

## Res. Asst. PhD BÜNYAMİN ÜMSÜR

### Personal Information

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### Education Information

Doctorate, Freie Universität Berlin, Fizik, Germany 2013 - 2017

Postgraduate, Freie Universität Berlin, Fizik, Germany 2010 - 2013

Undergraduate, Gebze Technical University, Temel Bilimler Fakültesi, Fizik Bölümü, Turkey 2005 - 2009

### Foreign Languages

French, A2 Elementary

German, B2 Upper Intermediate

English, B2 Upper Intermediate

### Dissertations

Doctorate, Surface engineering of Cu(In,Ga)Se<sub>2</sub> by KF and CdS – A study by high-energy photoemission spectroscopy, Freie Universität Berlin, Fizik, 2017

Postgraduate, Electronic characteristics and transport mechanisms at chemical bath deposited-Zn(S,O)/Cu(In,Ga)(S,Se)<sub>2</sub> heterojunctions, Freie Universität Berlin, Fizik, 2012

### Research Areas

Physics

### Academic Titles / Tasks

Research Assistant PhD, Yozgat Bozok University, Fen-Edebiyat Fakültesi, Fizik, 2017 - Continues

Research Assistant PhD, Yozgat Bozok University, Bilim Ve Teknoloji Uygulama Ve Araştırma Merkezi, 2018 - 2019

### Courses

Temel Fizik, Associate Degree, 2019 - 2020

### Articles Published in Journals That Entered SCI, SSCI and AHCI Indexes

1. Impact of RbF post deposition treatment on CdS/CIGSe and Zn(O,S)/CIGSe interfaces-A comparative HAXPES study

ÜMSÜR B., Maticiuc N., Kodalle T., Wenisch R., Majumdar I., Wang Y., Yetkin H. A. , Bertram T., Kaufmann C. A. , Schlatmann R., et al.

RENEWABLE ENERGY, vol.180, pp.626-636, 2021 (Journal Indexed in SCI)

- II. **Depth-resolved analysis of the effect of RbF post deposition treatment on CIGSe with two different Cu concentrations**  
Maticiuc N., Kodalle T., ÜMSÜR B., Bertram T., Wenisch R., Wang Y., Majumdar I., Yetkin H. A. , Abou-Ras D., Schafer N., et al.  
SOLAR ENERGY MATERIALS AND SOLAR CELLS, vol.226, 2021 (Journal Indexed in SCI)
- III. **In situ investigation of as grown Cu(In,Ga)Se-2 thin films by means of photoemission spectroscopy**  
Calvet W., Uemsuer B., Steigert A., Prietzel K., Greiner D., Kaufmann C. A. , Unold T., Lux-Steiner M., Lauer mann I.  
JOURNAL OF VACUUM SCIENCE & TECHNOLOGY A, vol.37, no.3, 2019 (Journal Indexed in SCI)
- IV. **Cu(In, Ga)Se-2 surface treatment with Na and NaF: A combined photoelectron spectroscopy and surface photovoltage study in ultra-high vacuum**  
Parvan V., Mizrak A., Majumdar I., Uemsuer B., Calvet W., Greiner D., Kaufmann C. A. , Dittrich T., Avancini E., Lauer mann I.  
APPLIED SURFACE SCIENCE, vol.444, pp.436-441, 2018 (Journal Indexed in SCI)
- V. **Valence and conduction band edges of selenide and sulfide-based kesterites-a study by x-ray based spectroscopy and ab initio theory**  
Olar T., Manoharan A., Draxl C., Calvet W., ÜMSÜR B., Parvan V., Chacko B., Xie H., Saucedo E., Valle-Rios L. E. , et al.  
SEMICONDUCTOR SCIENCE AND TECHNOLOGY, vol.32, no.10, 2017 (Journal Indexed in SCI)
- VI. **Surface modifications of Na and K metal incorporated Cu(In,Ga)Se2 absorbers investigated by synchrotron-based spectroscopies**  
Majumdar I., ÜMSÜR B., Chacko B., Greiner D., Lux-Steiner M. C. , Schlatmann R., Lauer mann I.  
PHYSICA STATUS SOLIDI C: CURRENT TOPICS IN SOLID STATE PHYSICS, VOL 14 NO 5, vol.14, no.10, 2017 (Journal Indexed in SCI)
- VII. **Investigation of the potassium fluoride post deposition treatment on the CIGSe/CdS interface using hard X-ray photoemission spectroscopy - a comparative study**  
Uemsuer B., Calvet W., Steigert A., Lauer mann I., Gorgoi M., Prietzel K., Greiner D., Kaufmann C. A. , Unold T., Lux-Steiner M. C.  
PHYSICAL CHEMISTRY CHEMICAL PHYSICS, vol.18, no.20, pp.14129-14138, 2016 (Journal Indexed in SCI)
- VIII. **Correlating the Local Defect-Level Density with the Macroscopic Composition and Energetics of Chalcopyrite Thin-Film Surfaces**  
Broeker S., Kueck D., Timmer A., Lauer mann I., Uemsuer B., Greiner D., Kaufmann C. A. , Moenig H.  
ACS APPLIED MATERIALS & INTERFACES, vol.7, no.23, pp.13062-13072, 2015 (Journal Indexed in SCI)
- IX. **Locally resolved investigation of wedged Cu(In,Ga)Se-2 films prepared by physical vapor deposition using hard X-ray photoelectron and X-ray fluorescence spectroscopy**  
Calvet W., Uemsuer B., Hoepfner B., Lauer mann I., Prietzel K., Kaufmann C. A. , Unold T., Lux-Steiner M. C.  
THIN SOLID FILMS, vol.582, pp.361-365, 2015 (Journal Indexed in SCI)
- X. **Investigation of Cu-poor and Cu-rich Cu(In,Ga)Se-2/CdS interfaces using hard X-ray photoelectron spectroscopy**  
Uemsuer B., Calvet W., Hoepfner B., Steigert A., Lauer mann I., Gorgoi M., Prietzel K., Navirian H. A. , Kaufmann C. A. , Unold T., et al.  
THIN SOLID FILMS, vol.582, pp.366-370, 2015 (Journal Indexed in SCI)
- XI. **Assessment of chemical and electronic surface properties of the Cu<sub>2</sub>ZnSn(SSe)(4) after different etching procedures by synchrotron based spectroscopies**  
Olar T., Lauer mann I., Xie H., Neuschitzer M., Saucedo E., Calvet W., Steigert A., ÜMSÜR B., Chacko B., Parvan V., et al.  
PROCEEDINGS OF THE EMRS 2015 SPRING MEETING - SYMPOSIUM C ON ADVANCED INORGANIC MATERIALS AND STRUCTURES FOR PHOTOVOLTAICS, vol.84, pp.8-16, 2015 (Journal Indexed in SCI)

## Refereed Congress / Symposium Publications in Proceedings

- I. **Impact of RbF Post Deposition Treatment on CdS/CIGSe and Zn(O,S)/CIGSe Interfaces – A Comparative HAXPES Study**  
ÜMSÜR B., Maticiu N., Kodalle T., Majumdar I., Wang Y., Wenisch R., Yetkin H. A., Bertram T., Kaufmann C. A., Schlatmann R., et al.  
2nd International Conference on Photovoltaic Science and Technologies (PVCon2020), 30 November - 02 December 2020
- II. **Surface Modification of Na and K Incorporated Cu(In,Ga)Se<sub>2</sub> Absorbers Investigated by Synchrotron Based Spectroscopies**  
Majumdar I., ÜMSÜR B., Chacko B., Parvan V., Greiner D., Lux-Steiner M. C., Schlatmann R., Lauer mann I.  
E-MRS Spring Meeting, Strasbourg, France, 22 - 26 May 2017
- III. **XPS Analysis of Cd Diffusion into Cu-poor and Cu-rich Cu(In,Ga)Se<sub>2</sub> Solar Cell Absorbers**  
ÜMSÜR B., Calvet W., Bercegol A., Steigert A., Kiss J., Mirhosseini H., Gorgoi M., Greiner D., Kaufmann C. A., Lux-Steiner M. C., et al.  
1st International Underground Resources and Energy Conference, Yozgat, Turkey, 6 - 08 October 2016
- IV. **Depth profiled XPS analysis and NEXAFS study of Na, K-PDT on CIGSe as a function of deposition temperature using synchrotron radiation**  
Majumdar I., ÜMSÜR B., Heinemann M. D., Chacko B., Smirnov D., Calvet W., Parvan V., Mızrak A. V., Lauer mann I.  
MSE Congress, Darmstadt, Germany, 27 - 29 September 2016
- V. **Analysis of surface composition and device performance of UHV and air-transferred CIGSe thin film solar cell absorbers on alkali-containing substrate glass**  
Calvet W., Majumdar I., ÜMSÜR B., Steigert A., Chacko B., Parvan V., Kaufmann C. A., Greiner D., Lauche J., Navirian H. A., et al.  
32nd European Photovoltaic Solar Energy Conference and Exhibition, Munich, Germany, 20 - 24 June 2016
- VI. **The band edges development in Cu<sub>2</sub>ZnSn(S,Se)<sub>4</sub> with different [S]/([S][Se]) ratios tackled with synchrotron-based spectroscopy**  
Olar T., Lauer mann I., Manoharan A., Pardini L., Hannewald K., Draxl C., Xie H., Saucedo E., Calvet W., Steigert A., et al.  
E-MRS Spring Meeting, Lille, France, 2 - 06 May 2016
- VII. **In-situ characterization of solar cells using synchrotron techniques**  
Lauer mann I., Mainz R., Calvet W., ÜMSÜR B., Olar T., Steigert A., Lux-Steiner M. C.  
E-MRS Spring Meeting, Lille, France, 2 - 06 May 2016
- VIII. **The impact of thin KF, NaF, K, and Na layers on CIGS studied with SPV and XPS/UPS**  
Parvan V., Mızrak A. V., ÜMSÜR B., Calvet W., Steigert A., Lauer mann I., Dittrich T., Greiner D., Kaufmann C. A., Lux-Steiner M. C.  
E-MRS Spring Meeting, Lille, France, 2 - 06 May 2016
- IX. **Electronic and chemical surface properties of kesterite with different [S]/([S][Se]) ratios tackled by the synchrotron-based spectroscopies**  
Olar T., Lauer mann I., Xie H., Saucedo E., Calvet W., Steigert A., ÜMSÜR B.  
Kesterite European Meeting, Newcastle, Australia, 19 - 20 November 2015
- X. **Comparison of surface composition, electronic properties, and solar cell performance of UHV-transferred and air exposed CIGSe thin film solar cell absorbers**  
Calvet W., ÜMSÜR B., Steigert A., Lauer mann I., Chacko B., Parvan V., Olar T., Prietzel K., Navirian H. A., Brunken S., et al.  
31st European Photovoltaic Solar Energy Conference and Exhibition, Hamburg, Germany, 14 - 18 September 2015
- XI. **Diffusion of indium in kesterite thin-film solar cells investigated by hard x-ray photoelectron spectroscopy**  
Olar T., Lauer mann I., Xie H., Saucedo E., Calvet W., Steigert A., ÜMSÜR B., Lux-Steiner M. C.  
The 562nd Wilhelm and Else Heraeus-Seminar "From Sunlight to Fuels", Bad-Honnef, Germany, 11 May 2014 - 16 May 2015

- XII. **Assessment of the Cu<sub>2</sub>ZnSnS<sub>4</sub> chemical and electronic surface properties after different etching procedures by synchrotron-based spectroscopies**  
Olar T, Lauermann I, Xie H, Saucedo E, Calvet W, Steigert A, ÜMSÜR B, Chacko B, Parvan V, Lux-Steiner M. C.  
E-MRS Spring Meeting, Lille, France, 11 - 15 May 2015
- XIII. **Investigation of the potassium fluoride-post deposition treatment on the CIGS/CdS interface using hard x-ray photoemission spectroscopy – a comparative study**  
ÜMSÜR B, Calvet W, Steigert A, Lauermann I, Gorgoi M, Prietzel K, Greiner D, Kaufmann C. A. , Unold T, Lux-Steiner M. C.  
E-MRS Spring Meeting, Lille, France, 11 - 15 May 2015
- XIV. **Comparison of surface composition, electronic properties, and solar cell performance of UHV-transferred and air exposed CIGSe thin film solar cell absorbers.**  
Calvet W., ÜMSÜR B., Steigert A., Lauermann I., Chacko B., Parvan V., Olar T., Prietzel K., Navirian H. A. , Brunken S., et al.  
E-MRS Spring Meeting, Lille, France, 11 - 15 May 2015
- XV. **Investigation of KF-PDT on the CIGSe/CdS interface using hard x-ray photoemission spectroscopy**  
ÜMSÜR B., Calvet W., Höpfner B., Steigert A., Lauermann I., Gorgoi M., Prietzel K., Brunken S., Greiner D., Kaufmann C. A. , et al.  
SolarTR-3, Ankara, Turkey, 27 - 29 April 2015
- XVI. **Assessment of the Cu<sub>2</sub>ZnSnS<sub>4</sub> surface properties after different etching procedures by x-ray, ultraviolet and hard x-ray photoelectron spectroscopies**  
Olar T, Lauermann I, Xie H, Saucedo E, Calvet W, Steigert A, ÜMSÜR B.  
Kesterite European Meeting, Talin, Armenia, 13 - 14 November 2014
- XVII. **The impact of pre-and post-deposition sodium fluoride treatments on CIGSe absorbers and solar cell performance - a comparative study using surface and bulk sensitive analysis tools**  
Calvet W., ÜMSÜR B., Steigert A., Lauermann I., Prietzel K., Navirian H. A. , Brunken S., Kaufmann C. A. , Unold T.  
29th European Photovoltaic Solar Energy Conference and Exhibition, Amsterdam, Netherlands, 22 - 26 September 2014
- XVIII. **Thickness dependent investigation of wedged Cu(In,Ga)Se<sub>2</sub> films prepared by physical vapor deposition (PVD) using hard x-ray photoelectron spectroscopy (HAXPES)**  
Calvet W., ÜMSÜR B., Steigert A., Höpfner B., Lauermann I., Prietzel K., Kaufmann C. A. , Unold T., Lux-Steiner M. C.  
E-MRS Spring Meeting, Lille, France, 26 - 30 May 2014
- XIX. **Investigation of Cu-poor and Cu-rich Cu(In,Ga)Se<sub>2</sub>/CdS interfaces using hard x-ray photoelectron spectroscopy (HAXPES)**  
ÜMSÜR B., Calvet W., Steigert A., Höpfner B., Lauermann I., Prietzel K., Kaufmann C. A. , Unold T., Lux-Steiner M. C.  
E-MRS Spring Meeting, Lille, France, 26 - 30 May 2014
- XX. **Thickness dependent investigation of wedged Cu(In,Ga)Se<sub>2</sub> films prepared by physical vapor deposition (PVD) using hard x-ray photoelectron spectroscopy (HAXPES)**  
Calvet W., ÜMSÜR B., Steigert A., Höpfner B., Lauermann I., Prietzel K., Kaufmann C. A. , Unold T., Lux-Steiner M. C.  
The 562nd Wilhelm and Else Heraeus-Seminar "From Sunlight to Fuels", Bad-Honnef, Germany, 11 - 16 May 2014
- XXI. **Synchrotron-based analysis of the Cu(In,Ga)Se<sub>2</sub>/CdS and Cu(In,Ga)Se<sub>2</sub>/ZnS interfaces using soft x-ray photoemission spectroscopy (SXPS) and near edge x-ray absorption fine structure spectroscopy (NEXAFS)**  
ÜMSÜR B., Calvet W., Höpfner B., Steigert A., Lauermann I., Lux-Steiner M. C.  
International Conference on Solar Energy for World Peace, İstanbul, Turkey, 17 - 19 August 2013
- XXII. **Development of chemical bath deposited Zn(S,O) buffer layer for cadmium free Cu-chalcopyrite thin film solar cells during the NeuMaS project**  
Ennaoui A, Lauermann I, ÜMSÜR B, Hergert F, Kasper W, Hahn T, Flückiger A.  
27th European Photovoltaic Solar Energy Conference and Exhibition, Frankfurt, Germany, 24 - 28 September 2012

## Citations

Total Citations (WOS):53

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