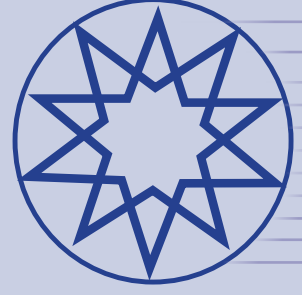


ISSN 2636-8498

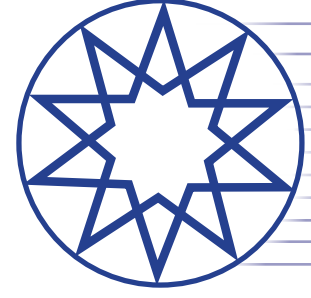


# ***Environmental Research & Technology***

Year 2024  
Volume 7  
Number 1

**YTÜ  
PRESS**

[www.ert.yildiz.edu.tr](http://www.ert.yildiz.edu.tr)



# ***Environmental Research & Technology***

**Volume 7 Number 1 Year 2024**

## **EDITOR-IN-CHIEF**

**Prof. Dr. Ahmet Demir**, *Yıldız Technical University, İstanbul, Türkiye*

**Prof. Dr. Mehmet Sinan Bilgili**, *Yıldız Technical University, İstanbul, Türkiye*

## **ACADEMIC ADVISORY BOARD**

**Prof. Dr. Adem Baştürk**, *Yıldız Technical University, İstanbul, Türkiye*

**Prof. Dr. Mustafa Öztürk**, *Yıldız Technical University, İstanbul, Türkiye*

**Prof. Dr. Lütfi Akça**, *İstanbul Technical University, İstanbul, Türkiye*

**Prof. Dr. Oktay Tabasaran**, *University of Stuttgart, Germany*

## **SCIENTIFIC DIRECTOR**

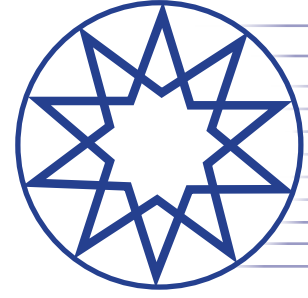
**Prof. Dr. Ahmet Demir**, *Yıldız Technical University, İstanbul, Türkiye*

## **ASSISTANT EDITOR**

**Dr. Hanife Sarı Erkan**, *Yıldız Technical University, İstanbul, Türkiye*

## **LANGUAGE EDITOR**

**Prof. Dr. Güleda Engin**, *Yıldız Technical University, İstanbul, Türkiye*



# ***Environmental Research & Technology***

**Volume 7 Number 1 Year 2024**

## **CO-EDITORS (AIR POLLUTION)**

**Prof. Dr. Mohd Talib Latif**, *Department of National University of Malaysia/Universiti Kebangsaan Malaysia, Malaysia*

**Prof. Dr. Nedim Vardar**, *Inter American University, Puerto Rico*

**Prof. Dr. Sait Cemil Sofuođlu**, *İzmir Institute of Technology, İzmir, Türkiye*

**Prof. Dr. Wina Graus**, *Copernicus Institute of Sustainable Development, Utrecht University, Netherlands*

## **CO-EDITORS (ENVIRONMENTAL ENGINEERING AND SUSTAINABLE SOLUTIONS)**

**Prof. Dr. Bülent İnanç**, *İstanbul Technical University, İstanbul, Türkiye*

**Prof. Dr. Güleda Engin**, *Yıldız Technical University, İstanbul, Türkiye*

**Prof. Dr. Hossein Kazemian**, *University of Northern British Columbia, Canada*

**Prof. Dr. Raffaella Pomi**, *La Sapienza, Italy*

**Prof. Dr. Yılmaz Yıldırım**, *Zonguldak Bülent Ecevit University, Zonguldak, Türkiye*

## **CO-EDITORS (WASTE MANAGEMENT)**

**Prof. Dr. Bestami Özkaya**, *Yıldız Technical University, İstanbul, Türkiye*

**Prof. Dr. Bülent Topkaya**, *Akdeniz University Faculty of Engineering, Antalya, Türkiye*

**Prof. Dr. Kahraman Unlu**, *Department of Environmental Engineering, Middle East Technical University, Ankara, Türkiye*

**Prof. Dr. Mohamed Osmani**, *Loughborough University, School of Architecture, Building and Civil Engineering, United Kingdom*

**Prof. Dr. Pin Jing He**, *Tongji University, China*

## **CO-EDITORS (WATER AND WASTEWATER MANAGEMENT)**

**Prof. Dr. Ayşe Filibeli**, *Dokuz Eylül University, İzmir, Türkiye*

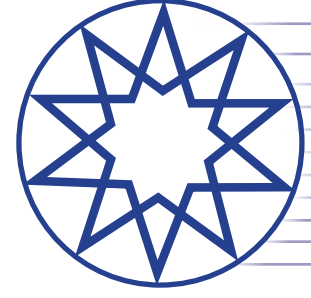
**Prof. Dr. Barış Çallı**, *Marmara University, İstanbul, Türkiye*

**Prof. Dr. Marina Prisciandaro**, *University Of L'aquila, Italy*

**Prof. Dr. Md. Ahmaruzzaman**, *National Institute of Technology Silchar, India*

**Prof. Dr. Selvam Kaliyamoorthy**, *Mie University, Japan*

**Prof. Dr. Subramanyan Vasudevan**, *Academy For Scientific and Innovative Research, New Delhi, India*



# ***Environmental Research & Technology***

**Volume 7 Number 1 Year 2024**

## **EDITORIAL BOARD**

**Prof. Dr. Andjelka Mihajlo**, *Department of Environmental Engineering and Occupational Safety and Health, Faculty of Technical Sciences, University of Novi Sad, Serbia*

**Prof. Dr. Artur J. Badyda**, *Warsaw University of Technology, Poland*

**Prof. Dr. Azize Ayol**, *Dokuz Eylül University, İzmir, Türkiye*

**Prof. Dr. Didem Balkanlı**, *Yıldız Technical University, İstanbul, Türkiye*

**Prof. Dr. Erwin Binner**, *University of Natural Resources and Life Science Vienna, Austria*

**Prof. Dr. Eyüp Debik**, *Yıldız Technical University, İstanbul, Türkiye*

**Prof. Dr. Dilek Sanin**, *Middle East Technical University, Ankara, Türkiye*

**Prof. Dr. Gülsüm Yılmaz**, *İstanbul University-Cerrahpaşa, İstanbul, Türkiye*

**Prof. Dr. Hamdy Seif**, *Beirut Arab University, Beirut, Lebanon*

**Prof. Dr. Hanife Büyükgüngör**, *Ondokuz Mayıs University, Samsun, Türkiye*

**Prof. Dr. Ilirjan Malollari**, *University of Tirana, Albania, Albanian Academy of Sciences, Albania*

**Prof. Dr. İsmail Koyuncu**, *İstanbul Technical University, İstanbul, Türkiye*

**Prof. Dr. Jaakko Puhakka**, *Tampere University of Applied Sciences, Tampere, Finland*

**Prof. Dr. Lucas Alados Arboledas**, *University of Granada, Granada, Spain*

**Prof. Dr. Mahmoud A. Alawi**, *University of Jordan, Amman, Jordan*

**Prof. Dr. Marcelo Antunes Nolasco**, *University of São Paulo, São Paulo, Brasil*

**Prof. Dr. Martin Kranert**, *University of Stuttgart, Stuttgart, German*

**Prof. Dr. Mesut Akgün**, *Yıldız Technical University, İstanbul, Türkiye*

**Prof. Dr. Mukand S. Babel**, *Asian Institute of Technology, Pathum Thani, Thailand*

**Prof. Dr. Mustafa Odabaşı**, *Dokuz Eylül University, İzmir, Türkiye*

**Prof. Dr. Müfide Banar**, *Eskişehir Technical University, Eskişehir, Türkiye*

**Prof. Dr. Mufit Bahadır**, *Technische Universität Braunschweig, German*

**Prof. Dr. Neslihan Doğan Sağlamtimur**, *Niğde Ömer Halisdemir University, Niğde, Türkiye*

**Prof. Dr. Nihal Bektaş**, *Gebze Technical University, Gebze, Türkiye*

**Prof. Dr. Osman Arıkan**, *İstanbul Technical University, İstanbul, Türkiye*

**Prof. Dr. Osman Nuri Ağdağ**, *Pamukkale University, Denizli, Türkiye*

**Prof. Dr. Pier Paolo Manca**, *University of Cagliari, Italy*

**Prof. Dr. Saim Özdemir**, *Sakarya University, Sakarya, Türkiye*

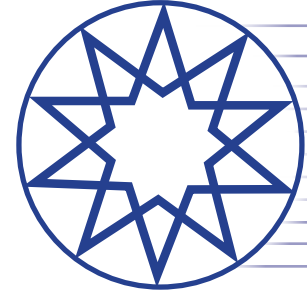
**Prof. Dr. Serdar Aydın**, *İstanbul University-Cerrahpaşa, İstanbul, Türkiye*

**Prof. Dr. Timothy O. Randhir**, *University of Massachusetts Amherst, USA*

**Prof. Dr. Ülkü Yetis**, *Middle East Technical University, Ankara, Türkiye*

**Prof. Dr. Victor Alcaraz Gonzalez**, *University of Guadalajara, Mexico*

**Prof. Dr. Ejaz Khan**, *Health Services Academy, Pakistan*



# ***Environmental Research & Technology***

Volume 7 Number 1 Year 2024

## **CONTENTS**

### **Editorial**

- 1** **Celebrating a new milestone for environmental research and technology**  
*Ahmet DEMİR, Mehmet Sinan BİLGİLİ*

### **Research Articles**

- 3** **A comparative study on the selection of the most suitable route for the collection and transportation of municipal solid waste**  
*Abdullah İzzeddin KARABULUT, Benan YAZICI KARABULUT, Perihan DERİN, Mehmet İrfan YEŞİLNACAR, Hale PAMUKÇU*
- 13** **Physicochemical characterization of university campus' wastewater for internal treatment system installation (Casablanca, Morocco)**  
*Khaoula GRIMAH, Abdelmottalib NAHLI, Asma LAZRAK, Mohamed CHLAIDA*
- 27** **Appraisal of reclaimed asphalt pavement as coarse aggregates in cement concrete**  
*Michael Toryila TİZA, Jonah AGUNWAMBA, Fidelis OKAFOR*
- 41** **Assessment of tube well water quality in selected residential areas in Khulna**  
*Sumaya TABASSUM, Jinat Tasnim DRISTY, Asif AHMED, Riyadul Hashem RIYAD*
- 61** **The relationship between air pollution and cardiovascular diseases in Türkiye**  
*Gülay EKİNCİ*
- 71** **The biodiversity and conservation assessment of Bamui bee in Bangladesh: Current status and threats**  
*Rasel MIA, Mostafizur RAHMAN, Angkur CHOWDHURY, Basir AHAMMAD, Chironjib Singha Samanta CHANDAN, Bhaskar Chandra MAJUMDAR, Shaila AKTER, Zobayer RAHMAN*
- 83** **Evaluation of the environmental exposure risks of pesticides used in vegetable production in Türkiye**  
*Elif Pınar KULA, Recep Kaya GÖKTAŞ*
- 97** **Roles of mobile applications in removing barriers to individual recycling: Case of Türkiye**  
*İnci DURSUN, Ebru TÜMER, Hediye YÜRÜYEN KILIÇ*
- 108** **Effect of purification methods on the quality and morphology of plastic waste-derived carbon nanotubes**  
*Helen MODEKWE, Ishmael RAMATSA*
- Reviews Articles**
- 118** **Towards net zero energy buildings: A review of barriers and facilitators to the adoption of building energy efficiency practices**  
*Yahaya Hassan LABARAN, Hussaini MATO, Gaurav SAINI, Auwal Alhassan MUSA*
- 131** **Sustainable spatial strategies for mitigating air pollution in quick commerce environments**  
*Eunhye SON, Ki Han KWON*
- 140** **Review on the use of artificial neural networks to determine the relationship between climate change and the occupancy rates of dams**  
*Furkan DEMİRBAŞ, Emine ELMASLAR ÖZBAŞ*