



Nationality: Albanian,
Macedonian

Date of Birth: September
7, 1972

Married with two children

EDUCATION

- Ph.D. in Physics, 2001-2005, Manchester Metropolitan University, Manchester, United Kingdom.
- M.Sc. in Physics, 1997-2000, University of Siegen, Siegen, Germany.
- B.Sc. (5 years study program), 1991-1996, University of Tirana, Tirana, Albania.

POST - DOCTORAL TRAINING

- September 2008-September 2009, Postdoctoral Research Associate, Centre for Drug Design, University of Minnesota, MN, USA.
- September 2006-September 2008, Postdoctoral Research Associate. Centre for Biological Physics, Arizona State University, Department of Chemistry & Biochemistry, Tempe, AZ, USA.
- January 2006-June 2006, Postdoctoral Fellow, University of Alberta, National Institute of Nanotechnology, Edmonton, Alberta, Canada.
- January 2004-December 2005, Postdoctoral Research Associate, Manchester Metropolitan University, Manchester, United Kingdom.

POST - GRADUATE TRAINING

- February 2000-August 2001, Postgraduate Student, Max-Planck Institute of Biophysics, Frankfurt am Main, Germany.

VISITING SCHOLAR

- August 2014-September 2014, Visiting Scholar Researcher, University of South Florida, USA.

VOCATIONAL TRAINING

- January 2002, Workshop at Manchester Research centre for computational science on Visualisation and virtual reality for scientific applications, Manchester, United Kingdom.
- October 2001, Autumn School at Manchester University on High performance computing and SGI NUMAflex, Manchester, United Kingdom.
- December 2001, British Liquid Crystal Society Winter Workshop at Hull University, Hull, United Kingdom.
- June 2000, summer school at UMIST Manchester on Molecular modelling and computer simulations, Manchester, United Kingdom.



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AWARDS, FELLOWSHIPS, GRANTS, PROJECTS

- **International Balkan University, Skopje, R. of Macedonia** Transversal Skills in Applied Artificial Intelligence (TSAAI) - Curriculum Development, European Project 2022-Present (Erasmus+ ES01-KA220-HED-000030125).
- **International Balkan University, Skopje, R. of Macedonia** Eco/Logical Learning and Simulation Environments in Higher Education (ELSE-Project), European Project 2018-2021 (Erasmus+ KA203 Project ELSE).
- **International Balkan University, Skopje, R. of Macedonia** Certificate of Excellence with motivation "For his outstanding performance in academic research during the academic year 2015/2016", September 2016.
- **University of Minnesota, Minneapolis, USA** First Prize in Bioinformatics: Building Bridges Symposium. Work presented as a poster – *Computational Alanine scanning of β -lactamase Inhibitor Protein and TEM-1 β -lactamase Complex*, April 2009.
- **University of Alberta, National Institute of Nanotechnology, Edmonton, Alberta, Canada** January 2006-June 2006, Postdoctoral Fellowship.
- **Manchester Metropolitan University, Manchester, United Kingdom** September 2003-December 2004, PhD Scholarship.
- **Coventry University, Coventry, United Kingdom** September 2001-August 2003, PhD Scholarship.
- **University of Siegen, Siegen, Germany** October 1997-February 2000, Master Studies Studentship awarded by Deutsche Forschungsgemeinschaft.
- **Max-Planck Institute of Biophysics, Frankfurt/Main, Germany** February 2000–August 2001, Studentship of postgraduate studies awarded by Deutsche Forschungsgemeinschaft.
- **University of Tirana, Tirana, Albania** Dean's list of outstanding students, Tirana, Albania, July 1996.
- **Region Mathematical Olympiad Committee, Vlore, Albania** Second prize of the mathematical Olympiad, April 1986.



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ACADEMIC TEACHING EXPERIENCE

- **April 2020-Present, Full Professor**

Institution: International Balkan University, Skopje, North Macedonia

Instructor of the following courses:

Undergraduate studies - Physics I, Physics II, Discrete Mathematics, Systems Modelling, Computer Graphics, Algorithms, Introduction to Robotics;

Master Studies - Information Theory, Theory of Probability;

PhD Studies - Implementation of Database Management Systems, Scientific Programming.

- **April 2014-April 2020, Associate Professor**

Institution: International Balkan University, Skopje, North Macedonia

Instructor of the following courses:

Undergraduate studies - Physics I, Utilisation of Electric Energy, Electromagnetic Theory, Physics II, Static Power Converters, Power Systems Analysis, Discrete Mathematics, Algorithms;

Master Studies - Information Theory, Theory of Probability.

- **April 2014-April 2020, Adjunct Associate Professor**

Institution: State University of Tetovo, Tetovo, North Macedonia

Instructor of the following courses:

Master Studies - Theoretical Methods in Physics.

- **September 2009-March 2014, Assistant Professor**

Institution: International Balkan University, Skopje, North Macedonia

Instructor of the following courses:

Undergraduate studies - Introduction to Programming, Algorithms, Systems Modelling, Probability & Statistics, Discrete Computational Structures, Information Technology, Computer Architecture.

- **September 2011-March 2014, Adjunct**

Assistant Professor Institution: State University of Tetovo, Tetovo, North Macedonia

Instructor of the following courses:

Undergraduate studies - Medical Physics, Electrodynamics, Classical Mechanics, Statistical Physics.

- **September 2003-December 2005, Teaching Assistant**

Institution: Manchester Metropolitan University, Manchester, United Kingdom

Instructor of the following courses:

Undergraduate studies - Visual Programming using Delphi, Microsoft Office.

- **September 2001-August 2003, Teaching Assistant**



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Institution: Coventry University, Coventry, United Kingdom
Instructor of the following courses:

Long-life learning studies - Introduction to Programming with Java; Instructor at the Students Help Centre.

• **September 1996-June 1997, Teaching Assistant**

Institution: University of Tirana, Tirana, Albania

Instructor of the following courses:

Undergraduate studies - Optics, Electrodynamics, Statistical Physics.

ACADEMIC ADMINISTRATIVE DUTIES

● **January 2017-September 2019**

Institution: International Balkan University, Faculty of Engineering

Position: Acting Dean of Faculty of Engineering

● **September 2015-January 2017**

Institution: International Balkan University

Position: Rector's Advisor for Research and Projects

● **September 2012-September 2013**

Institution: International Balkan University, Faculty of Engineering

Position: Head of Department of Information Technology

● **September 2009-2019**

Institution: International Balkan University

Position: Member of the Senate

● **September 2009-Present**

Institution: International Balkan University, Faculty of Engineering

Position: Member of the Faculty Council

MEMBER OF PROFESSIONAL BOARDS

• **Position: Editor-in-Chief**

- 2014-2015: American Journal of Applied Sciences, Engineering and Technology

• **Position: Editorial Board Member**

- 2014-2017: International Journal of Dataset Papers in Physics
- 2014-Present : Turkish Academic Journal of Intelligent Systems
- 2017-2020: European Journal of Biophysics
- 2018-Present: SCIREA Journal of Physics

• **Position: Peer Reviewer**

- International Journal of Computational and Theoretical Chemistry
- International Journal of Electrical Power & Energy



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Systems

- Science Journal of Applied Mathematics and Statistics
- Journal of Chemical Information and Modelling
- Journal of Molecular Graphics and Modelling
- BMC Bioinformatics
- Entropy
- BBA: Proteins and Proteomics
- Journal of Biomolecular Structure & Dynamics
- Polymers

RESEARCH INTERESTS

- Theoretical and Computational Physics/Chemistry
- Soft matter, Biophysics and Nanophysics
- Protein and DNA dynamics
- Bio-inspired optimization
- Artificial Intelligence, Machine Learning & Deep Learning approaches
- Quantum Machine Learning Algorithms
- Bioinformatics
- Numerical integrators for molecular dynamics
- Monte Carlo and molecular dynamics techniques
- Free energy calculations
- Information flow in biomolecular systems
- Coarse-grained models of proteins and DNA
- Swarm particle intelligence optimization
- GPU-accelerated computing
- Quantum simulations of molecular systems

PROFESSIONAL MEMBERSHIPS

- **2022-Present: Albanian National Institute of Physics (Albania)**
Position: Member of the Management Board
- **2020-Present: Association of Engineering Researchers (India)**
Position: Member
- **2018-Present: Materials Research Society of Macedonia (Macedonia)**
Position: Member
- **2014-2014: Research Institute of Science and Technology (Albania)**
Position: Member and Group Leader of Computational Biophysics
- **2011-2016: American Chemical Society (USA)**
Position: Member
- **2006-2009: American Biophysics Society (USA)**
Position: Member



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● **2001-2005: British Liquid Crystal Society
(United Kingdom)**

Position: Member

BOOKS

1. **Hiqmet Kamberaj** (2023) *Computer Simulations in Molecular Biology*, Springer Nature.
2. **Hiqmet Kamberaj** (2023) *Introduction to Algorithms: Learning Algorithms by Examples*, Lambert Academic Publishing, ISBN 978-620-6-15263-7.
3. **Hiqmet Kamberaj** (2022) *Relativistic Theory of Mechanics and Electromagnetism*, Lambert Academic Publishing, ISBN 978-620-550898-5.
4. **Hiqmet Kamberaj** (2022) *Electromagnetism: With solved problems*, Springer Nature, Switzerland, Undergraduate Textbook in Physics, ISBN (Electronic) 978-3-030-96780-2, ISBN (Paperback) 978-3-030-96779-6, <https://link.springer.com/book/9783030967796>.
5. **Hiqmet Kamberaj** (2021) *Classical Mechanics*, De Gruyter, ISBN (Electronic) 9783110755824, ISBN (Paperback) 9783110755817. <https://www.degruyter.com/document/isbn/9783110755824/html>
6. **Hiqmet Kamberaj** (2020) *Molecular Dynamics Simulations in Statistical Physics. Theory and Applications*. Springer Nature, Switzerland, Scientific Computation Series, (Hardcopy: ISBN 978-3-030-35701-6; ISSN 1434-8322. Electronic: ISBN 978-3-030-35702-3; ISSN 2198-2589). <https://www.springer.com/gp/book/9783030357016>

JOURNALS/BOOK CHAPTERS

1. **Hiqmet Kamberaj**, Viewpoint: The Physics in the New Era of Computing, *European Scientific Journal*, Submitted 2023.
2. Rabie A. Ramadan, Ahmed Y. Khedr, Kusum Yadav, Eissa Jaber Alreshidi, Md Haidar Sharif, Ahmad Taher Azar, and **Hiqmet Kamberaj** (2022), Convolution neural network based automatic localization of landmarks on lateral X-ray images. *Multimedia Tools and Applications*. <https://doi.org/10.1007/s11042-021-11596-3>
3. **Hiqmet Kamberaj**(2022), Random walks in a free energy landscape combining augmented molecular dynamics simulations with a dynamic graph neural network model, *Journal of Molecular Graphics and Modelling*, 114, 108199.
4. RABIE A. RAMADAN, MD. HAIDAR SHARIF, EISSA JABER ALRESHIDI, MD. HARIS UDDIN SHARIF, IBRAHIM FURKAN INCE, **HIQMET KAMBERAJ**, AND AHMED Y. KHEDR (2021), Energy Coherent Fog Networks Using Multi-Sink Wireless Sensor Networks, *IEEE Access*, 9, 167715.
5. Merve Gurboga, Gizem Kugu, **Hiqmet Kamberaj** and Ozal Mutlu, (2021) Identification of Benzamide Inhibitors for Histone Deacetylase 1 from Babesia and Theileria Species by Virtual High-Throughput Screening and Molecular Dynamics Simulations, *Parasitology Research*, 120, 2175-2187.



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6. Damir Rahmani and **Hiqmet Kamberaj** (2021), The Capsule - An Artificial Intelligence Powered Chatbot in Human Resources Management Systems, *IBU International Journal of Technical and Natural Sciences*, 2, 53-69.
7. Merjem Hoxha and **Hiqmet Kamberaj**, (2021) Automation of Some Macromolecular Properties Using a Machine Learning Approach, *Machine Learning: Science and Technology*, 2, 035016.
8. **Hiqmet Kamberaj**, (2021) Heat Flow Random Walks in Biomolecular Systems Using Symbolic Transfer Entropy and Graph Theory, *Journal of Molecular Graphics and Modelling*, 104, 107838.
9. Dh. Nebiu and **Hiqmet Kamberaj**, (2020) Symbolic Information Flow Measurement (SIFM): A Software for Measurement of Information Flow Using Symbolic Analysis, *SoftwareX*, 11, 100470-8.
10. M. Hoxha, B. Rahmani and **Hiqmet Kamberaj**, (2019) A database used for automation of molecular properties using a machine deep-learning approach, *Bulletin of Natural Sciences*, 28, 62-80.
11. **Hiqmet Kamberaj**, (2019) Advanced Methods Used in Molecular Dynamics Simulation of Macromolecules, in *Mechanical Design, Materials and Manufacturing*, Nova Science Publishers, Inc., Pages 57-133.
12. **Hiqmet Kamberaj**, (2018) Faster Protein Folding Using Enhanced Conformational Sampling of Molecular Dynamics Simulation, *Journal of Molecular Graphics and Modelling*, 81, 32-49.
13. R. Izairi and **Hiqmet Kamberaj**, (2017) Comparison Study of Polar and Non - polar Contributions to Solvation Free Energy, *Journal of Chemical Information and Modeling*, 57(10), 2539-2553.
14. **Hiqmet Kamberaj**, (2017) Sampling Convergence of Collective Motions in Proteins, *Journal of Applied Physical Science International*, 8(3), 101 - 112.
15. **Hiqmet Kamberaj**, (2016) Replica Exchange Using q - Gaussian Swarm Quantum Particle Intelligence Method, *Engineering and Applied Sciences*, 1(2), 20-25.
16. **Hiqmet Kamberaj**, (2015) Conformational Sampling Enhancement of Replica Exchange Molecular Dynamics Simulations Using Swarm Particle Intelligence, *The Journal of Chemical Physics*, 143, 124105.
17. **Hiqmet Kamberaj**, (2014) Q-Gaussian Swarm Quantum Particle Intelligence on Predicting Global Minimum of Potential Energy Function, *Applied Mathematics and Computation*, 229, 94-106
18. Spiriti, J., **Hiqmet Kamberaj**, de Graff, A., Thorpe, M.P., van der Vaart, A., (2012) DNA bending through large angles is aided by ionic screening, *Journal of Chemical Theory and Computation*, 8 (6), 2145- 2156.
19. Spiriti, J., **Hiqmet Kamberaj**, and van der Vaart, A., (2012) Development and application of enhanced sampling techniques to simulate the long-time scale dynamics of biomolecular systems, *International Journal of Quantum Chemistry*, 112, 33-43.
20. **Hiqmet Kamberaj** (2011) A Theoretical Model for the Collective Motion of Proteins by Means of Principal Component Analysis. *Central European Journal of Physics*, 9(1), 96-109.
21. **Hiqmet Kamberaj** and van der Vaart, A. (2009) Extracting



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- the causality of correlated motions from molecular dynamics simulations. *Biophysical Journal*, 97(6), 1747-1755.
22. **Hiqmet Kamberaj** and van der Vaart, A. (2009) An optimized replica exchange method for molecular dynamics simulations. *Journal of Chemical Physics*, 130(7), 074904-6.
 23. **Hiqmet Kamberaj** and van der Vaart, A. (2009) Correlated Motions and Interactions at the Onset of the DNA -Induced Partial Unfolding of Ets-1. *Biophysical Journal*, 96, 1307-1317
 24. **Hiqmet Kamberaj** and van der Vaart, A. (2007) Multiple scaling replica exchange method for the efficient sampling of biomolecular systems. *The Journal of Chemical Physics*, 127(23), 234102-7.
 25. **Hiqmet Kamberaj**, Low, R.J., and Neal, M.P. (2006) Correlation between molecular chirality and helical twisting power. A computer simulation study. *Molecular Physics*, 104(3), 335-357.
 26. Neal, M.P., **Hiqmet Kamberaj**, and Low, R.J. (2005) Some calculations of molecular chirality. *Molecular Crystal Liquid Crystal*, 439, 1937-1943.
 27. **Hiqmet Kamberaj**, Low, R.J., and Neal, M.P. (2005) Molecular structure and helical twisting power, *Ferroelectrics*, 315, 183-196.
 28. **Hiqmet Kamberaj**, Low, R.J., and Neal, M.P. (2005) Symplectic and time reversible integrators for molecular dynamics simulations of rigid molecules. *The Journal Chemical Physics*, 122(22), 224114-30.
 29. **Hiqmet Kamberaj**, Osipov, M.A., Low, R.J., and Neal, M.P. (2004) Helical twisting power and chirality indices. *Molecular Physics*, 102(5), 431- 446.
 30. **Hiqmet Kamberaj**, Low, R.J., and Neal, M.P. (2003) Symplectic and time reversible integrators for rigid bodies. *System Science*, 29(2), 31-45.
 31. **Hiqmet Kamberaj**, and Helms, V. (2001) Monte Carlo simulation of biomolecular systems with BIOMCSIM, *Computer Physics Communications*, 141 (3), 375-402.

CONFERENCES (FULL PAPER)

1. Damir Rahmani and **Hiqmet Kamberaj**, Implementation and Usage of Artificial Intelligence Powered Chatbots in Human Resources Management Systems, 2nd International Conference on Social and Applied Sciences, Tirana, Albania on 20-21 May, 2021.
2. **Hiqmet Kamberaj**, Low, R.J., and Neal, M.P. (2003) *Symplectic and time reversible integrators for rigid bodies*, 16th Conference on Systems Engineering, ICSE 2003, editors: K.J. Burnham and O.C.L. Haas, Coventry University, Coventry, UK, Vol. 1, 320-325, September 9-11.
3. T. Conka-Nurdan, K. Nurdan, F. Constantinescu, B. Freisleben, **Hiqmet Kamberaj**, N.A. Pavel, I. Rauhut, K. Reichmann, A.H. Walenta (2001) *Influence of the Detector Parameters on a Compton Camera*, IEEE, 22- 26.



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CONGRESSES, CONFERENCES AND SYMPOSIA (ABSTRACTS)

- 1. Hiqmet Kamberaj**, *From Galilean to Lorentz Transformations: A Pedagogical Viewpoint*, 4th International Congress on Applied Sciences, Engineering, and Mathematics, October 20-23, 2022, Tekirdağ, Turkey.
- 2. Amra Feta, Aleksandra P. Kujundziski, Hiqmet Kamberaj**, Ervin Domazet, Damir Rahmani, Neslihan Ademi, Francisco Lopez Valverde, Sergio Gálvez Rojas, Eduard Petlenkov, Ivan Štajduhar, Tobias Hagen, Anton Gradisek, and Aleksander Zidanšek, *Transversal Skills in Applied Artificial Intelligence - Curriculum Development*, 4th International Congress on Applied Sciences, Engineering, and Mathematics, October 20-23, 2022, Tekirdağ, Turkey.
- 3. Hiqmet Kamberaj**, *Interactive molecular dynamics simulations of biological molecules*, 1st conference of National Institute of Physics, Academy of Sciences of Albania, 10-11 February 2022.
- 4. Hiqmet Kamberaj**, *Electrostatic Properties of Solutions*, International Conference on Applied Sciences, Engineering and Mathematics (iCASEM 2021), Skopje, 3-4 June, 2021.
- 5. Damir Rahmani and Hiqmet Kamberaj**, *Implementation and Usage of Artificial Intelligence Powered Chatbots in Human Resources Management Systems*, 2nd International Conference on Social and Applied Sciences, University of New York Tirana, 20-21 May 2021, Tirana, Albania.
- 6. Hiqmet Kamberaj**, *Cavity Quantum Electrodynamics Model to Study Quantum Fluctuations in Vacuum: Application to Quantum Information Processing*, International Conference on Applied Sciences, Engineering and Mathematics (iCASEM 2020), Skopje, 4-6 June, 2020.
- 7. M. Hoxha and Hiqmet Kamberaj**, *Design of a Virtual Classroom for Engineering Students: Application of a Web-based Service and Machine Learning*, International Conference on Applied Sciences, Engineering and Mathematics (iCASEM 2020), Skopje, 4-6 June, 2020.
- 8. B. Rahmani and Hiqmet Kamberaj**, *Dynamics and their Time Scales in Complex Macromolecular Systems*, International Conference on Applied Sciences, Engineering and Mathematics (iCASEM 2020), Skopje, 4-6 June, 2020.
- 9. Hiqmet Kamberaj**, *Automation of Molecular Properties Using Machine Learning Approaches*, 6th International Congress on Fundamental and Applied Sciences, Tirana, Albania on 18 – 20 June, 2019.
- 10. Hiqmet Kamberaj**, *Analyzing Causality of Molecular Interactions: A Case S Molecular Dynamics Simulation of Protein-RNA System*, Applied Physics 2018, 02-03 July, Vienna, Austria, 2018. (Published in Journal of Physical Chemistry & Biophysics, 08, 2018).
- 11. Izairi-Bexheti, R. and Hiqmet Kamberaj**, *On the calculation protein-protein binding free energy using molecular dynamics simulations*, 1st International



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Conference of Natural Sciences and Mathematics,
Tetovo, R. of Macedonia, June 16-17, 2017.

- 12. Hiqmet Kamberaj**, *Perspectives on Molecular Dynamics Simulations & Free Energy Calculations for Biomolecular Systems*, International Conference on Applied Sciences, Engineering and Mathematics, Ohrid, R. of Macedonia, May 5-7, 2017.
- 13. Izairi, R. and Hiqmet Kamberaj**, *Molecular Dynamics Simulation Study of Protein-Protein Interactions*, ALBNANO2016 NANOTECHNOLOGY AND BIOSENSORS, May 29-31, 2016, Tirana, Albania.
- 14. Hiqmet Kamberaj**, 2nd International Conference on Pure & Applied Sciences, June 1-5 2016, Istanbul Turkey, Enhanced Transition Path Sampling Using Swarm Particle Intelligence in Replica Exchange Molecular Dynamics.
- 15. Izairi, R. and Hiqmet Kamberaj**, The 10th Conference of the Society of Physicists of Macedonia, Skopje, Macedonia, Sept. 25-28, 2014, Calculations of the Electronic Properties of Molecules using Computational Quantum Mechanics Models.
- 16. Mutlu, O., Hiqmet Kamberaj**, 2nd International Bau-Drug Design Symposium, Novel methods and emerging targets in drug discovery & patented drug development, Bahcesehir University, Istanbul, Turkey, 17 -19 April 2014, Structural Modelling, Molecular Docking and Molecular Dynamics Simulation of Trypanothione Synthase.
- 17. Hiqmet Kamberaj**, International Conference on Applied Analysis and Mathematical Modeling, Istanbul, Turkey, 2-5 June 2013, *Symbolic Mutual Information for Estimation of Nonlinear Higher Order Correlated Fluctuations*.
- 18. Hiqmet Kamberaj**, International Meeting on Atomic and Molecular Physics and Chemistry, Scuola Normale Superiore Pisa, Italy (12-14 September 2012), *Dynamics and static dielectric response of water in anionic hydration shells using ab-initio molecular dynamics simulation*.
- 19. Hiqmet Kamberaj**, 6th International Annual Meeting of Alb-Science Institute, Prishtina, Kosova (1-4 September 2011), *Modeling of protein-protein interactions: Calculation of the binding free energy and computational alanine scanning*.
- 20. Hiqmet Kamberaj**, 8th European Biophysics Congress, Budapest, Hungary (23-27 August 2011), *Elucidating the modular structure of the protein G C2 fragment and human IgG Fc domain binding site using computer simulations* (Published in *European Biophysics Journal with Biophysics Letters*, 40, 108-108.)
- 21. van der Vaart, A., Hiqmet Kamberaj** (2009) Extracting The Causality Of Correlated Motions From Molecular Dynamics Simulations, *Biophysical Journal Abstracts*, 96(3), pp 406a.
- 22. Hiqmet Kamberaj**, and Sham, Y. (2009) Bioinformatics: Building Bridges Symposium, Minneapolis, MN, USA. Work presented as a poster – Computational Alanine Scanning of β -lactamase Inhibitor Protein and TEM-1 β -lactamase Complex, April 17.
- 23. Hiqmet Kamberaj** and Sham, Y. (2009) MIKI Meeting, Minneapolis, MN, USA. Work presented as poster – Computational Alanine Scanning of β -lactamase Inhibitor Protein and TEM-1 β -lactamase Complex, April 3- 5.
- 24. Hiqmet Kamberaj** and van der Vaart, A. (2008) Biophysics Society 52 -th Annual Meeting & 16-th IUPAB International Biophysics Congress, Long Beach, CA, USA. Work presented as a poster - *Unfolding upon binding: Elucidation of the complex*



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binding dynamics of the Ets-1 transcription factor by computer simulation, February 2- 6.

- 25. Hiqmet Kamberaj** and van der Vaart, A. (2007) Postdoctoral Research Day symposium at Biodesign Center, Tempe, Arizona, USA. Work presented as a poster - *Unfolding upon binding: Elucidation of the complex binding dynamics of the Ets-1 transcription factor by computer simulation*, October 6.
- 26. Hiqmet Kamberaj** (2007) Annual meeting BioPhest 2007 at Arizona State University, Tempe, Arizona, USA. Work presented as a talk - *Multiple scaling replica exchange method for the efficient sampling of biomolecular systems*, April 21.
- 27. Hiqmet Kamberaj** (2006) Postdoctoral Research Day Symposium at University of Alberta, Edmonton, Alberta, Canada. Work presented as a poster – *Multiple time scale molecular dynamics simulations of biomolecular systems*, April 7.
- 28. Neal, M.P., Hiqmet Kamberaj** and Low, R.J. (2006) 21st International Liquid Crystal Liquid Crystals Conference 2006, Keystone, Colorado, USA. Work presented as poster – *On predicting ferroelectric liquid crystal reduced spontaneous polarization or polarization power*, July 2-7.
- 29. Hiqmet Kamberaj**, Low, R.J., and Neal, M.P. (2005) 6th International Conference on Liquid Matter at Utrecht University, Utrecht, The Netherlands. Work presented as a poster – *Calculation of molecular chirality and helical twisting power*, July 1- 6.
- 30. Hiqmet Kamberaj**, Low, R.J., and Neal, M.P. (2005) British Liquid Crystal Society Annual Meeting at Exeter University, Exeter, UK. Work presented as a talk - *Calculations of the Molecular Chirality*, March 22- 26.
- 31. Hiqmet Kamberaj**, Low, R.J., and Neal, M.P. (2004) British Liquid Crystal Society Annual Meeting at Manchester Metropolitan University, Manchester, UK. Work presented as a talk and in poster format - *Applications of Calculations of the Molecular Chirality and Helical Twisting Power*, April 5-7.
- 32. Hiqmet Kamberaj**, Low, R.J. and Neal, M.P. (2003) 9th International Conference on Ferroelectric Liquid Crystals at Trinity College, Dublin, Ireland. Work presented in poster format – *Molecular structure and helical twisting power*, August 24-29.
- 33. Hiqmet Kamberaj**, Low, R.J., and Neal, M.P. (2003) British Liquid Crystal Society Annual Meeting at Cambridge University, Cambridge, UK. Work presented in poster format, April 7 -9.
- 34. Hiqmet Kamberaj**, Low, R.J., and Neal, M.P. (2002) 19th International Liquid Crystal Conference 2002, Edinburgh, UK. Work presented in poster format, June 30-July 5.

KEYNOTE SPEAKER

- 1. Hiqmet Kamberaj**, Computer Simulation and Modelling of Biological Molecular Systems, Advances in Molecular Biology Congress, 19-22 September 2022, Istanbul, Turkey.
- 2. Hiqmet Kamberaj**, Advances in Computer Simulations of Macromolecular Systems, 2nd International conference on New Computer Science and Engineering Trends, 30th of December 2021, Online.
- 3. Hiqmet Kamberaj**, Molecular Dynamics Simulations of DNA- and RNA-Protein Systems, 4th International Conference on Medical Devices (ICMD'2021), June 10-12, 2021, Gaziantep, Turkey.



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- 4. Hiqmet Kamberaj**, Replica Exchange using an Augmented Molecular Dynamics Method, 3rd International Conference on Artificial Intelligence towards Industry 4.0 (ICAII4'2020), 12-14 November 2020, Izmir, Turkey.
- 5. Hiqmet Kamberaj**, Advances in Computer Simulations of Macromolecular Systems, International Conference on New Computer Science and Engineering Trends, 1-2 July 2020, Istanbul, Turkey.

CONFERENCE/WORKSHOP ORGANIZER

- 1. Hiqmet Kamberaj**, Main organiser, Workshop on Computer Simulations of Macromolecular Systems, International Balkan University, 3-4 June 2021, Skopje, R. of North Macedonia, <http://www.icasem.ibu.edu.mk/workshops/>.
- 2. Hiqmet Kamberaj**, Associate Organizer, International Conference on Advances in Material Science 2020, October 3, 2020, India.

INVITED CONTRIBUTIONS

- 1. Hiqmet Kamberaj** (2010) 8th Conference of the Society of Physicists of Republic of Macedonia, Skopje, R. of Macedonia. The role of correlated motions in biomolecular systems, September 23-25.
- 2. Hiqmet Kamberaj** (2010) Causality of Correlated Motions in Biomolecular Systems & Novel Algorithm for Global Optimization Problems in Ligand and/or peptide-protein binding, Schrodinger Company, New York, NY USA, November 16.
- 3. Hiqmet Kamberaj** and Sham, Y. (2009) Gordon Conference on Computer aided Drug Design, Tilton, NH, USA. Computational Alanine Scanning of β -lactamase Inhibitor Protein and TEM-1 β -lactamase Complex, July 19- 24.
- 4. Hiqmet Kamberaj** (2004) Mini-Symposium on the Chirality and Nonlinearity in Liquid Crystals, The Rank Prize, UK. Work presented as a talk - Calculations of Molecular Chirality, Nov 29-Dec 2.
- 5. Hiqmet Kamberaj** (2004) Young Materials Modellers Forum at Daresbury Laboratory, UK. Work presented as a talk - Symplectic and Time Reversible Integrators for Molecular Dynamics Simulations of Rigid Molecules, May 27.

PANELS, SEMINARS, WORKSHOPS, FORUMS

- 1. Hiqmet Kamberaj**, Participant (Virtual) at Meeting ``Transversal Skills in Applied Artificial Intelligence - Curriculum Development'', January 17, 2023.
- 2. Hiqmet Kamberaj**, Participant (Virtual) at Scientific Forum on ``Physics at Pre-University System in Albania'', January 14, 2023.
- 3. Hiqmet Kamberaj**, Participant at Meeting ``Transversal Skills in Applied Artificial Intelligence - Curriculum Development'', September 29-30, 2022, Skopje, North Macedonia.
- 4. Hiqmet Kamberaj**, Panelist at Advances in Molecular Biology Congress, 19-22 September 2022, Istanbul, Turkey.
- 5. Hiqmet Kamberaj**, Chair of the Panel ``Computer and Communication Engineering I'', International Conference on



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- Applied Sciences, Engineering and Mathematics, June 3-4, 2021, Skopje, R. of North Macedonia.
6. **Hiqmet Kamberaj**, Inauguration Speech (4 minutes) and Associate Organiser, International Conference on Advances in Material Science 2020, October 3, 2020, India.
 7. **Hiqmet Kamberaj**, Chair of the Panel "Computer and Communication Engineering II", International Conference on Applied Sciences, Engineering and Mathematics, June 4-6, 2020, Skopje, R. of North Macedonia.
 8. **Hiqmet Kamberaj**, Chair of the Panel "Chemistry, Chemical and Environmental Engineering and Protein Engineering", International Conference on Applied Sciences, Engineering and Mathematics, June 4-6, 2020, Skopje, R. of North Macedonia.
 9. **Hiqmet Kamberaj**, Third Meeting of "Eco/Logical Learning and Simulation Environments in Higher Education", June 11-13 2019, Nicosia, Cyprus.
 10. **Hiqmet Kamberaj**, Second Meeting of "Eco/Logical Learning and Simulation Environments in Higher Education", February 2019, Skopje, R. of North Macedonia.
 11. **Hiqmet Kamberaj**, Kick-off Meeting of "Eco/Logical Learning and Simulation Environments in Higher Education", 7-10 November 2018, Viterbo, Italy.
 12. **Hiqmet Kamberaj**, Moderator of the Panel "Engineering Information Technology", 5th IBU International Student Congress 2018, "Investing in Youth for a Sustainable Future", 04-06 October 2018, Skopje, R. of Macedonia.
 13. **Hiqmet Kamberaj**, Moderator of the Panel "Engineering Information Technology", 4th IBU International Student Congress 2017, "The Creation of the New World in a Globalized Era", 05-06 October 2017, Skopje, R. of Macedonia.
 14. **Hiqmet Kamberaj**, Moderator of the Panel "Industrial Engineering", International Conference of Applied Sciences, Engineering and Mathematics (ICASEM 2017), 5-7 May 2017, Struga-Ohrid, R. of Macedonia.
 15. **Hiqmet Kamberaj**, Kick-off meeting and strategy workshop within the project "Needs Assessment, Strategy and Policy Development for National Technology Transfer Office", 3rd February 2015, Skopje, R. of Macedonia.

THESIS

Doctoral dissertation: Hiqmet Kamberaj (2005)

Title: *Simulation and modelling of liquid crystal mesophases linked to the design of real materials*, Manchester Metropolitan University, Manchester, United Kingdom,

Supervisors: Prof. Dr. Maureen Neal and Prof. Dr. Robert Low

Master Thesis: Hiqmet Kamberaj (2000)

Title: *The Influence of Detector Parameters on the Image Reconstruction for a Compton Camera*, University of Siegen, Siegen, Germany.

Supervisor: Prof. Dr. Nikolae Pavel

Undergraduate Thesis: Hiqmet Kamberaj (1996)

Title: *Thermodynamics and Dynamics of Two Dimensional Ising Spin Ladder Lattice Model*, B.Sc. Thesis (in Albanian), University of Tirana, Tirana, Albania.

Supervisor: Prof. Dr. Rexhep Meidani



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SOFTWARE

1. Interactive Molecular Dynamics Simulations of Biological Molecules (In Python & Fortran 90.) - Molecular Mechanics and Quantum Mechanics Simulations
2. BSANN (in Python & Fortran90). A python library for performing Bootstrapping Swarm Artificial Neural Network optimization (fitting and dimensionality reduction using encode-decode algorithm.)
3. SIFM (in Fortran 90), Symbolic Information Flow Measurement, A Software for Measurement of Information Flow Using Symbolic Analysis.
4. MMGBSA (in Fortran 90), A software for calculation of the solvation free energy of (bio)molecular systems (including polar and nonpolar terms).
5. BIOMCSIM (in C), A Monte Carlo software for computer simulation of biomolecular systems (Published in Computer Physics Communication journal).
6. SQPO (in C++), A Swarm Quantum Optimization general purpose code. 6) MDGOSim (in Fortran, C++), Swarm Particle Replica Exchange Molecular dynamics simulations of proteins using coarse- grained methods.
7. MDAnalTools (Matlab, Fortran, Python), A collection of programs and scripts for modeling and statistical analyzing of molecular dynamics simulations.

DATABASES/WEB-SERVICES

1. **Hiqmet Kamberaj** (2022-updated) A database for Helical Twisting Power of Chiral Molecular Dopants serving as an input for machine learning approaches.
2. **Hiqmet Kamberaj** (2020-updated) A database for macromolecular properties serving as an input for machine learning approaches.
3. **Hiqmet Kamberaj** (2020 - updated) Innovating pedagogies at tertiary level: a hypertext of good practices, ELSE Erasmus + Project, <http://hoc12.elet.polimi.it/else/io1/>

LECTURE NOTES

1. **Hiqmet Kamberaj** (2023) Lecture Materials (for Instructors and Students) in Artificial Intelligence in Finance, For the Transversal Skills in Applied Artificial Intelligence (TSAAI) - Curriculum Development, European Project (Erasmus+ ES01-KA220-HED-000030125).
2. **Hiqmet Kamberaj** (2020) Lecture Notes in Information Theory, International Balkan University, Skopje, R. of North Macedonia.
3. **Hiqmet Kamberaj** (2020) Lecture Notes in Physics I, International Balkan University, Skopje, R. of North Macedonia.
4. **Hiqmet Kamberaj** (2020) Lecture Notes in Discrete Mathematics, International Balkan University, Skopje, R. of North Macedonia.
5. **Hiqmet Kamberaj** (2016) Algorithms, International Balkan University, Skopje, R. of North Macedonia.
6. **Hiqmet Kamberaj** (2016) Lecture Notes In Physics II (Optics), International Balkan University, Skopje, R. of North Macedonia.



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7. **Hiqmet Kamberaj** (2016) Lecture Notes in Electromagnetic Theory. International Balkan University, Skopje, R. of North Macedonia.
8. **Hiqmet Kamberaj** (2014) Probability and Statistics. Essentials about Probability and Statistics, International Balkan University. Skopje, R. of Macedonia.
9. **Hiqmet Kamberaj** (2014) Thermodynamics & Statistical Physics, State University of Tetovo, Tetovo, R. of Macedonia.
10. **Hiqmet Kamberaj** (2012) Fundamentals of Medical Physics, State University of Tetovo, Tetovo, R. of Macedonia.
11. **Hiqmet Kamberaj** (2010) Introduction to Programming. An undergraduate engineering student textbook, International Balkan University, Skopje, R. of Macedonia.

MENTORSHIPS

PhD Students

1. Esra Albayrak (2022-Present; co-mentor) - PhD candidate, Marmara University, Faculty of Arts and Sciences, Department of Biology, Istanbul, Turkey.
2. Safa Sadaghiyanfam (2019-Present; co-mentor) - PhD candidate, Izmir Katip Celebi University, Department of Biomedical Technologies, The Graduate School of Natural and Applied Sciences, Izmir, Turkey.
3. Festim Kamberi (2021-Present; mentor) - PhD candidate, International Balkan University, Faculty of Engineering, Department of Computer Engineering, Skopje, R. of North Macedonia

Master Students

1. Sara Ismail (2021-2022), Computational Methods for Analyzing Next Generation Sequencing Data, International Balkan University, Skopje, R. of North Macedonia.
2. Xheneta Veseli (2022-2022), Inventory Management System with Django, International Balkan University, Skopje, R. of North Macedonia.
3. Hixhrete Demiri (2021-Present), Mathematical Formulation of Some Physics Concepts, State University of Tetovo, Tetovo, R. of North Macedonia.
4. Muhammed Shaban (2021-2022), Deep Learning, Machine Learning and Artificial Intelligence – General Assessment and their Relationships, International Balkan University, Skopje, R. of North Macedonia.
5. Berkay Karadeniz (2020-Present), Developing Mobile Application using React-Native and presenting the advantage of React and Single Page Applications (SPA), International Balkan University, Skopje, R. of North Macedonia.
6. Dahmir Rahmani (2020-2021): The Capsule – An Artificial Intelligence Job Interviewer, International Balkan University, Skopje, R. of North Macedonia.
7. Merjem Hoxha (2019 -Present): Design of a Virtual Classroom for Engineering Students, International Balkan University, Skopje, R. of North Macedonia.
8. Blerta Rahmani (2018-2020): The dynamics and their time-scales in macromolecular systems, State University of Tetova, Tetova , R. of North Macedonia.
9. Festim Kamberi (2017-2019): Development of a Web-Based University Career Network Center, International Balkan



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- University, Skopje, R. of North Macedonia.
10. Redona Izairi (2016-2018): Study of Protein-Protein Interactions Using the Molecular Dynamics Simulations, State University of Tetova, Tetova, R. of North Macedonia.
 11. Granit Nebiu (2017-2018): The Semantics of Web Design and Development, International Balkan University, Skopje, R. of North Macedonia.
 12. Dhurata Nebiu (2017 - 2018): Local and Average Transfer Entropy as an Information Flow Measure , International Balkan University , Skopje, R. of North Macedonia.

Undergraduate Students

- Mentored more than 40 (forty) undergraduate student projects.

COMMITTEE MEMBER OF MASTER THESIS

- **Master Thesis:** Amra Feta, Analysis and Design of Networks of Queues, International Balkan University, Skopje, 2021.
Position: President of the Committee
- **Master Thesis:** Enis Isov, Distortion performance of underwater acoustic MIMO mobile networks, International Balkan University, Skopje, 2021.
Position: Committee Member
- **Master Thesis:** Hajrija Kozica, Green selection using fuzzy data envelopment analysis, International Balkan University, Skopje, 2020.
Position: Committee Member
- **Master thesis:** Skofiar Kamberi, Composition of the Web Services for Student Evaluation System, International Balkan University, Skopje, 2017.
Position: President of the Committee
- **Master thesis:** Muhammed Narin, International Balkan University, Skopje, 2017.
Position: Committee Member
- **Master thesis:** Incinur Shabani, Personnel Selection Using Fuzzy Hybrid Multi-Criteria Decision Methods, International Balkan University, Skopje, 2017.
Position: Committee Member
- **Master thesis:** Burcu Cavus, Supplier Selection Process in Dairy Industry Using Fuzzy TOPSIS Method, International Balkan University, Skopje, 2014.
Position: Committee Member

INTERNSHIP STUDENTS

- January 2018: Merve ÇOLAK, Muğla Sıtkı Koçman University- (Formal Education), Faculty of Science, Molecular Biology and Genetic, Turkey.

VISITING RESEARCH SCHOLARS

- 2011: YALÇIN İŞLER, Ph.D., Assistant Professor, Zonguldak Karaelmas University Department of Electrical and



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Electronics Engineering, Zonguldak, Turkey.

- 2015: YALÇIN İŞLER, Ph.D. Assistant Professor, Izmir Qatip Celibi University, Department of Biomedical Engineering, Izmir Turkey.

SKILLS & ACTIVITIES

COMPUTER SKILLS

- Working Knowledge: Microsoft Office
- Working Knowledge: LaTeX
- Computer Programming Skills: Fortran, C/C++, Python, Java, PHP, HTML, Perl, awk, Shell Scripting, and Machine Learning Codes
- Development of Artificial Intelligence Platforms for Molecular Dynamics Simulations based on ChatBots
- Working and Training Skills: Parallel Programming (using MPI)
- Working and Training Skills: Matlab and Mathematica
- Working and Developer Knowledge: CHARMM Software (Chemistry at Harvard Macromolecular Mechanics), VMD (Visual Molecular Dynamics) program
- Working Knowledge: NAMD, Gromacs, CPMD software

OTHER SKILLS

- Chemical- and Bio-Physics
- Molecular Dynamics & Monte Carlo Simulations
- Computational Materials Science
- Computational/Theoretical Biophysics
- Principles of Thermodynamics
- Thermodynamics of Biological Phenomena
- Statistical Physics
- Protein Dynamics
- Classical and Quantum Mechanics
- Principal Component Analysis
- Applied Statistics & Probability
- Liquid Crystal Physics
- Ionic Liquids Physics
- Free Energy & Solvation Energy Calculations
- Cluster Analysis
- Mutual information and Transfer Entropy
- Symbolic Analysis
- Machine Learning Approaches
- Machine Learning in Physics
- Artificial Intelligence in Teaching
- Classroom Strategies in Teaching
- Entropy calculation
- Phase Transitions
- Chirality
- Molecular Modeling



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- Optimization Methods
- Random Sampling & Processes
- Biologically Inspired Optimization Methods
- MATLAB Simulation & Modelling
- Fluid Mechanics
- Academic Writing
- Differential Equations
- Numerical Integration
- Data Processing and Computer Science
- Computer Simulation of (Macro)Molecular Systems
- Calculation of Molecular Surfaces
- Swarm Particle Optimizations
- Analysis Tools for Molecular Dynamics and Monte Carlo Simulations
- Database & Web-based Services
- Development of Enhancement Conformation Sampling Techniques
- Replica Exchange Technique



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