

## Assoc. Prof. EMRE BÜKÜŞOĞLU

### Personal Information

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### International Researcher IDs

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Publons / Web Of Science ResearcherID: AAZ-8999-2020

ScopusID: 55827457200

Yoksis Researcher ID: 263414

### Education Information

Doctorate, University of Wisconsin-Madison, Kimya Mühendisliği Bölümü, United States Of America 2010 - 2015

Postgraduate, Middle East Technical University, Faculty of Engineering, Department of Chemical Engineering, Turkey  
2008 - 2010

Undergraduate, Middle East Technical University, Faculty of Engineering, Department of Chemical Engineering, Turkey  
2003 - 2008

### Dissertations

Doctorate, Design of Functional Materials Based on Confined Liquid Crystals, University Of Wisconsin-Madison, Kimya Mühendisliği Bölümü, 2015

Postgraduate, Dehydration of alcohol solutions obtained from a solvent recovery process by pervaporation, Middle East Technical University, Faculty of Engineering, Department of Chemical Engineering, 2010

### Research Areas

Thermodynamics, Separation Operations, Optical Properties, Interface Chemistry, Polymeric Materials, Thermodynamics, Surface Chemistry

### Academic Titles / Tasks

Assistant Professor, Middle East Technical University, Faculty of Engineering, Department of Chemical Engineering, 2018  
- Continues

Assistant Professor, Middle East Technical University, Faculty of Engineering, Department of Chemical Engineering, 2017  
- 2018

### Academic and Administrative Experience

Deputy Head of Department, Middle East Technical University, Faculty of Engineering, Department of Chemical Engineering, 2018 - 2021

## Courses

Thermodynamics II, Undergraduate, 2019 - 2020

Interfacial Phenomena, Undergraduate, 2017 - 2018

## Advising Theses

Büküşođlu E., Development of polymeric gas sensors, Doctorate, Ö.BATIR(Student), 2023

Büküşođlu E., Nanoscale patterning of liquid crystal-aqueous interfaces, Postgraduate, A.AKMAN(Student), 2023

Büküşođlu E., Çulfaz Emecen P. Z., Membrane fabrication via shear induced deposition and chemical stabilization of cellulose nanocrystals, Postgraduate, B.CAN(Student), 2023

BÜKÜŞOĐLU E., Controlled synthesis of organic-inorganic composite particles, Postgraduate, E.ERÇELİK(Student), 2022

BÜKÜŞOĐLU E., Investigation of active microparticle motion at structured oil-aqueous interfaces and microcargo release via interfacial shear, Postgraduate, R.UMUT(Student), 2022

ÇULFAZ EMECEN P. Z., BÜKÜŞOĐLU E., Processing cellulose nanocrystal suspensions for aligned deposition, Postgraduate, C.KOCAMAN(Student), 2022

KALIPÇILAR H., BÜKÜŞOĐLU E., Modification of pebax and zif-8/pebax membranes by additional solvent treatment to improve co<sub>2</sub>/n<sub>2</sub> separation performance, Postgraduate, A.Abdulalem(Student), 2020

Büküşođlu E., SYNTHESIS AND CHARACTERIZATION OF SENSOR MICROPARTICLES TEMPLATED FROM CHOLESTERIC LIQUID CRYSTALS, Postgraduate, D.IŞINSU(Student), 2020

Büküşođlu E., LIQUID CRYSTAL - TEMPLATED SYNTHESIS OF POLYMERIC MICROPARTICLES WITH COMPLEX NANOSTRUCTURES, Postgraduate, B.AKDENİZ(Student), 2019

Kalıpçılar H., Büküşođlu E., Design of functional materials using liquid crystals as molecular templates, Postgraduate, A.KARAUSTA(Student), 2018

## Jury Memberships

Doctorate, Doctorate, Orta Dođu Teknik Üniversitesi, September, 2018

## Published journal articles indexed by SCI, SSCI, and AHCI

- I. **Responsive Soft Interface Liquid Crystal Microfluidics**  
Özşahin A. N., BÜKÜŞOĐLU E.  
Advanced Materials Interfaces, vol.11, no.29, 2024 (SCI-Expanded)
- II. **Optically responsive dry cholesteric liquid crystal marbles**  
KOCAMAN C., BATIR Ö., BÜKÜŞOĐLU E.  
Journal of Colloid and Interface Science, vol.671, pp.374-384, 2024 (SCI-Expanded)
- III. **Cross-Linked Cellulose Nanocrystal Membranes with Cholesteric Assembly**  
İÇTEN B. C., BÜKÜŞOĐLU E., ÇULFAZ EMECEN P. Z.  
LANGMUIR, vol.40, no.25, pp.13247-13255, 2024 (SCI-Expanded)
- IV. **Nanoparticle-Assisted Liquid Crystal Droplet Sensors Enable Analysis of Low-Concentration Species in Aqueous Medium**  
SEZER S., BÜKÜŞOĐLU E.  
Langmuir, vol.40, no.6, pp.3154-3167, 2024 (SCI-Expanded)
- V. **Understanding directed assembly of concentrated nanoparticles at energetically heterogeneous**

**interfaces of cholesteric liquid crystal droplets**

AKMAN A., BÜKÜŞOĞLU E.

Journal of Colloid and Interface Science, vol.649, pp.772-784, 2023 (SCI-Expanded)

**VI. Controlled release of microcargo from water-in-liquid crystal emulsions via interfacial shear induced by synthetic microstirrers**

Dinç R. U., Büküşoğlu E.

SOFT MATTER, vol.19, no.23, pp.4304-4314, 2023 (SCI-Expanded)

**VII. Tuning electrostatic interactions for controlled structure and rejection of cellulose nanocrystal membranes**

KOCAMAN C., BÜKÜŞOĞLU E., ÇULFAZ EMECEN P. Z.

Journal of Membrane Science, vol.661, 2022 (SCI-Expanded)

**VIII. Contactless Pulsed and Continuous Microdroplet Release Using Photothermal Liquid Crystals**

BEYAZKILIÇ AYAS P., Akcimen S., Elbuken C., Ortac B., Cai S., BÜKÜŞOĞLU E.

ADVANCED FUNCTIONAL MATERIALS, vol.32, no.44, 2022 (SCI-Expanded)

**IX. Interpenetrating network based polymeric sensors with enhanced specificity, sensitivity, and reusability**

BATIR Ö., BAT E., BÜKÜŞOĞLU E.

Sensors and Actuators B: Chemical, vol.367, 2022 (SCI-Expanded)

**X. Liquid crystal microcapillary-based sensors for affordable analytical applications**

Kurt E., Büküşoğlu E.

SOFT MATTER, vol.18, pp.4009-4016, 2022 (SCI-Expanded)

**XI. Nanoparticle adsorption induced configurations of nematic liquid crystal droplets**

Sengul S., AYDOĞAN N., BÜKÜŞOĞLU E.

JOURNAL OF COLLOID AND INTERFACE SCIENCE, vol.608, pp.2310-2320, 2022 (SCI-Expanded)

**XII. Controlling Ultrafiltration Membrane Rejection via Shear-Aligned Deposition of Cellulose Nanocrystals from Aqueous Suspensions**

Kocaman C., Büküşoğlu E., Çulfaz Emecen P. Z.

ACS APPLIED MATERIALS & INTERFACES, vol.13, no.30, pp.36548-36557, 2021 (SCI-Expanded)

**XIII. Controlling the shapes and internal complexity of the polymeric particles using liquid crystal-templates confined into microwells**

KARAUSTA A., KOCAMAN C., BÜKÜŞOĞLU E.

JOURNAL OF MOLECULAR LIQUIDS, vol.324, 2021 (SCI-Expanded)

**XIV. Chameleon skin-inspired polymeric particles for the detection of toluene vapor**

Avsar D. I., Büküşoğlu E.

SOFT MATTER, vol.16, pp.8683-8691, 2020 (SCI-Expanded)

**XV. Identification and sorting of particle chirality using liquid crystallinity**

Akdeniz B., Batır Ö., Büküşoğlu E.

JOURNAL OF COLLOID AND INTERFACE SCIENCE, vol.574, pp.11-19, 2020 (SCI-Expanded)

**XVI. Strain-enhanced sensitivity of polymeric sensors templated from cholesteric liquid crystals**

Batır Ö., Bat E., Büküşoğlu E.

SOFT MATTER, vol.16, no.29, pp.6794-6802, 2020 (SCI-Expanded)

**XVII. Prolate and oblate chiral liquid crystal spheroids**

Sadati M., Martinez-Gonzalez J. A., Zhou Y., Qazvini N. T., Kurtenbach K., Li X., Büküşoğlu E., Zhang R., Abbott N. L., Pablo Hernandez-Ortiz J., et al.

SCIENCE ADVANCES, vol.6, no.28, 2020 (SCI-Expanded)

**XVIII. Programming van der Waals interactions with complex symmetries into microparticles using liquid crystallinity**

Fuster H. A., Wang X., Wang X., Bukusoglu E., Spagnolie S. E., Abbott N. L.

SCIENCE ADVANCES, vol.6, no.25, 2020 (SCI-Expanded)

**XIX. Addressing challenges in the ultrafiltration of biomolecules from complex aqueous environments**

Büküşoğlu E., Koku H., Çulfaz-Emecen P. Z.

Current Opinion in Colloid and Interface Science, vol.46, pp.52-64, 2020 (SCI-Expanded)

- XX. **Design Parameters and Principles of Liquid-Crystal-Templated Synthesis of Polymeric Materials via Photolithography**  
AKDENİZ B., BÜKÜŞOĞLU E.  
LANGMUIR, vol.35, no.40, pp.13126-13134, 2019 (SCI-Expanded)
- XXI. **Liquid Crystal Templates Combined with Photolithography Enable Synthesis of Chiral Twisted Polymeric Microparticles**  
AKDENİZ B., BÜKÜŞOĞLU E.  
MACROMOLECULAR RAPID COMMUNICATIONS, vol.40, no.15, 2019 (SCI-Expanded)
- XXII. **Liquid Crystal-Templated Synthesis of Mesoporous Membranes with Predetermined Pore Alignment**  
Karausta A., Büküşoğlu E.  
ACS APPLIED MATERIALS & INTERFACES, vol.10, no.39, pp.33484-33492, 2018 (SCI-Expanded)
- XXIII. **Self-reporting and self-regulating liquid crystals**  
Kim Y., Wang X., Mondkar P., Bukusoglu E., Abbott N. L.  
NATURE, vol.557, no.7706, pp.539-560, 2018 (SCI-Expanded)
- XXIV. **Dehydration of Industrial Byproduct Solutions for Recycling via Pervaporation-Adsorption Hybrid Process**  
BÜKÜŞOĞLU E., KALIPÇILAR H., YILMAZ L.  
INDUSTRIAL & ENGINEERING CHEMISTRY RESEARCH, vol.57, no.6, pp.2277-2286, 2018 (SCI-Expanded)
- XXV. **Strain-induced alignment and phase behavior of blue phase liquid crystals confined to thin films**  
Büküşoğlu E., Martinez-Gonzalez J. A., Wang X., Zhou Y., De Pablo J. J., Abbott N. L.  
SOFT MATTER, vol.13, no.47, pp.8999-9006, 2017 (SCI-Expanded)
- XXVI. **Active Janus Particles at Interfaces of Liquid Crystals**  
Mangal R., Nayani K., Kim Y., Büküşoğlu E., Cordova-Figueroa U. M., Abbott N. L.  
LANGMUIR, vol.33, no.41, pp.10917-10926, 2017 (SCI-Expanded)
- XXVII. **Patterned surface anchoring of nematic droplets at miscible liquid-liquid interfaces**  
Wang X., Zhou Y., Kim Y., Miller D. S., Zhang R., Martinez-Gonzalez J. A., Büküşoğlu E., Zhang B., Brown T. M., De Pablo J. J., et al.  
SOFT MATTER, vol.13, no.34, pp.5714-5723, 2017 (SCI-Expanded)
- XXVIII. **A Practical Guide to the Preparation of Liquid Crystal-Templated Microparticles**  
Wang X., Büküşoğlu E., Abbott N. L.  
CHEMISTRY OF MATERIALS, vol.29, no.1, pp.53-61, 2017 (SCI-Expanded)
- XXIX. **Synthesis of Optically Complex, Porous, and Anisometric Polymeric Microparticles by Templating from Liquid Crystalline Droplets**  
Wang X., Büküşoğlu E., Miller D. S., Pantoja M. A. B., Xiang J., Lavrentovich O. D., Abbott N. L.  
ADVANCED FUNCTIONAL MATERIALS, vol.26, no.40, pp.7343-7351, 2016 (SCI-Expanded)
- XXX. **Structural Transitions in Cholesteric Liquid Crystal Droplets**  
Zhou Y., BÜKÜŞOĞLU E., Martinez-Gonzalez J. A., Rahimi M., Roberts T. F., Zhang R., Wang X., Abbott N. L., de Pablo J. J.  
ACS NANO, vol.10, no.7, pp.6484-6490, 2016 (SCI-Expanded)
- XXXI. **Experimental Insights into the Nanostructure of the Cores of Topological Defects in Liquid Crystals**  
Wang X., Kim Y., Büküşoğlu E., Zhang B., Miller D. S., Abbott N. L.  
PHYSICAL REVIEW LETTERS, vol.116, no.14, 2016 (SCI-Expanded)
- XXXII. **Positioning colloids at the surfaces of cholesteric liquid crystal droplets**  
BÜKÜŞOĞLU E., Wang X., Zhou Y., A. Martinez-Gonzalez J., Rahimi M., Wang Q., de Pablo J. J., Abbott N. L.  
SOFT MATTER, vol.12, no.42, pp.8781-8789, 2016 (SCI-Expanded)
- XXXIII. **Topological defects in liquid crystals as templates for molecular self-assembly**  
Wang X., Miller D. S., Büküşoğlu E., De Pablo J. J., Abbott N. L.  
NATURE MATERIALS, vol.15, no.1, pp.106-114, 2016 (SCI-Expanded)
- XXXIV. **Design of Responsive and Active (Soft) Materials Using Liquid Crystals**  
BÜKÜŞOĞLU E., Pantoja M. B., Mushenheim P. C., Wang X., Abbott N. L.

ANNUAL REVIEW OF CHEMICAL AND BIOMOLECULAR ENGINEERING, VOL 7, vol.7, pp.163-196, 2016 (SCI-Expanded)

- XXXV. **Stimuli-Responsive Cubosomes Formed from Blue Phase Liquid Crystals**  
BÜKÜŞOĞLU E., Wang X., Martinez-Gonzalez J. A., de Pablo J. J., Abbott N. L.  
ADVANCED MATERIALS, vol.27, no.43, pp.6892-6899, 2015 (SCI-Expanded)
- XXXVI. **Blue-phase liquid crystal droplets**  
Martinez-Gonzalez J. A., Zhou Y., Rahimi M., BÜKÜŞOĞLU E., Abbott N. L., de Pablo J. J.  
PROCEEDINGS OF THE NATIONAL ACADEMY OF SCIENCES OF THE UNITED STATES OF AMERICA, vol.112, no.43, pp.13195-13200, 2015 (SCI-Expanded)
- XXXVII. **Nanoparticle self-assembly at the interface of liquid crystal droplets**  
Rahimi M., Roberts T. F., Armas-Pérez J. C., Wang X., BÜKÜŞOĞLU E., Abbott N. L., de Pablo J. J.  
PROCEEDINGS OF THE NATIONAL ACADEMY OF SCIENCES OF THE UNITED STATES OF AMERICA, vol.112, no.17, pp.5297-5302, 2015 (SCI-Expanded)
- XXXVIII. **Hierarchical Microstructures Formed by Bidisperse Colloidal Suspensions within Colloid-in-Liquid Crystal Gels**  
Diestra-Cruz H., BÜKÜŞOĞLU E., Abbott N. L., Acevedo A.  
ACS APPLIED MATERIALS & INTERFACES, vol.7, no.13, pp.7153-7162, 2015 (SCI-Expanded)
- XXXIX. **Colloid-in-liquid crystal gels formed via spinodal decomposition**  
BÜKÜŞOĞLU E., Pal S. K., de Pablo J. J., Abbott N. L.  
SOFT MATTER, vol.10, no.10, pp.1602-1610, 2014 (SCI-Expanded)
- XL. **Colloid-in-Liquid Crystal Gels that Respond to Biomolecular Interactions**  
Agarwal A., Sidiq S., Setia S., BÜKÜŞOĞLU E., de Pablo J. J., Pal S. K., Abbott N. L.  
SMALL, vol.9, no.16, pp.2785-2792, 2013 (SCI-Expanded)

## Articles Published in Other Journals

- I. **Shape Effects on the Structure and Response of the Polymeric Particles Synthesized from Cholesteric Liquid Crystal Templates**  
Avşar D. I., BÜKÜŞOĞLU E.  
Erciyes Üniversitesi Fen Bilimleri Enstitüsü Dergisi, vol.37, pp.26-35, 2021 (Peer-Reviewed Journal)
- II. **Positioning of Cubic Shaped Particles with Different Edge Structures in Nematic Medium**  
KARAUSTA A., BÜKÜŞOĞLU E.  
Celal Bayar Üniversitesi Fen Bilimleri Dergisi, vol.17, no.2, pp.115-120, 2021 (Peer-Reviewed Journal)

## Refereed Congress / Symposium Publications in Proceedings

- I. **Nanoparticle adsorption-induced configurations of liquid crystal droplets**  
Şengül S., BÜKÜŞOĞLU E.  
ACS Fall 2021, 22 - 26 August 2021
- II. **Enhanced sensitivity of polymeric sensors templated from cholesteric liquid crystals**  
BATIR Ö., BAT E., BÜKÜŞOĞLU E.  
ACS Fall 2021, 22 - 26 August 2021
- III. **Liquid Crystal Self-Assembly: A Route for Anisotropic Composites**  
Şengül S., BÜKÜŞOĞLU E.  
20th International Metallurgy and Materials Congress, 10 - 12 June 2021
- IV. **Düşük Maliyette Uygulamalara Yönelik Mikrokapiler Sıvı Kristal Sensörler**  
Kurt E., Büküşoğlu E.  
Ulusal Kimya Mühendisliği Kongresi, Konya, Turkey, 10 - 12 June 2021
- V. **Designing Responsive Polymeric Materials using Liquid Crystallinity**

BÜKÜŞOĞLU E., Akdeniz B., Avşar D. I., Karausta A.

Nano TR, Turkey, 3 - 06 November 2019

- VI. **Liquid Crystal-Templated Synthesis of Complex Microparticles and their Sensor Applications**  
Akdeniz B., Karausta A., Kocaman C., Avşar D. I., BÜKÜŞOĞLU E.  
Gordon Research Conferences on Liquid Crystals, 7 - 12 July 2019
- VII. **Synthesis of Liquid Crystal Templated Polymeric Microparticles Shaped by Microwells**  
Kocaman C., Akdeniz B., Büküşoğlu E.  
Eastern Mediterranean Chemical Engineering Conferences 9, Ankara, Turkey, 30 August - 01 September 2018, pp.1
- VIII. **Liquid Crystal-Templated Synthesis of Anisotropic Ultrafiltration Membranes**  
Büküşoğlu E., Karausta A.  
Eastern Mediterranean Chemical Engineering Conference 9, Ankara, Turkey, 30 August - 01 September 2018, pp.1
- IX. **Synthesis and Characterization of Micro Particles Templated from Cholesteric Liquid Crystal for Sensor Application**  
Büküşoğlu E., Avşar D. I.  
Eastern Mediterranean Chemical Engineering Conference 9, Ankara, Turkey, 30 August - 01 September 2018, pp.1
- X. **Synthesis of 3D Chiral Microparticles from Nematic Liquid Crystal Templates**  
Büküşoğlu E., Akdeniz B.  
Eastern Mediterranean Chemical Engineering Conference 9, Ankara, Turkey, 30 August - 01 September 2018, pp.1
- XI. **Cholesteric Liquid Crystal Based Polymeric Sensors for Detection of Volatile Organic Compounds**  
Batır Ö., Bat E., Büküşoğlu E.  
Eastern Mediterranean Chemical Engineering Conferences 9, Ankara, Turkey, 30 August - 01 September 2018, pp.1
- XII. **Liquid Crystal-Templated Synthesis of Polymeric Films and their Potential Use in Chemical Processes**  
Karausta A., Büküşoğlu E.  
27th International Liquid Crystal Conference, Kyoto, Japan, 22 - 28 July 2018
- XIII. **Synthesis of Optically Complex, Porous and Anisometric Polymeric Materials by Templating from Liquid Crystalline Media**  
BÜKÜŞOĞLU E., Wang X., Abbott N. L.  
Gordon Research Conferences on Liquid Crystals, 18 June 2017 - 23 June 2016
- XIV. **Triggered Release of Dispersed Microdroplets from Anisotropic Fluids**  
Kim Y., Wang X., BÜKÜŞOĞLU E., Mondkar P., Abbott N. L.  
APS March Meeting, 13 March 2017

## Supported Projects

ÇULFAZ EMECEN P. Z., BÜKÜŞOĞLU E., Project Supported by Higher Education Institutions, Kontrollü koloid birikimi ile membran üretimi: Koloid filtrasyonunun gözlemlenmesi ve koloidler arası etkileşimlerin belirlenmesi, 2022 - Continues

Büküşoğlu E., H2020 Project, Liquid Crystals in Flow: A New Era in Sensing and Diagnostics, 2022 - 2027

BÜKÜŞOĞLU E., ÖZÇUBUKÇU S., Saylam A., TUBITAK Project, Development of Whole Synthetic Enzyme-Liquid Crystal Sensor Platforms, 2023 - 2025

Çulfaz Emecen P. Z., Erel Göktepe İ., Büküşoğlu E., Ondaral S., TUBITAK Project, Selüloz Nanokristal Ve Nanofibriller Kullanılarak Katman-Katman Kendiliğinden Yapılanma Yöntemi İle Nanofiltrasyon Membranlarının Geliştirilmesi, 2021 - 2024

İÇTEN B. C., BÜKÜŞOĞLU E., Project Supported by Higher Education Institutions, Selüloz nanokristal membranlar, 2022 - 2023

BÜKÜŞOĞLU E., BAT E., BATIR Ö., Project Supported by Higher Education Institutions, Polimerik Gaz Sensörlerinin Geliştirilmesi, 2020 - 2022

## Activities in Scientific Journals

Frontiers in Soft Matter, Committee Member, 2021 - Continues

## Scientific Refereeing

SOFT MATTER, SCI Journal, November 2023

JOURNAL OF COLLOID AND INTERFACE SCIENCE, SCI Journal, September 2023

NATURE COMMUNICATIONS, SCI Journal, August 2023

LANGMUIR, SCI Journal, August 2023

ANALYST, THE, SCI Journal, July 2023

JOURNAL OF COLLOID AND INTERFACE SCIENCE, SCI Journal, July 2023

JOURNAL OF COLLOID AND INTERFACE SCIENCE, SCI Journal, May 2023

LANGMUIR, SCI Journal, February 2023

SMALL, SCI Journal, January 2023

ADVANCED MATERIALS, SCI Journal, December 2022

ACS APPLIED POLYMER MATERIALS, SCI Journal, October 2022

SMALL, SCI Journal, July 2022

SOFT MATTER, SCI Journal, May 2022

ACS APPLIED MATERIALS & INTERFACES, SCI Journal, April 2022

CURRENT OPINION IN COLLOID AND INTERFACE SCIENCE, SCI Journal, April 2022

ACS APPLIED MATERIALS & INTERFACES, SCI Journal, December 2020

ACS APPLIED MATERIALS & INTERFACES, SCI Journal, October 2020

ACS OMEGA, SCI Journal, October 2020

TUBITAK Project, 1002 - Quick Support Program, Middle East Technical University, Turkey, June 2020

ACS APPLIED POLYMER MATERIALS, SCI Journal, May 2020

LANGMUIR, SCI Journal, April 2020

TUBITAK Project, 1002 - Quick Support Program, Middle East Technical University, Turkey, January 2020

## Metrics

Publication: 58

Citation (WoS): 1085

Citation (Scopus): 1111

H-Index (WoS): 17

H-Index (Scopus): 17

## Congress and Symposium Activities

Eastern Mediterranean Chemical Engineering Conferences, Working Group, Ankara, Turkey, 2018

Eastern Mediterranean Chemical Engineering Conferences, Working Group, Ankara, Turkey, 2018

Eastern Mediterranean Chemical Engineering Conferences, Working Group, Ankara, Turkey, 2018

International Liquid Crystals Conference 2018, Working Group, Kyoto, Japan, 2018

## Awards

Büküşoğlu E., Üstün Başarılı Genç Bilim İnsanı Ödülü, Türkiye Bilimler Akademisi, December 2021

Büküşoğlu E., Bilim Akademisi Genç Bilim İnsanı Ödülü, Bilim Akademisi, April 2019