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## CEM SEVİK

Condensed Matter Theory Group, Department of Physics, University of Antwerp, Antwerp, Belgium  
[Google Scholar](#)  
[Research Gate](#)

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## EXPERTISE

### First Principles Simulations

Electronic, Magnetic, Optical, Mechanical, Dynamical, Thermal, ... Properties  
Electronic and Thermal Transport Properties  
Thermoelectric Properties  
Battery Applications  
Piezoelectric and Ferroelectric Properties

### Molecular Dynamics Simulations

Dynamical, Mechanical, Thermodynamical... Properties  
Thermal Transport Properties  
Membranes

### Interatomic Potential Generation

Machine Learning Potentials  
Tersoff and Stillinger-Weber Force Field Generation  
Stochastic and Machine Learning Algorithms

### Ensemble Monte Carlo Simulation

Photo Diode  
Gunn Oscillator

### Materials Growth and Characterization

CVD growth of Two-Dimensional Materials, Graphene, MoS<sub>2</sub>  
RAMAN and PL

## RECORDS

**Google Scholar** Citation: 6783 h-index: 40 – 34 (since 2020)

**Web of Science** Citation: 5234 h-index: 37

## EDUCATION

### PhD

Physics, Bilkent University, Türkiye, 2008  
Thesis: Carrier dynamics in silicon and germanium nanocrystals.  
Advisor: Dr. Ceyhun Bulutay

### MS

Physics, Bilkent University, Türkiye, 2003  
Thesis: High field transport phenomena in wide bandgap semiconductors.  
Advisor: Dr. Ceyhun Bulutay

### BC

Physics, Abant İzzet Baysal University, Türkiye, 2001

## WORK EXPERIENCE

### May 2022 –

University of Antwerp, Belgium  
Department of Physics

### June 2018 – May 2022

Eskişehir Technical University, Türkiye  
Department of Mechanical Engineering, *Department Head (2018-2021)*

### February 2021 – August 2021

Antwerp University, Belgium  
Computational Materials Theory, Department of Physics, *Visiting Researcher*

### February 2015 – June 2018

Anadolu University, Türkiye  
Department of Mechanical Engineering, *Department Head*

### March 2012 – February 2015

Anadolu University, Türkiye  
Department of Mechanical Engineering, *Faculty Member*

### February 2012 – March 2012

Anadolu University, Türkiye  
TUBITAK – *Research Associate*  
**May 2008 – February 2012**  
Texas A&M University, TX, ABD  
Postdoctoral Research Associate  
**September 2001 – December 2008**  
Bilkent University, Türkiye  
Research Assistant, MS and PhD Scholarship

## ACADEMIC TITLES

|                     |                                                                  |
|---------------------|------------------------------------------------------------------|
| Associate Professor | Physics, University of Antwerp, 05/2022 (30% ZAP 70% Researcher) |
| Professor           | Mechanical Engineering, Anadolu University, 08/2019              |
| Associate Professor | Mechanical Engineering, Anadolu University, 01/2015              |
| Assistant Professor | Mechanical Engineering, Anadolu University, 02/2013              |

## ACADEMIC EXPERIENCE

**June 2019 - June 2022**

TUBITAK International Bilateral Projects Group (UPAG) Executive Board Member

**June 2020 - June 2021**

YÖK Online Physics Experiment Development Advisory Board Member

## AWARDS

**2017** The Scientific and Technological Research Council of Türkiye, TUBITAK, Incentive Award  
**2017** Science Academy, BAGEP  
**2014** Turkish Academy of Science, GEBİB  
**2013** Anadolu University, Encouragement Award  
**2012** TUBITAK Reintegration Program  
**2006** European Material Research Society Graduate Student Award, Nice, France

## GIVEN COURSES

ESTU: Eskisehir Technical University, Turkey (Education in English)

ME: Mechanical Engineering

MSE: Materials Science and Engineering

PHY: Physics

FE: Faculty of Engineering

FS: Faculty of Science

UGC: Undergraduate Course

GC: Graduate Course

**2021 – 2022 Fall**

MKM 330 MATLAB Programming for Engineers (UGC) – Role: Lecturer – ME, FE, ESTU

**2020 – 2021 Spring**

MKM 330 MATLAB Programming for Engineers (UGC) – Role: Lecturer – ME, FE, ESTU

MKM 404 Design in Mechanical Engineering II (UGC) – Role: Lecturer – ME, FE, ESTU

**2020 – 2021 Fall**

BIL 200 Computer Programming (UGC) – Role: Lecturer – ME, FE, ESTU

MKM 403 Design in Mechanical Engineering I (UGC) – Role: Lecturer – ME, FE, ESTU

**2019 – 2020 Spring**

MKM 102 Introduction to Mechanical Engineering (UGC) – Role: Lecturer – ME, FE, ESTU

FIZ 552 Quantum Physics (GC) – Role: Lecturer – PHY, FS, ESTU

MKM514 Atomic Simulation of Materials (GC) – Role: Lecturer – FE, ESTU

**2019 – 2020 Fall**

BIL 200 Computer Programming (UGC) – Role: Lecturer – ME, FE, ESTU

ITN 511 Advanced C++ Programming (GC) – Role: Lecturer – FE, ESTU

**2018 – 2019 Spring**

MKM 102 Introduction to Mechanical Engineering (UGC) – Role: Lecturer – ME, FE, ESTU

MLZ 498 Design for Materials Science and Engineering (UGC) – Role: Lecturer – MSE, FE, ESTU

**2018 – 2019 Fall**

BIL 200 Computer Programming (UGC) – Role: Lecturer – FE, ESTU

ITN 511 Advanced C++ Programming (GC) – Role: Lecturer – FE, ESTU

**2017 – 2018 Spring**

ITN 503 Nanotechnology Application Areas (GC) – Role: Lecturer – FE, ESTU

IST 201 Statistics (UGC) – Role: Lecturer – FE, ESTU  
 MLZ 497 Design for Materials Science and Engineering (UGC) – Role: Lecturer – MSE, FE, ESTU

**2017 – 2018 Fall**  
 BIL 200 Computer Programming (UGC) – Role: Lecturer – FE, ESTU  
 IST 201 Statistics (UGC) – Role: Lecturer – FE, ESTU  
 MLZ 497 Design for Materials Science and Engineering (UGC) – Role: Lecturer – MSE, FE, ESTU  
 MKM 511 Advanced C++ Programming (GC) – Role: Lecturer – FE, ESTU

**2016 – 2017 Spring**  
 MLZ 497 Design for Materials Science and Engineering (UGC) – Role: Lecturer – MSE, FE, ESTU  
 MLZ 498 Design Applications in Materials Science (UGC) – Role: Lecturer – MSE, FE, ESTU  
 IST 201 Statistics (UGC) – Role: Lecturer – FE, ESTU  
 FIZ 552 Quantum Physics (GC) – Role: Lecturer – PHY, FS, ESTU

**2016 – 2017 Fall**  
 MKM 103 Technical English for Mechanical Engineers (UGC) – Role: Lecturer – ME, FE, ESTU  
 IST 201 Statistics (UGC) – Role: Lecturer – FE, ESTU  
 MLZ 497 Design for Materials Science and Engineering (UGC) – Role: Lecturer – MSE, FE, ESTU

**2015 – 2016 Spring**  
 MLZ 498 Design Applications in Materials Science (UGC) – Role: Lecturer – MSE, FE, ESTU  
 IST 201 Statistics (UGC) – Role: Lecturer – FE, ESTU

**2015 – 2016 Fall**  
 MLZ 497 Design for Materials Science and Engineering (UGC) – Role: Lecturer – MSE, FE, ESTU

**2014 – 2015 Spring**  
 MLZ 498 Design Applications in Materials Science (UGC) – Role: Lecturer – MSE, FE, ESTU

**2014 – 2015 Fall**  
 BIL 255 Advanced Computer Programming (UGC) – Role: Lecturer – FE, ESTU  
 MLZ 498 Design Applications in Materials Science (UGC) – Role: Lecturer – MSE, FE, ESTU

**2013 – 2014 Spring**  
 IST 201 Statistics (UGC) – Role: Lecturer – FE, ESTU  
 MLZ 450 Computational Materials Science (UGC) – Role: Lecturer – MSE, FE, ESTU  
 MLZ 497 Design for Materials Science and Engineering (UGC) – Role: Lecturer – MSE, FE, ESTU  
 ITN 503 Nanotechnology Application Areas (GC) – Role: Lecturer – FE, ESTU

**2013 – 2014 Fall**  
 BIL 255 Advanced Computer Programming (UGC) – Role: Lecturer – FE, ESTU  
 IST 201 Statistics (UGC) – Role: Lecturer – FE, ESTU  
 MLZ 497 Design for Materials Science and Engineering (UGC) – Role: Lecturer – MSE, FE, ESTU  
 MLZ 498 Design Applications in Materials Science (UGC) – Role: Lecturer – MSE, FE, ESTU

## EDUCATION ACTIVITIES

### Online Lecture Document Development – January 2015 – December 2018

Eskisehir Technical University Distant Education System, Türkiye  
 Online Lecture Presentation and Test preparation

### Research Assistance – September 2001 – January 2008

Department of Physics, Bilkent University, Türkiye  
 Undergraduate Physics Mechanic and Electric Laboratory Assistant  
 Undergraduate Physics Mechanic and Electric Tutor

## SUPERVISION ACTIVITIES

Jovana Vlahovic – Ph.D. Co-Supervisor, 2022 – ...  
 Physics Department, Antwerp University, Belgium

Wilson Nieto – Ph.D. Co-Supervisor, 2022 – ...  
 Physics Department, Antwerp University, Belgium

Ali Ghojavand – Ph.D. Co-Supervisor 2022 – ...  
 Physics Department, Antwerp University, Belgium

Reyhan Başar – Ph.D. Co-Supervisor, 2017 – 2023  
 Materials Science and Engineering Department, Eskisehir Technical University, Türkiye

Ayberk Özden – Ph.D. Co-Supervisor, 2014 – 2019  
 Materials Science and Engineering Department, Eskisehir Technical University, Türkiye

Yağmur Aksu Korkmaz – Ph.D. Co-Supervisor, 2015 – 2021  
 Physics Department, Bilkent University, Türkiye

Arash Mobaraki – Ph.D. Co-Supervisor, 2013 – 2019  
 Physics Department, Bilkent University, Türkiye

Tuğbey Kocabaş – Ph.D. Co-Supervisor, 2018 – 2025  
 Materials Science and Engineering Department, Eskisehir Technical University, Türkiye

Öznur Demirkol – Ph.D. Co-Supervisor, 2021 – 2024  
 Physics Department, Eskisehir Technical University, Türkiye

Ali Kandemir – MS Supervisor, 2013 – 2015  
 Materials Science and Engineering Department, Eskisehir Technical University, Türkiye

Uğur Yorulmaz – MS Supervisor, 2015 – 2017  
 Materials Science and Engineering Department, Eskisehir Technical University, Türkiye

Tuğbey Kocabaş – MS Supervisor, 2016 – 2018  
 Advanced Research Center, Eskisehir Technical University, Türkiye

İlker Demiroğlu – Postdoctoral Supervisor, 2017 – 2020  
 Mechanical Engineering Department, Eskisehir Technical University, Türkiye

Yenal Karaaslan – Postdoctoral Supervisor, 2018 – 2020  
 Mechanical Engineering Department, Eskisehir Technical University, Türkiye

Zafer Kandemir – Postdoctoral Supervisor, 2019 – ...  
 Mechanical Engineering Department, Eskisehir Technical University, Türkiye

## PUBLICATIONS

### JOURNAL PUBLICATIONS

- RB Boz, **C Sevik**, S Turan, Improving the power factor of spark plasma sintered BiO, 5Sb1, 5Te3 via TiC dispersion, [Journal of Alloys and Compounds](#) 1010, 177917 2025
- A Ghojavand, M Soenen, N Rezaei, M Alaei, **C Sevik**, MV Milošević, Strain-tunable magnetic and magnonic states in Ni-dihalide monolayers, [Physical Review Materials](#) 8 (11), 114401 2024
- BN Šoškić, J Bekaert, **C Sevik**, MV Milošević, Enhanced Superconductivity of Hydrogenated  $\beta$ 12 Borophene, [Nano Letters](#) 24 (40), 12650-12657 2024
- Z Kandemir, P D'Amico, G Sesti, C Cardoso, MV Milošević, **C Sevik**, Optical properties of metallic MXene multilayers through advanced first-principles calculations, [Physical Review Materials](#) 8 (7), 075201 2024
- BN Šoškić, J Bekaert, **C Sevik**, Ž Šljivančanin, MV Milošević, First-principles exploration of superconductivity in intercalated bilayer borophene phases, [Physical Review Materials](#) 8 (6), 064803 2024
- U Yorulmaz, D Šabani, **C Sevik**, MV Milošević, Goodenough–Kanamori–Anderson high-temperature ferromagnetism in tetragonal transition-metal xenes, [2D Materials](#) 11 (3), 035013 2024
- Z Kandemir, P D'Amico, G Sesti, C Cardoso, MV Milošević, **C Sevik**, Optical properties of metallic MXene multilayers through advanced first-principles calculations, [Physical Review Materials](#) 8 (7), 075201 2024
- DMN Thomen, **C Sevik**, MV Milošević, LK Teles, A Chaves, Strain and stacking registry effects on the hyperbolicity of exciton polaritons in few-layer black phosphorus, [Physical Review B](#) 109 (24), 245413 2024
- T Kocabaş, B Samanta, ES Barboza, **C Sevik**, MV Milošević, D Çakır, Electron-phonon coupling and thermal conductivity of MAB compounds, [Physical Review Materials](#) 8 (5), 055002 2024
- E. Torun, F. Paleari, M. V. Milosevic, L. Wirtz, and **C. Sevik**, Intrinsic control of interlayer exciton generation rate in van der Waals materials via Janus layers, [Nano Letters](#), 23 (8), 3159-3166 2023
- D Kaya, I Demiroglu, IB Isik, HH Isik, SK Çetin, **C Sevik**, A Ekicibil, .et al. Highly active bimetallic Pt–Cu nanoparticles for the electrocatalysis of hydrogen evolution reactions: Experimental and theoretical insight, [International Journal of Hydrogen Energy](#) 48 (95), 37209-37223 2023
- SO Akande, B Samanta, **C Sevik**, D Çakır, First-principles investigation of mechanical and thermal properties of MAIB (M=Mo, W), Cr<sub>2</sub>AlB<sub>2</sub>, and Ti<sub>2</sub>InB<sub>2</sub>, [Physical Review Applied](#) 20 (4), 044064 2023
- SA Sumaiya, I Demiroglu, OR Caylan, GC Buke, **C Sevik**, MZ Baykara, Atomically Resolved Defects on Thin Molybdenum Carbide ( $\alpha$ -Mo<sub>2</sub>C) Crystals, [Langmuir](#) 39 (31), 10788-10794 2023
- IM Padilla Espinosa, Y Karaaslan, **C Sevik**, A Martini, Atomistic model of the anisotropic response of ortho-Mo<sub>2</sub>C to indentation, [AIP Advances](#) 13 (6) 2023

- E. Zuñiga-Puelles, V. Levytskyi, A. Özden, T. Gürel, N. Bulut, C. Himcinschi, [C. Sevik](#), J. Kortus, R. Gumeniuk, Thermoelectric properties and scattering mechanisms in natural PbS, [Physical Review B](#) 107 (19), 195203 2023
- G Özbal Sargin, S Sarikurt, H Sevinçli, [C Sevik](#), The peculiar potential of transition metal dichalcogenides for thermoelectric applications: A perspective on future computational research, [Journal of Applied Physics](#) 133 (15) 2023
- M Zamani, H Yapicioglu, A Kara, [C Sevik](#), Statistical analysis of porcelain tiles' technical properties: full factorial design investigation on oxide ratios and temperature, [Physica Scripta](#) 98 (12), 125953 2023
- [C. Sevik](#), J. Bekaert, M. V. Milosevic, Superconductivity in functionalized niobium-carbide MXenes, [Nanoscale](#) 15 (19), 8792-8799 2023
- T Kocabaş, M. Keceli, Á. V. Mayagoitia, [C. Sevik](#), Gaussian Approximation Potentials for Accurate Thermal Properties of Two-Dimensional Materials, [Nanoscale](#) 15 (19), 8772-8780 2023
- [C Sevik](#), J Bekaert, M Petrov, MV Milošević, High-temperature multigap superconductivity in two-dimensional metal borides, [Physical Review Materials](#) 6 (2), 024803 2023
- T Gürel, YA Altunay, P Bulut, S Yıldırım, [C Sevik](#), Comprehensive investigation of the extremely low lattice thermal conductivity and thermoelectric properties of BaIn<sub>2</sub>Te<sub>4</sub> [Physical Review B](#) 106 (19), 195204 2022
- M Seyedmohammadzadeh, [C Sevik](#), O Gülseren, Two-dimensional heterostructures formed by graphenelike ZnO and MgO monolayers for optoelectronic applications, [Physical Review Materials](#) 6 (10), 104004 2022
- U Yorulmaz, D Šabani, M Yagmurcukardes, [C Sevik](#), MV Milošević, High-throughput analysis of tetragonal transition metal Xenes, [Physical Chemistry Chemical Physics](#) 24 (48), 29406-29412 2022
- Z Kandemir, E Torun, F Paleari, C Yelgel, [C Sevik](#), Surface termination dependence of electronic and optical properties in MXene monolayers, [Physical Review Materials](#) 6 (2), 026001 2022
- M Öper, U Yorulmaz, [C Sevik](#), F Ay, N Kosku Perkgöz , Controlled CVD growth of ultrathin (MXene) flakes, [Journal of Applied Physics](#) 131 (2), 025304 2022
- EI Duden, U Savacı, S Turan, [C Sevik](#), I Demiroglu, Intercalation of argon in honeycomb structures towards promising strategy for rechargeable Li-ion batteries, [Journal of Physics: Condensed Matter](#) 35 (8), 085301 2022
- J Bekaert, [C Sevik](#), MV Milošević, Enhancing superconductivity in MXenes through hydrogenation, [Nanoscale](#) 14 (27), 9918-9924 2022
- Ö Demirkol, [C Sevik](#), İ Demiroğlu, First principles assessment of the phase stability and transition mechanisms of designated crystal structures of pristine and Janus transition metal dichalcogenides, [Physical Chemistry Chemical Physics](#) 24 (12), 7430-7441 2022
- L Rani, [C Sevik](#), Hot Electron Relaxation in Ferromagnetic Metals: Memory Function Approach, [Journal of Superconductivity and Novel Magnetism](#) 35 (1), 167-177 2022
- T Kocabaş, D Çakır, [C Sevik](#), First-principles discovery of stable two-dimensional materials with high-level piezoelectric response, [Journal of Physics: Condensed Matter](#) 33 (11), 115705 2021
- YA Korkmaz, C Bulutay, [C Sevik](#), k·p Parametrization and Linear and Circular Dichroism in Strained Monolayer (Janus) Transition Metal Dichalcogenides from First Principles, [The Journal of Physical Chemistry C](#) 125 (13), 7439 2021
- F Saiz, Y Karaaslan, R Rurali, [C Sevik](#), Interatomic potential for predicting the thermal conductivity of zirconium trisulfide monolayers with molecular dynamics, [Journal of Applied Physics](#) 129 (15), 155105 2021
- Y Karaaslan, JB Haskins, H Yapicioglu, [C Sevik](#), Influence of randomly distributed vacancy defects on thermal transport in two-dimensional group-III nitrides, [Journal of Applied Physics](#) 129 (22), 224304 2021
- I Demiroğlu, Y Karaaslan, T Kocabaş, M Keçeli, Á Vázquez-Mayagoitia, [C Sevik](#), Computation of the Thermal Expansion Coefficient of Graphene with Gaussian Approximation Potentials, [The Journal of Physical Chemistry C](#) 125 (26), 14409 2021

- I Demiroglu, C Sevik, Extraordinary negative thermal expansion of two-dimensional nitrides: A comparative ab initio study of quasiharmonic approximation and molecular dynamics simulations, *Physical Review B*, 103 (8), 085430 2021
- J Sun, Y Li, Y Karaaslan, C Sevik, Y Chen, Misfit dislocation structure and thermal boundary conductance of GaN/AlN interfaces, *Journal of Applied Physics* 130 (3), 035301 2021
- Y Karaaslan, H Yapicioglu, C Sevik, Assessment of Thermal Transport Properties of Group-III Nitrides: A Classical Molecular Dynamics Study with Transferable Tersoff-Type Interatomic Potentials, *Physical Review Applied* 13 (3), 034027 2021
- P Bulut, B Beceren, S Yıldırım, C Sevik, T Gürel, Promising room temperature thermoelectric conversion efficiency of zinc-blende AgI from first principles, *Journal of Physics: Condensed Matter* 33 (1) 2020
- EMD Siriwardane, I Demiroglu, C Sevik, FM Peeters, D Çakır, Assessment of Sulfur-Functionalized MXenes for Li-Ion Battery Applications, *The Journal of Physical Chemistry C*, 124 (39) 2020
- T Kocabaş, D Çakır, C Sevik, First-principles discovery of stable two-dimensional materials with giant piezoelectric response, *Journal of physics. Condensed Matter* 33 (11) 2020
- S Sarikurt, T Kocabaş, C Sevik, High-throughput computational screening of 2D materials for thermoelectrics, *Journal of Materials Chemistry A* 8 (37), 19674 2020
- J Bekaert, C Sevik, MV Milosevic, First-principles exploration of superconductivity in MXenes, *Nanoscale*, 12 (33), 17354 2020
- F Turker, OR Caylan, N Mehmood, TS Kasirga, C Sevik, G Cambaz Buke, CVD synthesis and characterization of thin Mo<sub>2</sub>C crystals, *Journal of the American Ceramic Society* 103, 5586 2020
- YA Korkmaz, C Bulutay, C Sevik, Defect states in monolayer hexagonal BN: A comparative DFT and DFT-1/2 study, *Physica B: Condensed Matter* 584, 411959 2020
- U Yorulmaz, İ Demiroğlu, D Çakır, O Gülseren, C Sevik, A systematical ab-initio review of promising 2D MXene monolayers towards Li-ion battery applications, *Journal of Physics: Energy* 2 (3), 032006 2020
- Y Karaaslan, H Yapicioglu, C Sevik, Assessment of Thermal Transport Properties of Group-III Nitrides: A Classical Molecular Dynamics Study with Transferable Tersoff-Type Interatomic Potentials, *Physical Review Applied* 13 (3), 034027 2019
- YA Korkmaz, C Bulutay, C Sevik, Defect states in monolayer hexagonal BN: A comparative DFT and DFT-1/2 study, *Physica B: Condensed Matter* 584, 411959 2019
- EMD Siriwardane, I Demiroglu, C Sevik, D Çakır, Achieving Fast Kinetics and Enhanced Li Storage Capacity for Ti<sub>3</sub>C<sub>2</sub>O<sub>2</sub> by Intercalation of Quinone Molecules, *ACS Applied Energy Materials* 2 (2), 1251-1258 2019
- G Özbal, RT Senger, C Sevik, H Sevinçli, Ballistic thermoelectric properties of monolayer semiconducting transition metal dichalcogenides and oxides, *Physical Review B* 100 (8), 085415 2019
- M Yagmurcukardes, C Sevik, FM Peeters, Electronic, vibrational, elastic, and piezoelectric properties of monolayer Janus MoSTe phases: A first-principles study, *Physical Review B* 100 (4), 045415 2019
- A Mobaraki, C Sevik, H Yapicioglu, D Çakır, O Gülseren, Temperature-dependent phonon spectrum of transition metal dichalcogenides calculated from the spectral energy density: Lattice thermal conductivity as an application, *Physical Review B* 100 (3), 035402 2019
- H Şar, A Özden, İ Demiroğlu, C Sevik, NK Perkgöz, F Ay, Long-Term Stability Control of CVD-Grown Monolayer MoS<sub>2</sub>, *Physica Status Solidi (RRL)–Rapid Research Letters* 13 (7), 1800687 2019
- C Sevik, D Çakır, Tailoring Storage Capacity and Ion Kinetics in Graphene Heterostructures by Functionalization of Graphene, *Physical Review Applied* 12 (1), 014001 2019
- B Yorulmaz, A Özden, H Şar, F Ay, C Sevik, NK Perkgöz, CVD growth of monolayer WS<sub>2</sub> through controlled seed formation and vapor density, *Materials Science in Semiconductor Processing* 93, 158 2019

- I Demiroglu, FM Peeters, O Gulseren, D Çakır, C Sevik, Alkali metal intercalation in MXene/graphene heterostructures: A new platform for ion battery applications, *The Journal of Physical Chemistry Letters* 10 (4), 727 2019
- T Kocabas, A Ozden, I Demiroglu, D Cakir, C Sevik, Determination of Dynamically Stable Electrenes towards Ultra fast Charging Battery Applications, *The Journal of Physical Chemistry Letters*, 9, 4267 2018
- S. Sarikurt, D. Cakir, M. Keceli, C. Sevik, Influence of surface functionalization on thermal transport and thermoelectric properties of MXene monolayers, *Nanoscale*, 10, 8859. 2018
- M. Khazaei, V. Wang, C. Sevik, A. Ranjbar, M. Arai, S. Yunoki, Electronic structures of iMAX phases and their two-dimensional derivatives: A family of piezoelectric materials, *Physical Review Materials*, 2, 074002 2018
- T. Kocabas, D. Cakir, O. Gulseren, F. Ay, N. K. Perkgoz, C. Sevik, Distinct Correlation between the Vibrational and Thermal Transport Properties of Group VA Monolayer Crystals, *Nanoscale* 10, 7803. 2018
- Y. Aierken, C. Sevik, O. Gulseren, F. Peeters, and D. Cakir, MXenes/graphene heterostructures for Li battery applications: a first principles study, *Journal of Materials Chemistry A* 6, 2337. 2018
- A. Mobaraki, A. Kandemir, H. Yapicioglu, O. Gulseren, C. Sevik, Validation of inter-atomic potential for WS<sub>2</sub> and WSe<sub>2</sub> crystals through assessment of thermal transport properties, *Computational Materials Science* 144, 92. 2018
- H. Sar, A. Ozden, B. Yorulmaz, C. Sevik, N. K. Perkgoz, F. Ay, A comparative device performance assesment of CVD grown MoS<sub>2</sub> and WS<sub>2</sub> monolayers, *Journal of Materials Science: Materials in Electronics* 29, 8785. 2018
- Y. Aierken, C. Sevik, O. Gulseren, F. M. Peeters, D. Cakir, In pursuit of barrierless transition metal dichalcogenides lateral heterojunctions, *Nanotechnology* 29 295202. 2018
- M Demirtas, C Odacı, NK Perkgöz, C Sevik, F Ay, Low Loss Atomic Layer Deposited Al<sub>2</sub>O<sub>3</sub> Waveguides for Applications in On-Chip Optical Amplifiers, *IEEE Journal of Selected Topics In Quantum Electronics* 24 (4), 3100508 2018
- E. M. D. Siriwardane, P. Karki, C. Sevik, D. Cakir, Electronic and mechanical properties of stiff rhenium carbide monolayers: a first-principles investigation, *Applied Surface Science*, 458, 762 2018
- C. Sevik, J. Wallbank, O. Gulseren, F. Peeters, D. Cakir, Gate induced monolayer behavior in twisted bilayer black phosphorus, *2D Materials* 4, 035025. 2017
- K. H. Michel, D. Cakir, C. Sevik, C. Sevik, F. M. Peeters, Piezoelectricity in two-dimensional materials: Comparative study between lattice dynamics and ab initio calculations, *Phys. Rev. B*. 95, 125415. 2017
- A. Kandemir, A. Ozden, T. Cagin, C. Sevik, Thermal conductivity engineering of bulk and one-dimensional Si-Ge nanoarchitectures, *Science and Technology of Advanced Materials* 18, 187. 2017
- A. Ozden, F. Ay, C. Sevik, N. K. Perkgoz, CVD growth of monolayer MoS<sub>2</sub>: Role of growth zone configuration and precursors ratio, *Japanese Journal of Applied Physics* 56, 06GG05. 2017
- A. Özden, H. Şar, A. Yeltik, B. Madenoğlu, C. Sevik, F. Ay, N. K. Perkgöz; CVD Grown 2D MoS<sub>2</sub> Layers: A Photoluminescence and Fluorescence Lifetime Imaging Study; *Physica Status Solidi-Rapid Research Letters*, 10, 792. 2016
- C. Sevik, H. Sevinçli, Promising Thermoelectric Properties of Phosphorenes; *Nanotechnology*, 27, 355705. 2016
- U. Yorulmaz, A. Özden, N. K. Perkgöz, F. Ay, C. Sevik, Vibrational and Mechanical Properties of Single Layer MXene Structures: a First-Principles Investigation, *Nanotechnology* 27, 335702. 2016
- C. Sevik, D. Çakır, O. Gülseren, F. M. Peeters, Peculiar Piezoelectric Properties of Soft Two-Dimensional Materials, *Journal of Physical Chemistry C* 120, 13948. 2016
- A. Özden, A. Kandemir, F. Ay, N. K. Perkgöz, C. Sevik, Thermal Conductivity Suppression in Nanostructured Silicon and Germanium Nanowires, *Journal of Electronic Materials* 45, 1594. 2016
- D. Cakir, C. Sevik, O. Gulseren, F. M. Peeters, Mo<sub>2</sub>C as a high capacity anode material: a first-principles study, *J. Mater. Chem. A* 4, 6069. 2016

- S. Sarikurt, A. Ozden, A. Kandemir, [C. Sevik](#), A. Kinaci, J. B. Haskins, T. Cagin, Tailoring thermal conductivity of silicon/germanium nanowires utilizing core-shell architecture, [J. Appl. Phys.](#) 119, 155101. 2016
- A. Cakan, [C. Sevik](#), C. Bulutay, Strained band edge characteristics from hybrid density functional theory and empirical pseudopotentials: GaAs, GaSb, InAs and InSb, [J. Phys. D: Appl. Phys.](#) 49, 085104. 2016
- A Kandemir, H Yapicioglu, A Kinaci, T Cagin, [C. Sevik](#), Thermal transport properties of MoS<sub>2</sub> and MoSe<sub>2</sub> monolayers, [Nanotechnology](#) 27, 055703. 2016
- A Özden, A Kandemir, F Ay, NK Perkgöz, [C Sevik](#), Thermal Conductivity Suppression in Nanostructured Silicon and Germanium Nanowires, [Journal of Electronic Materials](#), 7. 2015
- D. Cakir, [C. Sevik](#), and F. M. Peeters, Significant effect of stacking on the electronic and optical properties of few-layer black phosphorus, [Phys. Rev. B](#) 92, 165406. 2015
- M. M. Alyoruk, Y. Aierken, D. Cakir, F. M. Peeters, and [C. Sevik](#), Promising Piezoelectric Performance of Single Layer Transition-Metal Dichalcogenides and Dioxides, [J. Phys. Chem. C](#) 119, 23231. 2015
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## INVITED PRESENTATIONS

- Tuning the Interlayer Excitons in Heterobilayer Transition Metal Chalcogenides, NanoTR24, Turkiye 2024
- Gaussian Approximation Potentials for Accurate Thermal Properties of 2-Dimensional Materials, International Conference on Natural Science and Technologies, Bulgaria 2023
- Accurate Prediction of Thermal and Optical Properties of Two-Dimensional Crystals, Technical University of Eindhoven, Nederland 2023
- Systematic Analysis of Errors and Uncertainty Across Scales from Materials Modeling & Discovery to Manufacturing: Towards Best Practices, BRICC, 4100 N Fairfax Drive, Suite 450, Arlington, VA 2023
- Computational Characterization of Novel Two-Dimensional Materials, 13<sup>th</sup> Nanoscience Nanotechnology Conference, Antalya, Turkey 2017
- Piezoelectricity at Nanoscale, Wright-Patterson Air Force Base, Dayton, OH, USA 2016
- Simulation of 2D Materials for Different Device Applications, EOARD Meeting, University College London, UK 2016

- Thermal Expansion Coefficient of Two-Dimensional Materials, TMS-MEMA-2015, Doha, Qatar 2015
- Lattice Thermal Conductivity of Low-Dimensional Materials, IIMEC Annual Meeting, College Station, TX, USA 2014
- Thermal transport properties of C and BN based nanomaterials, Material Science Division. Oak Ridge National Laboratory, KY, USA 2010
- First principles electronic and thermal transport properties of chalcogenide semiconductor materials, Condensed Matter and Materials Division. Lawrence Livermore National Laboratory, CA, USA 2010
- Carrier Dynamics in Si and Ge Nanocrystals, Nano-bio Spectroscopy Group, European Theoretical Spectroscopy Facility (ETSF), Spain 2007
- Carrier Dynamics in Si and Ge Nanocrystals, Max-Planck Institute, Stuttgart, Germany 2007

#### CONFERENCE CONTRIBUTIONS

- I Demiroglu, Y Aierken, F Peeters, D Cakir, C Sevik, O Gulseren, Exploring MXenes/graphene heterostructures for ion battery applications from first-principles, APS March Meeting Boston, MA, USA. 2019
- Oguz Gulseren, Yierpan Aierken, Cem Sevik, François Peeters, Deniz Cakir, “In pursuit of barrierless transition metal dichalcogenides lateral heterojunctions”, APS March Meeting Los Angeles, CA, USA. 2018
- Arash Mobaraki, Ali Kandemir, Haluk Yapicioglu, Oguz Gulseren, Cem Sevik, “Evaluation of Thermal Transport Properties for Verification of Inter-atomic Potentials for WS<sub>2</sub> and WSe<sub>2</sub> Crystals”, APS March Meeting Los Angeles, CA, USA. 2018
- Sevil Sarikurt, Deniz Cakir, Murat Keceli, Cem Sevik, “Thermoelectric properties of functionalized MXene structures”, APS March Meeting Los Angeles, CA, USA. 2018
- Deniz Cakir, Tugbey Kocabas, Oguz Gulseren, Feridun Ay, Nihan Perkgoz, Cem Sevik, “Thermal Conductivity of Group VA Puckered Monolayer Structures”, APS March Meeting Los Angeles, CA, USA. 2018
- A. Ozden, H. Sar, C. Odaci, C. Sevik, F. Ay, N. K. Perkgoz, “Time Dependent Structural Analysis of CVD Grown MoS<sub>2</sub> Flakes with Different Configurations”, SSDM, Japan 2017
- M. Demirtas, C. Odaci, N. K. Perkgoz, C. Sevik, F. Ay, “Control of optical amplification process with extremely low background loss in Er:Al<sub>2</sub>O<sub>3</sub> Waveguides”, IEEE Photonics Conference (IPC), Orlando, FL, USA 2017
- Cem Sevik, Deniz Cakir, Oguz Gulseren, Francois M Peeters, “Peculiar Piezoelectricity in Two-Dimensional Materials”, APS March Meeting, New Orleans, LA, USA. 2017
- Haluk Yapicioglu, Arash Mobaraki, Ali Kandemir, Tahir Cagin, Oguz Gulseren, Cem Sevik, “Thermal Transport Properties of Transition Metal Dichalcogenide Monolayers”, APS March Meeting, New Orleans, LA, USA. 2017
- Huseyin Sar, Ayberk Ozden, Cem Sevik, Nihan Kosku Perkgoz, Feridun Ay, “Time Resolved Fluorescence Lifetime Imaging Analysis of MoS<sub>2</sub>/Graphene Heterostructures” APS March Meeting, New Orleans, LA, USA. 2017
- Cem Sevik, “Simulation of 2D Materials for Different Device Applications”, EOARD Meeting, University College London, UK 2016
- D. Çakır, O. Gulseren, F. M. Peeters, C. Sevik, “Peculiar Piezoelectric Properties of Two-Dimensional Materials”, E-MRS Spring Meeting, Lille, France 2016
- H. Sar, A. Özden, O. Balci, C. Kocabaş, N. K. Perkgoz, F. Ay, C. Sevik, “Systematic Characterization of MoS<sub>2</sub> CVD Growth on Transferred and As-grown Graphene” E-MRS Spring Meeting, Lille, France 2016
- B. Madenoğlu, A. Özden, T. Özmen, F. Ay, N. K. Perkgoz, C. Sevik, “Controlled Growth of Two Dimensional WS<sub>2</sub> Structures Using CVD” E-MRS Spring Meeting, Lille, France 2016

- Ayberk Özden, Büşra Madenoğlu, Aydan Yeltik, Cem Sevik, Feridun Ay, Nihan Kosku Perkgöz, “A Comparative Study of CVD-Grown Monolayer MoS<sub>2</sub> Flake Formations: Electrical and Optical Properties”, E-MRS Spring Meeting, Lille, France 2016
- Sarıkurt Sevil, Sevik Cem, Kınacı Alper, Haskins Justin B, Cagin Tahir, “Cross-Sectional Size and Interface Roughness Effects on Thermal Conductivity of Ge/Si Core/Shell Nanowires” TMS 2015 144<sup>th</sup> Annual Meeting & Exhibition, Orlando, FL, USA 2015
- Soykan Cengiz, Özdemir Kart Sevgi, Sevik Cem, Tahir Cagin, “Martensitic Transformation of Ni<sub>2</sub>FeGa Magnetic Shape Memory Alloy Studied by Density Functional Theory” TMS-MEMA-2015, Doha, Qatar 2015
- Kandemir Ali, Sevik Cem, “Thermal Transport Properties of Si-Ge Superlattices: an equilibrium molecular dynamics study”, CECAM-DE-MM1P, Bremen, Germany 2015
- Ayberk Özden, Kandemir Ali, Ay Feridun, Kosku Perkgöz Nihan, Sevik Cem, “Thermal Conductivity Supression in Si and Ge Nanowires”, 34<sup>th</sup> Annual International Conference On Thermoelectrics, Dresden, Germany 2015
- Kandemir Ali, Sevik Cem, “Thermal Transport Properties of Low Dimensional Si, Ge and Si-Ge Superlattice Structures”, APS March Meeting, San Antonio, TX, USA 2015
- Sarıkurt Sevil, Alper Kınacı, Justin B Haskins, Sevik Cem, Tahir Çağın, “Tailoring Thermal Conductivity of Ge/Si Core-Shell Nanowires”, TMS-MEMA-2015, Doha, Qatar 2015
- Sevik Cem, “Thermal Expansion Coefficient of Two Dimensional Materials”, TMS-MEMA-2015, Doha, Qatar 2015
- Sarıkurt Sevil, Alper Kınacı, Justin B Haskins, Sevik Cem, Tahir Çağın, “Influence of Core-Shell Architecture Parameters on Thermal Conductivity of Si-Ge Nanowires”, MRS Fall Meeting 2014
- Sevik Cem, “Lattice Thermal Conductivity of Low-Dimensional Materials”, IIMEC Annual Meeting, College Station, TX, USA 2014
- Sarıkurt Sevil, Sevik Cem, Alper Kınacı, Justin B Haskins, Tahir Çağın, “Lattice Thermal Conductivity of Si and Ge Nanowires”, IIMEC Annual Meeting, College Station, TX, USA 2014
- Sevik Cem, Sevincli Haldun, Gianaurelio Cuniberti, Cagin Tahir, “Substantial reduction of thermal conductivity of defected carbon nanotubes”, APS March Meeting, Dallas, TX, USA 2011
- Yılmaz Dünder, Sevik Cem, Bulutay Ceyhun, Cagin Tahir, “Understanding Vibrational Spectra of Silicon Nanocrystals”, APS March Meeting, Dallas, TX, USA 2011
- Gürel Tanju, Sevik Cem, Cagin Tahir, “Investigation of first principle thermoelectric properties of compound semiconductors”, APS March Meeting, Dallas, TX, USA 2011
- Sevik Cem, Cagin Tahir, “Thermoelectric Performance of Quaternary Compounds: Cu<sub>2</sub>ZnSnX<sub>4</sub>, X=S, Se, Te”, MRS Fall Meeting, Boston, MA, USA 2010
- Sevik Cem, Cagin Tahir, “Structural and Electronical properties of CeO<sub>2</sub>, ThO<sub>2</sub> and their alloy formations, DFT+U study”, MRS Fall Meeting, Boston, MA, USA 2010
- Sevik Cem, Bulutay Ceyhun, “Atomistic Theoretical Modeling of Auger Recombination in Si and Ge Nanocrystals”, MRS Fall Meeting, Boston, MA, USA 2007
- Sevik Cem, Bulutay Ceyhun, “Atomistic Theoretical Modeling of Auger Recombination in Si and Ge Nanocrystals”, Seminano Meeting, Bad Honnef, Germany 2007
- Sevik Cem, “Nanocrystal research at Bilkent University”, Cost 288 Meeting, Nottingham, UK 2006
- Sevik Cem, Bulutay Ceyhun, “Computational modeling of quantum-confined impact ionization in Si nanocrystals embedded in SiO<sub>2</sub>”, E-MRS Spring Meeting, Nice, France 2006
- Sevik Cem, Bulutay Ceyhun, “Novel high-k inverse silver oxide phases of SiO<sub>2</sub>, GeO<sub>2</sub>, SnO<sub>2</sub>, and their alloys”, E-MRS Spring Meeting, Nice, France 2006
- Sevik Cem, Bulutay Ceyhun, “The Hot carrier impact ionization in Si nanocrystals embedded in SiO<sub>2</sub>, First International Workshop on Semiconductor Nanocrystals”, Seminano Meeting, Budapest, Hungary 2005
- Sevik Cem, Bulutay Ceyhun, “Harmonic enhancement of Gunn oscillations in GaN, 27th International Conference on physics of Semiconductors”, ICPS27, Flagstaff, AZ, USA 2004

- Sevik Cem, Bulutay Ceyhun, “Gunn oscillation in GaN based Gunn Diodes, 13th International Conference on Non-equilibrium Carrier Dynamics in Semiconductors”, HCIS13, Modena, Italy 2003

#### BOOK CHAPTERS

- P. Derosa and T. Çağın, Multiscale Modelling: From atoms to devices. CNR Publication, December 2010. (Chapter 8 by Cem Sevik: Ensemble Monte Carlo Device Modelling: High-Field Transport in Nitrides. ) 2010

#### PROJECTS

| TITLE                                                                                                                                                                                                      | FUNDING                                                                   | ROLE       | PERIOD    |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------|------------|-----------|
| Photo-thermo-structural characterisation of mono- and bimetallic Au and Ag nanoparticles                                                                                                                   | FWO-Belgium                                                               | CO-PI      | 2023-2025 |
| The Formation and Characterization of 2D Metal Carbides for EM Shielding Applications: Experimental and First Principles Computational Study                                                               | Air Force Office of Scientific Research, USA                              | CO-PI      | 2019-2022 |
| Classification of 2-dimensional MXen structures through a systematic study of electronic and magnetic properties and designing MXen based spintronic devices                                               | Turkish Scientific and Technological Research Council of Turkey (TUBITAK) | PI         | 2020-2022 |
| Systematical determination of superconducting critical temperatures of 2D materials (MXene, Boride and Electride) and the effect of functionalization by means of Density Functional (Perturbation) Theory | The European Cooperation in Science and Technology (COST)                 | PI         | 2019-2021 |
| Systematical Investigation of Dynamical Mechanical and Electronic Properties of Innovative 2D MXene Crystals and Their Large Area CVD Growth                                                               | TUBITAK                                                                   | PI         | 2016-2019 |
| Investigation of Thermal Transport Properties of one- and two-dimensional Si, Ge, and Si-Ge Nano Structures and Determination of Possible High-Performance Thermoelectric Structures.                      | TUBITAK                                                                   | PI         | 2014-2017 |
| Computational investigation of two-dimensional double transition metal Mxene materials towards ion-battery applications                                                                                    | Argonne National Laboratory CNM                                           | PI         | 2017-2018 |
| Atomistic simulation of thermal conduction and phonon transport in single layer Chalcogens MoX <sub>2</sub> (X=S, Se, Te)                                                                                  | Argonne National Laboratory CNM                                           | PI         | 2015-2016 |
| Atomistic Simulations of Thermal Transport in Hybrid MoX <sub>2</sub> / WX <sub>2</sub> (X=S, Se) Transition Metal Dichalcogenides                                                                         | Argonne National Laboratory CNM                                           | PI         | 2016-2017 |
| Investigation Thermal Transport Properties of C Based Nanomaterials                                                                                                                                        | TUBITAK                                                                   | PI         | 2012-2014 |
| Growth of single layer Ti <sub>2</sub> C by CVD                                                                                                                                                            | Anadolu University                                                        | PI         | 2017-2018 |
| Temperature Dependent RAMAN Characterization of TMDCs                                                                                                                                                      | Anadolu University                                                        | PI         | 2016-2017 |
| Stillinger-Weber Type Interatomic Potential Generation for Two-Dimensional Transition Metal Dichalcogenides (Such as MoS <sub>2</sub> )                                                                    | Anadolu University                                                        | PI         | 2015-2016 |
| CVD Growth of Two-Dimensional Transition Metal Dichalcogenides (Such as MoS <sub>2</sub> )                                                                                                                 | Anadolu University                                                        | PI         | 2014-2015 |
| Nano Piezoelectric Materials                                                                                                                                                                               | Anadolu University                                                        | PI         | 2013-2014 |
| Novel, High-Gain Solid-State Waveguide Amplifiers for Applications in Backplane and Inter-Chip Optical Interconnects                                                                                       | TUBITAK                                                                   | Researcher | 2015-2018 |
| Design of Novel Graphene Like Two Dimensional Materials Based on Heterostructures of Transition Metal Dichalcogenides                                                                                      | TUBITAK BELGIUM FWO                                                       | Researcher | 2015-2017 |
| Investigation of Piezoelectric Properties of Hybrid Nanostructures (BN, MoS <sub>2</sub> , C-BN) by First Principles Calculations                                                                          | TUBITAK                                                                   | Consultant | 2014-2017 |

|                                                                                                           |                    |             |           |
|-----------------------------------------------------------------------------------------------------------|--------------------|-------------|-----------|
| Investigation of Non-Radiative Energy Transfer in 2D MoS <sub>2</sub>                                     | Anadolu University | Researcher  | 2014-2015 |
| International Institute of Materials for Energy Conversion at Texas A&M University                        | NSF DMR 0844082    | Researcher  | 2010-2016 |
| Computational Materials Science and Engineering                                                           | LLNS-INER PROGRAM  | Researcher  | 2008-2011 |
| Development of Solid State Softwares to Investigate Electronic and Structural Properties of Nanomaterials | TUBITAK            | Scholarship | 2006-2009 |
| High-Field Transport in Wide Band-Gap Semiconductors                                                      | TUBITAK            | Researcher  | 2002-2004 |

## CONFERENCE ORGANIZATION

Organizing Committee Member, Graphene Related Materials 2014, IYTE, Izmir, Turkey  
Organizing Committee Member, Graphene Related Materials 2016, Bilkent University, Ankara, Turkey  
Scientific Committee Member, 13<sup>th</sup> Nanoscience and Nanotechnology Conference, 2017, Antalya, Turkey  
Scientific Committee Member, 14<sup>th</sup> Nanoscience and Nanotechnology Conference, Izmir, Turkey

## REFEREE

H2020 FETOPEN RIA Remote Evaluator  
Turkish Scientific and Technological Research Council of Turkey  
American Physical Society Journals  
American Chemical Society Journals  
Elsevier Journals

## MEMBERSHIP

American Physical Society (APS)  
Materials Research Society (MRS)  
The Minerals Metals and Materials Society (TMS)

## COMPUTATIONAL TOOL EXPERIENCE

LAMMPS  
GULP  
VASP  
ABINIT  
QUANTUM ESPRESSO  
YAMBO  
SHENGBTE  
BOLTZTRAP  
PHONOPY  
TurboGAP

## PROGRAMMING EXPERIENCE

Fortran (MPI, OpenMP)  
C++  
C #  
Python  
Bash Scripting  
Cluster Management (Linux)