

## Curriculum Vitae

### M. Saleem, Ph.D.

Faculty of Physics

Department of Physics

Bellarmino University, Louisville, KY 40205

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### Education:

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*State University of New York at Albany, NY* (May 2005)

#### Ph.D. Experimental High Energy Particle Physics

*Thesis Topic:* Measurements of  $\Lambda_c^+$  Branching Fractions for Cabibbo-Suppressed Decay Modes using the BABAR Detector. **Thesis on SLAC Data base:** SLAC-R-793

**Published as a peer reviewed paper in Physical Review D:** Phys. Rev. D75, 052002 (2007),

**Conference publication :** ICHEP 2004. (arXiv:hep-ex/0408024) ,

SLAC-PUB-10593, BABAR-CONF-04/04

*State University of New York at Albany, NY* (May 2001)

#### M.S. in Physics

*Quaid-e-Azam University, Islamabad, Pakistan* (Dec. 1996)

#### M.Phil. in Theoretical Particle Physics

*Punjab University, Lahore, Pakistan* (May 1992)

#### M.S. in Physics

*University of Central Oklahoma, Edmond, OK* (May 2014)

**Certificate of Online Classrooms Training,** Center for eLearning and Continuing Education,

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### Teaching Experience:

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**Bellarmino University, Louisville, KY**

**Aug 2016 – Present**

Teaching Physics course, Data Analysis using Machine Learning, Big Data and Robotics

Research in High Energy Particle Physics, Data Analysis using Machine Learning, Big Data

**Cameron University, Lawton, OK**

**Aug 2015 – May 2016**

Taught Physics course, Data Analysis using Machine Learning, Big Data and Robotics

Research in High Energy Particle Physics, Data Analysis using Machine Learning, Big Data

**University of Central Oklahoma, Edmond, OK**

**Aug 2014 – May 2015**

*Visiting Professor, Dept. of Engineering & Physics*

Taught Physics course, Data Analysis using Machine Learning, Big Data and Computational Physics.

Research in High Energy Particle Physics, Data Analysis using Machine Learning, Big Data

**University of Oklahoma, Norman, OK**

**Jan 2013 – July 2014**

*Part-time Physics Instructor, Dept. of Physics and Astronomy*

*Postdoctoral Researcher in High Energy Physics and Computation Physics, Machine learning using Big Data.*

**State University of New York, Albany, NY**

*Graduate Teaching Assistant, Department of Physics*

**Aug 1998 – Dec 2002**

- **Courses/Labs Taught as a TA:** General Physics I & II Labs (Provided instructional lectures to introduce lab experiments and goals, General Physics Lab experiments and goals,
- Conducted labs as directed by the lab coordinator
- Maintain a safe and orderly work and enforce all department safety regulations
- Assist students in their experiments and answered questions during lab and dedicated help sessions; Graded lab reports and returned every week.
- **Technology/Software used for Labs:** Pasco and Vernier Instruments; Data Studio and Logger Pro.
- Lead recitation session for *Problem Solving in Physics Course* – 1 credit hour course (assisted students to help solve physics problems in groups for Physics I and II)
- Tutoring sessions for *Introductory Astronomy course*, offered help sessions to students, served as a proctor during exams
- *Microprocessor Application Theory:* Team taught course, arranged helping sessions for students related to course during office hours). Graded exams.
- *Microprocessor Application Lab course:* prepared lab instruments/experiments, assisted students in Lab experiments, answered lab questions during labs and during dedicated help sessions, graded lab reports returned for feedback to students before the next lab
- Helped the professor by reviewing and grading assignments and exams
- Promoted student success by making myself available to students outside of classroom and office hours, through emails, special appointments and arranging review sessions before the exams
- Received excellent evaluations from my students and course supervisors.

*Graduate Research Assistant, Department of Physics (During Summers)*

**Aug 1998 – Dec 2002**

- **Student/High School Teachers Mentor:**

- Mentored high school students (K-10, K-12) – trained them for data analysis, data visualization using high energy particle physics data – under Quark Net project funded by Department of Energy.
- Supervised and trained undergraduate students for data analysis using high energy particle physics data

*Graduate Research Assistant, Department of Physics*

**Jan 2003 – May 2005**

- Based at Stanford Linear Accelerator Center (SLAC), Stanford University to continue Ph.D. thesis research (Focused in the area of Heavy Flavor Physics with a focus on charm quark production and decays) results published in peer reviewed journal, also played a significant role to participate for the Babar detector hardware, computation and data analysis activities as well to represent the State University of New York at Albany, NY group, helped my fellow group members to learn about the Babar detector software for data analysis. Lead workshop for my group fellows at SUNY Albany high energy physics group for understanding the data analysis software (our group joined the Babar detector and I was the first student who was deployed at SLAC).
- Trained first/second year graduate students for data analysis using high energy particle physics data and computation from BABAR experiment at Stanford Linear Accelerator Center, CA
- worked on - Online Data Quality monitoring system of the BABAR detector at SLAC. Developed and maintained software to perform online Data Quality Monitoring (DQM) for online data.
- Worked on the CLEO-III at CESR, Cornell, Silicon Vertex tracker detector upgrade project. Tested and Validated high density flexible interconnects for the optical communication system of silicon vertex system of the CLEO III detector. Worked on digital electronic boards and detector systems using FPGA firmware and Lab View based software interface for data acquisition system of the detector for smooth data taking.

## **Research Experience:**

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### **Bellarmine University, Louisville, KY**

*Research (mentor undergraduate students), Department of Chemistry and Physics*    **Aug 2016 – Present**

Designed, Organized and Supervised different research projects for undergraduate students

Mentored: Student research project on Astrophysics using Large Synoptic Survey Telescope (LSST) – Dark energy Science Collaboration (DESC).

Mentored: Student research projects Using the Data from the ATLAS Experiment - LHC at CERN, Switzerland

Mentored: Student research on Performance Studies of Parallel Computations Using Beowulf Cluster with Different CPU speed. Linux OS, and MPI Middleware

Mentored: Student research on Data analysis using Machine learning techniques using Big Data with it

application to Industry.

*Research Collaboration work on Large Synoptic Survey Telescope (LSST)*

**Aug 2016 – Present**

- Involving undergraduate students in this work including data simulation, data analysis, data visualization

**University of Oklahoma, Norman, OK**

*Collaborator at Oklahoma Center for High Energy Physics (OCHEP)*

**June 2014 – present**

- Conduct research in experimental high energy physics with the ATLAS experiment at the Large Hadron Collider (LHC) at CERN as a research collaborator at the Oklahoma Center for High Energy Physics (OCHEP) using the Tier2 and Tier3 High Performance (HPC) Cluster
- From 02/14 to 02/15- Helped to setup software to generate Monte Carlo Simulations for the IMRT study for biomedical research group at OU, using Oklahoma Center for High Energy Physics (OCHEP)'s HPC Cluster.

*Postdoctoral fellow/Research Scientist Based at CERN, Geneva Switzerland*

**Aug 2006 – April 2012**

*Postdoctoral fellow/Research Scientist, Department of Physics and Astronomy*

**May 2012 – May 2014**

- Conducted research in experimental high energy physics with the ATLAS experiment at the Large Hadron Collider (LHC) at CERN using the LHC grid computing and Tier2 High Performance Grid Computing systems. The large-scale data analysis research tasks involved the usage of multivariate techniques (MVA) using the petabyte-scale ATLAS datasets focused on the detailed studies of the top quark and search for new physics beyond the Standard Model involving the Top quark.
- As part of my tasks at OU's HEP Group, using the ATLAS datasets and grid technology, I trained and mentored both undergraduate and graduate students at OU's HEP group to carry out data analysis, data visualization, and data mining using statistical pattern recognition and multivariate techniques using OU's Tier3 HPC cluster.
- Worked on the assembly, commissioning and operations of the ATLAS Pixel (Silicon Vertex) detector Electronics and Data Acquisition System at CERN. Along with the ATLAS team members, developed and implemented the ATLAS pixel detector software used for data acquisition system (DAQ) with 1800 on-detector modules (80 million channels). Tested and validated the ATLAS pixel detector Digital Signal Processing (DSP) chip software, a backbone of the silicon vertex – ATLAS pixel detector Read-Out System for smooth online data taking.

**Brunel University, London, England**

*Research Associate, based at Stanford Linear Accelerator Center (SLAC)*

**April 2005 – July 2006**

- As a postdoc for the BABAR experiment at the Stanford Linear Accelerator Center (SLAC), worked on the Rare b-quark decays leading to matter anti-matter asymmetry of the universe
- Validated and maintained hardware and software for the BABAR electro-magnetic CsI (Cesium Iodide) calorimeter detector online front-end electronics system ADBs (analogue to digital circuit boards), IOBs (Input/output boards). Led a team of 5 graduate students.

## Honors & Awards

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**Faculty Development Fellowship** funded by Bellarmine University (\$3000) **June 2017 – May 2018**  
06/17 – 05/18. For developing and implementing Multivariate Analysis methods for high energy physics for undergraduate teaching and research.

American Association of Physics Teachers (AAPT) new faculty workshop travel award funded by APS (\$600) **Summer 2017**

**Faculty Development Travel Fund:** funded by Bellarmine University College of Arts and Sciences Faculty **Development** travel Stipend (\$1540) **Fall 2017**

**Faculty Development Fund:** funded by Bellarmine University College of Arts and Sciences faculty **Pedagogic Development** travel Stipend (\$1500) **Fall 2016**

**Department of Energy (DOE), USA; Fellowship Award**  
*Research Associate, University of Oklahoma, Norman, OK* **Aug 2006 – May 2014**

**Particle Physics and Astronomy Research Council (PPARC), England; Fellowship Award**  
*Postdoctoral Research, Brunel University* **April 2005 – Aug 2006**

**Department of Energy (DOE), USA Fellowship Award**  
*Research Assistantship, State Univ. of New York at Albany, NY* **Jan 2003 – Mar 2005**  
*(with full Tuition remission for Ph.D. completion)*

**State University of New York, Albany, NY (Teaching Assistant Award)**  
*Teaching Assistantship with full Tuition remission for Ph.D. studies* **Aug 1998 – Dec 2002**

## Service to Department, University and Planning Committees

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### Bellarmino University, Louisville, KY

- Member Honors Council at Bellarmine University **Jan. 2018 – present**
- Member Honors council sub-committee (Honors Advising to Honors Students) at Bellarmine University **May 2018 – present**
- Member Research/Grant writing group committee (A group setup by vice-provost of research to explore the STEM/STEAM related research grants) at Bellarmine University **May 2018 – present**

- Member Faculty development affairs committee at Bellarmine University, **Aug. 2018 – present**
- Member Strategic plan – Course Delivery Work group committee at Bellarmine University, **May 2018 - present**
- **Chair of Physics Program** Bellarmine University, Louisville, KY **Jan. 2018 – May 2018**
- Member non-regular faculty affairs committee at Bellarmine University, 09/17 – 08/18
- Eureka Learning Community Physics Coordinator for Bellarmine University **Aug. 16 – Present**
- Organized Robotics Outreach Activities at the Eureka Learning activities on **September 2016 – present**
- Organized Physics Club Activities and Meetings with the Physics Club President. **Fall 2017**
- Represented Physics program on Bellarmine University on Preview day academics and Campus Life Fair, **10/21/2018**
- Participated in “Distinguished Scholars Luncheon” as a physics program representative **02/19/2017**
- Represented Physics program on Bellarmine University on Preview day academics and Campus Life Fair, **10/09/2016, 01/22/17**
- Participated in “Distinguished Scholars Luncheon” as a physics program representative **01/07/2018**
- Represented Physics program on Bellarmine University on Preview day academics and Campus Life Fair, **10/22/2017**
- Participated and contributed to the *Liberal Education Task Force* (LET) meeting discussions in Department of Chemistry and Physics at Bellarmine University. Progressive discussions with Kathy West and other participants on Gen. Ed courses from the Physics Program’s point of view – **Oct. 2016**

### **Cameron University, Lawton, OK**

- Member- Program Quality Improvement Reports (PQIR) Committee at Cameron University, **08/15 – 05/16**
- Faculty Mentor- Physics club and Sigma Pi Sigma Honor Society at Cameron University, **08/15 – 05/16**

### **University of Central Oklahoma, Edmond, OK**

- Served as a member of the Physical Science Course Committee at the University of Central Oklahoma (this committee is responsible for curriculum preparation, revision and assessment implementation) **Aug 14 – May 15**

### **Service to Community**

- Mentoring a middle school student Kyle Sanderfer from Saint Francis of Assisi Catholic School, Louisville, KY. Kyle working on Muon chamber experiment to detect cosmic ray muons. Student is preparing his work to present in Kentucky science regional fair to be held in Spring 2018 **Spring 2018**

Kyle presented this work in **Louisville Regional Science Fair (in Mar. 2017)** and won the 2nd place in Physics and Astronomy and Naval research award and was also qualified for Broadcom science fair.

- Career day Speaker at the Jefferson County Publics School System (JCPS) – physics/Robotics presentation for JCPS school Children **October, 2017**
- Career day Speaker at the Jefferson County Publics School System (JCPS) – physics presentation for JCPS school Children **April 21, 2017**
- Mentored a middle school student Kyle Sanderfer from Saint Francis of Assisi Catholic School, Louisville, KY. Kyle worked on cloud chamber experiment to detect cosmic ray muons. Student won position in Kentucky science regional fair **Spring 2017**

## **Involvement in Grants/Funding/Scholarship Activities**

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### **Bellarmino University, Louisville, KY**

- **2018 LSSTC Grant Award Program (2018)**, Proposal was submitted for “Full-implementation of a dedicated LSST Grid Site at Bellarmine University Using the Open Science Grid Cyberinfrastructure for the LSST-DESC Collaboration”, proposal was submitted jointly with co-PI Dr. A. Mahmood. Proposal was appreciated and encouraged to resubmit next years but not funded for year 2018. **Fall 2017**
- **Faculty Development Fellowship (2017-18)**, funded by Bellarmine University, Award amount \$3000.00 (PI for proposed project: “Multivariate Data Analysis Techniques for Undergraduate Research”)
- Applied for **Teaching/Learning enhancement** stipend in School of Arts and Science at Bellarmine University in 2016. Award amount \$500.00. This proposal was not funded **Fall 2016**

### **Cameron University, Lawton, OK (2015-16)**

- Awarded **\$2000** for Physics Education Research with students at Cameron University (Internal Funding). **(PI)**

### **University of Central Oklahoma, Edmond, OK (2015)**

- Submitted an internal proposal in the amount of \$1500 to University of Central Oklahoma to involve undergraduate students on a project to design of serial converters for a dual computing system with single I/O input using the data stream multiplexer EIA 232 protocol. **(PI)** – Proposal was not funded

### **University of Oklahoma, Norman, OK (2008 – 2013)**

- Part of the University of Oklahoma’s HEP proposal that has been funded by the Department of Energy (DOE) from **2008 to 2013**-contributed to writing the Physics analysis section of the proposal that focused on the studies of the physics processes with the top quark at the ATLAS experiment at the LHC. Total amount awarded in the last 5 years to the University of Oklahoma’s HEP Group- **\$620,000. (Contributor)**

## Workshops

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### **APS National Mentoring Community – Bridge program Conference** **Nov. 2018**

American Physics Society – National Mentoring Community and Bridge Program, Stanford University, CA and Google, CA (Nov. 16 – 18), 2018

This conference provides a forum for developing collaboration between institutes and for students to choose a mentor from other institutes for collaborative research projects and shares the resources for research. One of my students presented research work in the conference.

### **KAS 2018 Annual Meeting at Western Kentucky University** **Nov. 2018**

KAS 2018 Annual meeting, held at Western Kentucky University, Bowling, KY (November 2 - 3, 2018). Research work presented with 2 of my students.

### **Kentucky Area Astronomical Society (KAAS) Meeting April 2018 at NKU** **April 2018**

KAAS April 10, 2018 meeting, held at Northern Kentucky University, Highland Heights, KY (April 10, 2018). Dr. Saleem presented the Status of DESC, LSST contribution of the Bellarmine University at the workshop.

### **KAPT Spring 2018 Workshop at Marshall University, Huntington, West Virginia** **March 2018**

Research presentation at the KAPT Spring 2018 meeting, by 2 of my research students, held at Marshall University, Huntington, WV (March 10, 2018).

### **DESC - LSST Collaboration hack week meeting** **Dec 2017**

Dark Energy Science Collaboration for LSST Collaboration meeting at Argonne National Lab, Chicago, IL

The purpose of this workshop was to get hands on training with the LSST tools and develop collaboration with the other institutes. I took 2 students with me and it was most useful working week for students to learn about interesting astrophysics at LSST while it is preparing for telescope installation and data taking and producing simulated data using the Data Challenge II (a.k.a DC II). Bellarmine University High Performance tier2 computing facility is one of the resource for this collaboration for data processing and for the DC II.

### **DESC – LSST Collaboration meeting** **July 2017**

Dark Energy Science Collaboration for LSST collaboration workshop at SUNY Stony Brook, NY. The purpose of this meeting is to gets hands on training with the DESC-LSST tools and meet collaborators from other institutes. I presented a report from Bellarmine University for preparation of our Tier2 computing as simulation and data analysis facility for the collaboration and plans to involve our students.

### **AAPT – conference** **June 2017**

American Association of Physics Teachers workshop, APS Center, MD, USA



This conference was centered on Active Learning in Physics teaching and provided opportunity to learn more about innovative pedagogical approaches and technological tools used to teach physics with learner-centered approach.

### **DESC - LSST Collaboration hack week Meeting**

**April 2017**

Dark Energy Science Collaboration for LSST Collaboration meeting at Fermi National Lab, Chicago, IL

The purpose of this workshop is to get hands on training with the LSST tools and develop collaboration with the other institutes. I took 2 students with me and it was most useful working week for students to learn about interesting astrophysics at LSST while it is preparing for telescope installation and data taking and producing simulated data. Bellarmine University High Performance tier2 computing facility is one of the resource for this collaboration for data processing.

### **APS NMC Conference**

**Oct. 2016**

American Physics Society – National Mentoring Community, University of Houston, TX

This conference provides a forum for developing collaboration between institutes and for students to choose a mentor from other institutes for collaborative research projects and shares the resources for undergraduate research. One of my student presented research work in this conference.

## **Talks & Presentations**

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### **APS NMC – Bridge program workshop**

**Nov. 2018**

American Physics Society – National Mentoring Community and Bridge Program, Stanford University, CA and Google, CA, Poster presented Co-authored with my student:

- “Robotics with Humanoid Robot NAO and Hexapod (Robotic Spider)”, Mentored research project with students Carlos Galindo, **Mentors:** Dr. M. Saleem and Dr. Akhtar Mahmood; presentation at the KAS 2018 Annual meeting, held at Western Kentucky University, Bowling, KY (November 2 - 3, 2018).

### **Presentations at KAS 2018 Annual Meeting (by students) at Western Kentucky University:**

- “Photon Simulation Studies for the Dark Energy Science Collaboration (DESC) at LSST (Large Synoptic Survey Telescope)”, Mentored research project with students Sean Lawless, Carlos Galindo, **Mentors:** Dr. M. Saleem and Dr. Akhtar Mahmood; presented at the KAS 2018 Annual meeting, held at Western Kentucky University, Bowling, KY (November 2 - 3, 2018).
- “Robotics with Humanoid Robot NAO and Hexapod (Robotic Spider)”, Mentored research project with students Carlos Galindo, **Mentors:** Dr. M. Saleem and Dr. Akhtar Mahmood; presentation at the KAS 2018 Annual meeting, held at Western Kentucky University, Bowling, KY (November 2 - 3, 2018).

### **Presentations at Kentucky Area Astronomical Society (KAAS) Meeting April 2018 at Northern Kentucky University, Highland Heights, KY:**

- “Photon Simulation Studies for LSST’s Dark Energy Science Collaboration (DESC) Using Bellarmine University’s Open Science Grid (OSG) Tier2 Grid Supercomputer” Presentation by Dr. M. Saleem, Co-authored with Stephen Brown and Dr. Akhtar Mahmood; Oral presentation at the KAAS April 10, 2018 meeting, held at Northern Kentucky University, Highland Heights, KY (April 10, 2018).

### **Presentations at KAPT Spring 2018 Meeting (by students) at Marshall University, Huntington, West Virginia:**

- “Robotics with Humanoid Robot NAO and Hexapod (Robotic Spider)”, Mentored research project with students Carlos Galindo, **Mentors:** Dr. M. Saleem , Stephen Brown and Dr. Akhtar Mahmood; presentation at the KAPT Spring 2018 meeting, held at Marshall University, Huntington, WV (March 10, 2018).
- “Photon Simulation Studies for LSST’s Dark Energy Science Collaboration (DESC) Using Bellarmine University’s Open Science Grid (OSG) Tier2 Grid Supercomputer”, Mentored research project with students Russell Sexton, Stephen Denny, Stephen Brown and **Mentors:** Dr. M. Saleem and Dr. Akhtar Mahmood; presentation at the KAPT Spring 2018 meeting, held at Marshall University, Huntington, WV (March 10, 2018).

**Presentations at KAS 2017 Annual Meeting (by students) at Murray State University:**

- “Open Science Grid (OSG) Tier2 grid site at Bellarmine University for the LSST (Large Synoptic Survey Telescope) Project”, Mentored research project with students Russell Sexton, Stephen Denny, **Mentors:** Dr. M. Saleem and Dr. Akhtar Mahmood; presented at the KAS 2017 Annual meeting, held at Murray State University, Murray, KY (November 3 - 4, 2017). (**Poster won 1<sup>st</sup> place award in this category**)
- “Data Mining in Astronomy Using Exoplanet Data from the Space and Ground Based Telescopes”, Mentored research project with students Joseph Erskine, Jordan Dowdy, Stephen Denny, **Mentors:** Dr. M. Saleem and Dr. Akhtar Mahmood; presentation at the KAS 2017 Annual meeting, held at Murray State University, Murray, KY (November 3 - 4, 2017). (**Presentation won 1<sup>st</sup> place award in this category**)

**Presentations at KAPT Spring 2017 Meeting (by students) at Bluegrass Community and Technical College, Lexington:**

- “Latest Results on Exoplanets from the Space and Ground-Based Telescopes”, Mentored research project with students Stephen Denny, Christopher Steitz, Russell Sexton, **Mentors:** Dr. M. Saleem and Dr. Akhtar Mahmood; presentation at the KAPT Spring 2017 meeting, held at Bluegrass Community and Technical College, Lexington, KY (March 11, 2017).
- “Parallel Computing in the Undergraduate Physics Curriculum using Beowulf Clusters”, co-mentored research project with students Jordan Matty, Mark Plicher, Zachary Eckert, **Mentors:** Dr. M. Saleem and Dr. Akhtar Mahmood; Oral presentation at the KAPT Spring 2017 meeting, held at Bluegrass Community and Technical College, Lexington, KY (March 11, 2017).

**DESC – LSST Collaboration workshop**

- “Presented a report from Bellarmine University for preparation of Bellarmine Tier2 computing to be used as DESC simulation and data analysis facility for the collaboration and plans to involve our students”. Workshop help at SUNY Stony Brook, NY (July 2017).

**Presentations at 31<sup>st</sup> Annual National Conference on Undergraduate Research (NCUR):**

- “Study of Exoplanets Data from the Kepler Telescopes (Updated Results)”, co-mentored undergraduate research project with students Christopher Steitz, Stephen Denny, Russell Sexton, **Mentors:** Dr. M. Saleem, Dr. Akhtar Mahmood; Presented by Christopher Steitz as a talk (which was peer reviewed) at 31<sup>st</sup> Annual National Conference on Undergraduate Research (NCUR): Meeting (Apr 6-8, 2017), held at University of Memphis, Memphis, TN
- “Search for the Z-prime Boson Using the Data from the ATLAS Experiment at CERN”, co-mentored undergraduate research project with student Veronica Winters, **Mentors:** Dr. M. Saleem and Dr. Akhtar Mahmood; Presented by Christopher Steitz as a talk (which was peer reviewed) at 31<sup>st</sup> Annual National Conference on Undergraduate Research (NCUR): Meeting (Apr 6-8, 2017), held at University of Memphis, Memphis, TN

**Presentations at KAPT/AAPT:**

- “Latest Results on Exoplanets from the Space and Ground Based Telescopes”, co-mentored research project with students Stephen Denny, Christopher Steitz, Russell Sexton, Mentors: Dr. M. Saleem, Dr. Akhtar Mahmood; Presented by Stephen as a talk (which was peer reviewed) at The Kentucky Association of Physics Teachers (KAPT – a chapter of American Association of Physics Teachers – AAPT, <http://physics.wku.edu/kapt/>) Meeting (Mar 11, 2017), held at Bluegrass Community and Technical College, Lexington, KY
- “Parallel Computing in the Undergraduate Physics Curriculum using Beowulf Clusters”, Mentored research project with students Jordan Matty, Mark Pilcher, Zachary Eckert, Mentors: Dr. M. Saleem, Dr. Akhtar Mahmood; Presented by Jordan Matty as a talk (which was peer reviewed) at The Kentucky Association of Physics Teachers (KAPT – a chapter of American Association of Physics Teachers – AAPT, <http://physics.wku.edu/kapt/>) Meeting (Mar 11, 2017), held at Bluegrass Community and Technical College, Lexington, KY

#### **Presentations given at APS:**

- “Astrophysics on the Kepler exoplanet data”, Mentored undergraduate research project with student Stephen Denny, Mentors: Dr. M. Saleem, Dr. Akhtar Mahmood; Presented by Stephen (which was peer reviewed) at the American Physics Society National Mentoring Society Meeting (Oct. 21 -23, 2016), held at University of Houston, TX.

#### **Presentations given at Other Conferences:**

- “Recent Results on Top Physics at ATLAS”, presented at Oklahoma Center for High Energy Physics (OCHEP) 2014 at OU-OSU collaborative meeting (May 01 – 03, 2014), Upton, NY.
- “Overview of ATLAS Results”, presented at the 16th Lomonosov Conference on Elementary Particle Physics (Lomonosov2013 – Aug 22 to 28, 2013), Moscow, Russia.
- “Recent Results on Top Physics at ATLAS”, presented at BNL Forum 2013 at Brookhaven National Lab (May 01 – 03, 2013), Upton, NY.
- “Recent Results on Top Physics at ATLAS”, presented at US LHC user organization at Fermi Lab (Oct. 17 – 20, 2012), Chicago, IL.
- “Invited for SNOWMAS 2013 planning meeting to participate for Top Physics studies for SNOWMASS 2013”, presented at FermiLab (Oct. 11 – 13, 2012) Chicago, IL.
- “A Milestone towards the LHC discoveries: Recent Measurements on the top quark physics At ATLAS”, presented at Stanford Linear Accelerator Center seminar (June 21, 2011), SLAC, Menlo Park, CA.
- “Measurement of the top-pair production cross-section at ATLAS“, presented at the Meeting of the Division of Particles and Fields of the American Physical Society (DPF2011- Aug 08 – 13, 2011), Brown University, Providence, Rhode Island.
- “Results from Top Physics at the ATLAS”, presented at the 23rd *Recontres de Blois*, Particle Physics and Cosmology (May 29 – June 03, 2011), Château Royal de Blois, Blois, France.
- “Top cross-section measurements with early ATLAS data”, presented at the 3rd International Workshop on Top Quark Physics (May 31- June 04, 2010), Top2010, Bruges, Belgium.
- “B-tagging Algorithms At ATLAS”, presented at the Signaling the Arrival of the LHC Era from Dec. 08 - 13, 2008, Inter- national center for Theoretical Physics (ICTP), Trieste, Italy.

- “Charm Spectroscopy, Charm decays and new states at BABAR, Belle, CLEO”, presented at the XIV International workshop on Deep Inelastic Scattering (DIS2006; April 20 - 24, 2006), Tsukuba, Japan.
- “Measurement of  $\Lambda_c$  Branching Fractions for Cabibbo-suppressed decays”, presented at the Meeting of the Division of Particles and Fields (DPF 2004 - Aug 26 -31, 2004), UC Riverside, CA.
- “Measurement of the top pair plus jet production cross-section at ATLAS”, presented at the US-ATLAS Physics Meeting (Aug. 13 - 15, 2012), University of Michigan in Ann Arbor, MI.
- “Measurement of the top pair production cross-section at ATLAS”, presented at the US-ATLAS Physics Meeting (Aug. 15 - 17, 2011), Boston University, Boston, Massachusetts.
- “Results from top Cross-section measurement at ATLAS with 2010 data”, presented at the ATLAS Physics Jamboree, (Apr 15 - 17, 2011), University of Texas, Arlington.
- “Top Observation Status at ATLAS (Invited talk)”, presented at the US-ATLAS Physics and Performance (Oct. 05, 2010), Brookhaven National Laboratory (BNL), New York.
- “Mis-tag Rate measurements for b-tagging on ATLAS Data (Invited Talk)”, presented at the US-ATLAS Physics and Performance (Oct 13 - 15, 2010), Flavor Tagging Workshop, Freiburg, Germany.
- “Mis-tag rate measurement for b-tagging on Data (Invited Talk)”, presented at ATLAS Physics Jamboree, (May 17 - 20, 2010), University of Texas, Arlington, TX
- “Measurements of b-tagging Fake Rates in ATLAS Data (Poster Presentation)”, presented at the US-ATLAS meeting of Americans (Aug. 03 - 05, 2009), New York University, New York.
- “Measurements of Top pair production Cross-section at 10TeV energy using single lepton decay channel for ATLAS Experiment”, presented at the BNL Analysis Jamboree (Jun. 15 - 19, 2009), Brookhaven National Laboratory (BNL), NY.

## List of Representative Publications

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### A. List of Publications/Book as a Lead/Primary Author (2016 – 2018):

1. “The Hiperwall tiled-display wall system for Big-Data research”, Saleem et al. Journal of BigData (2018) 5:41. <https://rdcu.be/bah4N>
2. I am authoring 2.5 chapters of eBook with Dr. Masood of University of Houston Clear Lake titled “Frontiers in Nuclear and Particle Physics”, which will be published by Bentham Science Publishers by March 31<sup>st</sup>, 2018.
3. “Measurements of top-quark pair differential cross-section in the lepton+jets channel in pp collisions at  $\sqrt{s} = 8$  TeV using the ATLAS detector”, ATLAS Collaboration, Georges Aad *et. al.*, European Phys. J. C76 538(2016) 538.
4. “Performance of *b*-jet identification in the ATLAS experiment”, ATLAS Collaboration, Georges Aad *et. al.*, JINST 11 (2016) P04008.

5. “Search for charged Higgs boson in  $H^{\pm} \rightarrow tb$  decay channel in pp collision at  $\sqrt{s} = 8$  TeV using the ATLAS detector”, ATLAS Collaboration, Georges Aad *et. al.*, JHEP 03 (2016) 127.
6. “Measurements of fiducial cross-sections for  $tt$  production with one or two additional  $b$ -jets in  $pp$  collisions at  $\sqrt{s} = 8$  TeV using the ATLAS detector”, ATLAS Collaboration, Georges Aad *et. al.*, European Phys. J. C76 11(2016) 11.
7. “Measurements of the production cross-sections of a single top quark in association with a W boson at 8 TeV with the ATLAS experiment”, ATLAS Collaboration, Georges Aad *et. al.*, JHEP 01 (2016) 064.
8. “Measurement of the top quark pair production cross-section 8 TeV proton-proton collisions using kinematic information in the lepton+jets final states with ATLAS”, ATLAS Collaboration, Georges Aad *et. al.*, Physical Review D91 112013 (2015) 11, 112013.

## **B. List of Publications as the Lead/Primary Author from the ATLAS and BABAR Experiments- (2014 – beyond)**

9. “Measurement of the  $t$ - $tbar$  production cross-section using  $e\mu$  events with  $b$ -tagged jets in pp collisions at  $\sqrt{s} = 7$  TeV and 8 TeV with the ATLAS detector”, ATLAS Collaboration, Georges Aad *et. al.*, European Phys. J. C74 3109 (2014) 10, 3109.
10. “Measurement of the top quark pair production cross-section with ATLAS in the single lepton final states”, ATLAS Collaboration, Georges Aad *et. al.*, Physics Lett. B711 244-263 (2012) 244-263.
11. “Measurement of the top  $\bar{t}$ -pair production cross section with ATLAS in pp collisions at  $\sqrt{s} = 7$  TeV”, ATLAS Collaboration, Georges Aad *et. al.*, European Phys. J. C71 1577 (2011).
12. “ATLAS pixel detector electronics and sensors”, ATLAS Collaboration, Georges Aad *et. al.*, J. of Instrumentation (JNIST) 3, P07007 (2008).
13. “Observation of  $B^0 \rightarrow K^{*0}(\text{anti})K^{*0}$  and Search for  $B^0 \rightarrow K^{*0}K^{*0}$ ”, BABAR Collaboration, B. Aubert, *et. al.*, Physics Lett. 100, 081801 (2008).
14. “Measurements of  $\Lambda_c^+$  Branching Fractions of Cabibbo-Suppressed Decay Modes involving Lambda and Sigma”, BABAR Collaboration, B. Aubert, *et. al.*, Physical Rev. D 75, 052002 (2007).
15. “Observation of an excited charm baryon  $\Omega_c^*$  decaying into  $\Omega_c^0\gamma$ ”, BABAR Collaboration, B. Aubert, *et. al.*, Physics Rev. Lett. 97, 232001 (2006).

16. “Measurement of the absolute branching fractions  $B \rightarrow D\pi, D^*\pi, D^{**}\pi$  with a missing mass method”, BABAR Collaboration, B. Aubert, et. al, Physical Rev. D 74, 111102 (2006).

## **B. Conference Proceedings (Lead/Primary Author)-**

1. M. Saleem et. al, ATLAS Collaboration, “Measurement of the top quark pair production cross section in the single-lepton channel with ATLAS in proton-proton collisions at 8 TeV using kinematic fits with b-tagging”, presented at HCP 2012 in Japan. Published in ATLAS-CONF-2012-149.
2. M. Saleem et. al, ATLAS Collaboration, “Measurement of the cross-section for  $tt + \text{jets}$  production using kinematic fit method with the ATLAS detector”, presented at ICHEP 2012 in Australia. Published in ATLAS-CONF-2012-083.
3. M. Saleem et. al, “ATLAS Collaboration, “Measurement of the Top Pair Production Cross section at ATLAS”. Published in conference proceedings for DPF 2011, Brown University, Providence, RI. ATL-PHYS-PROC-2011-123.
4. M. Saleem et. al, ATLAS Collaboration, “Calibrating the b-Tag efficiency and Mis-tag Rate in  $35 \text{ pb}^{-1}$  of Data with the ATLAS Detector “, Published in ATLAS-CONF-2011-089.
5. M. Saleem, et. al, ATLAS Collaboration, “Top Quark Pair Production Cross-section Measurement in ATLAS in the Single Lepton + Jets Channel without b-tagging”. Published in ATLAS-CONF-2011-023.
6. M. Saleem et. al, ATLAS Collaboration, “Invariant mass distribution of jet pairs produced in association with one lepton and missing transverse energy at the ATLAS experiment”. Published in ATLAS-COM-CONF-2011-079.
7. M. Saleem et. al, ATLAS Collaboration, “Calibrating the b-Tag Efficiency and Mis-tag Rate of the SV0 b-Tagging Algorithm in  $3 \text{ pb}^{-1}$  of Data with the ATLAS Detector “. Published in ATLAS-CONF-2010-099.
8. M. Saleem for ATLAS Collaboration. “Top quark cross-section measurements with the early ATLAS data”. Published in Conference Proceedings for 3rd International Workshop on Top Quark Physics - Top2010, Il Nuovo Cimento C, Vol. 33, Issue 4, pp. 331-334, 2010.
9. M. Saleem for BABAR Collaboration, “Charm Spectroscopy, Charm Decays and New States at BABAR”. Published in Conference proceedings for 14th International Workshop on Deep Inelastic Scattering (DIS 2006), Tsukuba, Japan, 20-24 Apr 2006 (Tsukuba 2006, Deep inelastic scattering 633-636).
10. M. Saleem et. al, BABAR Collaboration, “Measurements of  $\Lambda^{c+}$  Branching Fractions of Cabibbo-Suppressed Decay Modes”, Published in BABAR-CONF-04/04, Aug 2004.
11. M. Saleem et. al, BABAR Collaboration, “Search for strange pentaquark production in  $e^+e^-$  annihilations at  $\sqrt{s} = 10.58 \text{ GeV}$  and in  $\text{Upsilon}(4S)$  decays”. Published in ICHEP04 BABAR-CONF-04/36, Aug2004.

## **C. Recent Representative Publications for Research Contributions to the ATLAS Experiment (2013-2016)-**

*(A full list of publications can be provided upon request)*

1. “Measurement of total and differential  $W^+W^-$  production cross-sections in proton-proton collisions at  $\sqrt{s} = 8 \text{ TeV}$  using the ATLAS detector and limits on anomalous triple-gauge-boson couplings”, ATLAS Collaboration, Georges Aad et. al., JHEP 09 (2016) 029.
2. “Search for photonic signatures of gauge-mediated supersymmetry in 8 TeV pp collisions with the ATLAS detector”, ATLAS Collaboration, Georges Aad et. al., Phys. Rev. D92 (2015) 7, 072001.

3. “Study of the spin and parity of the Higgs boson in diboson decays with the ATLAS detector”, ATLAS Collaboration Georges Aad *et. al.*, Eur. Phys. J. C75 (2015) 10, 476.
4. “Study of (W/Z) H production and Higgs boson couplings using  $H \rightarrow WW^*$  decays with the ATLAS detector”, ATLAS Collaboration, Georges Aad *et. al.*, JHEP 1508 (2015) 137.
5. “Search for the associated production of the Higgs boson with a top quark pair in multilepton final states with the ATLAS detector”, ATLAS Collaboration, Georges Aad *et. al.*, Phys. Lett. B749 (2015) 519-541.
6. “Search for metastable heavy charged particles with large ionization energy loss in pp collisions at  $\sqrt{s} = 8$  TeV using the ATLAS experiment”, ATLAS Collaboration, Georges Aad *et. al.*, Eur. Phys. J. C75 (2015) 9, 407.
7. “Search for Dark Matter in Events with Missing Transverse Momentum and a Higgs Boson Decaying to Two Photons in  $pp$  Collisions at  $\sqrt{s} = 8$  TeV with the ATLAS Detector”, ATLAS Collaboration, Georges Aad *et. al.*, Phys. Rev. Lett. 115 (2015) 13, 131801.
8. “A search for  $t$ - $tbar$  resonances using lepton-plus-jets events in proton-proton collisions at  $\sqrt{s} = 8$  TeV with the ATLAS detector”, ATLAS Collaboration, Georges Aad *et. al.*, JHEP 1508 (2015) 148.
9. “Search for production of vector-like quark pairs and of four top quarks in the lepton-plus-jets final state in  $pp$  collisions at  $\sqrt{s} = 8$  TeV with the ATLAS detector”, ATLAS Collaboration, Georges Aad *et. al.*, JHEP 1508 (2015) 105.
10. “Measurement of the top pair production cross section in 8 TeV proton-proton collisions using kinematic information in the lepton+jets final state with ATLAS”, ATLAS Collaboration, Georges Aad *et. al.*, Phys. Rev. D91 (2015) 11, 112013.
11. “Combined Measurement of the Higgs Boson Mass in  $pp$  Collisions at  $\sqrt{s} = 7$  and 8 TeV with the ATLAS and CMS Experiments”, ATLAS and CMS Collaborations, Georges Aad *et. al.*, Phys. Rev. Lett. 114 (2015) 191803.
12. “Measurement of the top quark mass in the  $t$ - $tbar \rightarrow$  lepton+jets and  $t$ - $tbar \rightarrow$  dilepton channels using  $\sqrt{s} = 7$  TeV ATLAS data”, ATLAS Collaboration, Georges Aad *et. al.*, Eur. Phys. J. C75 (2015) 7, 330.
13. “Search for the Standard Model Higgs boson produced in association with top quarks and decaying into  $bb^-$  in pp collisions at  $\sqrt{s} = 8$  TeV with the ATLAS detector”, ATLAS Collaboration, Georges Aad *et. al.*, Eur. Phys. J. C75 (2015) 7, 349pp.
14. “Measurement of the top-quark mass in the fully hadronic decay channel from ATLAS data at  $\sqrt{s} = 7$  TeV”, ATLAS Collaboration, Georges Aad *et. al.*, Eur. Phys. J. C75 (2015) 4, 158.
15. “Measurement of Higgs boson production in the diphoton decay channel in pp collisions at center-of-mass energies of 7 and 8 TeV with the ATLAS detector”, ATLAS Collaboration, Georges Aad *et. al.*, Phys. Rev. D90 (2014) 11, 112015.
16. “Search for new particles in events with one lepton and missing transverse momentum in  $pp$  collisions at  $\sqrt{s} = 8$  TeV with the ATLAS detector”, ATLAS Collaboration, Georges Aad *et. al.*, JHEP 1409 (2014) 037.
17. “Search for neutral Higgs bosons of the minimal supersymmetric standard model in pp collisions at  $\sqrt{s} = 8$  TeV with the ATLAS detector”, ATLAS Collaboration, Georges Aad *et. al.*, JHEP 1411 (2014) 056.
18. “Measurements of spin correlation in top-antitop quark events from proton-proton collisions at  $\sqrt{s} = 7$  TeV using the ATLAS detector”, ATLAS Collaboration, Georges Aad *et. al.*, Phys.Rev. D90 (2014) 11, 112016.

19. “Search for contact interactions and large extra dimensions in the dilepton channel using proton-proton collisions at  $\sqrt{s} = 8$  TeV with the ATLAS detector”, ATLAS Collaboration, Georges Aad *et. al.*, Eur. Phys. J. C74 (2014) 12, 3134.
20. “Search for pair-produced third-generation squarks decaying via charm quarks or in compressed supersymmetric scenarios in  $pp$  collisions at  $\sqrt{s} = 8$  TeV with the ATLAS detector”, ATLAS Collaboration, Georges Aad *et. al.*, Phys. Rev. D90 (2014) 5, 052008.
21. “Search for supersymmetry in events with large missing transverse momentum, jets, and at least one tau lepton in 20 fb<sup>-1</sup> of  $\sqrt{s} = 8$  TeV proton-proton collision data with the ATLAS detector”, ATLAS Collaboration, Georges Aad *et. al.*, JHEP 1409 (2014) 103.
22. “Search for strong production of supersymmetric particles in final states with missing transverse momentum and at least three  $b$  -jets at  $\sqrt{s} = 8$  TeV proton-proton collisions with the ATLAS detector”, ATLAS Collaboration, Georges Aad *et. al.*, JHEP 1410 (2014) 24.
23. “Comprehensive measurements of  $t$ -channel single top-quark production cross sections at  $\sqrt{s} = 7$  TeV with the ATLAS detector, ATLAS Collaboration, Georges Aad *et. al.*, Phys. Rev. D90 (2014) 11, 112006.
24. “Search for  $t$ - $\bar{t}$  resonances in the lepton plus jets final state with ATLAS using 4.7 fb<sup>-1</sup> of  $pp$  collisions at  $\sqrt{s} = 7$  TeV”, ATLAS Collaboration, Georges Aad *et. al.* Phys. Rev. D 88 (2013) 1, 012004.
25. “Search for a light charged Higgs boson in the decay channel  $H^+ \rightarrow c\bar{s}$  in  $t$ - $\bar{t}$  events using  $pp$  collisions at  $\sqrt{s} = 7$  TeV with the ATLAS detector”, ATLAS Collaboration, Georges Aad *et. al.*, Eur. Phys. J. C 73 (2013) 6, 2465.
26. “Measurement of the  $t$ - $\bar{t}$  production cross section in the tau+jets channel using the ATLAS detector”, ATLAS Collaboration, Georges Aad *et. al.*, Eur. Phys. J. C73 (2013) 3, 2328.
27. “Search for pair production of heavy top-like quarks decaying to a high- $p_T$   $W$  boson and a  $b$  quark in the lepton plus jets final state at  $\sqrt{s} = 7$  TeV with the ATLAS detector”, ATLAS Collaboration, Georges Aad *et. al.*, Phys. Lett. B 718 (2013) 1284.
28. “Search for  $WH$  production with a light Higgs boson decaying to prompt electron-jets in proton-proton collisions at  $\sqrt{s} = 7$  TeV with the ATLAS detector”, ATLAS Collaboration, Georges Aad *et. al.*, New J. Phys. 15 (2013) 043009.
29. “Measurement of the top quark charge in  $pp$  collisions at  $\sqrt{s} = 7$  TeV with the ATLAS detector”, ATLAS Collaboration, Georges Aad *et. al.*, ”, ATLAS Collaboration, Georges Aad *et. al.*, JHEP 1311 (2013) 031.
30. “Search for resonances decaying into top-quark pairs using fully hadronic decays in  $pp$  collisions with ATLAS at  $\sqrt{s} = 7$  TeV”, ATLAS Collaboration, Georges Aad *et. al.*, JHEP 1301 (2013) 116.

## Software Skills, Large-Scale Data Analysis, High Performance and Grid Computing Experience

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- Object oriented C++, C, Python/Anaconda, Java, Fortran, Assembly language, Linux/UNIX, Shell Scripting, Labview, MATLAB, Mathematica, R, html, and xml.
- Systems Operation/Administration experience in High Performance Computing (HPC) system at Oklahoma Supercomputing Center for Education and Research (OSCER), which is linked to the national Open Science Grid



(OSG) Cyberinfrastructure.

- Knowledge and experience with the OSG Cyberinfrastructure for large-scale data analysis in high energy physics.
- Over 10 years research experience in HEP Big-Data Mining, Data Visualization, Monte-Carlo (MC) Simulation and Modeling using GEANT4 to study complex physics processes inside particle detectors.
- Expert in Large-Scale Data Analysis using the ROOT/RooFit/Python software package, Statistical-Pattern Recognition (SPR) and Multivariate Analysis techniques (MVA) such as NN, BDT, SVM, LH.
- Over 12 years of software code development for large-scale data analysis using Python and C/C++.

## **Memberships in Scientific Collaborations, Professional Affiliations & Activities:**

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- Active member of the statewide committee (Kentucky Association for Research with LSST) KARL with the Large Synoptic Survey Telescope (LSST) organization at the Large Hadron Collider (LHC) at CERN, Geneva, Switzerland.
- Active member of the ATLAS collaboration at the Large Hadron Collider (LHC) at CERN, Geneva, Switzerland.
- Past member of the BABAR collaboration at Stanford Linear Accelerator Center (SLAC).
- Past member of the CLEO collaboration at Cornell Electron Storage Ring (CESR).
- Chaired conference session on Exotics and SUSY searches, 16th Lomonosov Conference on Elementary Particle Physics, held at Moscow State University, Russia (**Aug. 22 – 29, 2013**).
- Served as a Peer reviewer for American Journal Experts (AJE), **2013 - 2015**.
- Served as a Peer Reviewer for International Journal of Physics (IJP), 2011 – 2012.
- Served as an External Member of Ph.D. Thesis Evaluation Committees of 5 graduate students at the Department of Physics at State University of New York at Albany, since 2006.
- Supervised and trained Oklahoma State University graduate student Babak Abi (Graduated in Dec. 2012); *Thesis Topic: Top Quark pair production with the ATLAS detector.*
- Co-supervised State University of New York at Albany graduate student Teeba Rashid (Graduated in 2013); *Thesis Topic: Measurement of the  $t\bar{b}$  production cross-section in  $\tau^+$  jets channel using the ATLAS detector.*
- Member of Ph.D. thesis committee of State University of New York at Albany graduate student Bin Pan (Graduated in 2007); *Thesis Topic: Search for the Doubly Charmed Baryon  $\Omega_{cc}^+$  using the BABAR Detector.*
- Member of American Physics Society (APS), since 2004.
- Served as a member of the Graduate studies committee (which consisted of senior professors and top 2 graduate students) at the Department of Physics at the State University of New York at Albany (2000-2002); this

committee was responsible for the graduate students admission and approval of graduate level courses for the Department of Physics.

- Served as a Secretary of the Graduate Students Organization at the Department of Physics at the State University of New York at Albany (2000-2003).

## **Leadership Role in Research Activities and Accomplishments**

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- Bellarmine University APS (American Physics Society) National Mentoring Community Representative for Physics Majors, 10/16 – present
- Headed a 30-member scientific team at the Large Hadron Collider (LHC) on Physics Analysis. Supervised numerous students undergraduate and graduate on HEP data analysis research projects.
- Editor of ATLAS Physics Note- “Measurement of the top pair production cross-section 8 TeV proton-proton collisions using kinematic information”.
- Editor of ATLAS Physics Note- “First ttbar inclusive cross-section using 8 TeV data from ATLAS experiment”. This analysis was presented at HCP 2012 (ATLAS-CONF-2012-149).
- Editor of ATLAS Physics Note- “ttbar + jets cross section measurement using kinematic fit note”. This analysis was published and presented at ICHEP 2012 (ATLAS-CONF-2012-083).
- Proposed and led analysis work for the first precise measurement of the top quark pair production cross-section using multivariate (MVA) techniques with the ATLAS data. This analysis was presented in Winter 2011 HEP conferences including Moriond 2011. Published in Physics Letter B711 (2012) 244-263.
- First to develop and lead the mis-tag rate measurement in b-tagging in ATLAS. The results from this study were used by several analyses groups within the ATLAS collaboration. This analysis was presented in Winter 2011 and Summer 2011 HEP conferences.
- Software Performance Management Board Coordinator for the ATLAS b-tagging group (2010 – 2013).
- Event Data Management (EDM) Coordinator for b-tagging group in the ATLAS (2011 – 2014). Responsible for suggesting optimization of the b-tagging software in order to make it cost effective in terms of CPU usage while running centrally over Data and MC.
- Made a major contribution to the “Measurement of absolute branching fractions  $B \rightarrow D\pi, D^*\pi, D^{**}\pi$  with a missing mass method”, BABAR editorial board - Phys. Rev. D 74, 111102 (2006).
- As a graduate student, I reported the "Measurements of  $\Lambda_c$  branching fractions for Cabibbo-suppressed decay modes using the BABAR detector" (Ph.D. Thesis) – Published in Phys. Rev. D75, 052002 (2007); ICHEP 2006, 2004 (hep-ex/0601017, 0408024); SLAC-R-793.
- Played a major in the ATLAS silicon pixel detector commissioning effort during its assembly and installation in the ATLAS Cavern, with a team of 40 people. (2006-2008).
- Wrote and delivered a part of the ATLAS Pixel Software (optical link test code using C++) for testing the Optical link communication with 1800 on-detector modules (80M channels) during its assembly and Installation (Summer 2007).
- Played an expert leading role for the BABAR Electromagnetic Calorimeter - EMC (2006). Led a team of graduate students for keep running the EMC electronics system (Front-end-boards, Analogue-to-digital boards) during the

BABAR data taking.

- BABAR online Data Quality Manager (2002-2005); implemented BABAR online data quality software and trained several graduate/undergraduate students/scientists/faculty to use the software for the BABAR data quality shifts.