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Dr hab. Anna Zawadzka, prof. UMK

Toruń, 28/03/2025

Head of Microelectronics Laboratory, Institute of Physics,
Faculty of Physics, Astronomy and Informatics,
Head of Low-dimensional Structures Laboratory,
Center for Modern Interdisciplinary Technologies

Nicolaus Copernicus University, Torun, Poland

Co-authorship Statement

I hereby confirm my co-authorship in the following research articles:

Article . 1: A. Laouid, A.A. Belghiti, K. Wisniewski, A. Hajjaji, B. Sahraoui, A. Zawadzka, Generation of red light with intense photoluminescence assisted by Forster resonance energy transfer from Znq2 and DCM thin films, Environ Sci Pollut Res 30(34) (2023), 81647-81666, https://doi.org/10.1007/s11356-022-23217-z. My contribution to the work is 11 %.

Article . 2: A. Laouid, A. Alaoui Belghiti, K. Wisniewski, J. Strzelecki, A. Karakas, A. Gozutok, Y. El kouari, A. Bouich, M. Tlemçani, P. Plociennik, A. Hajjaji, A. Zawadzka, Optical and morphological properties of DCM thin films co-doped of Znq2 by PVD: Theoretical and experimental investigations, Vacuum 222 (2024) 112997. https://doi.org/10.1016/j.vacuum.2024.112997. My contribution to the work is 7 %.

Article . 3: A. Laouid, A. Alaoui Belghiti, K. Wisniewski, M. Boumhamdi, J. Strzelecki, P. Plociennik, A. Hajjaji, A. Zawadzka, A study of morphological, optical, and photoluminescence properties of ZnS thin films doped Mn and ca, Materials Chemistry and Physics (2024) 129270. https://doi.org/10.1016/j.matchemphys.2024.129270. My contribution to the work is 10 %.

Article . 4: Laouid A, Alaoui Belghiti A, Wisniewski K, Abouais A, Tlemcani M, Plociennik P, et al. Enhancing the efficiency and stability of Non_Toxic RbSn0.5Ge0.5I3_Based perovskite solar cells through optimization, Materials Science and Engineering: B 310 (2024) 117672. https://doi.org/10.1016/j.mseb.2024.117672. My contribution to the work is 6 %.

Article . 5: Laouid A, El Karout H, Alaoui Belghiti A, Wisniewski K, Plociennik P, El Kouari Y, et al. Control of second-and third-order nonlinear optical properties of DCM and Znq2 composites fabricated by the physical vapor co-deposition process. Optical Materials 2024;157:116045. https://doi.org/10.1016/j.optmat.2024.116045. My contribution to the work is 5 %.

Article . 6: A. Zawadzka, A. Marjanowska, A. Laouid, K. Wisniewski, Y. El Kouari, Y. El Hani, P. Płóciennik, Low-temperature influence on the properties and efficiency of thin-film perovskite solar cells fabricated by the PVco-D technique, Solar Energy Materials and Solar Cells 274 (2024) 112993. https://doi.org/10.1016/j.solmat.2024.112993. My contribution to the work is 60 %.

My contributions encompassed initiating and defining the research direction, coordinating international collaboration, shaping the research strategy, and providing technical support for the project. Additionally, I took part in supervising PhD students, securing necessary resources, overseeing manuscript development, and ensuring the scientific quality of the work.

However, in article 6 where I am the first author, my responsibilities also extended to Conceptualization, Data Curation, Formal Analysis, Writing – Original Draft, and Writing – Review & Editing, in addition to my supervisory and administrative duties.



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Co-authorship Statement

Article . 1: A. Laouid, A.A. Belghiti, K. Wisniewski, A. Hajjaji, B. Sahraoui, A. Zawadzka, Generation of red light with intense photoluminescence assisted by Forster resonance energy transfer from Znq2 and DCM thin films, Environ Sci Pollut Res (2022) 1–20. https://doi.org/10.1007/s11356-022-23217-z. My contribution to this work is 6%.

Article . 2: A. Laouid, A. Alaoui Belghiti, K. Wisniewski, M. Boumhamdi, J. Strzelecki, P. Plociennik, A. Hajjaji, A. Zawadzka, A study of morphological, optical, and photoluminescence properties of ZnS thin films doped Mn and ca, Materials Chemistry and Physics (2024) 129270. https://doi.org/10.1016/j.matchemphys.2024.129270. My contribution to this work is 5 %.

Article . 3: A. Laouid, A. Alaoui Belghiti, K. Wisniewski, J. Strzelecki, A. Karakas, A. Gozutok, Y. El kouari, A. Bouich, M. Tlemçani, P. Plociennik, A. Hajjaji, A. Zawadzka, Optical and morphological properties of DCM thin films co-doped of Znq2 by PVD: Theoretical and experimental investigations, Vacuum 222 (2024) 112997. https://doi.org/10.1016/j.vacuum.2024.112997. My contribution to this work is 5 %.

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Article . 5: Laouid A, Alaoui Belghiti A, Wisniewski K, Abouais A, Tlemcani M, Plociennik P, et al. Enhancing the efficiency and stability of Non_Toxic RbSn0.5Ge0.5I3_Based perovskite solar cells through optimization 2024. https://doi.org/10.1016/j.mseb.2024.117672. My contribution to this work is 5%.

My contributions to these research efforts spanned multiple dimensions, including supervision (all articles), where I guided project direction and ensured methodological rigor. I played a pivotal role in reviewing and editing manuscripts (Articles 1, 2, and 3) to enhance clarity and academic quality, as well as in validation (Articles 2, 4, and 5) to verify data integrity and results. My analytical expertise included formal analysis (Articles 1, 4, and 5) for data interpretation and methodology design (Article 6).

Amine Alaoui Belghiti



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Prof. Abdelowahed Hajjaji
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Co-authorship Statement

I hereby declare that I'm co-author in the following articles:

Article . 6: A. Laouid, A.A. Belghiti, K. Wisniewski, A. Hajjaji, B. Sahraoui, A. Zawadzka, Generation of red light with intense photoluminescence assisted by Forster resonance energy transfer from Znq2 and DCM thin films, Environ Sci Pollut Res (2022) 1–20. https://doi.org/10.1007/s11356-022-23217-z.

My role was : Review & editing, Formal analysis, Supervision. My contribution to the work is 6 %.

Article . 7: A. Laouid, A. Alaoui Belghiti, K. Wisniewski, M. Boumhamdi, J. Strzelecki, P. Plociennik, A. Hajjaji, A. Zawadzka, A study of morphological, optical, and photoluminescence properties of ZnS thin films doped Mn and ca, Materials Chemistry and Physics (2024) 129270. https://doi.org/10.1016/j.matchemphys.2024.129270.

My role was : Writing – review & editing, Visualization, Validation, Supervision. My contribution to the work is 5 %.

Article . 8: A. Laouid, A. Alaoui Belghiti, K. Wisniewski, J. Strzelecki, A. Karakas, A. Gozutok, Y. El kouari, A. Bouich, M. Tlemçani, P. Plociennik, A. Hajjaji, A. Zawadzka, Optical and morphological properties of DCM thin films co-doped of Znq2 by PVD: Theoretical and experimental investigations, Vacuum 222 (2024) 112997. https://doi.org/10.1016/j.vacuum.2024.112997.

My role was : Writing – review & editing, Validation, Supervision, Formal analysis. My contribution to the work is 4 %.

Article . 9: Laouid A, El Karout H, Alaoui Belghiti A, Wisniewski K, Plociennik P, El Kouari Y, et al. Control of second-and third-order nonlinear optical properties of DCM and Znq2 composites fabricated by the physical vapor co-deposition

process. Optical Materials 2024;157:116045. https://doi.org/10.1016/j.optmat.2024.116045.

My role was : Writing – review & editing, Visualization, Validation, Supervision, Formal analysis. My contribution to the work is 5 %.

Article . 10: Laouid A, Alaoui Belghiti A, Wisniewski K, Abouais A, Tlemcani M, Plociennik P, et al. Enhancing the efficiency and stability of Non_Toxic RbSn0.5Ge0.5I3_Based perovskite solar cells through optimization 2024. https://doi.org/10.1016/j.mseb.2024.117672.

My role was : Writing – review & editing, Validation, Supervision. My contribution to the work is 5 %.



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Co-authorship Statement

I hereby declare that I'am the co-author of the following publications:

(i) Laouid, A., El Karout, H., Alaoui Belghiti, A., Wisniewski, K., Plociennik, P., El Kouari, Y., Sahraoui, B., Hajjaji, A., Zawadzka, A., 2024. Control of second-and third-order nonlinear optical properties of DCM and Znq2 composites fabricated by the physical vapor co-deposition process. Optical Materials 157, 116045. https://doi.org/10.1016/j.optmat.2024.116045.

(ii) A. Laouid, A.A. Belghiti, K. Wisniewski, A. Hajjaji, B. Sahraoui, A. Zawadzka, Generation of red light with intense photoluminescence assisted by Forster resonance energy transfer from Znq2 and DCM thin films, Environ Sci Pollut Res (2022) 1–20. https://doi.org/10.1007/s11356-022-23217-z.

My contributions to the papers include: review and editing, formal analysis, supervision, validation, methodology, investigation, funding acquisition, and data curation in both articles. My contribution to the work is 5 % in (i) and 6 % in (ii) .

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Co-authorship Statement

To Whom It May Concern,

I declare that I'm a co-author in the following articles:

1. A. Laouid, A. Alaoui Belghiti, K. Wisniewski, J. Strzelecki, A. Karakas, A. Gozutok, Y. El kouari, A. Bouich, M. Tlemçani, P. Plociennik, A. Hajjaji, A. Zawadzka, Optical and morphological properties of DCM thin films co-doped of Znq2 by PVD: Theoretical and experimental investigations, Vacuum 222 (2024) 112997. https://doi.org/10.1016/j.vacuum.2024.112997.

➔ My role was: Conducting investigations and performing formal data analysis.

My contribution to the work is 4 %.

2. A. Laouid, A. Alaoui Belghiti, K. Wisniewski, M. Boumhamdi, J. Strzelecki, P. Plociennik, A. Hajjaji, A. Zawadzka, A study of morphological, optical, and photoluminescence properties of ZnS thin films doped Mn and ca, Materials Chemistry and Physics (2024) 129270. https://doi.org/10.1016/j.matchemphys.2024.129270.

   ➔ My role was: Creating visual representations of data, validating results, utilizing software tools for analysis, and managing resources. My contribution to the work is 5 %.

3. A. Zawadzka, A. Marjanowska, A. Laouid, K. Wisniewski, Y. El Kouari, Y. El Hani, P. Płóciennik, Low-temperature influence on the properties and efficiency of thin-film perovskite solar cells fabricated by the PVco-D technique, Solar Energy Materials and Solar Cells 274 (2024) 112993. https://doi.org/10.1016/j.solmat.2024.112993.

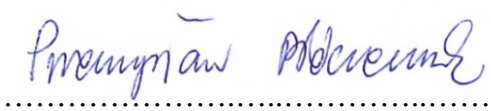
➔ My role was: Encompassed reviewing and editing the manuscript, developing visual representations of data, utilizing software tools for analysis, designing and implementing methodologies, conducting investigations, performing formal data analysis, and managing data curation. My contribution to the work is 10 %.

4. Laouid A, Alaoui Belghiti A, Wisniewski K, Abouais A, Tlemcani M, Plociennik P, et al. Enhancing the efficiency and stability of Non_Toxic RbSn0.5Ge0.5I3_Based perovskite solar cells through optimization 2024. https://doi.org/10.1016/j.mseb.2024.117672.

➔ My role was: Validating results, utilizing software tools for analysis, conducting investigations, and managing data curation. My contribution to the work is 6 %.

5. Laouid A, El Karout H, Alaoui Belghiti A, Wisniewski K, Plociennik P, El Kouari Y, et al. Control of second-and third-order nonlinear optical properties of DCM and Znq2 composites fabricated by the physical vapor co-deposition process. Optical Materials 2024;157:116045. https://doi.org/10.1016/j.optmat.2024.116045.

➔ My role was: Validating results, utilizing software tools for analysis, conducting investigations, and managing data curation. My contribution to the work is 5 %.



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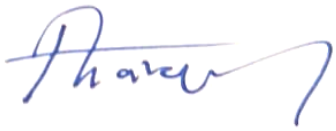
Co-authorship Statement

I declare that I'm a co-author of the following article:

- A. Laouid, A. Alaoui Belghiti, K. Wisniewski, J. Strzelecki, A. Karakas, A. Gozutok, Y. El kouari, A. Bouich, M. Tlemçani, P. Plociennik, A. Hajjaji, A. Zawadzka, Optical and morphological properties of DCM thin films co-doped of Znq2 by PVD: Theoretical and experimental investigations, Vacuum 222 (2024) 112997. https://doi.org/10.1016/j.vacuum.2024.112997.

My contributions to this paper involved conducting the theoretical calculations (DFT) and participating in the manuscript writing.
My contribution to the work is 7 %.

Prof. Dr. Aslı KARAKAŞ 26th March 2025



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Co-authorship Statement

I declare that in the paper

- Laouid, A. Alaoui Belghiti, K. Wisniewski, M. Boumhamdi, J. Strzelecki, P. Plociennik, A. Hajjaji, A. Zawadzka, A study of morphological, optical, and photoluminescence properties of ZnS thin films doped Mn and ca, Materials Chemistry and Physics (2024) 129270. https://doi.org/10.1016/j.matchemphys.2024.129270.

My role in this manuscript involved conducting FTIR measurements and performing the data analysis.
My contribution to the work is 5 %.

Mohammed Boumhamdi



Toruń, 26/03/2025

Agnieszka Marjanowska

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Co-authorship Statement

Ideclare that I'am the co-author of the publication:

Zawadzka, A. Marjanowska, A. Laouid, K. Wisniewski, Y. El Kouari, Y. El Hani, P. Płóciennik, Low-temperature influence on the properties and efficiency of thin-film perovskite solar cells fabricated by the PVco-D technique, Solar Energy Materials and Solar Cells 274 (2024) 112993. https://doi.org/10.1016/j.solmat.2024.112993. My contributions to this manuscript included visualization, methodology, and investigation.

My contribution to the work is 6 %.

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Institute of Physics,
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Co-authorship Statement

I hereby declare my co-authorship in the following articles:

6. A. Laouid, A.A. Belghiti, K. Wisniewski, A. Hajjaji, B. Sahraoui, A. Zawadzka, Generation of red light with intense photoluminescence assisted by Forster resonance energy transfer from Znq2 and DCM thin films, Environ Sci Pollut Res (2022) 1–20. https://doi.org/10.1007/s11356-022-23217-z. My contribution to the work is 7 %.

7. A. Laouid, A. Alaoui Belghiti, K. Wisniewski, J. Strzelecki, A. Karakas, A. Gozutok, Y. El kouari, A. Bouich, M. Tlemçani, P. Plociennik, A. Hajjaji, A. Zawadzka, Optical and morphological properties of DCM thin films co-doped of Znq2 by PVD: Theoretical and experimental investigations, Vacuum 222 (2024) 112997. https://doi.org/10.1016/j.vacuum.2024.112997. My contribution to the work is 4 %.

8. A. Laouid, A. Alaoui Belghiti, K. Wisniewski, M. Boumhamdi, J. Strzelecki, P. Plociennik, A. Hajjaji, A. Zawadzka, A study of morphological, optical, and photoluminescence properties of ZnS thin films doped Mn and ca, Materials Chemistry and Physics (2024) 129270. https://doi.org/10.1016/j.matchemphys.2024.129270. My contribution to the work is 8 %.

9. A. Zawadzka, A. Marjanowska, A. Laouid, K. Wisniewski, Y. El Kouari, Y. El Hani, P. Płóciennik, Low-temperature influence on the properties and efficiency of thin-film perovskite solar cells fabricated by the PVco-D technique, Solar Energy Materials and Solar Cells 274 (2024) 112993. https://doi.org/10.1016/j.solmat.2024.112993. My contribution to the work is 6 %.

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11. Laouid A, El Karout H, Alaoui Belghiti A, Wisniewski K, Plociennik P, El Kouari Y, et al. Control of second-and third-order nonlinear optical properties of DCM and Znq2 composites fabricated by the physical vapor co-deposition process. Optical Materials 2024;157:116045. https://doi.org/10.1016/j.optmat.2024.116045. My contribution to the work is 5 %.

My contributions to the articles included Validation, ensuring the accuracy of results; Software, utilizing tools for data analysis; Investigation, actively contributing to the research process; Data Curation, managing and maintaining data integrity; and reviewing, refining the manuscript for clarity and quality.



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Krzysztof Wisniewski, prof. UMK

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Co-authorship Statement

I declare that I'm a co-author in the following research publications:

(i) A. Laouid, A. Alaoui Belghiti, K. Wisniewski, J. Strzelecki, A. Karakas, A. Gozutok, Y. El kouari, A. Bouich, M. Tlemçani, P. Plociennik, A. Hajjaji, A. Zawadzka, Optical and morphological properties of DCM thin films co-doped of Znq2 by PVD: Theoretical and experimental investigations, Vacuum 222 (2024) 112997. https://doi.org/10.1016/j.vacuum.2024.112997.

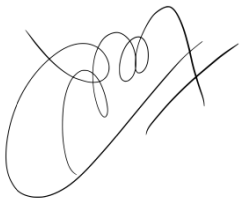
(ii) Laouid A, Alaoui Belghiti A, Wisniewski K, Abouais A, Tlemcani M, Plociennik P, et al. Enhancing the efficiency and stability of Non_Toxic RbSn0.5Ge0.5I3_Based perovskite solar cells through optimization 2024. https://doi.org/10.1016/j.mseb.2024.117672.

My contributions include:

- **Methodology** (Articles 1): Designing research frameworks and analytical approaches.
- **Investigation** (All articles): Conducting experiments, data collection, or literature synthesis.
- **Formal Analysis** (All articles): Performing quantitative/qualitative analyses and validation.
- **Review** (Article 1): Critical manuscript evaluation and editing.
- **Funding Acquisition** (Article 2): Securing financial support for the research.

My contribution in article (i) is 4% and 6% in article (ii)%.

Signature: Mouhaydine Tlemcani



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Author Contribution Statement

I hereby declare that in the following publications:

- A. Laouid, A. Alaoui Belghiti, K. Wisniewski, J. Strzelecki, A. Karakas, A. Gozutok, Y. El kouari, A. Bouich, M. Tlemçani, P. Plociennik, A. Hajjaji, A. Zawadzka, Optical and morphological properties of DCM thin films co-doped of Znq2 by PVD: Theoretical and experimental investigations, Vacuum 222 (2024) 112997. https://doi.org/10.1016/j.vacuum.2024.112997.
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- Laouid A, El Karout H, Alaoui Belghiti A, Wisniewski K, Plociennik P, El Kouari Y, et al. Control of second-and third-order nonlinear optical properties of DCM and Znq2 composites fabricated by the physical vapor co-deposition process. Optical Materials 2024;157:116045. https://doi.org/10.1016/j.optmat.2024.116045.

My contribution are follows: (i) Investigation and Formal analysis (4 % of the work); (ii) Writing – review & editing, Visualization, Methodology (6 % of the work), and (iii) Investigation, Formal analysis, Conceptualization (5 % of the work).

Prof. Youssef El Kouari



27/03/2025, Mohammedia, Morocco

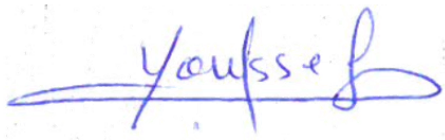
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Co-authorship Statement

I hereby declare that in the work : A. Zawadzka, A. Marjanowska, A. Laouid, K. Wisniewski, Y. El Kouari, Y. El Hani, P. Płóciennik, Low-temperature influence on the properties and efficiency of thin-film perovskite solar cells fabricated by the PVco-D technique, Solar Energy Materials and Solar Cells 274 (2024) 112993. https://doi.org/10.1016/j.solmat.2024.112993. My contribution consisted of this manuscript include investigation, formal analysis, and data curation.

My contribution to the work is 6 %.

Youssef El Hani



Toruń, 26/03/2025

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Co-authorship Statement

I declare that in the paper:

Laouid A, Alaoui Belghiti A, Wisniewski K, Abouais A, Tlemcani M, Plociennik P, et al. Enhancing the efficiency and stability of Non_Toxic RbSn0.5Ge0.5I3_Based perovskite solar cells through optimization 2024. https://doi.org/10.1016/j.mseb.2024.117672.

My role in this manuscript involved Software, Resources, Investigation.
My contribution to the work is 5 %.

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I declare that in the following papers:

- A. Laouid, A. Alaoui Belghiti, K. Wisniewski, J. Strzelecki, A. Karakas, A. Gozutok, Y. El kouari, A. Bouich, M. Tlemçani, P. Plociennik, A. Hajjaji, A. Zawadzka, Optical and morphological properties of DCM thin films co-doped of Znq2 by PVD: Theoretical and experimental investigations, Vacuum 222 (2024) 112997. https://doi.org/10.1016/j.vacuum.2024.112997.
- A. Laouid, A. Alaoui Belghiti, K. Wisniewski, M. Boumhamdi, J. Strzelecki, P. Plociennik, A. Hajjaji, A. Zawadzka, A study of morphological, optical, and photoluminescence properties of ZnS thin films doped Mn and ca, Materials Chemistry and Physics (2024) 129270. https://doi.org/10.1016/j.matchemphys.2024.129270.

I was responsible for methodology and investigation in [1], with a 4% contribution to the work. For [2], I contributed to investigation, funding acquisition, and data curation, with a 5% overall contributionc.

Janusz Strzelecki



SCIENTIFIC ACHIEVEMENT

LIST OF ALL PUBLISHED ARTICLES

1. **A. Laouid**, A. Alaoui Belghiti, K. Wisniewski, A. Hajjaji, A. Zawadzka, Structural and optical properties of DCM thin films prepared by PVD, Materials Today: Proceedings (2022). https://doi.org/10.1016/j.matpr.2022.03.244.
2. **A. Laouid**, A.A. Belghiti, K. Wisniewski, A. Hajjaji, B. Sahraoui, A. Zawadzka, Generation of red light with intense photoluminescence assisted by Forster resonance energy transfer from Znq_2 and DCM thin films, Environ Sci Pollut Res (2022) 1–20. https://doi.org/10.1007/s11356-022-23217-z.
3. **A. Laouid**, A. Alaoui Belghiti, K. Wisniewski, J. Strzelecki, A. Karakas, A. Gozutok, Y. El kouari, A. Bouich, M. Tlemçani, P. Plociennik, A. Hajjaji, A. Zawadzka, Optical and morphological properties of DCM thin films co-doped of Znq_2 by PVD: Theoretical and experimental investigations, Vacuum 222 (2024) 112997. https://doi.org/10.1016/j.vacuum.2024.112997.
4. **A. Laouid**, A. Zawadzka, A. Alaoui Belghiti, A. Hajjaji, M. Tlemcani, Morphology, electrical & optical properties of BaO thin films deposited by PVD, (2024). https://doi.org/10.1051/mattech/2023033.
5. I. El Ouedghiri-Idrissi, Z. Sofiani, **A. Laouid**, A. Talbi, A. Tarbi, Y. El Kouari, A. Zawadzka, Experimental and theoretical study on the optical and morphological properties of highly photoluminescent material 2,4,5-triphenyl imidazole, Opt Quant Electron 56 (2024) 491. https://doi.org/10.1007/s11082-023-06186-6.
6. **A. Laouid**, A. Alaoui Belghiti, K. Wisniewski, M. Boumhamdi, J. Strzelecki, P. Plociennik, A. Hajjaji, A. Zawadzka, A study of morphological, optical, and photoluminescence properties of ZnS thin films doped Mn and ca, Materials Chemistry and Physics (2024) 129270. https://doi.org/10.1016/j.matchemphys.2024.129270.
7. A. Zawadzka, A. Marjanowska, **A. Laouid**, K. Wisniewski, Y. El Kouari, Y. El Hani, P. Płóciennik, Low-temperature influence on the properties

and efficiency of thin-film perovskite solar cells fabricated by the PVco-D technique, Solar Energy Materials and Solar Cells 274 (2024) 112993. https://doi.org/10.1016/j.solmat.2024.112993.

8. **Laouid A**, Alaoui Belghiti A, Wisniewski K, Abouais A, Tlemcani M, Plociennik P, et al. Enhancing the efficiency and stability of Non_Toxic $RbSn_{0.5}Ge_{0.5}I_3$_Based perovskite solar cells through optimization 2024. https://doi.org/10.1016/j.mseb.2024.117672.
9. **Laouid A,** El Karout H, Alaoui Belghiti A, Wisniewski K, Plociennik P, El Kouari Y, et al. Control of second-and third-order nonlinear optical properties of DCM and Znq_2 composites fabricated by the physical vapor co-deposition process. Optical Materials 2024;157:116045. https://doi.org/10.1016/j.optmat.2024.116045.
10. Zawadzka A, Marjanowska A, **Laouid A**, Wisniewski K, Plociennik P. Low-temperature perovskites thin films solar cell. 2024. https://doi.org/10.1109/ICTON62926.2024.10647447.
11. Plociennik P, Zawadzka A, El Ouedghiri-Idrissi I, Sofiani Z, Wisniewski K, **Laouid A**, et al. ZnO-based thin-film transparent contacts for applications in perovskite solar cells. 2024. https://doi.org/10.1109/ICTON62926.2024.10647841.
12. **Laouid A**, Alaoui Belghiti A, Wisniewski K, Plociennik P, Hajjaji A, Zawadzka A. Investigation of the Physical Properties of Doped ZnS Thin Films Manufactured by PVD. 2024. https://doi.org/10.1109/ICTON62926.2024.10647836.
13. Abouais A, Belghiti AA, Strzałkowski K, **Laouid A**, Singh D, Kamiński DM, and al. Optical and thermal properties of grown bulk ZnMgS mixed crystals. Materials Science and Engineering: B 2025;313:117924. https://doi.org/10.1016/j.mseb.2024.117924.

ORAL SCIENTIFIC COMMUNICATIONS

1. The 1st International Conference on Sustainable Energy Systems ICOSES 2025. 24-26 Apr 2025, El Jadida, Morocco (Remote Edition). [Best oral communication Award]

A. LAOUID, M. Mateusz, A. Alaoui Belghiti, K. Wisniewski, P. Płóciennik, A. Hajjaji, A. Zawadzka.'' *Fabrication and Characterization of $CsPbI_3$ Perovskite Thin Films via Physical Vapor Deposition''*

2. The 4th Edition of international conference on Industrial Systems and Processes SPIn. 12-14 Nov 2024, Khouribga, Morocco.

A. LAOUID, A. ALAOUI BELGHITI, K. WIŚNIEWSKI, A. HAJJAJI, A. ZAWADZKA. ''*Integrating Experimental Techniques and Simulation for Optimizing all- inorganic perovskite Solar Cell''*.

3. The 6th international conference on Advanced Materials for Photonics, Sensing and Energy Conversion Energy Applications 31 Oct – 1 Nov 2024, Marrakech, Morocco. [Best oral communication Award]

A. LAOUID, A. ALAOUI BELGHITI, K. WIŚNIEWSKI, A. HAJJAJI, A. ZAWADZKA. ''*Perovskite Solar Cells: Bridging Theory and Experiment for Enhanced Performance*''.

4. The 5th International Conference on Advanced Functional Materials 14-15 Oct 2024, London, UK.

A. LAOUID, A. ALAOUI BELGHITI, K. WIŚNIEWSKI, A. HAJJAJI, A. ZAWADZKA. ''*Exploring the Potential of CsPbBr3 Perovskite Solar Cells: Experimental and Theoretical Investigations''*.

5. 24 th ICTON2024 14-18 Jul 2024, Bari, Italy.

A. LAOUID, A. ALAOUI BELGHITI, K. WIŚNIEWSKI, A. HAJJAJI, A. ZAWADZKA." *Investigation of the Physical Properties of Doped ZnS Thin Films Manufactured by PVD*".

6. XVII Séminaire Doctoral Copernicien 06-07 Jun 2024,Torun, Poland. [Best Oral Communication Award]

A. LAOUID, A. ALAOUI BELGHITI, K. WIŚNIEWSKI, A. HAJJAJI, A. ZAWADZKA. "*Structural and optical properties of PbS thin films grown by the physical vapor deposition for the photovoltaic application*".

7. The 5th international conference on Advanced Materials for Photonics, Sensing and Energy Conversion Energy Applications 25-26 May 2023, Marrakech, Morocco. [Best oral communication Award]

A. LAOUID, A. ALAOUI BELGHITI, K. WIŚNIEWSKI, A. HAJJAJI, A. ZAWADZKA. ''*Influence of temperature on the morphological, electrical, and optical properties of ZnO-SnO_2 Thin Films deposited by physical vapor deposition (PVD)*''.

8. The 3th Edition of international conference on Industrial Systems and Processes SPIn.11- 12 May 2022, EL JADIDA Morocco.

A. LAOUID, A. ALAOUI BELGHITI, A. MARJANOWSKA, K. WIŚNIEWSKI, A. HAJJAJI, A. ZAWADZKA. ''*Atomic force microscopy study of substrate effects on structural properties of DCM thin films prepared by PVD*''.

9. The 9th International Conference on Energy and City of the Future 14-15 Nov 2022, El Jadida, Morocco.

A. LAOUID, K. WISNIEWSKI, A. ALAOUI BELGHITI, J. STRZELECKI, Przemysław Płóciennik, A. HAJJAJI, A. ZAWADZKA. ''*The structure and optical properties of PbS thin films grown by the physical vapor deposition for the photovoltaic application*''.

10. XV Séminaire Doctoral Copernicien 20- 22 Jun 2022, Torun, Poland. [Best oral communication Award]

A. LAOUID, A. ALAOUI BELGHITI, K. WISNIEWSKI, J. STRZELECKI, A. KARAKAS, A. GOZUTOK, A. HAJJAJI, B. SAHRAOUI, A. ZAWADZKA. ''*Theoretical and experimental investigations of Znq2 thin films doped with a red dye*''.

11. The 4th international conference on Advanced Materials for Photonics, Sensing and Energy Conversion Energy Applications 27-29 Oct 2021, Marrakech, Morocco.

A. LAOUID, A. ALAOUI BELGHITI, K. WIŚNIEWSKI, A. HAJJAJI, A. ZAWADZKA.''*Structural and Optical properties of DCM thin films prepared by PVD*''.

12. 5th Asia' International Conference on Surfaces, Coatings and Nanostructured Materials 25- 27, Oct 2021, Ankara, Turkey.

A. LAOUID, A. ALAOUI BELGHITI, K. WIŚNIEWSKI, A. HAJJAJI, A. ZAWADZKA. ''*Preparation and Characterization of DCM thin films prepared by physical vapor deposition*''.

SCIENTIFIC POSTERS

1. 23 th ICTON2023, 2-6 Jul 2023, Bukareszt, Rumunia.

A. LAOUID, A. ALAOUI BELGHITI, K. WIŚNIEWSKI, A. HAJJAJI, A. ZAWADZKA.''*Impact of annealing temperature on the structural and optical properties of red dye thin films*''.

2. The 4th international conference on Advanced Materials for Photonics, Sensing and Energy Conversion Energy Applications 27-29 Oct 2021, Marrakech, Morocco.

A. LAOUID, A. ALAOUI BELGHITI, K. WIŚNIEWSKI, A. HAJJAJI, A. ZAWADZKA. ''*Photoluminescence properties of DCM thin films grown by PVD*''.

3. The 3th Edition of international conference on Industrial Systems and Processes SPIn.11- 12 May 2022, EL JADIDA Morocco.

A. LAOUID, A. ALAOUI BELGHITI, A. MARJANOWSKA, K. WIŚNIEWSKI, A. HAJJAJI, A. ZAWADZKA. ''*Study of the effect of time on the photoluminescence of red dye thin films*''.

4. The International Conference AdvancedFunctional Materials for Optics, Lasers and Photovoltaics Applications 14-15-16 Jun 2022, in Kenitra, Morocco.

A. LAOUID, A. ALAOUI BELGHITI, K. WIŚNIEWSKI, A. HAJJAJI, P. PŁÓCIENNIK, J. STRZELECKI A. ZAWADZKA. ''*Structural and optical properties of ZnS thin films prepared by the physical vapor deposition*''.

5. XV Séminaire Doctoral Copernicien 20- 22 Jun 2022, Torun, Poland.

A. LAOUID, A. ALAOUI BELGHITI, K. WISNIEWSKI, J. STRZELECKI, A. KARAKAS, A. GOZUTOK, A. HAJJAJI, B. SAHRAOUI, A. ZAWADZKA. ''*Photoluminescence properties of DCM thin films co-doped* Znq_2''.

6. The 5th international conference on Advanced Materials for Photonics, Sensing and Energy Conversion Energy Applications 25-26 May 2023, Marrakech, Morocco.

A. LAOUID, A. ALAOUI BELGHITI, K. WIŚNIEWSKI, A. HAJJAJI, A. ZAWADZKA. '*Characterization of the morphological, electrical, and optical properties of BaO thin Films deposited by physical vapor deposition (PVD)*'.

PASSIVE PARTICIPATION IN CONFERENCES

- The 9th International Conference on Energy and City of the Future El Jadida, Morocco 14-15/11/2022 Oral communication and Poster.

I. El Ouedghiri-Idrissi, Z. Sofiani, **A. Laouid** and A. Zawadzka. *''Optical and structural investigation on organic material DPQ''*

- Co-author of the plenary lecture – conference: 5th AMPSECA'2023 Marrakech Morocco (25-26 May 2023).

A. Zawadzka, A. Marjanowska-Glanowska, **A. Laouid**, K. Wiśniewki, P. Płócennik. *''Hybrid perovskites thin films – fabrication, properties and applications*"

- Co-author of the invited lecture – conference – 23rd ICTON2023 Bukareszt Rumunia (2-6 July 2023).

A.Zawadzka, P. Płóciennik, A. Marjanowska, K. Wiśniewski, **A. Laouid**, B. Sahraoui. ''Optical effects in thin films of hybrid organic-inorganic halide perovskites"

- Co-author of the invited lecture – conference – 23rd ICTON2023 Bucharest Romania (2-6 July 2023).

P. Płóciennik, A. Zawadzka, K. Wiśniewski, **A. Laouid**, A. Marjanowska, Z. Łukasiak. *''Examples of Perovskite Solar Cells Construction and Techniques for Measuring their Basic Electrical Parameters"*

- Co-author of the plenary lecture 24rd ICTON2024 Bari, Italy, 14-18/2024.

A. Zawadzka, A. Marjanowska, **A. Laouid**, K. Wiśniewki, M. Zawadzki, P. Płócennik. *''Low-temperature hybrid perovskites thin films solar cell''*

- Co-author of the plenary lecture 24rd ICTON2024 Bari, Italy, 14-18/2024.

P. Płóciennik, A. Zawadzka, Ismail Elouedghiri Idrissi, Zouhair Sofiani, K. Wiśniewski, **A. Laouid**, A. Marjanowska and Z. Łukasiak *''ZnO-based thin-film transparent contacts for applications in perovskite solar cells''.*

ORGANIZATION AND SCIENTIFIC ANIMATION

- Co-organization of the 4th International conference on on Industrial Systems and Processes (SPIn) , Khouribga, Morocco, edition 2024.
- Co-organization of The International Conference on on Advanced Materials for Photonics, Sensing and Energy Conversion Energy Applications (AMPSECA) 5th (2023) and 6th (2024) Editions, Marrakech,Morocco.
- Co-organization of the 4th University Fab Lab Festival - Université Chouaïb Doukkali -(Morocco), 2022.

RESEARCH INTERNSHIPS

- **Funding: NAWA POLONIUM 2022-2023**
  Project partners: University of Angers, Angers, France.
  Implementation period: 01-10-2022 / 15-10-2022
- **Funding: NCU and NAWA - STER NCU program - PhD student mobility**
  Project partners: University of Évora, Évora, Portugal.
  Implementation period: 01-03-2023 / 31-12-2023).

Grants

- Grants4NCUStudents VIII- IDUB: project: 4101.00000070, project name: IDUB / granty dla doktorantów (mobilnosé i badania), budget n a m e : IDUB/EF/Grants4NCUStudents_ edycja_8_2024. Funding in the amount of 5 000 zl on the implementation of the trip entitled: 24th International Conference on Transparent Optical Networks (ICTON 2024).
- PROM 25 : Funding in the amount of 9 000 PLN on the implementation of the trip entitled: 25th International Conference on Transparent Optical Networks (ICTON 2025).
- NAWA Scholarship / STER Double PhD degrees: International research collaborations between Nicolaus CopernicusUniversity and Chouaib Doukkali University, El jadiada, Morocco.