Dr. Suyog Shrestha Curriculum Vitae

Contact Information

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Positions

Assistant Professor of Physics, Washington College	2022 - Present
Adjunct Assistant Professor of Physics, The Ohio State University	2022 - Present
Postdoctoral Researcher, CERN & The Ohio State University	2014 - 2021
Research Assistant, CERN & Iowa State University	2011 - 2014

Education

Iowa State University, Ames, IA	
Ph.D., Experimental Particle Physics	2014
Grinnell College, Grinnell, IA	
B.A., Physics	2006
Massachusetts Institute of Technology, Cambridge, MA	
Professional Certification, Applied Data Science	2023

External Grants (At WAC)

National Science Foundation LEAPS-MPS Grant (250K USD)	2025
American Physical Society Professional Dev. Grant (8.4K USD)	2024-25
US-ATLAS Equity, Diversity, and Inclusion Award (10K USD)	2024
Dept of Energy RENEW High Energy Physics Research Grant (1.2M USD, declined)	2024
NSF High Energy Physics Research Grant (200K USD, declined)	2024
NSF US-ATLAS Education Grant, USA (9K USD)	2023-2024
International Centre for Theoretical Physics (ICTP) Outreach Grant, Italy (6K Euros)	2023
International Particle Physics Outreach Group Grant, CERN (2K Euros)	2023
NSF High Energy Physics Research Grant (300K USD, declined)	2022

External Grants (Before WAC)

NSF US-ATLAS Outreach Grant, USA (7K USD)	2018-2022
International Centre for Theoretical Physics Course Dev. Grant, Italy (2K Euros)	2020
International Centre for Theoretical Physics Outreach Grant, Italy (5K Euros)	2019
Science & Technology Facilities Council Travel Grant, UK (1K GBP)	2018
CERN Int'l Relations & ICTP Outreach Grant, CERN & Italy (26K CHF)	2014-2017

Internal Grants

John S. Toll Fellowship Awards (continuous support since 2020)	2020-Present
Cater Seminar Grant	2023, 2025
Cromwell Fellowship for Course Development	AY 2023-25
Phi Beta Kappa Reception Grant	2023, 2024
William James Forum Fund	2023, 2024
Faculty Travel Award	2023, 2024, 2026
Faculty Enhancement Fund	2023, 2025

Honors/Awards

Grinnell College Alumni Award, Grinnell College	2023
Physics Mentor Award, The Ohio State University	2021
Graduate College Teaching Excellence Award, Iowa State University	2009
Richard G. Patrick Outstanding Teaching Award, Iowa State University	2009
Outstanding First Year Teaching Award, Iowa State University	2008
H. George Apostle Outstanding Senior Award in Physics, Grinnell College	2006
First runner-up, Iowa Collegiate Mathematics Competition	2005
International Merit Scholarship, Grinnell College	2003

Selected Peer-Reviewed Publications

I am a member of the ATLAS collaboration, which publishes about 100 papers each year. To many of these, I contribute through data-taking operations, trigger performance studies, detector calibration and simulation, and executing other responsibilities such as group coordination and student supervision. I appear as an author on all these publications, resulting in some 100 peer-reviewed, high-impact papers each year which bear my name, and since 2022, which also bear Washington College's name as my home institution. However, below is a list of peer-reviewed publications in which I have made significant contributions.

"Search for a heavy neutral Higgs boson (scalar H or pseudoscalar A) decaying into a heavy charged Higgs boson and a W boson," work in progress

"Search for a heavy scalar X decaying to di-Higgs in the 2b + 2l + MET channel with the Run2+ Run3 datasets collected with the ATLAS detector," work in collaboration review

"Search for Higgs boson pair production in the $bbWW^*$ final state with full Run2 data at $\sqrt{s}$ = 13 TeV with the ATLAS detector," under ATLAS Collaboration final review for submission.

"A search for triple Higgs boson production in a 6b final state using pp collisions at $\sqrt{s} = 13$ TeV with the ATLAS detector," ATLAS Collaboration, Phys. Rev. D 111 (2025) 032006

" Search for non-resonant Higgs boson pair production in final states with leptons, taus, and photons in pp collisions at $\sqrt{s} = 13$ TeV with the ATLAS detector," ATLAS Collaboration, Journal of High Energy Physics 08 (2024) 164.

"Search for Higgs boson pair production in the final state with 2 b-quarks, 2 charged leptons, and missing transverse energy at $\sqrt{s} = 13$ TeV with the ATLAS detector," ATLAS Collaboration, Journal of High Energy Physics **02** 037 (2024).

"Configuration and performance of the ATLAS b-jet triggers in Run 2," ATLAS Collaboration, European Physical Journal **C81**, 1087 (2021).

"Search for a heavy Higgs boson decaying into a Z boson and another heavy Higgs boson in the $\ell\ell bb$ and $\ell\ell WW$ final states in pp collisions at $\sqrt{s} = 13$ TeV with the ATLAS detector," ATLAS Collaboration, European Physics Journal **C81** 396 (2021).

"Combination of searches for Higgs boson pairs in pp collisions at $\sqrt{s} = 13$ TeV with the ATLAS detector," ATLAS Collaboration, Physics Letter **B800** 135103 (2020).

"Search for Higgs boson pair production in the dileptonic WWbb channel in pp collisions at $\sqrt{s}$ = 13 TeV," ATLAS Collaboration, Physic Letter **B801** 135145 (2020).

"Search for Higgs boson pair production in the $bbWW^*$ final state at $\sqrt{s} = 13$ TeV with the ATLAS detector," ATLAS Collaboration, Journal of High Energy Physics **04** 092 (2019).

"Search for Higgs boson pair production in the $WW^{(*)}WW^{(*)}$ decay channel using ATLAS data recorded at $\sqrt{s} = 13$ TeV," ATLAS Collaboration, Journal of High Energy Physics **05** 124 (2019).

"Search for pair production of vector-like top quarks in events with one lepton, jets, and missing transverse momentum in $\sqrt{s} = 13$ TeV pp collisions with the ATLAS detector," ATLAS Collaboration, Journal of High Energy Physics **08** 052 (2017).

"Measurement of the material of the ATLAS Inner Detector using Run-2 data from the LHC," ATLAS Collaboration, Journal of Instrumentation **12** P12009 (2017).

"Charged-particle distributions in $\sqrt{s} = 13$ TeV pp interactions measured with the ATLAS detector at the LHC," ATLAS Collaboration, Physics Letter **B758** 67 (2016).

"Search for pair production of new heavy quarks that decay into a W boson and a light quark in pp collisions at $\sqrt{s} = 8$ TeV with the ATLAS detector," ATLAS Collaboration, Phys. Rev. **D92** 112007 (2015).

Selected ATLAS Public Notes

Conference papers and other documents published by ATLAS are subject to a high level of peer-review within the collaboration. These are the notes in which I have made major contributions.

" Search for non-resonant Higgs boson pair production in final states with leptons, taus, and photons in pp collisions at $\sqrt{s} = 13$ TeV with the ATLAS detector," ATLAS Collaboration, ATLAS-CONF-2024-005

"Measurement of the ATLAS b-jet trigger efficiency in 2017 data," ATL-COM-DAQ-2019-077

"Search for pair production of vector-like top partners in events with one lepton and an invisibly decaying Z boson at $\sqrt{s} = 13$ TeV pp collisions at the ATLAS detector," ATLAS-CONF-2017-015.

"Search for pair production of vector-like top partners in events with exactly one lepton, at least four jets and large missing transverse momentum ," ATLAS-CONF-2016-101.

"Studies of the ATLAS ID material using $\sqrt{s} = 13$ TeV data," ATL-PHYS-PUB-2015-050.

"Charged-particle distributions in $\sqrt{s} = 13$ TeV pp interactions measured with the ATLAS detector at the LHC," ATLAS-CONF-2015-028.

Selected non-ATLAS Publication

"High Energy Physics in Africa, Latin America and other developing regions," Assamagan et. al, preprint on arXiv:2308.15373v1 (2023).

"Higgs boson potential at colliders: Status and perspectives," Di Micco et. al, Reviews in Physics **5** 100045 (2020).

"Search for 4th Generation Quarks with the ATLAS Detector at the LHC," S. Shrestha, AIP Conference Proceeding, 1560 (2013)

Colloquia and Seminars

"Voyage to the heart of matter," Sindhuli Multiple College, Nepal, 2026

"The Higgs Boson and the Quest for New Physics: A Journey into the Heart of Matter," Montgomery County Public Library Gaithersburg, Nov 2025

"Voyage to the heart of matter, and you should get onboard" St. Mary's College of Maryland, 2025

"Unraveling the mysteries of the universe at LHC," Public Talk, St. Xavier's College, Nepal, 2023

"Unraveling the mysteries of the universe at LHC," Public Talk, Deerwalk Sifal School, Nepal, 2023

"Higgs at 10! Ten years of measurements of the most recently discovered elementary particle," Physics Colloquium, Tribhuvan University, Nepal 2022

"Unraveling the mysteries of the universe one particle at a time ," Physics Colloquium, The College of the Holy Cross, MA 2020 (virtual)

"Higgs Boson as a tool in the search for new physics," Physics Seminar, Washington College, 2020

"Final Test of the Standard Model," High Energy physics Seminar, Ohio State University, OH, 2020

"Higgs boson as a probe in the search for new physics," Colloquium, Marietta College, OH, 2020

"Higgs boson as a probe in the search for new physics," Physics Seminar, University of Sussex, 2019

"Higgs boson as a tool to discover new physics," Physics Seminar, Grinnell College, Iowa, 2018

"Arresting God particle in Kathmandu," Public Seminar, Oxford University, UK, 2018

"Pushing the Frontiers of Knowledge at CERN's LHC," Colloquium, St. Olaf College, MN, 2017

"Borders and their human impacts colloquium series: Science without borders at CERN," Public Colloquium, Washington and Lee University, Lexington, VA, 2017

"Search for pair production and rare decay of the Higgs boson with the ATLAS detector," High Energy Physics Seminar, Iowa State University, Ames, IA, 2017

"Higgs Boson as a probe in the search for physics beyond the Standard Model," High Energy Physics Seminar, The Ohio State University, Columbus, OH, 2017

"Pushing the frontiers of knowledge at CERN," Public Talk, United States Edu. Fund, Nepal, 2017

"Taking high energy physics to higher altitudes," Public Seminar, ETH Zurich, 2017

"Voyage to the heart of matter," Public Colloquium, Kathmandu University, Nepal, 2016

"Search for new heavy quarks at ATLAS," University of Maryland, College Park, MD, 2014

"Search for a heavy, vector-like top-quarks," University of Texas-Dallas, 2014

Invited Talks in Conferences & Workshops

"Integrating Particle Physics Research in Undergraduate Curriculum at PUI," APS Global Summit, Denver, CO March 2026

"Involving Undergraduates from Liberal Arts Colleges in Particle Physics Research Undergraduate Education," APS Global Summit, Anaheim, CA March 2025

"Taking high energy physics to higher altitudes," APS April Meeting, Sacramento, CA 2024

"Career in physics," BCVPSIN School, Kathmandu University, Nepal, 2023 (virtual)

"Latest Di-Higgs results from ATLAS," APS April Meeting, Minneapolis, 2023

"ATLAS results on Di-Higgs," Higgs Hunting, Orsay-Paris, France, 2019

"Overview of ATLAS results on Di-Higgs search," Di-Higgs Workshop, Göttingen, Germany, 2019

"B-tagging trigger signature for Run3," Trigger Workshop 2019, Elba, Italy, 2019

"Status and prospect of Run2 Di-Higgs analyses in $bbWW$ and $WWWW$ channels," DBL-HBSM Workshop, Annecy, France, 2017

"Search for rare and exotic Higgs boson decay modes and Higgs boson pair production with the ATLAS detector," ICNFP2017, Crete, Greece, 2017

"Prospects for the search of Higgs boson pair production in pp collisions at $\sqrt{s} = 13$ TeV With the ATLAS detector," HH Orsay Workshop, Orsay, France, 2016

"Analysis of events with b-jets and a pair of leptons of the same charge in pp collisions at $\sqrt{s} = 8$ TeV with the ATLAS detector," PASCOS 2015, Trieste, Italy, 2015

"Understanding material distribution in the ATLAS inner detector with Run2 data," ATLAS Tracking Plenary, CERN, Switzerland, 2015

"Search for new heavy quarks that decay into a W boson and a light quark," U.S. ATLAS Workshop, Chicago, 2013

"Search for new heavy quarks that decay into a W boson and a light quark," ATLAS Physics and Performance Week, CERN, 2013

"Search for new heavy quarks at ATLAS," CIPANP 2012, St. Petersburg, FL, 2012

"Measurement of W boson helicity in top quark decay," APS Prairie, Iowa, 2009

Research Experience

Principal Investigator: The Shrestha Lab, Washington College 2022 - Present

I lead the particle physics group at WAC which consists of myself and students on 3 different fronts of particle physics research: theoretical, experimental, and computational. On computational front, I have trained several students on ATLAS data analysis. On experimental front, I have developed a hands-on particle physics lab for undergraduate students. In addition, students collaborate with other researchers at CERN, thereby gaining significant global exposure and experience. Since 2022, WAC has become an associate member of the ATLAS collaboration at CERN, which gives WAC students access to both data and supercomputing resources at CERN.

Lead Analyser & Analysis Coordinator: BSM Higgs Search 2024 - Present

The analysis aims to search for new types of Higgs bosons in the $bbWW$ 1-lepton final state in the pp collision data recorded by the ATLAS detector at CERN's Large Hadron Collider. I am the coordinator of the analysis project that consists of, besides myself and 2 WAC students, 3 professors, 3 PhD students, and 1 postdoc from Ohio State, University, University of Illinois-UC, and University of Warwick. Put simply, we are experimentally testing a theory that was proposed by Nobel laureate Steven Weinberg and colleagues in the 1970s. If discovered, the model will answer some of the pressing, outstanding questions in the field of particle physics.

Lead Analyser, Analysis Coordinator & Contact Editor: HH 1-lepton 2015 - Present

I was a lead analyser, analysis coordinator, and contact editor of an analysis that searched for pair produced Higgs bosons in $bbWW$ final state. I led a team of 20 researchers from 7 institutes to publish the result in the Journal of High Energy Physics (**Journal of High Energy Physics 04 092 (2019)**). This is the first result from ATLAS in $bbWW$ channel. This channel was previously deemed too challenging because of large background, and had not been tackled. My work demonstrated that the backgrounds can be controlled, and this channel could be a potential new way to study the Di-Higgs process. The second and improved iteration of this analysis with 5 times more data is currently under ATLAS collaboration review for submission to peer-reviewed journal.

Lead Analyser & Analysis Coordinator: HH 2-lepton 2017 - 2024

Building on the success of the 1-lepton channel mentioned above, I initiated the effort to include the 2-lepton channel. The analysis targeting only the non-resonant SM Higgs pair production in the

$bbll + MET$ final state was published in Physical Letter B (**Phys. Lett. B 801 135145 (2020)**), in which I demonstrated a great improvement in sensitivity, compared to the first iteration in the 1-lepton channel, to the signal by employing deep neural networks. Following the above publication, I initiated the second iteration of this analysis with sensitivity to larger class of signals. In the second iteration, I supervised several students, both undergraduate and graduate, to complete the analysis with much improved sensitivity. The manuscript has been published in the Journal of High Energy Physics (**Journal of High Energy Physics 02 037 (2024)**).

Lead Analyser, Coordinator, & Contact Editor: b-jet trigger performance 2017 - 2021
I led the study of the b-jet trigger performance in Run2 LHC data, deriving data-based correction to simulated studies. I was also selected the group co-coordinator to manage a team of about 30 researchers from 17 institutes. The work was published in European Physical Journal (**Eur. Phys. J. C 81 (2021) 1087**). Based on my extensive contribution, I was selected to be the contact editor (equivalent of corresponding author in smaller collaborative papers) of the published paper. I continue to supervise a graduate student from Ohio State on the calibration of the b-jet trigger.

Lead Analyser: Detector Simulation 2015 - 2017
I developed the framework for mapping the material distribution in the ATLAS detector using secondary hadronic interactions. This result, published in the Journal of Instrumentation (**JINST 11 11020 (2017)**) significantly improved the uncertainties associated with tracking.

Lead Analyser: Charged-particle multiplicities in the ATLAS detector 2015 - 2016
As a lead analyser of the analysis that measured the charged-particle multiplicity in proton-proton collisions, I validated simulated sample and measured the systematic uncertainty on the tracking efficiency. The paper is published in **Phys. Lett. B 758 67 (2016)**.

Lead Analyser, Analysis Coordinator & Contact Editor: VLQ Analysis 2013 - 2015
I was a lead analyser, analysis coordinator, and contact editor of an analysis that searched for pair produced vector-like quarks in the $Hq/Zq/Wq$ final states. Leading a team of 8 researchers from 3 institutes, I improved the previous limit on the mass of the new particle by 350 GeV, and also produced the first result on the mass of a VLQ in the two dimensional plane of BR($Q \to Wq$) versus BR($Q \to Hq$). The analysis was published in **Phys. Rev. D 92, 112007 (2015)**.

Likelihood-based kinematic fitting package 2013 - 2017
I developed a likelihood-based kinematic fitter for reconstruction of top-quark events. I also defined a log likelihood ratio discriminant that distinguishes new, heavy quarks from the main background, top-quarks. In 2017, I supervised a student to derive transfer functions at a higher center-of-mass energy for a kinematic fitting package, extensively used to reconstruct top-quark events in ATLAS.

Data Quality Monitoring in the ATLAS Control Room 2012 - 2016
I monitored the performance of different sub-systems of the ATLAS detector and the luminosity infrastructure, identified any potential problem, and coordinated among system shifters, ensuring high-quality data for the ATLAS experiment. Data taken during this period have resulted in several highly cited publications, among them the measurements of the Higgs boson properties.

Data Production and Validation 2009 - 2011
I produced simplified format for both simulated and actual proton-proton collision data. I significantly expanded the prototype data validation package, and validated the official data-making software. I investigated codes across different groups and documented the data content for the entire collaboration of 3000 physicists. This work was critical in my qualification as an author of the ATLAS collaboration's Higgs boson discovery, which resulted in the Nobel Prize in Physics in 2013.

Leadership

Organizer: BCVSPIN International Conference in Particle Physics and Cosmology, Kathmandu, Nepal Dec 2024
I was a leading organizer of a one-week long conference in particle physics and cosmology in Kathmandu in Dec 2024. The program, BCVSPIN, was originally conceived by Nobel laureate Abdus

Salam, and aims to inspire the next generation of scientists in Asia. The program in 2024 consists of a conference, 3-day workshop for university students, and several outreach programs in high schools. Keynote was delivered by Prof. Kajita Takaaki (Physics Nobel, 2015), who also gave a public colloquium at Rato Bangla High School. We raised over 20K USD for the conference, with which 39 student participants were supported.

***De facto* National Contact: Nepal @ CERN** 2013 - Present
I worked with the Ministry of Science and the Ministry of Foreign Affairs to accomplish the signing of International Cooperation Agreement with CERN. I coordinated the actions between CERN and researchers from Nepal and contributed to the grant proposal submitted to the European Commission. I continue to work with CERN Education and Outreach to recruit students and teachers from Nepal for training programs. A total of 11 high school teachers and 13 undergraduates from Nepal have been trained at CERN.

Organizer: Supercomputing Workshop, Kathmandu University October 2019
I organized a high performance computing workshop at Kathmandu University with 3 guest scientists from CERN and several local scientists.

Convener: Di-Higgs Kickoff Workshop, CERN February 2019
As a chair of the Di-Higgs search session, I prepared the agenda, invited the speakers, led the discussion, and prepared the summary of the session. As a result, 6 distinct analyses were launched targeting distinct topologies. These analyses have either been published or are expected to be published soon.

Convener: HH Production at Colliders Workshop, Fermilab September 2018
As a convener of the $bbVV$ session, I prepared the agenda, invited the speakers, led the discussion, and prepared the summary of the session. Subsequently, I edited a chapter of the workshop white paper, which was published in the journal **Reviews in Physics 5 100045 (2020)**.

Organizer: SAHEPI Workshop June 2017
I organized the first South Asian High Energy Physics Instrumentation (SAHEPI) Workshop. This was the first of a series of workshops to be held across South Asia to strengthen the region's ties with CERN. Following the workshop, I led a partnership with CERN to establish a high performance computing facility at Kathmandu University, the first of its kind in Nepal.

Student Supervision

I have immensely enjoyed working with students. In a big collaboration such as ATLAS, there are several self-contained and well-defined projects to which undergraduate students can make significant contributions. Below is a list of select students I have supervised. All of these works have contributed to papers we have published, or will publish.

- Ms. Yar Mary Ajang Amol, REU 2025-26 (Washington College)
- Ms. Kelsey Sanderell, REU 2025-26 (Washington College)
- Mr. Justin Chrien, Summer 2025 (Cal State Uni) (Cal State Uni)
- Ms. Fidaa Qorom, CERN Summer 2024 (Nablus Palestine) (University of Grenoble, France)
- Mr. Tapas Kumar, REU+SCE 2022/2023/2024 (Washington College)
- Mr. Zheng Lu, REU 2024-25 (Washington College)
- Mr. Jason Ikenaga, REU 2022/2023/2024 (Washington College)
- Ms. Rano Marufova, REU 2023 (Washington College)
- Ms. Eniya Jaber, REU 2022 (Washington College)
- Mr. Xiang Zhang, REU 2021 (Ohio State University) (PhD student at University of Virginia)
- Mr. Jacob Borison, REU 2021 (Ohio State University)
- Ms. Shiksha Pandey, CERN Summer 2021 (Bryn-Mawr College) (PhD student at Penn State)
- Mr. Dmitriy Zubov, CERN Summer 2021 (National University of Nuclear Research, Russia)

- Mr. Pratik Kafle, REU 2020 and 2021 (Reed College) (PhD student at Michigan State)
- Ms. Sneha V. Dixit, REU 2021/2022/2023 (WAC) (PhD student at Uni of Nebraska, Lincoln)
- Mr. Peyton Stewart, REU 2020 (Washington College) (PhD student at Clemson University)
- Ms. Rasmita Timalsina, CERN Summer 2020 (PhD student at Catholic Uni of America)
- Mr. Zhenyu Wu, REU 2019 (Ohio State University) (PhD student at University of Virginia)
- Mr. Chaosong Chen, REU 2019 (PhD student at Pennsylvania State University)
- Ms. Caeley Pittman, CERN Summer 2019, Report Link (PhD student at Boston University.)
- Mr. Roshan Joshi, CERN Summer 2019, Report Link (PhD student at Ohio State University)
- Ms. Rami D. KC, CERN Student 2018, Report Link (M.Sc. at St. Xavier's College, Nepal)
- Ms. Jessica Sydnor, CERN Student 2018, Report Link (PhD student at W. Virginia Uni.)
- Mr. Anthony Ciavarella, REU 2017, Thesis Link (PhD student at University of Washington)
- Ms. Kalpanie L., CERN Summer 2017, Report Link (PhD, Uni. of Ruhuna, Sri Lanka)
- Ms. Stephanie Fouts, REU 2016 (graduated from Washington & Lee University)
- Mr. Mahesh Thakuri, CERN Student 2016, Report Link (PhD student at OK State Uni.)
- Mr. Santosh Parajuli, CERN Student 2015, Report Link. (Postdoc at UI-Urbana Champaign)

In addition, I have also supervised, and continue to supervise, the works of several Ph.D. students. Below is a list of select Ph.D. students whose research I have supervised.

- Ms. Rachel Ashby Pickering, PhD candidate at University of Warwick, UK. Ms. Ashby Pickering and her supervisor are my collaborators.
- Mr. David Jiang, PhD candidate at University of Illinois - Urbana Champaign. Mr. Jian and his supervisor are my collaborators.
- Mr. Roshan Joshi, PhD candidate at Ohio State University. Mr. Joshi and his supervisor are my collaborators.
- Dr. Santosh Parajuli, PhD from Southern Methodist University. I served on Mr. Parajuli's thesis committee. He is currently a postdoc at UI-UC, and is my present collaborator.
- Dr. Benjamin Tannenwald, PhD from Ohio State (Senior Data Scientist at Metro Transit Authority, New york)
- Dr. Nurfikri N., PhD from University of Oxford (Postdoc at University of Helsinki, Finland)
- Dr. John Myers, PhD from University of Oregon (Data Scientist in Oregon)
- Dr. Giovanni Bartolini, PhD from from CPPM, France (Research Scientist in Italian company)

Select WAC Student Talks

- Studying the Top Quark Process as a Background in the Search for BSM Higgs Bosons, Zheng Lu '25, US-ATLAS National Symposium, August 2025
- Development of Kinematics-based Likelihood Discriminant in the Search for BSM Higgs Bosons, Tapas Kumar '24, US-ATLAS National Symposium, August 2024
- Modeling Top Quark Background for New Higgs-Boson Search at the Large Hadron Collider, Zheng Lu '26, ATLAS BSM Higgs Search Meeting, July 2023
- Modeling Top Quark Background for New Higgs-Boson Search at the Large Hadron Collider, Zheng Lu '26, John S. Toll Presentations, Summer 2023
- Trigger studies for Di-Higgs Search at the Large Hadron Collider, Sneha V. Dixit '23, US-ATLAS National Symposium, August 2023
- Developing particle physics lab for undergraduate curriculum, Tapas Kumar '24, John S. Toll Presentations, Summer 2023
- Classification of signal and background in search for Di-Higgs Boson at Large Hadron Collider, Rano Marufova '23, John S. Toll Presentations, Summer 2023

- Higgs Boson as a Tool for Search for New Laws of physics at CERN's Large Hadron Collider, Eniya Jaber '23 and Tapas Kumar '24, AstroPhilly22 Conference, Villanova Uni, 2022
- Higgs Boson as a Tool for Search for New Laws of physics at CERN's Large Hadron Collider, Eniya Jaber '23 and Tapas Kumar '24, John S. Toll Presentations, Summer 2022
- Modeling top-quark in the search for Di-Higgs Search at the Large Hadron Collider, Sneha V. Dixit '23, John S. Toll Presentations, Summer 2021
- Background modeling in the search for Di-Higgs with the ATLAS detector, Peyton Stewart '21, John S. Toll Presentations, March 2021
- Background modeling in the search for Di-Higgs with the ATLAS detector, Peyton Stewart '21, ATLAS Di-Higgs Meeting, Nov. 2020

Select WAC Student Posters

- Integrating Particle Physics Data Analysis into Undergraduate Curriculum Using Jupyter Notebooks, Kelsey Sanderell '27, American Physical Society Global Summit, March 2026
- Kinematic Studies of BSM Higgs Search in the Di-Lepton bbWW Channel, Yar Mary Amol '27, American Physical Society Global Summit, March 2026
- Reducing Systematic Uncertainties in Top-Quark Modeling in the Search for BSM Higgs Bosons, Kelsey Sanderell '27, ATLAS Collaboration Week at CERN, May 2025
- Modeling Top Quark Background for New Higgs-Boson Search at the Large Hadron Collider, Zheng Lu '26, American Physical Society Global Summit, Mar 2025
- Modeling Top Quark Background for New Higgs-Boson Search at the Large Hadron Collider, Zheng Lu '26, Fall Family Weekend Poster Session, Sep 2024
- Developing particle physics lab for undergraduate curriculum, Tapas Kumar '24, Fall Family Weekend Poster Session, Oct 2023
- Classification of signal and background in search for Di-Higgs Boson at Large Hadron Collider, Rano Marufova '23, Fall Family Weekend Poster Session, Oct 2023
- Higgs Boson as a Tool for Search for New Laws of physics at CERN's Large Hadron Collider, Eniya Jaber '23 and Tapas Kumar '24, Fall Family Weekend Poster Session, Oct 2022
- Modeling top-quark in the search for Di-Higgs Search at the Large Hadron Collider, Sneha V. Dixit '23, Fall Family Weekend Poster Session, Oct 2021

Education and Outreach

Organizer: WAC-NSF Physics Workshop, Washington College Fall 2025

Organized and led an NSF-supported outreach workshop at Washington College that brought QACHS and KCHS students to campus for immersive, hands-on experiences in physics and data science. The program introduced participants to particle physics, computational analysis, and real-world particle physics applications using simplified LHC worksheets. Through guided activities and mentorship, students gained exposure to college-level STEM learning, research practices, and pathways into physics and data-driven careers, with a particular emphasis on broadening participation from rural communities. 3 students from these groups have enrolled in PHY194, a dual-enrollment course that is an introduction to particle physics research. I am voluntarily offering this course in spring 2026.

Organizer: BCVSPIN Particle Physics School, Kathmandu University May 2023

I organized a two-week long summer school in particle physics and cosmology in Kathmandu in May 2023. The school, BCVSPIN, was originally conceived by Nobel laureate Abdus Salam, and aims to inspire the next generation of scientists in Asia. Several successful editions of the school have been held since 1989, traditionally supported by the local institutions and International Center for Theoretical Physics (Trieste, Italy). In 2023, we secured grants from The Bartol Institute (Uni of Delaware), NSF-funded US-ATLAS program, ICTP, IPPOG, and in-kind contribution from the local universities. The funding made it possible to fully sponsor 64 participating students. As part of the program, I gave a talk titled Career in Physics, and served on the panel for the discussion that followed.

Organizer: Particle Physics Winter School, Kathmandu University December 2018
I organized a Particle Physics Winter School in Nepal in partnership with ICTP (Italy) and US ATLAS Outreach Program of the National Science Foundation (USA). I gave lectures on particle physics to undergraduate students, and led hands-on session to analyse LHC data. I discussed career choices for physics students and reviewed their resumes.

Coordinator: Particle Physics @ CERN, Washington & Lee University 2016 - 2018
As the coordinator for the CERN visit of the spring term particle physics course given at Washington & Lee University, I prepared the visit agenda, gave lectures, invited guest lecturers from various CERN experiments, and moderated scientific and career-related discussions for students.

Organizer: Physics Without Frontiers-Nepal 2014 - 2016
I organized the first (2014-15) and second (2015-16) Physics Without Frontiers programs in Nepal in partnership with ICTP (Italy) and CERN. I gave lectures on particle physics and led hands-on session to analyze LHC data. I also moderated a video conference with scientists in the ATLAS Control Room, and discussed career choices for physics students and reviewed resumes. As part of the program, I visited high schools in rural Nepal, engaged the general public by screening the movie, Particle Fever, and served on the panel discussing the importance of basic science.

Particle Physics Masterclass 2013 - 2016
I moderated video conference from CERN to high schools across the world within the framework of the International Particle Physics Masterclass program. I led the student discussion on the hands-on analysis of LHC data that the students carried out, and discussed career options for physics majors.

Service to Community

Co-Coordinator: McLain Society Science Fiction Seminar — Spring 2026
Member: Washington College International Education Committee — July 2023 - June 2025
Advisor: Washington College Society of Physics Students — 2022 - Present
Co-Coordinator: McLain Society Environmental Science Seminar — Spring 2024
Co-Coordinator: McLain Society Physics Seminar — Spring 2024
Co-Coordinator: William James Forum Math/AI Seminar — Spring 2024
Member: Global Education Office Director Search Committee — Sep 2023 - May 2024
Member: Physics Department VAP Search Committee — Fall 2023
Co-Coordinator: Screening of Particle Fever movie and Panel Discussion — Spring 2024
Coordinator: William James Forum Bio/BioChem Seminar — Spring 2024
Co-Coordinator: Gibson-Wagner Computational Neuroscience Seminar — Spring 2023
PI/Advisor: Washington College Cater Society Outreach in India — Dec. 2022
Panelist: US-ATLAS Education and Outreach Program, Cal State Uni, East Bay — Oct. 2022
Voluntary Supervisor: Independent Research by WAC student Peyton Stewart — Fall 2020

Referee: *Journal of Instrumentation (JINST)* 2017 - Present
I review manuscripts on instrumentation in high energy and medical physics.

Editorial Board Chair: Search for resonant particle decay to 2 Higgs bosons 2025 - present
I am the editorial board chair of an ATLAS analysis that searches for resonant, new particles that decay into 2 Higgs bosons in the dilepton bbWW channel.

Editorial Board Chair: Search for triple Higgs production 2023 - 2025
I was the editorial board chair of an ATLAS analysis that searched for triply Higgs boson production in the $6b$ final states, now published by the Journal of High Energy Physics.

Editorial Board Chair: Vector-Like Quark Search 2018 - 2021
I was the editorial board chair of an ATLAS analysis that searched for heavy Higgs boson in the $bbll$ and $llWW$ final states, in a peer-reviewed paper, **Euro. Phy. Journal C 81 396 (2021)**.

Member: HPC Steering Committee, Kathmandu University 2019 - 2021

I served on the high performance computing (HPC) steering committee, which drafted the directives and usage policy for the computing facility for university-wide use. I also coordinated between the experts at CERN and the local team to maintain and operate the HPC facility.

Panelist: Roadmap for Sustainable Development, EPFL, Switzerland August 2017
I presented a case for the need to invest in basic science for sustainable development and the immediate need to establish a high performance computing facility in Nepal in order to digitize, collect, preserve, and analyse data on all fronts so as to inform policy-making.

Editorial Board Member: Vector-Like Quark Search 2016 - 2017
I was an editorial board member of an ATLAS analysis that searched for vector-like quark in the ZtX final state, resulting in 2 conference papers and 1 peer-reviewed paper, **Journal of High Energy Physics 08 052 (2017)**.

Public Articles/ Interviews

- The Meaning of Being a Scientist, Podcast Interview
  - https://www.youtube.com/watch?v=JeTFKsJ1Rto
- 2023-alumni-award-recipients
  - https://alumni.grinnell.edu/awards/2023-alumni-award-profiles-suyog-shrestha
- Washington College Becomes Member of International ATLAS Collaboration
  - https://www.washcoll.edu/live/news/atlas-collaboration.php
- Physicists work to bring more undergrads into research
  - https://www.symmetrymagazine.org/article/physicists-work-to-bring-more-undergrads-into-research
- Voice of America Science Edition: CERN's Large Hadron Collider
  - https://www.voaafrica.com/a/6659770.html
- From Nepal to Grinnell to Switzerland and beyond
  - https://campaign.grinnell.edu/our-stories/suyog
- The Internship Must Go On
  - https://www.washcoll.edu/stories/peyton-stewart.php
- Sharing CERN with Nepal, Symmetry Magazine
  - https://www.symmetrymagazine.org/article/sharing-cern-with-nepal
- A Career in Quantum Physics, Sujhaab Chautaari
  - https://chautaari.com/career-quantum-physics
- Physics Diplomacy, ICTP News
  - https://www.ictp.it/about-ictp/media-centre/news/2016/2/physicswithoutfrontiersnepal.aspx
- Representatives from CERN to Visit W&L, The Columns
  - https://columns.wlu.edu/representatives-from-the-european-organization-for-nuclear-research-to-visit-wl