

# Gözde ÖZBAL SARGIN

## Work Experience

- 2023 - **Sabancı University**  
Post Doctoral Researcher in Faculty of Engineering and Natural Sciences
- 2022 - 2023 **UNAM-Bilkent University**  
Post Doctoral Researcher in Institute of Materials Science and Nanotechnology
- 2019 -2021 **İzmir Institute of Technology**  
Post Doctoral Researcher in Materials Science and Engineering
- 2010-2019 **İzmir Institute of Technology**  
Research Assistant

## *Teaching Experience:*

- Presented the aspects of the course material.
- Prepared the material, solved problems, answered the questions associated with the course.
- Prepared and presented the laboratories associated with the course.
- Graded the laboratory submissions.
- Hold office hours for individual or small group consultation.

## Computer Skills

- Operating Systems
  - Microsoft Windows
  - Linux
- Software Packages
  - QuantumATK
  - Vienna Ab initio Simulation Package (VASP)
  - SIESTA
  - DFTB+
- Computational Languages
  - MATLAB
  - Python (Basic)
- Document Preparation
  - LaTeX: Expert

## Academic Career

2023 -	<b><u>Sabancı University</u></b> Post Doctoral Researcher in Faculty of Engineering and Natural Sciences
2022 - 2023	<b><u>UNAM-Bilkent University</u></b> Post Doctoral Researcher in Institute of Materials Science and Nanotechnology
2019 -2021	<b><u>İzmir Institute of Technology</u></b> Post Doctoral Researcher in Materials Science and Engineering
2013 - 2019	<b><u>İzmir Institute of Technology</u></b> Doctor of Philosophy in Physics
2010 - 2013	<b><u>İzmir Institute of Technology</u></b> Master of Science in Physics
2005 - 2010	<b><u>Dokuz Eylül University</u></b> Bachelor of Physics Education

## Research Interests

My research specialization is that of theoretical and computational condensed matter physics focusing mainly on graphene, graphene-related and 2D materials. More specifically, my research studies mostly are related to the electronic/thermal transport and thermoelectric properties of low-dimensional materials. Nowadays, we examine the transport properties of devices that we model with low-dimensional materials.

## Foreign Languages

English

## Thesis

**PhD. Thesis**, "THERMOELECTRIC EFFECT IN LAYERED NANOSTRUCTURES", (2019)

**M.Sc.Thesis, “FRÖHLICH POLARON  
CALCULATIONS IN NON-INTEGGER DIMENSIONAL  
SPACE AS A MODEL OF CONFINEMENT”, (2013)**

**Scientific Conference Organization**

- |                      |  |
|----------------------|--|
| 2-6 October 2023     | CECAM Flagship School “First Steps with Siesta: From Zero to Hero”   |
| 28 April 2023        | 10. Yoğun Madde Fiziği Toplantısı<br>İzmir Institute of Technology, İzmir<br><br>Oral Presentation “SiP Nanoşeritlerin Yapısal, Titreşimsel, Elektronik ve Transport Özellikleri”                                  |
| 5-8 September 2022   | NanoTR-16<br>Poster Presentation “Ballistic thermoelectric transport properties of two-dimensional group III-VI monolayers”  |
| 24-26 November 2021  | Magnetic Properties from First Principles<br>Eskisehir Teknik Üniversitesi   |
| 20-22 July 2021      | Virtual Conference on Thermoelectrics<br><br>Oral Presentation “Ballistic thermoelectric transport properties of two-dimensional group III-VI monolayers ”   |
| 19 April 2019        | 8. Yoğun Madde Fiziği İzmir Toplantısı<br>İzmir Institute of Technology, İzmir<br><br>Oral Presentation “Tek Tabakalı Yarıiletken Geçiş Metali Kalkojenitleri ve Oksitleri’nin Balistik Termoelektrik Özellikleri” |
| 11-15 September 2017 | DCMS Materials 4.0 Summerschool (The digitally enabled atom to system revolution)<br>Dresden, Germany  |

Oral Presentation “First Principle Calculations on Thermoelectric Properties of Monolayer Transition Metal Dichalcogenides”

4-8 July 2017

JAPMED’10  
İzmir Yüksek Teknoloji Enstitüsü, İzmir

Poster Presentation “Thermoelectric Properties of Two-Dimensional Transition Metal Dichalcogenides/Oxides”

“Formation of Hydrogen Lines on Graphene”

13-15 July 2016

(GRM-2016)

Graphene & Related Materials Conference

Bilkent Üniversitesi, Ankara  
Oral Presentation “A Mechanical Chain Reaction on Graphene at a Substrate Edge”

7-25 September 2015

School in Computational Condensed Matter Physics: From Atomistic Simulations to Universal Model Hamiltonians (Summer School)

ICTP Trieste, Italy

Participant

14-16 July

III. İzmir Genç Fizikçiler Kongresi

Organization committee

3-28 September 2012

Spin-Related Phenomena in Mesoscopic Transport (Summer School)

Stockholm, Sweden

Participant

13-15 June 2012

Gefik-2012 İzmir Genç Fizikçiler Kongresi

Oral Presentation “Kesirli D-Boyutlu Uzayda  
Fröhlich Polaronunun Taban Durum Enerjisi”

**Publications**

Dogukan Hazar Ozbey, Mirali Jahangirzadeh Varjovi, Gözde Özbal Sargın, Haldun Sevinçli and Engin Durgun, “Structural, electronic, vibrational, and thermoelectric properties of Janus Ge<sub>2</sub>PX (X = N, As, Sb, Bi) monolayers” Submitted to Physical Review B.

Gözde Özbal Sargın, Engin Durgun, Cem Sevik, Haldun Sevinçli, “Enhancement of thermoelectric performance in two-dimensional materials: A review of recent progress” Submitted to Physical Review Materials.

Gözde Özbal Sargın, Sevil Sarikurt, Hâldun Sevinçli, Cem Sevik; The peculiar potential of transition metal dichalcogenides for thermoelectric applications: A perspective on future computational research. *Journal of Applied Physics* 21 April 2023; 133 (15): 150902.

M. Neşet Çınar, Gözde Özbal Sargın, Koray Sevim, Burak Özdamar, Gizem Kurt and Hâldun Sevinçli “Ballistic thermoelectric transport properties of two-dimensional group III-VI monolayers”, Phys. Rev B. **103**, 165422, Doi: 10.1103/PhysRevB.103.165422

G. Özbal, R. T. Senger, C. Sevik, and H. Sevinçli, “Ballistic thermoelectric properties of monolayer semiconducting transition metal dichalcogenides and oxides”, Phys. Rev. B **100**, 085415, Doi: 10.1103/PhysRevB.100.085415

G. Özbal, J. T. Falkenberg, M. Brandbyge, R. T. Senger, and H. Sevinçli, “Directed growth of hydrogen lines on graphene: High-throughput simulations powered by evolutionary algorithm”, Phys.Rev.Materials **2**, 073406, Doi:10.1103/PhysRevMaterials.2.073406

Burak Özdamar, Gözde Özbal, M. Neşet Çınar, Koray Sevim, Gizem Kurt, Birnur Kaya, and Hâldun Sevinçli, “Structural, vibrational, and electronic properties of single-layer hexagonal crystals of group IV and V elements”, Phys.Rev.B **98**, 045431, Doi:10.1103/PhysRevB.98.045431

## Research Projects

2023-2025 Post-doc Researcher and PI, TÜBİTAK 2218 (123C159)  
Bifenilen Ağ Örgüleri'nin Elektronik, Termal ve Termoelektrik Taşınım Özellikleri

2022-2023 Post-doc Researcher, TÜBİTAK-ARDEB-1001 (121F126) Yarı-iletken İki-Boyutlu Malzemeler Kullanılarak Nano-Ölçekte Transistörlerin Modellenmesi ve Performanslarının Hesaplanması

2019-2021 Post-doc Researcher, FlagEra (ARDEB-117F480) "MECHANIC: Modelling Charge and Heat Transport in 2D materials based Composites"

2017-2019 PhD Student, TÜBİTAK-ARDEB-1001 (117F131) "Yeni Nesil İki Boyutlu Malzemelerde Termoelektrik Verimin Nano-yapılandırma ile Artırılması"