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CURRICULUM VITAE

MUHAMMAD ATIF SULTAN

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PERSONAL DETAILS

Father's name:	Muhammad Sultan Akhter
CNIC No:	33301-8163910-7
Domicile:	Punjab (T. T. Singh).
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DETAILS OF THE WORK PLACE

Name of the institution:	University of the Punjab, Lahore-Pakistan
Designation:	Lecturer
Working since:	September, 2014
Address:	Centre for High Energy Physics, University of the Punjab, Quid-e-Azam Campus, Lahore-Pakistan
Telephone:	+92 42 99231137 ext.307

PROFESSIONAL WORK EXPERIENCE

- Lecturer in Centre for High Energy Physics, University of the Punjab, Lahore-Pakistan (September 2014-to-date).
- Three years experience as Lecturer in Department of Technology, The University of Lahore, Lahore-Pakistan.
- One year experience as visiting lecturer in Department of Physics, University of the Punjab, Lahore-Pakistan.
- Six months experience as visiting lecturer in Centre for High Energy Physics, University of the Punjab, Lahore-Pakistan.
- Six months experience as a Teacher Assistant in Centre for High Energy Physics, University of the Punjab, Lahore-Pakistan.

ACADEMIC HISTORY

PH.D HIGH ENERGY PHYSICS   **(IN PROGRESS)**
CENTER FOR HIGH ENERGY PHYSICS, UNIVERSITY OF THE PUNJAB, LAHORE.

M.PHIL HIGH ENERGY PHYSICS
CENTER FOR HIGH ENERGY PHYSICS, UNIVERSITY OF THE PUNJAB, LAHORE.

B.SC (HONORS). COMPUTATIONAL PHYSICS
CENTRE FOR HIGH ENERGY PHYSICS, UNIVERSITY OF THE PUNJAB, LAHORE.

SUPERVISION OF THESES

Master Theses: (in progress)	**2**
Name of the student:	**AHSAN SAJJAD**
Department and institution:	HIGH ENERGY PHYSICS, UNIVERSITY OF THE PUNJAB, LAHORE, PAKISTAN
Name of the program:	M.PHIL HIGH ENERGY PHYSICS
Title of the thesis:	DECAYS OF HYBRID MESON
Expected Date of completion:	**02/2017**

Name of the student: IQRA LIAQAT
Department and institution: HIGH ENERGY PHYSICS, UNIVERSITY OF THE PUNJAB, LAHORE, PAKISTAN
Name of the program: M.PHIL HIGH ENERGY PHYSICS
Title of the thesis: SCHWINGER-DYSON APPROACH IN FINITE TEMPERATURE QED
Expected Date of completion: **09/2017**

Undergraduate Projects: (Concluded) 2

RESEARCH INTEREST

I am working and have interest in non-perturbative quantum chromodynamics (QCD).
My research interest spans the study of the non-perturbative dynamics of QCD and quantum electrodynamics (QED) through the Dyson-Schwinger equations (DSE's) under normal conditions. More concretely, my work involves research concerning chiral symmetry breaking and confinement, quark-gluon interaction, hadron physics. I am also working on the potential model for mesons and its extension for hybrid mesons. I have mainly works on models for the interaction between quark and anti-quark to study the spectroscopy, decays and properties of mesons.

PUBLICATIONS

- "Higher Hybrid Chatmonia in an Extended Potential Model", **M. Atif Sultan**, Nosheen Akbar, Bilal Masud and Faisal Akram, **Phys. Rev. D 90, 054001 (2014).**
- "Higher Hybrid Bottomonia in an Extended Potential Model", Nosheen Akbar, **M. Atif Sultan**, Bilal Masud and Faisal Akram, **Submitted in Phys. Rev. D.**

Articles in preparation

- "Dynamical Chiral Symmetry Breaking Through Full Quark-Gluon Interaction ", **M. Atif Sultan,** Faisal Akram, Bilal Masud and Adnan Bashir.
- "Decays and spectrum of bottom and bottom strange mesons", Ishrat Asghar, Bilal Masud, E. S. Swanson, Faisal Akram and **M. Atif Sultan.**

TALKS PRESENTED IN CONFERENCES

Name of the event: "8TH INTERNATIONAL MEETING ON PARTICLES AND FIELDS 2015" TO BE ORGANIZED BY COMSATS INSTITUTE OF INFORMATION TECHNOLOGY, LAHORE - PAKISTAN
Title of the talk: *CRITICAL NUMBER OF QUARK FLAVORS IN QCD*

ORGANIZATION OF CONFERENCE

- "8th International Meeting on Particles and Fields 2015" to be organized by COMSATS institute of Information Technology, Lahore - Pakistan (Member National Advisory Committee).
- "7th International Meeting on Particles and Fields 2015" organized by Centre for High Energy Physics, University of the Punjab, Lahore – Pakistan (Member Organizing Committee).
- "5th International Meeting on Particles and Fields 2012" organized by Centre for High Energy Physics, University of the Punjab, Lahore - Pakistan (Member Organizing Committee).

SEMINAR/WORKSHOP/CONFERENCE ATTENDED

- "5th School on Large Hadron Collider (LHC) Physics at NCP 2016" organized by the National Centre for Physics (NCP), Islamabad - Pakistan.
- "International Symposium on Physics Beyond Standard Model October 05-09, 2015" organized by National Center for Physics (NCP), Islamabad – Pakistan.
- "Symposium on Particle Physics December 17-19, 2014" organized by National Center for Physics (NCP), Islamabad – Pakistan.
- "6th International Meeting on Particles and Fields 2014" organized by National Center for Physics (NCP), Islamabad – Pakistan.
- "36th International Nathiagali Summer College on Physics and Contemporary Needs 2011 (1st scientific activity in particle physics)" organized by National Center for Physics (NCP) and Pakistan Atomic Energy Commission, Islamabad - Pakistan.
- "2nd School on Large Hadron Collider (LHC) Physics at NCP 2011" organized by the National Centre for Physics (NCP), Islamabad - Pakistan.
- "35th International Nathiagali Summer College on Physics and Contemporary Needs 2010 (2nd activity scientific computing and mathematical modeling)" organized by NCP and Pakistan Atomic Energy Commission, Islamabad - Pakistan.
- "International Scientific Spring March 2010 "organized by National Center for Physics (NCP), Islamabad – Pakistan.
- "PIP International Conference 2009" organized by Physics Department, University of Engineering and Technology, Lahore – Pakistan.

TEACHING EXPERIENCE

Undergraduate Course: 7

Course Title	**Computational Physics Simulation I, II**
	Giordano & Nakanishi: Computational Physics
	Gould, Tobochnik, & Wolfgang Christian: An Introduction to Computer Simulation Methods
Course Title	**Scientific Computing I**
	M. Heath : Scientific Computing, An Introductory Survey
	Bahder: Mathematica for Scientists and Engineers
Course Title	**Numerical Linear Algebra**
	Gerald : Applied Numerical Analysis
	McCalla: Introduction to Numerical Methods and FORTRAN Programming
Course Title	**Introduction to Computer Science**
	P. K. Sinha: Computer Fundamentals
Course Title	**Waves & Optics**
	Greiner: Classical Mechanics
	A. Ghatak: Optics
Course Title	**Modern Physics**
	Beiser: Concepts of Modern Physics
	Halliday, Resnick & Krane: Physics

| Course Title | **Applied Physics** |
| | Halliday, Resnick & Walker: Fundamentals of Physics |

COMPUTER SKILLS

- **Programming Languages**
  C/C++, FORTRAN and Mathematica.

- **Software Skills**
  Windows, Microsoft Office, Microsoft Visual C#, C++ 4, 5, 6, 8 and 12, Borland C++ 5.02, Dev C++, Turbo C, Mathematica 5, 6, 7, 8 and 9, FORTRAN 77 and 90.

B.SC (HONS) DEGREE PROJECT

Simulation of electron's motion in One Dimension (Quantum Mechanically) using Windows Programming techniques.
- **Bound States Simulation**
- **Scattering States Simulation**

This project seeks to explain the computational approach used for physical problems to be simulated on the computer. Quantum mechanics of electron moving in one dimension is studied for suitable potential wells and potential barriers. Results of different calculations and properties are plotted on the screen using numerical techniques of solving differential equations and calculating derivatives and integrals numerically. Hence different terms of the quantum mechanics of such physical problem are verified within a suitable tolerance. Just like bound states, scattering states, stationary states, quantum states, normalization, orthogonality, expectation values, principal of superposition, reflection and transmission probabilities.

M.PHIL THESIS

Searches for Exotic Hadrons in $\Psi(2S)$ Decays.
In this thesis, the production of exotic particles is discussed in $\Psi(2S)$ decays. It starts with the background of different types of particles. These particles are recognized on the basis of their properties. The established hadron states are compared to the quark model predictions and most hadron states are found to be well explained by the quark model. Expectations for hadrons lying outside the quark model are also mentioned in detailed. These states include hadron states with excited gluonic degrees of freedom (hybrids and glueballs), as well as multiquark states. In the end, the masses of J/Ψ and $\Psi(2S)$ are computed and compared with results published in different journals and research papers.