Curriculum Vitae at a Glance

1. **Name** : **Saeed Uddin**

2. **Age on July 31, 2011** : **50 Years**

3. **Present Position** : **Professor** ***in Department of Physics, Jamia Millia Islamia***

   Earlier Joined as Permanent Lecturer on **14.09.1998** in Department of Physics, Jamia Millia Islamia (A Central University by an Act of Parliament), New Delhi.

4. **Address** : **Department of Physics, Jamia Millia Islamia, New Delhi – 110025**

5. **E-mail** : **saeed_jmi@yahoo.co.in**

6. **Phone** : **(91) 11 26981160 (Res.), 26984631 (Off.) 9868369246 (M)**

7a. **Academic Record :**

Examinations/ Degrees	Year	Institution	% of Marks	Merit
B.Sc.	1985	Banaras Hindu University	65.6	-
M.Sc.	1987	do	77.9	***Gold Medalist***
Ph.D.	1991	do		

7b. CSIR – UGC Exam : JRF - NET - 1987

8. Total Teaching Experience : 17 Years (UG – 17 yrs and PG – 17 yrs)

13 Years (at Jamia) + 4 Years (at Banaras Hindu University)

9. Number of Years of Research Experience : 18 yrs. (After Completing Ph.D.)

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10. Total Publications : (27)

S.No.	Name of Journal	No. of Papers
1.	Physical Review	4
2.	Physical Letters	6
3.	Zeit. Fur Physik	2
4.	Euro. Phys. Jour. C	1
5.	J. Phys G. (IoP, Bristol)	1
6.	Prog. Theo. Phys. (Japan)	1
7.	Int. Jour. Mod. Phys. A	1
8.	Acta Physica Polonica B	1
9.	Others (*Conference, Symposium Proceedings etc.*)	10

11. Papers in *Single Authorship* : International (4)

S. No.	Name of Journal	No. of Papers
1.	Physics Letters	2
2.	J. Phys. G	1
3.	Euro. Phys. Jour C	1

12. Citations : *11* (In International Journals) + *1* (arXiv) = *12*

13. Major Project Running : One

Project Title : A Study of multi-Particle Production Phenomenon Ultra-relativistic Nucleus-Nucleus Collisions

Total Grant : 6.318 Lakhs Duration : 3 Years Funding Agency : UGC

14. Ph.D. Students : Degree Awarded - 1

No. of students currently working for Ph.D. - 3

Project Fellow currently working - 1

15. (Other) Administrative Assignments :

A) ***Coordinator*** **- B.Sc (Vocational) Instrumentation Course,** ***(since 1999 – continued)***, a **UGC sponsored** Job and Training Oriented three-years Regular Course in B.Sc.

B) ***Superintendent*** of "Entrance Tests of ***all the Centres of Jamia*** in ***2008***, ***2009 and 2010***"

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16. Conference Organizations :

A) "Organizing Secretary" of ***"International Workshop on Physics of Semiconductor Devices"*** to be held during December 14 – 18, 2009.

B) "Session Co-Chairman" for Physics in **Uttarakhand Science Congress** on 11 November 2009, G.B.P. University, Pantnagar, Uttarakhand.

C) "Organizing Secretary" of the DRS National Seminar on ***Condensed Matter, High Energy and Nuclear*** **Physics**, held during 23 – 24 March 2009.

D) "Organizing Secretary" of the DRS National Seminar on ***Condensed Matter, High Energy and Nuclear*** **Physics**, held during March 2008.

17. Additional Departmental Assignments :

In-Charge **B.Sc. Laboratory :** 5 years, has been involved in the (re)setting of the B.Sc. II and III year Labs.

18. Visits Abroad : 2

Visited International Centre for Theoretical Physics (ICTP), Trieste, ITALY on invitation as a Short Term Visitor during October 1993 – January 1994 and again during June to September 1995.

19. Invited Lectures :

- Delivered an invited talk on **"Ultra-relativistic Nucleus-Nucleus Collisions : What can we learn about the Fundamental Building Block of Nature"** Workshop on **"Current Trends in Physics - 2009"**, Department of Physics, Ch. Devi Lal University, Sirsa, Haryana, 24 October 2009.

- Delivered an invited talk on **"Multiple Fireball Formation and Rapidity Spectra of Protons, Antiprotons and Kaons at RHIC : What We Can Learn About Nuclear Transparency Effect"**, Proceedings of the **18th DAE-BRNS Symposium on High Energy Physics** ***Vol. 18,*** held at Department of Physics, **Banaras Hindu University**, Varanasi, during 14 – 18, December 2008.
- Delivered a Popular Level Talk under the auspices of Indian Physics Association (J.M.I. Chapter) on **"Ultra Relativistic Nucleus-Nucleus Collisions : Formation of Quark Gluon Plasma"** at the Department of Physics, J.M.I. in March 2006.

- Delivered a popular level talk on **"Nuclear Energy, Sun and Nuclear Reactors"** to the teacher participants at the Teachers Training Institute, Jamia Millia Islamia, New Delhi-110025 on 17 September 2002.

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- Delivered a lecture at the Tata Institute of Fundamental Research (**TIFR**), Bombay as a category "**A**" speaker under the TPSC program in March 1994 on the **"Equation of State of Finite-size Hadrons with Hard-core Repulsion and their Thermodynamical Consistency" i**n March 1994.

- Delivered a lecture on **"Signals of QGP"** at a workshop on "Physics and Astrophysics of Quark Gluon Plasma" held during July 9 - 11, **1991** at the Variable Energy Cyclotron Centre (**VECC**), Calcutta, India.

20. Awards / Honours :

- Received the MAAS **Best Paper Award** (Aligarh Muslim University) in 1997.
- Was selected as **category "A" speaker** under the **Theoretical Physics Seminar Circuit (TPSC) program** 1997-98.
- Received the MAAS **Best Paper Award** (Aligarh Muslim University) in 1995.
- Was selected as **category A speaker under the Theoretical Physics Seminar Circuit (TPSC)** program 1993-94.
- Qualified the **Joint CSIR-UGC** examination 1987 required for the award of **Junior Research Fellowship and Lecturer-ship.**
- Was awarded **UGC National Scholarship** in M.Sc.
- Was awarded **Gold** Medals for securing highest marks in M.Sc. (Physics) examination.

21. Publications (*Brief Description of Work*) :

- In total has **27 apers, in International Journals/ Proceedings/ Reports/ arXiv.**
- Some of these have been cited/referred by other international workers in the field (see the list of publications and citations/references).
- **Four** papers (**2** in Phys. Lett. ***B*** + **1** in J. Phys. ***G*** + **1** in Eur. Phys. J. ***C*** = ***4***) are in my **single authorship**.
- The paper (printed in Int. J. Mod. Phys. A) entitled "Pion Production and Collective Flow Effects in Intermediate Energy Nucleus-Nucleus Collisions" proposes a model to analyze the possible outcome of nuclear collisions at Intermediate Energies. The model describes a spherically symmetric **collective flow of a gas of hadrons**. Further the same model is applied to analyze the pion production data in detail. The said published ***paper involves 21 printed pages***.
- Our recent work on the analysis of the highest energy RHIC data has been carried out in the frame work of a new extended statistical thermal model. Though significant amount of theoretical work has been done to analyze the transverse mass data however very little has been done to explain the rapidity spectra of hadrons. This study is also very important in the view that there is a strong

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evidence of the chemical potential being rapidity dependent. We have shown that by using a rapidity dependent baryon chemical potential approach it is possible to explain the proton, antiproton, the ratio $\bar{p}/p$, $p-\bar{p}$, π, Kaon and antiKaon data simultaneously. The above analysis is vital in understanding the *effect of nuclear transparency at very high energy* central nuclear collisions. We have calculated several other particle ratios having different masses, which were otherwise difficult to describe through a theoretical analysis, (**cf. S. No. 22 - 24 of the list of publications**).

- In a very interesting analysis recently we have studied in detail the role of the resonance decay on the rapidity spectra of hadrons at the highest RHIC energy, (**cf. S. No.23-25 of the list of publications**).

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List of Publications

1. Singh, C.P. and **Saeed-Uddin** : Strangeness abundance as a signal of quark gluon plasma, **Phys. Rev. D41**, 870-874, (1990).

2. Singh, C.P. and **Saeed-Uddin** : Has a quark gluon plasma been observed at BNL?, **Prog. Theo. Phys. 83**, 77-83, (1990).

3. Singh, C.P., **Saeed-Uddin** and Kamal, A.N. : Negative binomial multiplicity distribution and the energy dependence of the parameters, **Phys. Lett. B237**, 284-286, (1990).

4. Singh, C.P. and **Saeed-Uddin** : On Singh-Uddin-Kamal relation in negative binomial distribution, **Phys. Lett. B243**, 165-168, (1990).

5. Singh, C.P., Shyam, M. and **Saeed-Uddin** : Negative binomial distribution for hadron-nucleus interactions, **Phys. Lett. B255**, 139-142, (1991).

6. **Saeed-Uddin** and Singh, C.P. : Effect of hadronic hard-core radius on the phase transition to an interacting quark-gluon plasma, **Zeit fur Physik C53,** 319-323, (1992).

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7. **Saeed-Uddin** and Singh, C.P. : Dependence of K/pi ration on temperature and chemical potential as a signature of quark gluon plasma, **Phys. Lett. B278**, 357-362, (1992).

8. Singh, C.P. and **Saeed-Uddin** : Strangeness: signal of QGP, Proceedings of the Second International Conference on **"Physics and Astrophysics of Quark-Gluon Plasma"** at Variable Energy Cyclotron Centre (VECC), Calcutta, India, January, 1993, 266-274 (World Scientific. Singapore).

9. Singh, C.P., Patra, B.K. and **Saeed-Uddin** : Baryon number fluctuations in a quark-hadron phase transition, **Phys. Rev. D49**, 4023-4027, (1994).

10. **Saeed-Uddin** and Singh, C.P. : Equation of state of finite-size hadrons : Thermodynamical consistency, **Zeit. Fur Physik C63**, 147-150, (1994).

11. **Saeed-Uddin** : Thermodynamical consistency of EOS of finite-size hadrons and the quark hadron phase transition, **Phys. Lett. B341**, 361-366, (1995).

12. **Saeed-Uddin** (1995): Strangeness production and thermal freeze-out conditions in S-S collisions at 200 GeV/A, **ICTP Preprint no. IC/1995/110.**

13. **Saeed-Uddin** (1995): Meson production from a rapidly hadronizing quark gluon plasma, **ICTP Internal Report no. IC/95/146.**

14. **Saeed-Uddin** and Waheed , A. (1995): Chemical freeze-out conditions in intermediate energy heavy-ion collision, **ICTP Internal Report no. IC/1995/308.**

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15. Patra, B.K., Singh, K.K., **Saeed-Uddin** and Singh, C.P. : Baryon-number density in hadronic gas models and baryon-asymmetry in the early universe, **Phys. Rev. D53**, 993-996, (1996).

16. Tiwari, V.K., Singh, S.K., **Saeed-Uddin** and Singh, C.P. : Strangeness conservation constraints in hadron gas models, **Phys. Rev. C53**, 2388-2393, (1996).

17. **Saeed-Uddin** : Fast hadronization of a quark gluon plasma and meson production, **Phys. Lett. B406**, 123-129, (1997).

18. **Saeed-Uddin** : Thermo-chemical equilibrium and strangeness production at freeze-out in S-S collisions at 200 GeV/A, **J. Phys. G24**, 779 - 789, (1998).

19. **Saeed-Uddin** : Quark-hadron phase transition and strangeness conservation constraints, **Euro. Phys. Jour. C6**, 355-363, (1999)

20. **Saeed Uddin :** Quark Gluon Plasma **:** Analyzing Strangeness (unpublished) (2004)

21. **Saeed Uddin,** N. Akhtar and M. Ali : Pion Production and Collective Flow effects in Intermediate Energy Nucleus-Nucleus Collisions, **Int. Journ. Mod. Phys. A21,** 1471-1492, (2006)

22. **Saeed Uddin et. al.** : Multiple Fireball Formation and Rapidity Spectra of Protons, Antiprotons and Kaons at RHIC : What We Can Learn About Nuclear Transparency Effect, Proceedings of the **18th DAE-BRNS Symposium on High Energy Physics,** December 14 - 18, 2008, pp 279 – 284**,** held at Department of Physics, Banaras Hindu University, Varanasi.

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23 **Saeed Uddin et. al.** : Net Proton Flow and Nuclear Transparency Effects at RHIC : A Multiple Fireball Model approach (**arXiv 0901.1376 [hep-th]**) 2009.

24 **Saeed Uddin et. al.** : Extended Statistical Thermal Model and Rapidity Spectra of Hadrons at 200 GeV/A (**arXiv 0911.0246v1 [hep-ph]**) 2009.

25. **Uddin et. al.** : Longitudinal Hadronic Flow at RHIC in Extended Statistical Thermal Model and Resonance Decay Effects, **Acta Physica Polonica B (Vol. 41, No. 11, 2010).**

26. **Saeed Uddin et. al.** : A Unified Approach Towards Describing Rapidity And Transverse Momentum Distributions In Thermal Freeze-Out Model (To appear in the Proceedings of International Conference on Physics & Astrophysics of Quark Gluon Plasma 2010 in Nuclear Physics A),also on **arXiv 1101.0918** and **Journal of Physics G** (under review**).**

27. **Saeed Uddin et. al.** : Quark Hadron Phase Transition in a Relativistic Mean Field Theory with Finite Volume Correction.
(To appear in the Proceedings of International Conference on Physics & Astrophysics of Quark Gluon Plasma 2010 in Nuclear Physics A), also on **arXiv**.

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CITATIONS/REFERENCES OF WORK

The research work done and published in various international journals have been cited/referred by other workers. Details are given below:

(i) The paper published in Phys. Lett. B406, 123 (1997) has been referred by Johann Rafelski and Jean Letessier in their published in Phys. Rev. Lett. 85, 4695 (2000).

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(ii) The work on the inclusion of hard-core repulsion among baryons and its effect on the critical parameters of the quark-hadron phase transition published as a paper in Physics Lett B341, 361 (1995) has been cited /referred by A.S. Parvan, V.D. Toneev and M. Ploszajczak in their paper published in Nuclear Physics A676, 409 (2000).

(iii) The paper published in J. Phys. G24, 779 (1998) has been referred by Jean Letessier and Johann Rafelski in their paper published in Acta Phys. Pol. B30, 153 (1999)

(iv) The paper published in Phys. Rev. C53, 2388 (1996) has been cited by Joseph Sollfrank in his papers in J. Phys. G23, 1903 (1997), University of Bielefeld preprint no. BI-TP-97-21, July 1997 and in his another paper published in Euro. Phys. Jour. C9, 69 (1999).

(v) The work done and published in Zeit. fur Physik C63, 147 (1994) as CSIR Research Associate has been cited/referred by Joseph Sollfrank in his paper which appeared in J. Phys. G23, 1903 (1997).

(vi) During the period of the CSIR Research Associateship the work done and published in Phys. Rev. D49, 4023 (1994) has been cited by De-fu Hou and Jia-rong Li in their paper published in Nucl. Phys. A618, 371 (1997).
The above paper has also been cited/referred by Deepak Chandra and Ashok Goyal in their paper in Int. J. Mod. Phys. A19, 5221 (2004).

(vii) The work done and published as a paper in Zeit. fur Physik C53, 319 (1992) during the course of the Ph.D. work has been cited/referred by Bi Pin-zhen and Shi Yao-ming in their paper published in Zeit. fur Physik C75, 735 (1997).

(viii) The work done and published in Phys. Lett. B278, 357 (1992) has been cited/referred in the paper of A. Nyfeler, published in Zeit. fur Physik C60, 159 (1993).

(ix) The work done and published as the first paper in Phys. Rev. D41, 870 (1990) during the course of the Ph.D. work has been cited/referred by Yamada et. al. in their paper published in Phys. Rev. D44, 617 (1991).

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A SHORT OUTLINE OF OVERALL RESEARCH WORK DONE

In general, the calculations, results and the suggestions presented in all the papers are new. However, in particular the model to derive the EOS of the hot hadronic matter incorporating the hard-core repulsion in a rigorously thermodynamically consistent manner was quite unique and suggested for the first time (cf. S. No. 9 and 10 of the list of publications).

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Similarly another model to calculate the relative abundance of various hadrons emitted from a rapidly hadronizing quark gluon plasma was also suggested for the first time by the author (cf. S. No. 13 and 19 of the list of publications). This model incorporates the kinematical aspects of the hadronization process in a rigorous way, which was ignored earlier. This model helps to calculate the relative abundance of hadrons having same valence quark structures but different masses which are emitted from QGP e.g. K and K^*, etc.

In an exhaustive analysis of the data on strangeness abundance at the CERN-SPS using the above mentioned thermodynamically consistent model, it has been found that although the mesons are generally supposed to be not affected by the hard-core hadronic repulsion yet their abundance is affected by the presence of baryons and antibaryons because these occupy a certain fraction of the total volume of the system (cf. S. No. 14 of the list of publications).

In an interesting analysis (cf. S. No. 15 of the list of publications) it has been suggested that it may not be possible for the strongly interacting matter to negotiate an equilibrium first order phase transition with strictly conserved strangeness. Hence the non-equilibrium effects may play more important role. The above study also indicated that the conservation of strangeness within the equilibrated HRG phase could be achieved only if the region of space occupied by the hadrons (having hard-core repulsive interaction) is not available to the “thermal mesons”. This is in perfect agreement with the observation made in the previous analysis of the CERN-SPS experimental data (cf. S. No. 14 and 17 of the list of publications).

Recently I have been working on the multi-particle production in nucleus-nucleus collisions in the framework of the fireball models. The systematic of this may also help throw some light on the onset of the much expected de-confinement phenomenon of the hadronic matter to quark gluon plasma (QGP). I have analyzed the spectra of various hadrons produced in such collisions.

A detailed analysis of rapidity spectra of strange as well as non strange hadrons has been carried out in the frame work of the extended statistical thermal model. We find that the model is capable of describing these spectra very well.

We are presently developing a model and working out certain parameterizations to explain the transverse momentum and rapidity spectra simultaneously through a single model.

With the LHC and particularly the ALICE project nearing their completion such analyses will be useful to know that what we can expect in ultra relativistic nuclear collisions at very high energy densities of the fireball formed.

We developed a unified model to describe the transverse and the rapidity spectra of the various hadrons produced in ultra-relativistic nuclear collisions. This is achieved in a single statistical thermal freeze-out model. The RHIC data on transverse momentum and rapidity can be successfully described by this unified model using single set of model parameters.

Besides we are also studying the Quark Hadron phase transition phenomenon in the framework of a relativistic mean field model, where we also incorporate the hadron’s finite size effects.

All the above models and analyses are interesting and important in understanding the behaviour of the hadronic matter under extreme conditions of temperature and density.

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