

UMUT AYDEMİR

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SCIENTIFIC MOTIVATION

My primary motivation in science is to conduct groundbreaking interdisciplinary research by combining basic and applied concepts of chemistry, physics, and materials science.

ACADEMIC QUALIFICATIONS

- 10/2019 – Present **Director**, Koç University Boron and Advanced Materials Application and Research Center (KUBAM), Turkey
- 08/2017 – Present **Assistant Professor**, Department of Chemistry, Koç University, Istanbul, Turkey.
- 08/2015 – 08/2017 **Research Associate**, Department of Materials Science and Engineering, Northwestern University.
Research Title: Synthesis and Characterization of Novel Thermoelectric Materials.
- 05/2016 – 10/2016 **Research Advisor**, Department of Chemistry, Koç University.
Research Title: Investigation of thermal and hydrothermal stability of synthesized oxides of aluminum, silicon, and titanium.
- 11/2013 – 08/2015 **Postdoctoral Scholar**, Department of Applied Physics & Materials Science, California Institute of Technology.
Research Title: Synthesis of Sb-based Zintl Phases as Thermoelectrics.
- 2013 – 2014 **Research Advisor**, Department of Chemistry, Koç University.
Research Title: Synthesis and Characterization of Refractory Materials in the Systems Re-B and Ti-B.
- 2012 – 2013 **Postdoctoral Researcher**, Department of Chemistry, Koç University.
Research Title: Synthesis and Characterization of Refractory Materials in the Systems Re-B and Ti-B.
- 2006 – 2012 **Dr. rer. nat. (Doctor of Science) in Chemistry (Magna Cum Laude, With Great Honor)**, Max Planck Institute for Chemical Physics of Solids (MPI-CPfS) – Dresden University of Technology, Dresden, Germany.
Thesis Advisor: Prof. Yuri Grin
Thesis Title: Preparation and Characterization of Clathrates in the Systems Ba–Ge, Ba–Ni–Ge, and Ba–Ni–Si.
- 2004 – 2006 **M.Sc. in Materials Science and Engineering**, Koç University, Istanbul, Turkey.
Thesis Advisor: Prof. Mehmet Somer
Thesis Title: Clathrate I Compounds of Barium with Transition Metal, Silicon and Germanium Framework and Contributions to TaNiSi.
- 1998 – 2004 **B.Sc. in Chemistry and Physics (Double Major)**, Koç University, Istanbul, Turkey.

FELLOWSHIPS AND AWARDS

2021	Recipient of the Middle East Technical University Prof. Dr. Mustafa Parlar Foundation Research Incentive Award
2019	Recipient of the 2019 The Turkish Academy of Sciences (TUBA) - Outstanding Young Scientist Award (GEBIP) in Chemistry, Ankara, Turkey.
2018	Recipient of the 2018 Science Academy's Young Scientist Award (BAGEP) in Chemistry, Istanbul, Turkey.
2016	Best Poster Award, the 35 th International Conference & the 1 st Asian Conference on Thermoelectrics, Wuhan, China.
2015	Best Poster Award, the 34 th Annual International Conference on Thermoelectrics & 13 th European Conference on Thermoelectrics, Dresden, Germany.
2013	Recipient of the Scientific and Technological Research Council of Turkey (TUBITAK) Postdoctoral Grant.
2006	Top-ranking student among the Materials Science and Engineering graduates at Koç University.
2004	Top-ranking student among the Chemistry graduates at Koç University.
1998	Vehbi Koç Scholarship for B.Sc. studies at Koç University.

TEACHING EXPERIENCE

2022 - Spring	Instructor of General Chemistry II (Chem 102), Koç University.
2021 - Fall	Instructor of General Chemistry I (Chem 101) and Materials Science and Engineering I (MASE 515), Koç University.
2021 - Spring	Instructor of General Chemistry II (Chem 102), Koç University.
2020 - Fall	Instructor of General Chemistry I (Chem 101) and Materials Science and Engineering I (MASE 515), Koç University.
2020 - Spring	Instructor of General Chemistry II (Chem 102), Koç University.
2019 - Fall	Instructor of General Chemistry I (Chem 101) and Materials Science and Engineering I (MASE 515), Koç University.
2019 - Spring	Instructor of General Chemistry (Chem 102 & 103), Koç University.
2018 - Spring & Fall	Instructor of General Chemistry (Chem 103), Koç University.
2017 - Fall	Instructor of General Chemistry (Chem 103), Koç University.

PUBLICATION SUMMARY

Author of 89 peer-reviewed articles published in top scientific journals such as *Nature Reviews Materials* (**IF**: 51.941), *Energy & Environmental Science* (**IF**: 30.067), *Advanced Materials* (**IF**: 21.950), *Advanced Energy Materials* (**IF**: 21.875), *Journal of the American Chemical Society* (**IF**: 14.357), etc.

Number of citations: 2928 (2534), **h-index:** 32 (28) **Source:** Google Scholar (Web of Science)

A guest editor of “Themed issue on the chemistry of thermoelectric materials” published in the *Journal of Materials Chemistry C*.

The journals reviewed include: *Advanced Energy Materials*, *Advanced Functional Materials*, *Nano Energy*, *Materials Today Energy*, *Chemistry of Materials*, *ACS Applied Materials & Interfaces*, *Physical Chemistry Chemical Physics*, *Materials Physics Today*, *Inorganic Chemistry*, *Scientific Reports*, *RCS Advances*, *Dalton Transactions*, *APL Materials*, etc.

Director of one symposium, scientific committee member of two conferences, one colloquium and twelve invited talks, 53 oral and poster presentations in national/international conferences and universities.

BOOK CHAPTERS

1. A. Zevalkink, U. Aydemir, G. J. Snyder, “Chain-Forming A_3MPn_3 and $A_5M_2Pn_6$ Zintl Phases”, Chapter in *Materials Aspect of Thermoelectricity*, by CRC Press, Taylor & Francis Group, Editor: Ctirad Uher

PUBLICATIONS

Peer-Reviewed Journal Articles

89. Key properties of inorganic thermoelectric materials – tables (version 1)
R. Freer, ..., M. Ozen, K. Saglik, U. Aydemir, ..., T. Mori, *J. Phys. Energy*, 2022,
<https://doi.org/10.1088/2515-7655/ac49dc> (in press)
88. Evaluating electrocatalytic activity of metal-substituted hafnium diboride ($Hf_{1-x}TM_xB_2$; TM = Ni and Co) toward water splitting
N.S. Peighambardoust, E. Sadeghi, B. Mete, M. Baris Yagci and U. Aydemir*, *J. Alloys Compd.*, 2022, 905, 164148
87. Effect of Polymer Topology on Microstructure, Segmental Dynamics, and Ionic Conductivity in PEO/PMMA-Based Solid Polymer Electrolytes
R. Bakar, S. Darvishi, T. Li, M. Han, U. Aydemir, S. Nizamoglu, K. Hong, E. Senses*, *ACS Appl. Polym. Mater.* 2021
86. Tailoring the Morphology of Cost-Effective Vanadium Diboride Through Cobalt Substitution for Highly Efficient Alkaline Water Oxidation
E. Sadeghi, N.S. Peighambardoust, and U. Aydemir*, *Inorg. Chem.*, 2021, 60, 19457.
85. Microwave-Assisted Auto-Combustion Synthesis of Binary/Ternary $CoxNi_{1-x}$ Ferrite for Electrochemical Hydrogen and Oxygen Evolution
S. Chamani, M. Khatamian*, N.S. Peighambardoust, and U. Aydemir*, *ACS Omega*, 2021, 6, 33024.

- 84.** Stress/pressure-stabilized cubic polymorph of Li_3Sb with improved thermoelectric performance
M. Yahyaoglu, T. Soldi, M. Ozen, C. Candolfi, G. J. Snyder* and U. Aydemir*, *J. Mater. Chem. A*, 2021, 9, 25024.
- 83.** High thermoelectric performance enabled by convergence of nested conduction bands in $\text{Pb}_7\text{Bi}_4\text{Se}_{13}$ with low thermal conductivity
L. Hu, Y.-W. Fang, F. Qin, X. Cao, X. Zhao, Y. Luo, D. V. M. Repaka, W. Luo, A. Suwardi, T. Soldi, U. Aydemir, Y. Huang, K. Hippalgaonkar, G. J. Snyder, J. Xu, Q. Yan, *Nat. Commun.* 2021, 12, 4793.
- 82.** Metal-substituted zirconium diboride ($\text{Zr}_{1-x}\text{TM}_x\text{B}_2$; $\text{TM} = \text{Ni, Co, and Fe}$) as low-cost and high-performance bifunctional electrocatalyst for water splitting
B. Mete, N. Sadat Peighambaroust, S. Aydin, E. Sadeghi, U. Aydemir*, *Electrochim. Acta*, 2021, 389, 138789.
- 81.** Fracture toughness of thermoelectric materials
G. Li, Q. An, B. Duan, L. Borgsmiller, M. A. Malki, M. Agne, U. Aydemir, P. Zhai, Q. Zhang, S. I. Morozov, W. A. Goddard III, G. J. Snyder, *Mater. Sci. Eng. R Rep.*, 2021, 144, 100607
- 80.** Metal doped layered MgB_2 nanoparticles as novel electrocatalysts for water splitting
E. Sadeghi, N. Sadat Peighambaroust, M. Khatamian, U. Unal, U. Aydemir*, *Scientific Reports*, 2021, 11, 3337.
- 79.** Phase-Transition-Enhanced Thermoelectric Transport in Rickardite Mineral $\text{Cu}_{3-x}\text{Te}_2$
M. Yahyaoglu, M. Ozen, Yu. Prots, O. E. Hamouli, V. Tshitoyan, H. Ji, U. Burkhardt, B. Lenoir, G. J. Snyder, A. Jain, C. Candolfi, and U. Aydemir*, *Chem. Mater.* 2021, 33, 1832
- 78.** Electrophoretic deposition and characterization of self-doped SrTiO_3 thin films
N. S. Peighambaroust, U. Aydemir*, *Turk. J. Chem.*, 2021, 45, 323
- 77.** Enhanced Thermoelectric Performance in $\text{Mg}_{3+x}\text{Sb}_{1.5}\text{Bi}_{0.49}\text{Te}_{0.01}$ via Engineering Microstructure through Melt-Centrifugation
M. Ozen, M. Yahyaoglu, C. Candolfi, I. Veremchuk, F. Kaiser, U. Burkhardt, G. J. Snyder, Y. Grin and U. Aydemir*, *J. Mater. Chem. A*, 2021, 9, 1733.
- 76.** Blue TiO_2 nanotube arrays as semimetallic materials with enhanced photoelectrochemical activity towards water splitting
N. S. Peighambaroust, U. Aydemir*, *Turk. J. Chem.*, 2020, 44, 1642.
- 75.** Crystal Structure and Atomic Vacancy Optimized Thermoelectric Properties in Gadolinium Selenides
F. Qin, S. A. Nikolaev, A. Suwardi, M. Wood, Y. Zhu, X. Tan, U. Aydemir, Y. Ren, Q. Yan, L. Hu,* and G. J. Snyder*, *Chem. Mater.*, 2020, 32, 10130.
- 74.** Vibrational dynamics of the type-I clathrates $\text{A}_8\text{Sn}_{44}\square_2$ ($\text{A} = \text{Cs, Rb, K}$) from lattice-dynamics calculations, inelastic neutron scattering, and specific heat measurements.
C. Candolfi*, M. M. Koza, U. Aydemir, W. Carrillo-Cabrera, Yu. Grin, F. Steglich, and M. Baitinger, *J. Appl. Phys.*, 2020, 127, 145104.
- 73.** Intrinsic mechanical behavior of MgAgSb thermoelectric material: An ab initio study
G. Li*, Q. An, U. Aydemir, S. I. Morozov, B. Duan, P. Zhai*, Q. Zhang, and W. A. Goddard III, *J. Materiomics*, 2020, 6, 24.

72. TiB₂-SiC-based ceramics as alternative efficient micro heat exchangers
S. Nekahi, M. Vajdi, F. S. Moghanlou, K. Vaferi, A. Motallebzadeh, M. Ozen, U. Aydemir, J. Sha, M. S. Asl*, *Ceram. Int.*, 2019, 45, 19060.
71. Ultrahigh figure-of-merit of Cu₂Se incorporated with carbon coated boron nanoparticles
M. Li, S. Md K. N. Islam, M. Yahyaoglu, D. Pan, X. Shi, L. Chen, U. Aydemir, X. Wang*, *InfoMat*, 2019, 1, 108.
70. Origins of Ultralow Thermal Conductivity in 1-2-1-4 Quaternary Selenides
J. J. Kuo, U. Aydemir, J.-H. Pohls, F. Zhou, G. Yu, A. Faghaninia, F. Ricci, M. A. White, G.-M. Rignanese, G. Hautier, A. Jain, G. J. Snyder*, *J. Mater. Chem. A*, 2019, 7, 2589.
69. First-principles calculations and experimental studies of XYZ 2 thermoelectric compounds: detailed analysis of van der Waals interactions
J.-H. Pöhls, Z. Luo, U. Aydemir, J.-P. Sun, S. Hao, J. He, I. G Hill, G. Hautier, A. Jain, X. Zeng, C. Wolverton, G. J. Snyder, H. Zhu, M. A. White*, *J. Mater. Chem. A*, 2018, 6, 19502.
68. Giant enhancement of the figure-of-merit over a broad temperature range in nano-boron incorporated Cu₂Se
S. Md. K. N. Islam, M. Li, U. Aydemir, X. Shi, L. Chen, G. J. Snyder, and X. Wang*, *J. Mater. Chem. A*, 2018, 6, 18409.
67. Melt-centrifuged (Bi,Sb)₂Te₃: engineering microstructure towards high thermoelectric efficiency
Y. Pan, U. Aydemir*, J. A. Grovogui, I. T. Witting, R. Hanus, Y. Xu, J. Wu, C.-F. Wu, F.-H. Sun, H.-L. Zhuang, J.-F. Dong, J.-F. Li*, V. P. Dravid, and G. J. Snyder*, *Adv. Mater.*, 2018, 30, 1802016.
66. Observation of Valence Band Crossing: The Thermoelectric Properties of CaZn₂Sb₂-CaMg₂Sb₂ solid Solution
M. Wood, U. Aydemir*, S. Ohno, and G. J. Snyder*, *J. Mater. Chem. A*, 2018, 6, 9437.
65. A Valence Balanced Rule for Discovery of 18-electron Half-Heuslers with Defects
S. Anand, K. Xia, V. I. Hegde, U. Aydemir, V. Kocovski, T. Zhu, C. Wolverton, G. J. Snyder*, *Energy Environ. Sci.*, 2018, 11, 1480.
64. Localized Symmetry Breaking for Tuning Thermal Expansion in ScF₃ Nano-scale Frameworks
L. Hu, F. Qin, A. Sanson, L.-F. Huang, Z. Pan, Q. Li, Q. Sun, L. Wang, F. Guo, U. Aydemir, Y. Ren, C. Sun, J. Deng, G. Aquilanti, J. M. Rondinelli, J. Chen*, and X. Xing, *J. Am. Chem. Soc.*, 2018, 140, 4477.
63. Mechanical properties in thermoelectric oxides: ideal strength, deformation mechanism, and fracture toughness
G. Li*, U. Aydemir, S. Morozov, S. A. Miller, Q. An, W. A. Goddard III, P. Zhai, Q. Zhang **, G. J. Snyder, *Acta Mater.*, 2018, 149, 341.
62. Quaternary Pavanites A_{1+x}Sn_{2-x}Bi_{5+x}S₁₀ (A⁺ = Li⁺, Na⁺): Site Occupancy Disorder Defines Electronic Structure
J. F. Khoury, S. Hao, C. C. Stoumpos, Z. Yao, C. D. Malliakas, U. Aydemir, T. J. Slade, G. J. Snyder, C. Wolverton, and M. G. Kanatzidis*, *Inorg. Chem*, 2018, 57, 2260.
61. Polycrystalline ZrTe₅ parametrized as a narrow-band-gap semiconductor for thermoelectric performance.
S. A. Miller, I. Witting, G. J. Snyder, U. Aydemir, L. Peng, A. J. E. Rettie, D. Y. Chung, P. Gorai, V.

- Stevanović, M. G. Kanatzidis, M. Grayson, and E. S. Toberer, *Phys. Rev. Applied*, 2018, 9, 014025.
- 60.** Unique role of refractory Ta alloying in enhancing the figure of merit of NbFeSb thermoelectric materials.
J. Yu, C. Fu, Y. Liu, K. Xia, U. Aydemir, T. C. Chasapis, G. J. Snyder, X. Zhao*, T. Zhu*, *Adv. Energy Mater.*, 2018, 8, 1701313.
- 59.** Metal phosphides as potential thermoelectric materials.
J-H. Pöhls, A. Faghaninia, G. Petretto, U. Aydemir, F. Ricci, G. Li, M. Wood, S. Ohno, G. Hautier, G. J. Snyder, G.-M. Rignanese, A. Jain and M. Anne White*, *J. Mater. Chem. C*, 2017, 5, 12441.
- 58.** Micro- and Macromechanical Properties of Thermoelectric Lead Chalcogenides.
G. Li, U. Aydemir, B. Duan, M. T. Agne, H. Wang, M. Wood, Q. Zhang, P. Zhai, W. A. Goddard III, G. J. Snyder*, *ACS Appl. Mater. Interfaces*, 2017, 9, 40488.
- 57.** Isotropic zero thermal expansion and local thermal vibration dynamics in (Sc,Fe)F₃.
F. Qin, J. Chen, * U. Aydemir, A. Sanson, J. Xu, C. Sun, Y. Ren, Z. Pan, J. Deng, R. Yu, L. Hu, G. J. Snyder, X. Xing, *Inorg. Chem.*, 2017, 56, 10840.
- 56.** Superstrengthening Bi₂Te₃ through nanotwinning.
G. Li, U. Aydemir, S. I. Morozov, M. Wood, Q. An, P. Zhai, Q. Zhang, W. A. Goddard III, G. J. Snyder*, *Phys. Rev. Lett.*, 2017, 119, 085501.
- 55.** Grain boundary engineering with nano-scale InSb producing high performance In_xCe_yCo₄Sb_{12-z} skutterudite thermoelectrics.
H. Li, X. Su, X. Tang*, Q. Zhang, C. Uher, G. J. Snyder, U. Aydemir*, *J. Materiomics*, 2017, **3**, 273.
- 54.** Self-Tuning n-Type Bi₂(Te,Se)₃/SiC Thermoelectric Nanocomposites to Realize High Performances up to 300 °C.
Y. Pan, U. Aydemir, F.-H. Sun, C.-F. Wu, T. C. Chasapis, G. J. Snyder*, J.-F. Li*, *Adv. Sci.*, 2017, 1700259.
- 53.** SnO as a Potential Oxide Thermoelectric Candidate.
S. Miller, P. Gorai, U. Aydemir, T. O. Mason, V. Stevanovic, E. Toberer, G. Jeffrey Snyder*, *J. Mater. Chem. C*, 2017, 5, 8854.
- 52.** Mechanical properties of thermoelectric lanthanum telluride from quantum mechanics.
G. Li, U. Aydemir, M. Wood, W. A. Goddard, P. Zhai, Q. Zhang, G. J. Snyder*, *J. Phys. D: Appl. Phys.*, 2017, 50, 274002.
- 51.** Data Descriptor: An electronic transport ab initio database for inorganic materials.
F. Ricci, W. Chen, U. Aydemir, G. J. Snyder, G.-M. Rignanese, A. Jain, G. Hautier*, *Sci. Data*, 2017, 4, 170085.
- 50.** Enhanced Stability and Thermoelectric Figure-of-Merit in Copper Selenide by Lithium Doping.
S. D. Kang, J.-H. Pöhls, U. Aydemir, P. Qiu, C. C. Stoumpos, R. Hanus, M. A. White, X. Shi, L. Chen, M. G. Kanatzidis, G. Jeffrey Snyder*, *Mater. Today Phys.*, 2017, 1, 7.
- 49.** Defect-Controlled Electronic Structure and Phase Stability in Thermoelectric Skutterudite CoSb₃
G. Li, U. Aydemir, M. Wood, W. A. Goddard, P. Zhai, Q. Zhang*, G. J. Snyder*, *Chem. Mater.*, 2017, 29, 3999.

48. Deformation Mechanisms in the High-Efficiency Thermoelectric Layered Zintl Compounds.
G. Li, U. Aydemir, M. Wood, Q. An, W. A. Goddard, P. Zhai, Q. Zhang*, G. J. Snyder*, *J. Mater. Chem. A*, 2017, 5, 9050.
47. Ideal Strength and Deformation Mechanism in High-Efficiency Thermoelectric SnSe.
G. Li, U. Aydemir, M. Wood, W. A. Goddard, P. Zhai, Q. Zhang*, G. J. Snyder*, *Chem. Mater.*, 2017, 29, 2382–2389.
46. A computational assessment of the electronic, thermoelectric, and defect properties of bournonite (CuPbSbS₃) and related substitutions.
A. Faghaninia*, G. Yu, U. Aydemir, M. Wood, W. Chen, G.-M. Rignanese, G. J. Snyder, G. Hautier, and A. Jain*, *Phys. Chem. Chem. Phys.*, 2017, 19, 6743-6756.
45. Achieving $zT > 1$ in inexpensive Zintl phase Ca₉Zn_{4+x}Sb₉ by phase boundary mapping.
S. Ohno, U. Aydemir, M. Amsler, J.-H. Pöhls, S. Chanakian, A. Zevalkink, M. A. White, S. K. Bux, C. Wolverton, and G. J. Snyder*, *Adv. Funct. Mater.*, 2017, 27, 1606361.
44. High Temperature Electronic and Thermal Transport Properties of EuGa_{2-x}In_xSb₂.
S. Chanakian, R. Weber, U. Aydemir*, A. Ormeci, J.-P. Fleurial, S. Bux, and G. J. Snyder, *J. Electron. Mater.*, 2017, 46, 4798.
43. Structure and failure mechanism of the thermoelectric CoSb₃/TiCoSb interface.
G. Li, S. Hao, U. Aydemir, M. Wood, W. A. Goddard, P. Zhai, Q. Zhang*, G. J. Snyder*, *ACS Appl. Mater. Interfaces*, 2016, 8, 31968-31977.
42. Enhanced ideal strength of thermoelectric half-Heusler TiNiSn by sub-structure engineering.
G. Li, Q. An, U. Aydemir, W. A. Goddard, M. Wood, P. Zhai, Q. Zhang*, G. J. Snyder*, *J. Mater. Chem. A*, 2016, 4, 14625-14636.
41. Engineering Half-Heusler Thermoelectric Materials Using Zintl Chemistry.
W. G. Zeier, J. Schmitt, G. Hautier, U. Aydemir, Z. M. Gibbs, C. Felser, and G. J. Snyder* *Nature Reviews Materials*, 2016, 1, 16032.
40. Understanding Thermoelectric Properties from High-Throughput Calculations: Trends, Insights, and Comparisons with Experiment.
W. Chen, J.-H. Pöhls, G. Hautier, D. Broberg, S. Bajaj, U. Aydemir, Z. M. Gibbs, H. Zhu, M. Asta, G. J. Snyder, B. Meredig, M. A. White, K. Persson, and A. Jain*, *J. Mater. Chem. C*, 2016, 4, 4414.
39. A novel europium (III) nitridoborate Eu₃[B₃N₆]: Synthesis, crystal Structure, magnetic properties, and Raman spectra.
U. Aydemir*, I. Kokal, Yu. Prots, T. Förster, J. Sichelschmidt, F. Schappacher, R. Pöttgen, A. Ormeci, M. Somer*, *J. Solid State Chem.*, 2016, 239, 75.
38. p-type Co interstitial defects in thermoelectric skutterudite CoSb₃ due to the breakage of Sb₄-rings.
G. Li, S. Bajaj, U. Aydemir, S. Hao, H. Xiao, W. A. Goddard, P. Zhai, Q. Zhang, G. J. Snyder*, *Chem. Mater.*, 2016, 28, 2172.
37. YCuTe₂: a member of a new class of thermoelectric materials with CuTe₄-based layered structure.
U. Aydemir*, J.-H. Pöhls, H. Zhu, G. Hautier, S. Bajaj, Z. M. Gibbs, W. Chen, G. Li, S. Ohno, D. Broberg, S. D. Kang, M. Asta, G. Ceder, M. A. White, K. Persson, A. Jain, and G. J. Snyder*, *J. Mater. Chem. A*, 2016, 4, 2461. (10)

- 36.** Enhanced thermoelectric properties of the Zintl phase BaGa₂Sb₂ via doping with Na or K
U. Aydemir*, A. Zevalkink, A. Ormeci, S. Bux, and G. J. Snyder, *J. Mater. Chem. A*, 2016, 4, 1867.
- 35.** Apparent critical phenomena in the superionic phase transition of Cu_{2-x}Se.
 S. D. Kang, S. A. Danilkin, U. Aydemir, M. Avdeev, A. Studer, and G. J. Snyder*, *New J. Phys.*, 2016, 18, 013025.
- 34.** Electronic band structure and low-temperature transport properties of the type-I clathrate Ba₈Ni_x□_yGe_{46-x-y}.
U. Aydemir, C. Candolfi, A. Ormeci, M. Baitinger, N. Oeschler, F. Steglich, Yu. Grin*, *Dalton Trans.*, 2015, 44, 7524-7537.
- 33.** Thermoelectric Properties of the Zintl Phases Yb₅M₂Sb₆ (M = Al, Ga, In).
U. Aydemir*, A. Zevalkink, A. Ormeci, H. Wang, S. Bux, J. Snyder, *Dalton Trans.*, 2015, 44, 6767-6774.
- 32.** Thermoelectric Enhancement in BaGa₂Sb₂ by Zn-Doping.
U. Aydemir*, A. Zevalkink, A. Ormeci, Z. M. Gibbs, S. Bux, and G. J. Snyder, *Chem. Mat.*, **2015**, 27, 1622.
- 31.** Inelastic Neutron Scattering Study of the Lattice Dynamics in the clathrate Compound BaGe₅.
 C. Candolfi*, U. Aydemir, M. M. Koza, M. Baitinger, F. Steglich, Yu. Grin, *J. Phys.: Condens. Matter*, 2015, 27, 485401.
- 30.** High temperature thermoelectric Properties of Zn-doped Eu₅In₂Sb₆.
 S. Chenakian, U. Aydemir*, A. Zevalkink, S. Bux, J. Fleurial, J. Snyder, *J. Mater. Chem. C*, 2015, 3, 10518-10524.
- 29.** Computational and experimental investigation of TmAgTe₂ and XYZ₂ compounds, a new group of thermoelectric materials identified by first principles high throughput screening.
 H. Zhu, G. Hautier, U. Aydemir, Z. M. Gibbs, G. Li, S. Bajaj, J.-H. Poehls, D. Broberg, W. Chen, A. Jain, M. Asta, G. J. Snyder, K. Persson, and G. Ceder*, *J. Mater. Chem. C*, 2015, 3, 10554-10565.
- 28.** Ca₃[BN₂]₃: The First Halide-Rich Alkaline Earth Nitridoborate with Isolated [BN₂]³⁻ Units
 T. Ezgi Toros, M. Yahyaoglu, U. Aydemir, C. Drathen, L. Akselrud, Y. Prots, P. Höhn, M. Somer* *Z. Anorg. Allg. Chem.*, 2015, 641, 2014–2019.
- 27.** Electronic Structure and Thermoelectric Properties of Pnictogen-Substituted ASn_{1.5}Te_{1.5} (A = Co, Rh, Ir) Skutterudites.
 A. Zevalkink*, K. Star, U. Aydemir, J.-P. Fleurial, S. Bux, T. Vo, P. von Allmen, *J. Appl. Phys.*, 2015, 118, 035107
- 26.** Enhanced Thermoelectric Properties of Sr₅In₂Sb₆ via Zn-doping.
 S. Chenakian, A. Zevalkink, U. Aydemir, S. Bux, J. Fleurial, J. Snyder*, *J. Mater. Chem. A*, 2015, 3, 10289-10295.
- 25.** Thermoelectric properties and electronic structure of the Zintl phase Sr₅In₂Sb₆ and the Ca_{5-x}Sr_xIn₂Sb₆ solid solution.
 A. Zevalkink, S. Chenakian, U. Aydemir, A. Ormeci, G. Pomrehn, S. Bux, J. Fleurial, J. Snyder*, *J. Phys.: Cond. Matter*, 2015, 27, 015801.
- 24.** High Temperature Transport Properties of BaZn₂Sn₂.
U. Aydemir*, A. Zevalkink, S. Bux, G. J. Snyder, *J. All. Comp.*, 2015, 622, 402.

- 23.** BaGe₆ and BaGe_{6-x}: Incommensurately Ordered Vacancies as Electron Traps.
L. Akselrud, A. Wosylus, R. Castillo, U. Aydemir, Yu. Prots, W. Schnelle, Yu. Grin, U. Schwarz*, *Inorg. Chem.*, 2014, 53, 12699.
- 22.** High temperature thermoelectric properties of the type-I clathrate Ba₈Ni_x□_yGe_{46-x-y}.
U. Aydemir, C. Candolfi, M. Baitinger, N. Oeschler, F. Steglich, Yu. Grin*, *J. Phys. Cond. Matter*, 2014, 26, 485801.
- 21.** Thermoelectric properties of the Ca₅Al_{2-x}In_xSb₆ solid solution.
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44. U. Aydemir, “Thermoelectricity and Superconductivity in Inclusion Compounds: A Case Study of Intermetallic Clathrates”, CSM2021: 7th International Conference on Superconductivity and Magnetism, Oct. 22 – 28, 2021, Bodrum, Turkey (**Invited Speaker**).
43. I. Terzi, U. Aydemir*, “Optimization of the Thermoelectric Properties of the Skutterudite Phase CoSb_3 through InSb and C-Coated Nano Boron Incorporation”, 8th National Inorganic Chemistry Congress of Turkey, Sept. 2-5, 2021, Turkey (**Oral**)
42. M. Yahyaoglu, M. Ozen, Y. Prots, U. Burkhardt, G. J. Snyder, A. Jain, C. Candolfi, U. Aydemir*, “Phase-Transition-Enhanced Thermoelectric Transport in Rickardite Mineral $\text{Cu}_{3-x}\text{Te}_2$ ”, *Virtual Conference on Thermoelectrics*, July 20-22, 2021 (**Oral**)
41. U. Aydemir, “High Efficiency Antimony-Based Zintl Thermoelectrics for Energy Harvesting”, *Eduard-Zintl-Kolloquium*, Technical University of Darmstadt, Jan. 22, 2020, Darmstadt, Germany (**Colloquium Speaker**).
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39. U. Aydemir, “Snyder effect: A distinct parameter to boost the performance of rich family of thermoelectric materials”, *2019 The North American Thermoelectric (Na-Te / Snyder) Workshop*, August 30 – September 02, **2019**, Evanston, USA (**Invited Speaker**).
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35. U. Aydemir, “KABAM: Boron and Advanced Materials Research”, *Symposium in Honor of the Retirement of Prof. Mehmet S. Somer*, June 21, **2019**, Koc University, Istanbul, Turkey (**Oral**)
34. M. Yahyaoğlu, M. Özen, B. Mete, U. Aydemir*, “Tuning the Thermoelectric Properties of Cu_2Se by B-doping”, *International Symposium on Boron*, April 17-19, **2019**, Nevsehir, Turkey (**Poster**)
33. U. Aydemir, “Giant Enhancement of the Figure-of-merit Over a Broad Temperature Range in Nanoboron Incorporated Cu_2Se ”, *International Symposium on Boron*, April 17-19, **2019**, Nevsehir, Turkey (**Oral, Member of Scientific Committee**)
32. U. Aydemir, “ $Ca_9Zn_{4+x}Sb_9$ ve $In_xCe_yCo_4Sb_{12+z}$: Designing and optimization of Zintl Phases with High Thermoelectric Efficiency”, *30th National Chemistry Congress*, November 5 – 8, **2018**, Gazimagusa, Turkish Republic of Northern Cyprus (**Oral**)
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3. M. Sakaliyska, U. Aydemir, S. Scudino, M. Baitinger, K. B. Surreddi, Yu. Grin, J. Eckert, “Mechanical Milling of $\text{Ba}_8\text{Ni}_x\text{Ge}_{46-x}$ Clathrates”, *Advanced Processing for Novel Functional Materials – APNFM 2008*, January 23 – 25, **2008**, Dresden, Germany (**Oral**).
2. S. Acar, I. Kokal, M. Somer, P. Höhn, U. Aydemir, R. Cardoso-Gil and L. Akselrud, “ $\text{Na}_2[\text{BH}_4][\text{NH}_2]$: A Novel complex hydride in $\text{NaNH}_2\text{-NaBH}_4$ system; Syntheses, Crystal structures, Thermal Analyses, Mass and Vibrational Spectra”, *11th European Conference on Solid State Chemistry*, W49, September 11 – 13, **2007**, Caen, France (**Poster**).
1. I. Kokal, M. Somer, U. Aydemir, W. Carrillo-Cabrera, Y. Prots, W. Schnelle, “ $\text{Li}_{0.42}\text{Eu}_3[\text{B}_3\text{N}_6]$: Synthesis, Crystal Structure, Vibrational Spectroscopy and Magnetic Properties”, *11th European Conference on Solid State Chemistry*, W39, September 11 – 13, **2007**, Caen, France (**Poster**).

PROJECT REVIEWS, SCHOOLS, AND WORKSHOPS ATTENDED

15. *IMSERC Powder X-ray diffraction workshop*, July 6, **2017**, Northwestern University, Illinois, USA.
14. *2016 International Summer School on Thermoelectrics*, July 25 – 27, **2016**, the Colorado School of Mines, Colorado, USA.
13. *Materials Project Annual Review Meeting*, August 3, **2015**, Lawrence Berkeley National Laboratory, California, USA.
12. *Materials Project Bi-Annual Review Meeting*, April 6, **2015**, San Francisco, California, USA.
11. *Materials Project Annual Review Meeting*, August 6, **2014**, Lawrence Berkeley National Laboratory, California, USA.
10. *Workshop on WinCSD Program Package for Crystallographic Calculations*, August 24 – 25, **2011**, MPI-CPfS, Dresden, Germany.
9. *Workshop on JANA 2006 - Program for Structure Analysis of Crystals Periodic in Three or More Dimensions from Diffraction Data -*, September 22 – 24, **2010**, MPI-CPfS, Dresden, Germany.
8. *Workshop on Electron Localizability and Chemical Bonding*, March 29th – April 1st, **2009**, MPI-CPfS, Dresden, Germany.
7. *Complex Metallic Alloys: Surfaces and Coatings*, 3rd European School in Materials Science, May 26 – 31, **2008**, Ljubljana, Slovenia.
6. *Workshop on XD2006 program package: Advanced Methods in X-ray Charge Density Analysis: Extracting Properties from a Multipole Refinement*, September 3 – 6, **2007**, Martina Franca, Italy.
5. *Properties and Application of Complex Metallic Alloys: 2nd European School in Materials Science*, May 21 – 26, **2007**, Ljubljana, Slovenia.

4. *The 11th BCA/CCG Intensive Teaching School in X-ray Structure Analysis*, March 24th – April 2nd, **2007**, Trevelyan College, University of Durham, UK.
3. *The Second Bilateral Workshop on Solid State and Materials Chemistry*, July 17 – 19, **2006**, MPI-CPfS, Dresden, Germany.
2. *Workshop of the AK Computational Crystallography of the DGK Electron Density – Theory and Applications*, February 19 – 21, **2006**, Aachen, Germany.
1. *The First Bilateral Workshop on Current Topics in Advanced Materials*, May 17 – 20, **2003**, Istanbul, Turkey.

MEMBERSHIPS

TÜBA-Young Academy

Science Academy – Young Scientist Working Group

Turkish Chemical Society (TCS)

International Thermoelectric Society (ITS)

Materials Research Society (MRS)

American Chemical Society (ACS)

European Integrated Center for the Development of New Metallic Alloys and Compounds (C-MAC, Successor Organization of NoE CMA)

LANGUAGES

Turkish: Native, English: Fluent, German: Intermediate