



Dr. Amit Kumar

Professor (Assistant)



Room No. - A111, Department of Chemistry, Jamia Millia Islamia, New Delhi-110025 (India)



www.atslab.co.in



akumar1@jmi.ac.in

About me

I want to excel in whichever field I step in to maximum of my potential. I am always keen to enhance my scientific skills by diverse expanse of the subject for advanced research in the field of Polymer Physics.

Skills

C-Programming

Python

Mathematica

Mathlab

Scilab

Fortran-Programming

LaTeX

Research Interests

Our research group focuses on developing mathematical models for the complex polymeric and biological systems with strong interest in the underlying principles and advance theories of Statistical Physics, which help to understand the various application in today's world. Our research interests encompass a number of different areas of condensed matter theory, including the statistical mechanics of complex fluids, polymer physics. We are keen to enhance our scientific skills using the concepts and vision presented by the diverse expanse of the subject itself.

Education

- 2014 Ph.D. in Theoretical Physical Chemistry Univeristy of Delhi, India
Thesis Title: A Generalized Theoretical Model to Evaluate the Conformational and Dynamic Properties of Semiflexible Dendrimers.
Thesis Advisor: Prof. Parbati Biswas, FNSc
- 2008 M.Sc. Chemistry Ramjas College, Univeristy of Delhi, India
 First Division, Physical Chemistry (Specialization)
- 2006 B.Sc. (H) Chemistry R.D. & D. J. College, Tilkamanjhi Bhagalpur University, India
 First Division

Career Profile

- 2019-cont. Assistant Professor (Level-10): Department of Chemistry, Faculty of Sciences, Jamia Millia Islamia (A Central University by act of parliament), New Delhi, India
- 2014 -19 Assistant Professor (Level-10): Department of Chemistry, Kalindi College (University of Delhi), New Delhi, India

Awards

- 2008 All India Rank-1 in Ph.D. Entrance Examination of University of Delhi in Chemistry conducted by Department of Chemistry, University of Delhi.
- 2008 CSIR-UGC NET(JRF) in Chemical Sciences.
- 2010 CSIR-UGC NET(SRF) in Chemical Sciences.
- 2016 Shikshak Samman awarded by Hindu Shiksha Samiti Nyas, Vidya Bharti Akhil Bhartiya Shiksha Sansthan Delhi

Ongoing Research Projects

- 2020 *UGC-BSR Project No.: -F-30/569/2021(BSR)* Sanctioned as PI
 Project Title: Understanding mechanical and structural deformation of cross-linked polymer-grafted nanoparticles under varying solvent conditions using Theory & Computer Simulations
 Sanctioned Amount-10 Lakhs
- 2021 *DST SRG Project No.: -SRG/2021/001709.* Sanctioned as PI
 Project Title: Statistical theory to understand the conformational heterogeneity of hyperbranched polymers and its impact on their association with nucleic acids
 Sanctioned Amount-28 Lakhs

Completed Research Projects

- 2015 *DU Innovation Project No. 302/2015.* Completed as PI
 Project Title: Microbial Fuel Cell - An efficient benign set up for electrochemical cell for removing of impurities from Laboratory Generated waste Water
- 2015 *Antardwani Project No.2015.* Completed as PI
 Title: To develop online software for Internal Assessment of Students



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Contribution to corporate life of JMI

- 2021 Establishment of first smart computer laboratory in Department of Chemistry with minimum resources.
- 2022 13 students had been placed in a single drive for Dubai based company during my placement coordinators.
- 2022 Contributed as Guest Editor to a Special Collection celebrating the 100th in *ChemistrySelect Journal Anniversary JMI inception*.
- 2022 One of my Ph.D. students (Ms. Shelly Bhardwaj) had been felicitated by the Vice Chancellor for awarding the prestigious Prime Minister Research Fellowship (PMRF) under Lateral Scheme May 2022 at 102nd Foundations Day of Jamia Millia Islamia.
- 2022 Proposed an application based advanced paper in M.Sc. Course.

Teaching Assignment

Graduate Courses (Ph.D.)

Paper No-1: Research Methodology
Paper No-2: Statistical Mechanics of Polymeric System & Complex Liquids (Discipline Specific)

Post-Graduate Courses

MCH-104: Thermodynamics
MCH-206: Computational Methods in Chemistry
MCH-313: Nuclear Chemistry & Radioactivity
MCH-313: Advanced Statistical Mechanics
MCH-415: Advanced Physical Chemistry

Under-Graduate Courses

BCH-204: Polymer Chemistry
CHG-403: Physical Chemistry-II
Molecular Modelling & Drug Designing
Quantum Chemistry
Application of Computers in Chemistry

Computer Skills

- 1 Experience of running and administering various operating systems including Linux (Fedora Core/Debian/Red Hat Enterprise/CentOs/Ubuntu), WindowsXP/vista/7/10.
- 2 Knowledge of software like VMD, PyMol, Gaussian, Chemdraw, Argus-lab, AVogardo etc.

Member of Learned Body

- 1 Life time member of Society for Promotion of Education and Science (SPES), Delhi, India.
- 2 Life time member of Biophysical Society of India, India.



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Research Publications : *h-index*=9

Research Articles=15, E-content=1, Book Chapters=3, Book=1

- 2023 Book
Molecular Modelling & Drug Designing
Authors: [Amit Kumar](#) and Riu Payal
In Press, Publisher Toretto.
- 2023 Synthesis and Characterization of Conducting Polymer/Alginate Composite Hydrogels: Effect of Conducting Polymer Loading on the Release Behaviour of Metformin Drug
Aleena Mir, [Amit Kumar](#) and Ufana Riaz
Journal of Molecular Liquids, 372, 121193.
- 2022 Recent advances in the utilization of polyaniline in protein detection: a short review
Ufana Riaz, N. Nabi, [Amit Kumar](#) and D. K. Taylor
RSC Advances, 12, 32885-32897.
- 2022 Conducting Polymer-Based Micro- and Nano-batteries for Biomedical Applications: A Short Review
Nikita Singh, [Amit Kumar](#) and Ufana Riaz
ChemistrySelect, 7(27), e202201302.
- 2022 A Short Review on the Synthesis and Advance Applications of Polyaniline Hydrogels
Aleena Mir, [Amit Kumar](#) and Ufana Riaz
RSC Advances, 12, 19122-19132.
- 2022 Book Chapter
Electronic (e-waste): Chemical assessment and treatment methods
Shelly Bhardwaj, Shilpi Khurana [Amit Kumar](#)
ISBN: 978-0-323-90463-6, Publisher Elsevier.
- 2022 Book Chapter
Transnational transport of e-waste and implications on human well-being and climate change
Sangeeta, Shilpi Khurana [Amit Kumar](#)
ISBN: 978-0-323-90463-6, Publisher Elsevier.
- 2022 Book Chapter
Microbial fuel cell: a greener way to protect the environment
Poorna Khanna, [Amit Kumar](#)
Contamination of Water, Publisher Elsevier, 575-584.
- 2021 Practical scale up synthesis of carboxylic acids and their bioisosteres 5-substituted-1 H-tetrazoles catalyzed by a graphene oxide-based solid acid carbocatalyst
Rupali Mittal, [Amit Kumar](#) and Satish K Awasth
RSC Advances, 11(9), 11166-11176.
- 2019 *International Journal of Zoological Investigations*, 5, 33.
Kapinder, Tarkeshwar [Amit Kumar](#) and A. K. Singh
Orientation and behavioural responses of *Cotesia plutellae* (Kurdjumov) (Hymenoptera: Braconidae) towards honey and sucrose
- 2018 *E-Pathshala: Macromolecules*
[Amit Kumar](#) and Parbati Biswas
- 2016 *Journal of Rheology*, 60, 111.
Govind Ji Rai, [Amit Kumar](#) and Parbati Biswas
Dynamics of dendrimers with excluded volume: A comparison with experiments and simulations
- 2015 *The Journal of Chemical Physics*, 142, 174906
Govind Ji Rai, [Amit Kumar](#) and Parbati Biswas
Effect of excluded volume on the rheology and transport dynamics of randomly hyperbranched polymers



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2014

The Journal of Chemical Physics, 141, 034902.

Govind Ji Rai, Amit Kumar and Parbati Biswas

Intramolecular relaxation of flexible dendrimers with excluded volume

2013

Physical Chemistry Chemical Physics, 15, 20294.

Amit Kumar and Parbati Biswas

Orientational Relaxation in Semiflexible Dendrimers

2013

The Journal of Chemical Physics, 138, 104902.

Amit Kumar, Govind Ji Rai and Parbati Biswas

Conformation and intramolecular relaxation dynamics of semiflexible randomly hyperbranched polymers

2013

Soft Matter, 9, 2375.

Amit Kumar and Parbati Biswas

Semiflexibility induced range of conformations in dendrimers

2012

The Journal of Chemical Physics, 137, 124903.

Amit Kumar and Parbati Biswas

Conformational Transitions in Semiflexible Dendrimers Induced by Bond Orientations

2011

The Journal of Chemical Physics, 134, 214901.

Amit Kumar and Parbati Biswas

Intramolecular Relaxation Dynamics in Semiflexible Dendrimers. Also selected for *Virtual Journal of Biological Physics Research*, in the issue of June 15, (2011).

2010

Macromolecules, 43, 7378.

Amit Kumar and Parbati Biswas

Dynamics of Semiflexible Dendrimer in Dilute Solutions

Invited Talks

2019

Resource person and delivered a lecture on the topic Chemistry at the helm of Essential Oils, Cosmetics, Fragrances and Wellness in In-House Skill Development Course organised by Department of Chemistry, Daulat Ram College, University of Delhi, Delhi.

2019

Resource person and delivered a lecture on the topic A Generalized theory for Semiflexible Dendrimers in National Conference on Recent Trends and Advancements in Chemical Sciences organised by Department of Chemistry, University of Delhi and Bhaskaracharya College of Applied Sciences, University of Delhi in association with Society for Promotion of Education and Science (SPES), from 29-31 March 2019, held at University of Delhi.

Organized Conferences

2020

Organised as coordinator, Series-2: International Seminar on Multiscale Simulation & Mathematical Modelling of Complex Biological Systems organized by School of Computational & Integrated Sciences, Jawaharlal Nehru University, Delhi in association with Rice University, USA.

2019

Organised as coordinator, International Seminar on Multiscale Simulation & Mathematical Modelling of Complex Biological Systems organized by School of Computational & Integrated Sciences, Jawaharlal Nehru University, Delhi in association with Rice University, USA.

2019

Member of organising committee for National Conference on Recent Trends and Advancements in Chemical Sciences organised by Department of Chemistry, University of Delhi and Bhaskaracharya College of Applied Sciences, University of Delhi in association with Society for Promotion of Education and Science (SPES), from 29-31 March 2019, held at University of Delhi.



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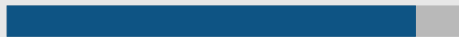
C-Programming



Python



Mathematica



Mathlab



Scilab



Fortran-Programming



LaTeX



2019

Organised as coordinator, a NAAC sponsored National workshop on Skill Enhancement at Institutions of Higher Learning: Training Today and Tomorrow through IQAC, Library and Science Departments, Kalindi College at Kalindi College, University of Delhi.

2019

Organised three day training workshop entitled as Entrepreneurship Awareness Camp for Science Student under Entrepreneurship Development Programme DST, Govt. of India, conducted by Department of Zoology in association with IQAC Kalindi College and National Institute for Entrepreneurship and Small Business Development (NIES-BUD), Ministry of Skill Development, Govt. of India at Kalindi College, University of Delhi.

Paper Presented/Conference Attended

2019

Paper presented in National Conference on Recent Trends and Advancements in Chemical Sciences and organised by Department of Chemistry, University of Delhi and Bhaskaracharya College of Applied Sciences, University of Delhi in association with Society for Promotion of Education and Science (SPES) at University of Delhi.

2019

Paper presented in National Seminar organised by Department of Zoology, Gargi college in association with Commission for Scientific and Technical Terminology, MHRD & Department of Higher Education at Gargi College University of Delhi.

2019

Paper presented in International Conference on Multiscale Simulation & Mathematical Modelling of Complex Biological Systems and presented a paper entitled "A theory to Predict Orientational Relaxation Dynamics of Protein" held from 30 January-1 February 2019, organised by School of Computational & Integrated Sciences, Jawaharlal Nehru University, Delhi in association with Rice University, USA.

2019

Paper presented in International Conference on 6th World Congress on Nanomedical Sciences: Chemical Biology, organised by Department of Chemistry, University of Delhi, Delhi in association with Jamia Hamdard University, Delhi.

2018

Paper presented in DST Sponsored National Seminar on Innovation in Sciences in Emerging Challenges in Health and Environment (NSHE-2018) organised by Department of Chemistry, Daulat Ram College, University of Delhi-110007. (Selected for Best Poster Award).

2018

Paper presented in the International Conference on Advances in Biological and Environmental Research for Human welfare organized by Department of Zoology, Deen Dayal Upadhyaya Gorakhpur University, Gorakhpur, Uttar Pradesh.

2018

Paper presented in the International Conference on Advances in Biological and Environmental Research for Human welfare organized by Department of Zoology, Deen Dayal Upadhyaya Gorakhpur University, Gorakhpur, Uttar Pradesh.

2017

Paper presented in UGC Sponsored National Seminar on Recent Innovations in Chemical Science and Environment Technology at Sri Aurobindo College, University of Delhi, Delhi-110017.

2017

Paper presented in DST Sponsored National Seminar on Saksham Mahila, Saksham Samaaj: Ek Vaigyanik Drishtikon: A Paradigm Shift Towards Empowerment of Women at Kalindi College, University of Delhi, Delhi-110008. (Selected for Best Poster Award).



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2017

Paper presented in National Conference on Environmental Sustainability and Wastewater Remediation: Current Status and Future Prospects organised by Department of Chemistry, Sri Venkateswara College (University of Delhi) in association with RSC (London).

2017

Participated in workshop DST Sponsored Third Lecture Workshop on Trans-disciplinary Areas of Research and Teaching by Shanti Swarup Bhatnagar Awardees at Deen Dayal Upadhyaya College, University of Delhi.

2016

Paper presented in International Conference on Green Chemistry in Environmental Sustainability & Chemical Education (ICGC-2016) organised by Department of Chemistry, Daulat Ram College, University of Delhi-110007.

2013

Paper presented in 50th Annual Convention of Chemists of Indian Chemical Society at Punjab University, Chandigarh, India.

2012

Paper presented in 4th Interdisciplinary Symposium of Materials Chemistry at B. A. R. C., Mumbai, India.

2010

Paper presented in 12th National Symposium in Chemistry at I. I. C. T., Hyderabad.

2010

Paper presented in Theoretical Chemistry Symposium at I. I. T., Kanpur, India.

2009

Attended school on Non-equilibrium statistical physics at R. R. I. Bangalore, India.

2007

Attended workshop on Green Chemistry Education at Department of Chemistry, University of Delhi (Sponsored by DST under Green Chemistry program).

2006

Attended workshop on Nanotechnology-Current Status & Challenges held under the aegis of the foundation of innovation and Technology Transfer organizes by I.I.T. Delhi.

Administrative Assignment

In Jamia Millia Islamia (Central University)

2019-Cont. Member of Board of Studies (BOS) of Department of Chemistry, Jamia Millia Islamia (A Central University)

2021-22 Placement Coordinator, Department of Chemistry, Jamia Millia Islamia (A Central University)

2021-22 In-charge Computer Laboratory, Department of Chemistry, Jamia Millia Islamia (A Central University)

In Kalindi College (University of Delhi)

2014-15 Advisory Committee member for Internal Quality Assurance Cell (IQAC), Kalindi College for National Assessment & Accreditation Council (NAAC).

2015-19 Core Committee Member for Internal Quality Assurance Cell (IQAC), Kalindi College.

2015-19 Member of software support team for using online module like Time-Table, Attendance, Admission etc in Student Management Software.

2016-19 Technical Committee member for Online Admission Committee.

2017-18 Co-convenor: Non-teaching Talent Show in Lehen the Inter-college Cultural Fest.



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- 2017-18 Member: Discipline committee for the event held for NCC-FEST UDAAN.
- 2014-15 Member: Compilation Committee for preparing Self-Study Report of Kalindi College for NAAC.
- 2015-16 Member: Steering Committee during the NAAC team visit in the Kalindi College.
- 2015-16 Member: Power-point presentation committee of Department of Chemistry for NAAC.
- 2014-18 Member: Discipline Committee, OBC Committee during undergraduate admission.
- 2015-19 Member: Committee for Organizing Lehen the Inter-college Cultural Fest.
- 2015-16 Member: Power-point presentation committee for Good Academic Practices in Antardhwani.
- 2015-19 Member: Registration committee for Cultural Festival LEHREN, Kalindi College.
- 2016-19 Member of Prize Committee for the Annual Day.
- 2016-19 Member of Scholarship Committee for the Annual Day.
- 2016-17 Member for printing certificates, poster and invitation card for UDAAN.
- 2015-16 Member for designing and instalation signage at various location in the College premises.
- 2015-16 Member for printing invitation card for HAWAN-2016 in the eve of Golden Jubilee Year.
- 2015-16 Committee Member for designing Kalindi College logo in the eve of Golden Jubilee Year.