CURRICULUM VITAE/RESUME

Dr. Arijit Mondal

Ph.D in Physics(Awarded on 14th Feb. 2020)
Jawaharlal Nehru University, New Delhi-110067

Personal Details:

Date of Birth:	02/04/1990	Sex:	Male
Category:	**GENERAL(UR)**	Father's name:	Ashok Mondal
Nationality:	Indian	Mother's name:	Rita Mondal
Languages:	Bengali, English, Hindi	Domicile:	West Bengal

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Career Objective:

To work hard and facilitate the process of self-enrichment and to give my best to the institution, where I work. To channelize my energies in a positive direction and to deliver the best possible service I can give.

Education:

Examination Passed	Board/University	Year of Passing	Total Marks	Marks Obtained	% of Marks /Grade	Class /Division	Subject Studied
Ph.D. Award date (14th Feb. 2020)	Jawaharlal Nehru University	**(2013-2019) Thesis Title-Configurational Entropy and Fragility of soft matter: A common basis using microscopic models** (Supervisor: Prof. Shankar Prasad Das)					

M.Sc.	Visva-Bharati University	2012	1200	738	61.5	1st	Physics
B. Sc.	Burdwan University	2010	800	481	60.12	1st	Phy.(H), Math.(S),Chem(S)
Higher Secondary	S.S,A. Institution	2007	500	370	74*	1st	Beng. Eng. Math, Phy., Chem., Bio.(A)
Secondary	S.S,A. Institution	2005	800	624	78	1st	Math., P.Sc., L.Sc, Eng., Beng. Hist., Geo.
GATE	IIT	2017	All India Rank-187				Physics
NET	CSIR-UGC	2018	Rank-LS-25				Physics
JEST	Research Institutes	2019	All India Rank-304				Physics
JAM	IIT	2012	All India Rank-206				Physics

***Without Counting Additional.**

Research Interest/Summary:

We are working on the glass System by using the Classical Density Functional Theory Approach(DFT**).** We calculate the free energy of a hard-sphere amorphous system by using Classical DFT. In classical DFT there are two methods of calculating the free energy of inhomogeneous system-Ramakrishnan-Yusuff free energy functional approach(RY) and Modified Weighted Density Functional Approach(MWDA). We extend this classical DFT by calculating the configurational entropy. The configurational entropy is defined as the difference between the total entropy and the configurational entropy of the system. Here MWDA approximation has been used to calculate the total free energy (or the total entropy) of the hard-sphere system. An amorphous structure-dependent behavior of configurational entropy is obtained here**.** This work has been **published** in Phy. Rev. E.

In our next project, we mapped the soft-sphere system with diameter σ interacting with pair-potential of the form $\epsilon\left(\frac{\sigma}{r}\right)^n$ (where n is the steepness parameter and ϵ is the strength of

interparticle potential) to a hard-sphere system with a properly chosen diameter(d) and estimate the free energy and the configurational entropy by using the aforementioned method. Here Barker-

Henderson equivalent diameter has been used to estimate the equivalent hard-sphere diameter of soft-sphere. The dynamics of the system is described by a term fragility which is the slope of relaxation time with volume fraction scaled with glass transition volume fraction. We calculate fragility of these kinds of system by linking thermodynamic quantity configurational entropy with dynamic quantity relaxation time through Adam-Gibbs relation. Here fragility is estimated from thermodynamic term configurational entropy, therefore, termed as Thermodynamic fragility. we have solved the Mountain-Zwangig(MZ) equations of high-frequency elastic modulus(shear-modulus and Bulk modulus) and numerically estimate the high-frequency elastic modulus of the aforementioned interacting potential system. The elastic response of the system is described by the term Poisson's ratio or the ratio of shear-modulus and Bulk modulus. In this work, a link between static elastic quantity Poisson's ratio with thermodynamic fragility is established (This work has been **published** to an international Journal(PTEP)).

In our third project, we have studied the elastic and dynamic properties of soft colloids. From the elastic energy curves of Mattson's. et. al. for soft colloids we obtained the steepness parameter(n) and strength(ϵ) when the interparticle potential has the aforementioned form by properly fitting MZ equation upon these. We have also done the same by using Hertzian potential as an interparticle interaction potential, where strength and diameter of the system have been taken as mapping parameters. Then by using these mapping parameters the high-frequency elastic properties of soft-colloids are estimated. A link between dynamics to elasticity for these colloid systems has been established later (This work had been **submitted** to an international Journal).

Publications:

Journal Publications:

(1) Dependence of the configurational entropy on amorphous structures of a hard-sphere fluid.

https://doi.org/10.1103/PhysRevE.96.012124

(2) A density functional theory model for fragility in the hard-sphere limit.

https://doi.org/10.1093/ptep/ptaa091

Conference Publication:

(3) Configurational entropy of a hard sphere system using Modified Density Functional Approximation(MWDA)
https://doi.org/10.1063/1.5113066

Working Papers:

4)Dynamic and Elastic properties of Soft-Colloids: A link through inter-particle Potential. **Submitted** to Journal of Rheology.

Achievements:

Exam. Qualified	Year	All India Rank
CSIR-UGC National Eligibility Test (NET)	Dec.2017	Lectureship-25
JEST	2019	304
GATE	2017	187
JAM	2012	206

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Seminars/Conferences attended:

1. Poster presentation and a conference proceeding at DAE conference. Date:18th Dec. 2018.
2. Bangalore School of Statistical Physics. Date:2nd June 2015 to 18th June 2015.

Teaching Assistantship:

Advanced Statistical Physics course (2015) at JNU

Technical skills:

- **Language:** C, Fortran, Latex
- **System Software:** Windows, Linux Mint, Ubuntu, Elementary Os, Zorin 9, Pippermint Os.

- **Application software:** Microsoft Office, Notepad++, Microsoft Excel. powerpoint

Date: 28.07.2019

Place: New Delhi, India **Signature**