

# Hristina Delibašić-Marković, Ph.D.

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## Employment History

- 2019 – present ■ **Teaching Assistant and Research Associate in the Department of Physics, Faculty of Science, University of Kragujevac, Serbia.** Working on theoretical research in the field of atomic, molecular, and optical physics, with a focus on the interactions between lasers and plasma with surfaces. After completing a doctoral dissertation, I have continued to refine my skills in numerical modeling and simulation. Actively involved in guiding and supporting students in their understanding of physics and computational techniques. Regularly attend advanced training programs to enhance my research expertise.
- 2017 – 2019 ■ **Junior Teaching Assistant in the Department of Physics, Faculty of Science, University of Kragujevac, Serbia.** Managed laboratory exercises, guiding undergraduates through complex experimental tasks. Utilized numerical coding to enhance master's research and provided comprehensive support in the development of students' computational skills for their theses.

## Education

- 2018 – 2023 ■ **Doctor of Philosophy (Ph.D.)** in Physics.  
Specialization: Laser and plasma interaction with surfaces.  
Department: Atomic, molecular, and optical physics.  
University: Faculty of Science, University of Kragujevac, Serbia.  
Thesis title: *Theoretical-numerical method for determining the parameters of ionization and electron concentrations in processes of interaction of pulsed laser radiation with materials of biological origin.*  
Grades: 9.67/10.
- 2016 – 2018 ■ **Master of Science (M.Sc.)** in Physics.  
University: Faculty of Science, University of Kragujevac, Serbia.  
Thesis title: *Exploring the role of magnetic field effects in examining electron correlation during strong-field ionization.*  
Grades: 9.40/10.
- 2012 – 2016 ■ **Bachelor of Science (B.Sc.)** in Physics.  
University: Faculty of Science, University of Kragujevac, Serbia.  
Grades: 9.03/10.

## Research Publications

### Journal Articles

- 1 Delibasic Markovic, H.,** K. Kaleris, N. A. Papadogiannis, and V. Petrovic, "Comparative analytical and numerical investigation of the plasma density in atmospheric air generated by nanosecond laser pulses," *Laser Physics Letters*, vol. 21, no. 3, pp. 1–10, 2024, ISSN: 1612-202X. [DOI: 10.1088/1612-202X/ad1cd9](https://doi.org/10.1088/1612-202X/ad1cd9).
- 2 Delibasic Markovic, H.,** V. Petrovic, and I. Petrovic, "Impact of coulomb interactions on ionization rates of noble gases in multi-cycle laser fields," *Romanian Reports in Physics*, vol. 76, no. 201, 2024.  
[URL: https://rrp.nipne.ro/IP/AP714.pdf](https://rrp.nipne.ro/IP/AP714.pdf).

- 3 **Delibasic Markovic, H.**, V. Petrovic, and I. Petrovic, "Non-sequential double ionization of the alkaline earth atoms with a near-single cycle laser pulse in a linearly polarized laser field," *Journal of Theoretical and Experimental Physics*, vol. 165, no. 2, 2024, In Press.
- 4 **Delibasic Markovic, H.**, V. Petrovic, and I. Petrovic, "Theoretical study of ionization dynamics under chirped few-cycle laser pulses," *Romanian Reports in Physics*, 2024, In Press. [URL: https://rrp.nipne.ro/IP/AP755.pdf](https://rrp.nipne.ro/IP/AP755.pdf).
- 5 V. Petrovic, **Delibasic Markovic, H.**, and I. Petrovic, "Coulomb corrected nonadiabatic instantaneous ionization rate and the electron trajectory in an elliptically polarized laser field," *Results in Physics*, vol. 51, p. 106 718, 2023, ISSN: 2211-3797. [DOI: 10.1016/j.rinp.2023.106718](https://doi.org/10.1016/j.rinp.2023.106718).
- 6 V. Petrovic, **Delibasic Markovic, H.**, and I. Petrovic, "Ionization rate in an elliptically polarized laser field with respect to momentum at the tunneling exit point for noble atoms," *Results in Physics*, vol. 53, p. 107 005, 2023, ISSN: 2211-3797. [DOI: 10.1016/j.rinp.2023.107005](https://doi.org/10.1016/j.rinp.2023.107005).
- 7 **Delibasic, H.**, V. Petrovic, I. Petrovic, C. Molpeceres, and S. Lauzurica, "Numerical modeling of plasma formation in skin tissues induced by nanosecond pulsed laser," *The European Physical Journal D*, vol. 75, no. 5, pp. 1–6, 2021, ISSN: 1434-6060. [DOI: 10.1140/epjd/s10053-021-00170-z](https://doi.org/10.1140/epjd/s10053-021-00170-z).
- 8 V. Petrović, **Delibasic, H.**, and I. Petrović, "Strong-field tunneling ionization rate based on landau-dykhne transition theory," *Journal of Experimental and Theoretical Physics*, vol. 160, no. 1, pp. 5–12, 2021, ISSN: 1090-6509. [DOI: 10.31857/S0044451021070014](https://doi.org/10.31857/S0044451021070014).
- 9 **Delibasic, H.**, V. Petrovic, and I. Petrovic, "Laser breakdown in water induced by  $\lambda = 532$  nm nanosecond pulses: Analytical calculation of the number density of free electrons," *Journal of the Physical Society of Japan*, vol. 89, no. 11, p. 114 501, 2020, ISSN: 0031-9015. [DOI: 10.7566/jpsj.89.114501](https://doi.org/10.7566/jpsj.89.114501).
- 10 **Delibasic, H.** and V. Petrović, "Ellipticity-dependent ionization yield for noble atoms," *Chinese Physics B*, vol. 28, no. 8, pp. 083200-1–083200-6, 2019, ISSN: 2058-3834. [DOI: 10.1088/1674-1056/28/8/083201](https://doi.org/10.1088/1674-1056/28/8/083201).
- 11 K. Isakovic, V. Petrovic, and **Delibasic, H.**, "Energy distribution of ejected photoelectrons in k-2v process," *Romanian Reports in Physics*, vol. 71, no. 203, 2019, ISSN: 1221-1451. [URL: https://rrp.nipne.ro/2019/AN71203.pdf](https://rrp.nipne.ro/2019/AN71203.pdf).
- 12 K. Isakovic, V. Petrovic, and **Delibasic, H.**, "The contribution of the atomic excitation and recollision effect during tunneling ionization on the transition rate," *Journal of Experimental and Theoretical Physics*, vol. 128, no. 2, pp. 171–177, 2019, ISSN: 1063-7761. [DOI: 10.1134/S1063776119010138](https://doi.org/10.1134/S1063776119010138).
- 13 V. Petrovic and **Delibasic, H.**, "Improved treatment of the photoionization process in the laser-induced optical breakdown in the laser tissue," *UPB Scientific Bulletin, Series A: Applied Mathematics and Physics*, vol. 81, no. 4, pp. 287–300, 2019, ISSN: 1223-7027. [URL: https://www.scientificbulletin.upb.ro/rev\\_docs\\_arhiva/fullf3d\\_436236.pdf](https://www.scientificbulletin.upb.ro/rev_docs_arhiva/fullf3d_436236.pdf).
- 14 V. Petrovic, K. Isakovic, and **Delibasic, H.**, "Theoretical study of the electron correlation and excitation effects on energy distribution in photon impact ionization," *Revista Mexicana de Física*, vol. 65, no. 3, pp. 224–230, 2019, ISSN: 0035-001X. [DOI: 10.31349/RevMexFis.65.224](https://doi.org/10.31349/RevMexFis.65.224).
- 15 **Delibasic, H.**, K. Isakovic, V. Petrovic, and T. Miladinovic, "Estimation of the influence of the magnetic component on the transition rate in a linearly polarized laser field," *International Journal of Theoretical Physics*, vol. 57, no. 2, pp. 406–413, 2018, ISSN: 1572-9575. [DOI: 10.1007/s10773-017-3572-7](https://doi.org/10.1007/s10773-017-3572-7).
- 16 K. Isakovic, V. Petrovic, and **Delibasic, H.**, "Simultaneous excitation and photoionization tunneling transition rate in an elliptically polarized laser field," *Laser Physics*, vol. 28, no. 12, p. 126 001, 2018, ISSN: 1054-660X. [DOI: 10.1088/1555-6611/aae184](https://doi.org/10.1088/1555-6611/aae184).
- 17 V. Petrovic, **Delibasic, H.**, and K. Isakovic, "Effect of the corrected ionization potential on the hhg transition rate in a linearly polarized laser," *Acta Physica Polonica A*, vol. 134, no. 6, pp. 1170–1175, 2018, ISSN: 1898-794X. [DOI: 10.12693/APhysPolA.134.1170](https://doi.org/10.12693/APhysPolA.134.1170).

## Books and Chapters

- 1 V. Petrovic and **Delibasic Markovic, H.**, *Practicum with Collection of Exercises in Digital Electronics*. Kragujevac, Serbia: Faculty of Science and Mathematics, University of Kragujevac, 2021, Co-published with the Ministry of Education, Science, and Technological Development of the Republic of Serbia as part of the "Higher Education Development" program, Project Title: "Improvement of Teaching in Digital Electronics, Digital Signal Processing, Physics Teaching Methodology, and Informatics Teaching Methodology", ISBN: 978-86-6009-082-1.

## Skills

Languages	📌 <b>Serbian:</b> Native, <b>English:</b> Full professional proficiency.
Programming & software	📌 Wolfram Language, Python, L <sup>A</sup> T <sub>E</sub> X, Origin, Altium Designer, EAGLE, CorelDRAW, and Microsoft Office.
Other	📌 Experienced in academic research, teaching, and training. Skilled in developing and delivering compelling PowerPoint presentations.

## Research Projects

2024 – present	📌 COST project CA21159, "Understanding interaction light - biological surfaces: possibility for new electronic materials and devices (PhoBioS)".
	📌 COST project CA22148, "An international network for Non-linear Extreme Ultraviolet to hard X-ray techniques".
2023 – present	📌 Science Fund of the Republic of Serbia, GRANT 6821, Atoms and (bio)molecules dynamics and collisional processes on short time scale - ATMOLCOL.
2020 – 2024	📌 COST project CA18222, "Attosecond Chemistry".
2019 – 2023	📌 COST project CA17126, "Towards understanding and modelling intense electronic excitation".
2018 – 2019	📌 RS-171020, "Physics of collisions and photo processes in atomic, (bio)molecular and nanosized systems".
2017	📌 COST project CM1204, "XLIC – XUV/X-ray light and fast ions for ultrafast chemistry".





## Miscellaneous Experience

### Awards and Achievements


2023-present	📌 <b>Dr. Karl Mey Scholarship</b> from the German Physical Society (DPG).
2023	📌 <b>Recognition from the Student Parliament of the University of Kragujevac</b> for outstanding commitment and excellence in student engagement, reflected in top student survey ratings.
2019	📌 <b>Towards understanding and modelling intense electronic excitation (TUMIEE) grant</b> under COST funds.
2018-present	📌 <b>Awarded a competitive scholarship by the Serbian Ministry of Education, Science and Technological Development</b> in recognition of being one of Serbia's top 100 promising young researchers.
2017	📌 <b>Dr. Zoran Đinđić Scholarship.</b>
2012-2017	📌 <b>Scholarship of the Ministry of Science and Technology, Republic of Serbia.</b> Awarded for maintaining an exceptional academic record throughout bachelor's and master's studies.

## Miscellaneous Experience (continued)




### Leadership Experience

- 2017-present  **Workshop Co-Organizer and Facilitator, Faculty of Science, University of Kragujevac.** Designed and led workshops in applied physics and electronics for primary and secondary school students, enhancing their practical and theoretical knowledge.
- 2021  **Co-Organizer, The Young Scientist Symposium 2021, Attochem Cost Action.** Collaborated with international PhD students and early-career investigators to facilitate a multidisciplinary conference. Key responsibilities included event planning, coordinating with team members across Europe, and managing logistics.
- 2020-2021  **Committee Member for the national physics competitions,** organized by the Physical Society of Serbia for primary and secondary school students.
- 2020  **Organizer, FELIX 2020 - Physics, Electronics, Informatics, and Experiments: Competition in Physics, Electronics, and Informatics** for secondary school students. Spearheaded the competition, overseeing everything from its initial concept to the final execution. The event was financially supported by the Faculty of Science and PANASONIC (VS Lighting Solutions).







### Professional associations

- 2023-present  Member of the German Physical Society.

### Review Activities

-  Reviewer for Applied Physics B: Lasers and Optics (Impact Factor: 2.1).
-  Reviewer for the AERA Open (Impact Factor: 2.8).
-  Reviewer for the Optical Review (Impact Factor: 1.047).

### Summer school, workshop & scientific communication

- 2022  **"COST/ZCAM - School on New Computational Methods for Attosecond Molecular Processes"**, flagship school held in Zaragoza, Spain.
-  **"30th Summer School and International Symposium on the Physics of Ionized Gases (SPIG 2022)"**, summer school held in Šabac, Serbia.
- 2019  **"Training young researchers on multidisciplinary approaches to electronic excitation problems"**, training course held at Rethymno, Crete, Greece.
- 2017  **"Computational Methods for Complex Molecular Systems"**, training course held at the Università degli Studi di Ferrara, Ferrara, Italy.
- 2017-present  **Posters @**  
DPG Spring Meeting of the Atomic, Molecular, Quantum Optics and Photonics Section (SAMOP) 2024 (Freiburg, Germany), 13th, 14th and 15th Conference of the Society of Physicists of Macedonia (CSPM) (Ohrid, North Macedonia), AttoChem Young Scientist Symposium 2023 (Vienna, Austria); III and IV Meeting on Astrophysical Spectroscopy (Fruška Gora, Serbia); VI, VII, and VIII International School and Conference on Photonics (Belgrade, Serbia), X, XI, and XII International Conference on Social and Technological Development (Trebinje, Bosnia and Herzegovina); National Seminar on Physics Education from the 14<sup>th</sup> to the 20<sup>th</sup>, organized by the Physical Society of Serbia (Serbia).
-  **Invited lectures @**  
32nd Summer School and International Symposium on the Physics of Ionized Gases (SPIG 2024), Belgrade, Serbia.

## Miscellaneous Experience (continued)

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- 📌 **Oral presentations @**  
XIII International Conference on Social and Technological Development (Trebinje, Bosnia and Herzegovina).

### Certificates

- 2024 📌 **"Python for Data Analysis: step-by-step with projects"**. Completed an intensive data analysis course, applying Python to distill actionable insights from real-world datasets. The program combined interactive notebooks and project-based learning, focusing on vital Python libraries, and merging these with fundamental statistical principles for a comprehensive understanding of data analysis techniques.
- 2023 📌 **"Computational Physics: Scientific Programming with Python (Udemy)"**. Finished an intensive course focused on numerical methods and their application in solving complex physics problems, including simulations and analysis of quantum systems.
- 2022 📌 **"Wolfram Mathematica Masterclass: from Beginner to Expert (Udemy)"**. Achieved expertise in Mathematica, from core concepts to advanced model creation, with a strong emphasis on dynamic visualization and interactive applications.
- 2021 📌 **"Programming in Mathematica (Udemy)"**. Completed an intermediate course in Mathematica, enhancing skills in data visualization, computational functions, and algorithmic solutions.
- 2017-2020 📌 **"CERN Masterclass, International Masterclasses in Serbia"**. Assistant in particle physics tutorials for high school students across Serbian universities and CERN, fostering scientific education and practical skills through real-world data analysis.

### Personal Interests

- 📌 *Enjoy reading, photography, traveling, yoga and dance, volunteering in community events, and visiting museums.*

## References

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Available on Request.