Curriculum Vitae

Personal information

Name:	David Otto Tiede
Address:	C/ Divina Pastora 47, A, B, 41003 Seville, Spain
Date and Place of Birth:	20. February 1996, Lich, Germany
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Education

2021-2024	**Marie Curie PhD-Fellowship** at the Institute of Materials Science of Seville, Spain. Date of defense: July 25th 2024, Qualification: *"Sobresaliente",* (highest grade)
2019-2020	**Master in Physics** at the University of Münster, Germany, Grade:1.1/6 Title of Master thesis*: Dielectric Properties of electrolyte gated transition metal dichalcogenides,* Grade: 1.0/6
2018-2019	**Master in Science and Technology of New Materials** at the University of Seville, Grade: 8.79/10 Title of Master thesis: *Photophysical processes in new semiconductor materials of interest in optoelectronic devices,* Grade: 10/10
2015-2018	**Bachelor in Physics** at the University of Münster, Grade: 2.0/6 Title of Bachelor thesis: *Improvement in photoluminescence of hybrid perovskite single crystals by exposure to halide vapors,* Grade: 1.0/6
2017-2018	**Erasmus stay** at the University of Seville, Spain
2012-2014	**Abitur**: Gymnasium Grootmoor, Hamburg, Germany, Grade: 1.2/6
2011-2012	**Stay abroad in Canada**, Ecole Secondaire de l'Île, Gatineau

Language skills

Spanish:	**Fluent**, five-year stay in Spain
English:	**Fluent**, everyday use, one-year stay in Canada
French:	**Fluent**, one-year stay in Canada, one-year stay in Togo
German:	**Mother tongue**

Social formation

2014-2015	**one-year voluntary service** in Togo, assistance in a library and a high school

Research experience

09/2024 – 12/2024 **Postdoctoral Researcher** at the Multifunctional Optical Materials (MOM) group of Prof. Hernán Míguez at the Institute of Materials Science of Seville of the Spanish Research Council (CSIC).

- Transition contract to finalize ongoing research projects
- Analysis of diffusion mechanisms in quantum dot solids

08/2021 – 07/2024 **Marie Curie PhD-Fellowship** in the Innovative Training Network (ITN) PERovskite for SEmiconductors for PHOtoNics (PERSEPHONe) at MOM group of the Spanish Research Council (CSIC).

- Advanced optical characterization of employing ultrafast transient absorption and fluorescent spectroscopy as well as spatially and time resolved photophysical characterization of lead halide perovskite (LHP) of different morphologies and dimensionalities
- Optical modelling and characterization of photonic structures employing LHPs

08/2023 - 09/2023 **Research stay** at IBM Zürich, Switzerland under supervision of Rainer Mahrt and Thilo Stoeferle. Study of strong coupling of LHP nanocrystals embedded in microcavities.

- First demonstration of room temperature condensation in a quantum dot solid

08/2022 – 11/2023 **Research stay** at Wake Forest University, United States under supervision of Prof. Ajay Kandada. Study of charge carrier interactions in LHP with reduced dimensionality

- Two dimensional electronic spectroscopy to analyze free charge carrier exciton interaction in LHP NCs
- Thermalization dynamics in LHP NCs

09/2020 - 06/2021 **Scientific employee** (full time) at the nanoelectronics group of Prof. U. Wurstbauer at University of Münster. Study of charge carrier density dependent multiparticle effects on 2D materials.

- Implementation of a cryogenic (1K) combined photoluminescence (PL), Raman and spectral imaging ellipsometry (SIE) setup
- Low temperature gate voltage dependent measurements on field effect devices of transition metal dichalcogenides (TMDC) few layers and 2D metals

10/2019 - 10/2020 **Master thesis** at the nanoelectronics group to study of multivalley properties and dielectric properties of TMDCs in doping and temperature dependence
Research assistant (9 hours per week) to equip new laboratories.

- Design, construction and programming (Python) of a confocal PL and Raman setup with cryogenic chambers
- Study and fabrication of exciton fine structures of TMDC mononlayers

10/2018 - 08/2019 **Master thesis and project assistant** (20 hours per week) at the MOM group. Study of photoinduced changes in LHP structures.

- Study of light-induced phase segregation of mixed halide LHP thin films

11/2017 - 07/2018 **Bachelor thesis** at the MOM group on halide gas treated LHP single crystals.

- Time resolved and confocal PL measurements on post fabrication LHP halide gas treatment

Publications

2024 **Tiede, D.**, Koch, K., Romero-Pérez, C., Ucer, B., Calvo, M., Galisteo-López, J. F., Míguez, H, Kandada, A. R. S. Role of inter-particle connectivity in the photo-carrier cooling dynamics in perovskite quantum dot solids, in press in Advanced Optical Materials. (accepted 2024-09-02)

2024 Antony, I.*, **Tiede, D.***, Piot, M., Roldán-Carmona, C., Galisteo-López, J.F., Míguez, H., Bolink, H. Strong grain boundary passivation effect of co-evaporated dopants enhances the photoemission of lead halide perovskites – answer to referees sent to ACS Appl. Mater. Interfaces

2024 Morán-Pedroso, M.*, **Tiede, D.***, Romero-Pérez, C., Calvo, M., Galisteo-López, J.F., Míguez, H. Interplay between Connectivity and Passivating Agents in Pervoskite Quantum Dot Networks, in press in J. Mater Chem. C. (accepted 2024-09-20)

2024 Georgakilas, I.*, **Tiede, D.***, Urbonas, D., Bujalance, C., Caliò, L., Mirek, R., ... & Stöferle, T. (2024). Room-temperature cavity exciton-polariton condensation in perovskite quantum dots. *arXiv preprint arXiv:2408.10667*.

2024 **Tiede, D.**, Romero-Pérez, C., Koch, K.,Calvo, M., Galisteo-López, J. F., Kandada, A. R. S., Míguez, H. *Effect of connectivity on the charge carrier dynamics of perovskite QD networks.*, ACS Nano 2024, 18, 3, 2325-2334

2024 Rojas-Gatjens, E., **Tiede, D.**, Koch, K. A., Romero-Perez, C., Galisteo-Lopez, J. F., Calvo, M. E., ... & Kandada, A. R. S. *Exciton-carrier coupling in a metal halide perovskite nanocrystal assembly probed by two-dimensional coherent spectroscopy*. J. Phys. Mater 2024, 7, 025002

2024	Bujalance, C., Calio, L., Dirin, D. N., **Tiede, D**., Galisteo-Lopez, J. F., Feist, J., ... & Miguez, H. *Strong light-matter coupling in lead halide perovskite quantum dot solids*. ACS Nano 2024, 18, 6, 4922-4931
2024	**Tiede, D.**, Galisteo-López, J. F., Míguez H. *Light Emission of Halide Perovskites* : Book chapter in *Halide Perovskite Semiconductors: Structures, Characterization, Properties and Phenomena*, John Wiley & Sons, 2024.
2023	Moretti, L., Rojas-Gatjens, E., Uboldi, L., **Tiede, D.**, Kumar, E. J., Trovatello, C., ... & Kandada, A. R. S. *Measurement principles for quantum spectroscopy of molecular materials with entangled photons.* J Chem. Phys., 2023, 159 (8)
2023	Synnatschke, K., van Dinter, J., Müller, A., **Tiede, D**., Spillecke, L., Shao, S., ... & Backes, C. *Exfoliablity, magnetism, energy storage and stability of metal thiophosphate nanosheets made in liquid medium*. 2D Materials, 2023, 10(2), 024003.
2022	**Tiede, D**; Saigal, N; Ostovar, H, Döring, V; Lambers, H; Wurstbauer, U *Exciton Manifolds in Highly Ambipolar Doped WS2,* Nanomaterials, 2022, 12(18), 3255
2020	**Tiede, D**; Calvo, M; Galisteo-López, J; Míguez, H *Local Rearrangement of Iodide Defect Structure Determines Phase Segregation Effect on Mixed Halide Perovskites*, J. Phys. Chem. Lett., 2020, 11, 12, 4911-4916
2020	**Tiede, D***; Rubino, A*; Calvo, M; Galisteo-López, J; Míguez, H *Monitoring, Modelling and Optimization of Lead Halide Pervoskite Nanocrystal Growth within Porous Matrices,* J. Phys. Chem. C 2020, 124, 14, 8041–8046
2018	**Tiede, D**; Calvo, M; Galisteo-López, J; Miguez, H *Improving the Bulk Emission Properties of $CH_3N_3PbBr_3$ by Modifying the Halide-Related Defect Structure*, J. Phys. Chem. C 2018, 122 27250-27255

Grants and scholarships

08/2021-07/2024	**Marie Curie PhD-Fellowship** at the Institute of Materials Science of Seville, Spain
02/2020	**Santander Mobility grant** for assisting at the International Conference on Perovskite Solar Cells, Photonics and Optoelectronics (NIPHO20)
09/2018 – 06/2019	**Full DAAD scholarship** for completion of a double degree master program with the University of Münster and the University of Seville
09/2017 - 06/2018	**Erasmus grant** for studying in Seville

Conference contributions

09/2024	**Oral contribution** “Slow Charge Carrier Cooling in Ligand-free Quantum Dot Solids – Elucidating the Influence of Interparticle Interactions” + **Poster contribution** “Revisiting time-resolved measurements – How amplitude derivatives reveal hidden global recombination dynamics”(**Poster prize award**) at the 7th International Conference on Perovskite Solar Cells and Optoelectronics, 2024, Perugia, Italy
06/2024	**Research seminar** “Tailoring the fate of carriers in quantum dots solids through connectivity: from cooling to trapping “ at the Condensed Matter Physics Center (IFIMAC), Madrid, Spain
05/2024	**Oral contribution** “Tailoring the fate of carriers in quantum dots solids through connectivity: from cooling to trapping” at the eMRS Spring Meeting, 2024, Strasbourg, France
12/2023	**Oral contribution** “Effects of charge transport on recombination and QY dynamics – a spectroscopic approach” at the Spanish Perovskite Network Meeting, 2023, Valencia, Spain
11/2023	**Oral contribution** “Role of Interconnectivity in Perovskite Nanocrystals: Charge Carrier Dynamics in Nanostructures Embedded in Porous Films” at the MRS Fall Meeting, 2023, Boston, United States
09/2023	**Oral contribution** “Charge transfer and trapping dynamics in ligand free perovskite nanocrystals” at the 6th International Conference on Perovskite Solar Cells and Optoelectronics, 2023, Oxford, United Kingdom
09/2023	**Oral contribution** “Tuning excited state interactions in interconnected and strongly coupled perovskite quantum dots” at the 14th International Conference on Optical Probes of Organic and Hybrid Semiconductors (OP2023), 2023, Como, Italy
05/2023	**Poster contribution** “From connected to isolated perovskite QDs: How to model trap filling, transport and emission of charge carriers in interconnected perovskite nanocrystal arrays” at the Second International Perovskite Workshop 2023, Lund, Sweden
05/2022	**Oral contribution** “Iodide Nanodomain Formation as Local Rearrangement Process during Phase Segregation in Mixed Halide Perovskites “ at the International Conference on Hybrid and Organic Photovoltaics (HOPV) 2022, Valencia, Spain
03/2022	**Poster contribution** “The Role of the Iodide Defect Structure and its Local Rearrangement during Phase Segregation in Mixed Halide Perovskites” at the nanolight conference 2022, Benasque, Spain
10/2021	**Poster contribution** “Spatially elucidating the role of defects in mixed halide perovskite phase segregation” at the nanoGe Fall Meeting 2021, Online – **Best poster price award**

05/2021	**Poster contribution** “Spectroscopic ellipsometry and photoluminescence on electrolyte gated WS2 monolayers” at the Graphene and Beyond Workshop 2021, Online
03/2020	**Poster contribution** “Electron and exciton phonon interaction in gate tunable transition metal dichalcogenide layers” at the International Winterschool on Electronic Properties of Novel Materials (IWEPNM) 2020, Kirchberg, Austria
02/2020	**Poster contribution** “Optical monitoring and modelling of lead halide perovskite nanocrystal growth within nanoporous matrices“ at the International Conference on Perovskite Solar Cells, Photonics and Optoelectronics (NIPHO) 2020, Seville, Spain
09/2019	**Poster contribution** “Improving the Bulk Emission Properties of $CH_3NH_3PbBr_3$ by Modifying the Halide-Related Defect Structure“ at the international *e-conversion* conference 2019, Venice, Italy
05/2019	**Poster contribution** “Improving the Bulk Emission Properties of $CH_3NH_3PbBr_3$ by Modifying the Halide-Related Defect Structure“ at the International Conference on Hybrid and Organic Photovoltaics (HOPV) 2019, Rome, Italy
05/2018	**Poster contribution** “Improving the Bulk Emission Properties of $CH_3NH_3PbBr_3$ by Modifying the Halide-Related Defect Structure“ at the International Conference on Hybrid and Organic Photovoltaics (HOPV) 2018, Benidorm, Spain