dolas, M. El-Ashry, and Mehmet Bayindir, A motion and sound activated, 3d printed, chalcogenide based triboelectric nanogenerator, Advanced Materials, volume 27, page 2367 (2015). [Back cover story]
15. E. Ozgur, P. Toren, O. Aktas, E. Huseyinoglu, and Mehmet Bayindir, Label-free biosensing with high selectivity in complex media using microtoroidal optical resonators, Scientific Reports, volume 5, 13173 (2015).
16. A. Yildirim and Mehmet Bayindir, Porosity difference based selective dissolution strategy to prepare shape-tailored hollow mesoporous silica nanoparticles, Journal of Materials Chemistry A, volume 3, page 3839 (2015).
17. T. Khudiyev and Mehmet Bayindir, Nanospring harvest light more efficiently, Applied Optics, volume 54, page 8018 (2015).
18. P. Toren, E. Ozgur, and Mehmet Bayindir, Real-time and selective detection of single nucleotide DNA mutations using surface engineered microtoroids, Analytical Chemistry, volume 87, 10920 (2015).
19. T. G. Ulusoy, B. Daglar, A. Yildirim, A. Ghobadi, M. Bayindir, and A. K. Okyay, Enhanced performance of dye-sensitized solar cells by omnidirectional antireflective coatings, Journal of Photonics for Energy, volume 5, 053090 (2015).
20. M. Kanik, O. Aktas, H. S. Sen, E. Durgun, and Mehmet Bayindir, Spontaneous high piezoelectricity in Poly (vinylidene fluoride) nanoribbons produced by iterative thermal size reduction technique, ACS Nano, volume 8, page 9311 (2014).
21. T. Khudiyev and Mehmet Bayindir, Superenhancers: Novel opportunities for nanowire optoelectronics, Scientific Reports, volume 4, page 7505 (2014).
22. P. Beyazkiloglu, A. Yildirim, and Mehmet Bayindir, Nanoconfinement of pyrene in mesostructured silica nanoparticles for trace detection of TNT in aqueous phase, Nanoscale, volume 6, page 15203 (2014).
23. B. Daglar, G. B. Demirel, T. Khudiyev, T. Dogan, O. Tobail, S. Altuntas, F. Buyukserin, and Mehmet Bayindir, Anemone-like nanostructures for non-lithographic, reproducible, large-area, and ultra-sensitive SERS substrates, Nanoscale, volume 6, page 12710 (2014).
24. F. E. Ozturk, A. Yildirim, M. Kanik, and Mehmet Bayindir, Photonic bandgap narrowing in conical hollow core Bragg fibers, Applied Physics Letters, volume 105, no 071102 (2014).
25. E. Ozgur, P. Toren, and Mehmet Bayindir, Phosphonate based organosilane modification for a simultaneously protein resistant and bioconjugable silica surface, Journal of Materials Chemistry B, volume 2, page 7118 (2014).
26. T. Khudiyev, O. Tobail, and Mehmet Bayindir, Tailoring self-organized nanostructured morphologies in kilometer-long polymer fiber, Scientific Reports, volume 4, article number 4864 (2014).
27. T. Khudiyev, T. Dogan, and Mehmet Bayindir, Biomimicry of multifunctional nanostructures in the neck feathers of mallard (*Anas platyrhynchos* L.) drakes, Scientific Reports, volume 4, article number 4718 (2014).
28. T. Khudiyev, E. Huseyinoglu, and Mehmet Bayindir, Non-resonant Mie scattering: Emergent optical properties of core-shell polymer nanowires, Scientific Reports, volume 4, article number 4607 (2014).
29. A. Yildirim, M. Yunusa, F. E. Ozturk, M. Kanik, and Mehmet Bayindir, Surface textured polymer fibers for microfluidics, Advanced Functional Materials, volume 24, page 4569 (2014).
30. O. Aktas, E. Ozgur, O. Tobail, M. Kanik, E. Huseyinoglu, and Mehmet Bayindir, A new route of fabricating on-chip chalcogenide microcavity resonator array, Advanced Optical Materials, volume 2, page 618 (2014).
31. P. Beyazkiloglu, A. Yildirim, and Mehmet Bayindir, Formation of pyrene excimers in mesoporous ormosil thin films for visual detection of nitro-explosives, ACS Applied Materials and Interfaces, volume 6, page 4997 (2014).
32. A. Yildirim and Mehmet Bayindir, Turn-on fluorescent dopamine sensing based on in situ formation of visible light emitting polydopamine nanoparticles, Analytical Chemistry, volume 86, page 5508 (2014).
33. U. Tuvshindorj, A. Yildirim, F. E. Ozturk, and Mehmet Bayindir, Robust Cassie state of wetting in transparent superhydrophobic coating, ACS Applied Materials and Interfaces, volume 6, page 9680 (2014).

34. A. Yildirim, F. E. Ozturk, and Mehmet Bayindir, *A hollow-core infrared fiber array based optoelectronic nose for discrimination of ethanol and methanol in complex environments*, Analytical Chemistry, volume 85, page 6384 (2013).
35. B. Daglar, T. Khudiyev, G. B. Demirel, F. Buyukserin, and Mehmet Bayindir, *Soft biomimetic tapered nanostructures for large-area antireflective surfaces and SERS sensing*, Journal of Material Chemistry B, volume 1, page 7842 (2013).
36. A. Yildirim, G. B. Demirel, R. Erdem, B. Senturk, T. Tekinay, and Mehmet Bayindir, *Pluronic polymer capped biocompatible mesoporous silica nanocarriers*, Chemical Communications, volume 49, page 9782 (2013).
37. G. B. Demirel, B. Daglar, and Mehmet Bayindir, *Extremely fast and highly selective detection of nitroaromatic explosive vapours by fluorescent polymer thin film*, Chemical Communications, vol. 49, 6140 (2013).
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11. RESEARCH INTERESTS

CURRENT RESEARCH INTERESTS

Specialty fibers, multimaterial fibers and fiber devices

- X-ray scintillator fibers
- Fiber-based perovskite photovoltaics
- Perovskite nanostructures for optoelectronic applications
- Nanostructured fibers for additive manufacturing
- Perovskite fibers for underwater optical communications
- Nanostructured perovskite fiber sensors for X-ray and high-energy particles
- Multifunctional fiber probes for optogenetics

Fiber-based top down nanofabrication technique

- Nanofabrication by iterative thermal size reduction
- Ultra-long nanostructures: Nanowires, nanotubes, core-shell nanowires, nanoribbons
- Semiconducting, piezoelectric, and conducting nanostructures
- Superconducting nanowires

Fiber-based electroactive nanosystems

- Understanding of negative piezoelectricity in PVDF and its copolymers
- Crystallization kinetics in confined systems
- Fabrication of kilometers-long piezoelectric/electrostrictive polymer nanostructures
- Electroactive nanomaterials for flexible electronics
- Wearable sensors and energy harvesting devices
- Artificial electronic skin, high-performance medical devices

Functional nanomaterials by design

- Enhanced triboelectricity in ferroelectric nanostructures
- Triboelectricity in polymeric nanosystems
- Triboelectric-based sensors and energy harvesting devices
- Electrical energy storage, supercapacitors
- Next-generation nanoprobe for cells and neural networks interfacing

Nanowire electronics, photonics, and mechanics

- Nanowire-based optoelectronic sensors
- Large-area flexible electronics and photonics
- Structural coloration of nanostructures, nanowire photovoltaics

PAST RESEARCH INTERESTS

Active fibers and fiber lasers

- MCVD growth of active silica fiber preforms
- Active fibers for high-power (20kW) fiber lasers
- Fiber-based high-performance optoacoustic microphones

Photonic band gap materials, photonic crystals, photonic band gap fibers

- Coupled-cavity structures in photonic crystals
- Hollow-core photonic band gap fibers for high-power IR laser beam delivery and QCLs
- Photonic band gap fibers for infrared spectroscopy

Micro- and nano-structured fibers

- Fiber based optoelectronic and thermal devices (smart textile)
- Multimaterials fibers and fiber-based sensors (including neuroscience application)
- Hierarchically surface textured fibers (on-fiber microfluidics)

Micro- and nanophotonics

- Toroidal microcavities
- Plasmonic sensors, plasmonic resonant antennas
- Metamaterials
- Supercontinuum generation in chalcogenide nanofibers and waveguides
- Optoelectronic nose (digital photonic nose)

Functional nanostructured surfaces

- Multifunctional (antireflective, self-cleaning) coatings for photovoltaics
- Superhydrophobic, superhydrophilic ormosil coatings
- Smart surfaces for chemical sensing

Multimaterials fibers and in-fiber devices

- Metal-insulator-semiconductor optoelectronic fibres
- Thermal sensing fibers

13. GRANTS / AWARDS

INTERNATIONAL GRANTS

1. Project Title: Piezoelectric polymer nanofibers for sensing, energy generation, and artificial skin
Funding Agency: ERC- European Research Council, ERC Proof of Concept
Funding Amount: 150,000 Euro
Position: Principal investigator
Period: 2016-
2. Project Title: Fabrication and characterization of dielectric encapsulated millions of ordered kilometer long nanowires and nanotubes and their applications
Funding Agency: ERC- European Research Council
Funding Amount: 1,500,000 Euro
Position: Principal investigator
Period: 2012-2016
3. Project Title: Digital photonic nose: Detection of toxic gases by using nanostructured photonic crystal fibers
Funding Agency: TUBITAK (COST)
Funding Amount: 178,500 USD
Position: Principal investigator
Period: 2013-2015
4. Project Title: Preparation of mechanically stable superhydrophobic and superhydrophilic coatings for ceramic and plastic surfaces
Funding Agency: Bosch-Siemens B/S/H
Funding Amount: 60,000 USD
Position: Principal investigator
Period: 2013-2013

NATIONAL GRANTS

5. Project Title: High-power fiber lasers
Funding Agency: Tubitak
Funding Amount: 7,890,000 USD
Position: Principal investigator
Period: 2012-2016
6. Project Title: Optomechanical and electromechanical sensors
Funding Agency: Tubitak
Funding Amount: 5,830,000 USD
Position: Principal investigator
Period: 2012-2014
7. Project Title: Ultra-high quality factor microtoroid optical resonators for biological sensing with high sensitivity and specificity
Funding Agency: The Turkish Scientific and Technical Research Council (TUBITAK)
Funding Amount: 168,000 USD
Position: Principal investigator
Period: 2012-2014
8. Project Title: Multifunctional nanostructured coatings using organically modified silica colloids for photovoltaics and sensors
Funding Agency: The Turkish Scientific and Technical Research Council (TUBITAK)
Funding Amount: 178,500 USD
Position: Principal investigator
Period: 2012-2014
9. Project Title: Nanotechnology roadmap for new generation banknote
Funding Agency: Central Bank of the Republic of Turkey
Funding Amount: 81,000 USD
Position: Principal investigator
Period: 2012-2013
10. Project Title: Polymer encapsulated very long metal/semiconductor/polymer nanowire and nanotube arrays and their applications
Funding Agency: The Turkish Scientific and Technical Research Council (TUBITAK)
Funding Amount: 178,000 USD
Position: Principal investigator
Period: 2011-2013
11. Project Title: Infrared laser fibers for medical applications
Funding Agency: The Turkish Scientific and Technical Research Council (TUBITAK)
Funding Amount: 2,000,000 USD
Position: Principal investigator
Period: 2007-2011
12. Project Title: Wide-band infrared light generation in nanofibers
Funding Agency: The Turkish Scientific and Technical Research Council (TUBITAK)
Funding Amount: 157,000 USD
Position: Principal investigator

Period: 2006-2009

13. Project Title: TÜBA Gebip Award

Funding Agency: Turkish Academy of Sciences (TUBA)

Funding Amount: 30,000 USD + 3,500 USD for PhD students

Position: Principal investigator

Period: 2007-2010

NATIONAL LARGE-SCALE INFRASTRUCTURE GRANTS

14. Project Title: National Nanotechnology Research Center

Funding Agency: State Planning Organization

Funding Amount: 27,000,000 USD

Position: Deputy Director

Period: 2006-2011